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CARDIOTHORACIC NEWS

An official publications of
Association of Thoracic and Cardio Vascular Surgeons of West Bengal

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An official organ of

Association of

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Cardio Thoracic News - Joint Editors

From the desk of the President

Dear esteemed members and delegates,

It gives me inmense pleasure to welcome you all to this ASM 2024 ATCVSWB and NEEACTS. Since 1998 ATCVSWB has stood as a joint platform of doctors working in public and private healthcare sector to contribute to growth and excellence in the field of Cardiothoracic Surgery.

Annual Scientific Meet initiated in 2014 has become a vibrant event, fostering innovations, sharing of knowledge, advancements and skill enhancements through workshops.

ASM 2024 is particularly significant as it marks several important milestones for us. Our proud achievement is first ever successful bilateral lung transplant on 1st May 2024 in West Bengal. I would take this privilege to congratulate once again the whole transplant team.

Our mission to expand the association and to create a greater umbrella, encompassing Eastern and North Easter states through NEEACTS is on the verge of seeing day light soon. Hope this initiative will strengthen our collaboration and broaden our horizon beyond geographical boundaries. We extend a warm welcome to all delegates particularly those joining us from those states.

In addition we are making a significant strides in documenting the history of Cardiothoracic Syrgery in Bengal which will serve as a valuable resource for future generations.

The "Cardiothoracic News" the official organ of the association has played a fundamental role in this archival project. I sincerely thank its editors and the team for their unwavering commitments.

Together let us continue to strive for excellence and innovation in Cardiothoracic Surgery, shaping a brighter future for the healthcare community.

I wish this ASM 2024 a grand success.

Thanks.

Dr. Ashis Mandal
President

From the desk of the Secretary

Dear Esteemed Colleagues,

On behalf of the Organising Committee, ASM 2024,

I extend warm welcome to all of you in our upcoming 26th Annual Scientific Meet to be held on 21st & 22nd December, 2024 of ATCVSWB in association with NEEACTS at Taj Vivanta, Kolkata.

In this event, we will have the opportunity for insightful discussions on various topics. Our beloved city is gradually becoming prominent in organ & tissue transplantation in this region, and we did the first successful bilateral lung transplantation. In this meet lung transplantation will be one of the important topics.

The Association of the Surgeons of Northeast & Eastern Region is being registered with it's registered office at Kolkata. Your participation is invaluable and will definitely enrich us academically , as well as strengthen our fraternity in this part of the country.

The members from these states need active participation in this budding phase of the NEEACTS.

Our project about the archive on the history of Cardiothoracic Surgery in Bengal is in the process with diligent participation of the Editorial Board of the "Cardiothoracic News". We are really thankful to them and I hope it will be there soon.

I sincerely thank our sponsors and invite generous participation as patrons for ATCVSWB and the on-growing NEEACTS.

Thanks and regards

Dr. Subhendu S Mahapatra
Secretary

From desk of the Editor

Prof. Ajay Kumar Chandra, ex principal of NRS Medical College, then of Calcutta Medical College, then director of IPG MER, then DME of West Bengal, when he was my guide of MS thesis in 1983, told, you should not, you need not copy surgical techniques of other hands. Moreover results of surgery by same process may be different in different hands of surgeons and different in different patients. You have to see same surgical process from different surgeons. Then you have to develop your own style which will be best from your hand. Don't follow blindly others.

Prof Saibal Gupta, about 3 decades back, in one published article in Bengali weekly 'Desh' wrote that he will advise his juniors to go abroad to different centers of cardiac surgery to see what they are doing and more to see how they are doing, more important to see how they have come to this stage of activity. If you learn only what they are doing, you will after coming back to your country, you will just go on copying what you have seen there. You will not advance. By that time they will advance a few decades ahead of you. That means you will never be equal to them. You will always remain behind them. But if you know how they have come to this stage of activity, you will advance, you will research. One day you will be equal to them. May be, you will be ahead of them, one day.

In this volume a write up on interview of Prof Saibal Gupta is printed. I have tried to keep words of him as they were. Those interviews of him are in my site in YouTube. Sorry for some mistakes in grammar and in composition, as it was in the interviews.

Some articles unedited are printed to enable others to see how works are going on in our discipline of Cardiothoracic Surgery in different centers.

When, we are standing on earth surface, we can see up to some horizon. If we stand on shoulder of wisdom of ancesstor, we can see up to a bigger horizon. Let me end with a quote from lips of Prof. Ajoy Kr. Chadra " Nature. Mother has given words to mouth of human to express mind to others, but, tragedy when they use it to hide mind".

Dr. Madhusudan Pal
Editor

Message from the President, NEEACTS

Hope this letter finds all the eminent and budding Cardiac surgeons in good health. This gives us immense pleasure to introduce a young but promising organization of Cardiovascular and Thoracic surgeons of Northeast and Eastern part of India under one roof, NEEACTS.

Learning is a continuous process which should embrace old teachings and must incorporate newer technologies. As a new association, we invite all seniors and budding cardiac surgeons of this region to come hand in hand with us to empower our knowledge in this ever emerging field. Together we can learn, advance our surgical skills and with team approach can make immediate and long term surgical outcomes predictable.

Since 2022, NEEACTS has acted actively to incorporate not only established surgeons but also the young buds who are ultimately the torch bearers of our future.

Let's all join together to march ahead with the technological advancement and innovations in cardiovascular and thoracic surgery for a brighter future.

Thank you all,

Dr. Bipin Bihari Mohanty
President, NEEACTS

Message from the Vice President, NEEACTS

Dear esteemed colleagues and all the members of Cardiothoracic fraternity of Northeast & Eastern India.

As we congregate for the Annual Scientific Meet 2024 organised by Association of Thoracic and Cardiovascular Surgeons of West Bengal (ATCVSWB), I take this opportunity to thank all the members and the office bearer of ATCVSWB for hosting the same and given us the platform to officially launch the newly formed Association of so called greater Eastern India comprising not only eastern but the entire North Eastern region of India namely (NEECTS).

This convergence of Cardiothoracic professionals will definitely help us in showcasing the expertise of entire region in terms of Cardiac Surgical care equivalent to the National level in unison with Indian Association of Cardiovascular Thoracic Surgeons of India.

I am truly honoured and excited today as one of you to express my opinion as the Vice-President of newly formed NEECTS. I take this opportunity to congratulate the President, office bearers along with the entire members of the region whose collective decision and cooperation will definitely help us to transforming cardiac surgical landscape to world standard.

The possibilities we looked for regular performance of our works with excellence but to serve a broader cause of fulfilling our social responsibilities with high moral & ethical standard along with legal obligations.

Though we differ geographically and culturally in these vast Eastern India but we all embark on this new journey together with a single motto of imparting knowledge and service as Cardiac Surgical fraternity not only to the region but also to the entire Nation.

The formation of our Society marks the beginning of a crucial chapter where we all can cultivate professional relationship, share knowledge and elevate our standard of practice in conformity with national and international level.

I want to emphasize that our central mission is to collaboration, innovation, promote excellence in cardiac care and research. The challenges we face in the Cardiac Surgery are immense but by working together we can mitigate all these difficulties and enhance our outcomes. I am sure the association will serve as a platform for discussion, guiding young one with mentorship and allowing every member with an opportunity to share their voice for common goal to achieve excellence in the field of Cardiac Surgery.

I urge each one of you to actively participate in our activities and your engagement is vital to our successas a Society. Let us come together to support one another to face all the challenges and marched ahead.

Finally, I want to express my gratitude for your support and I am excited to work with all of you so as to make this Association as a beacon of excellence in our field.

Merry Christmas and Happy New Year to you all in advance.

Dr. Manuj Kumar Saikia
Chief Cardiac Surgeon & HOD Dept. of Cardiac Surgery
Apollo Excel Care Hospital, Guwahati, Assam
Former Professor & HOD CTVS, NEIGRIHMS, Shillong

Dr. Saibal Gupta

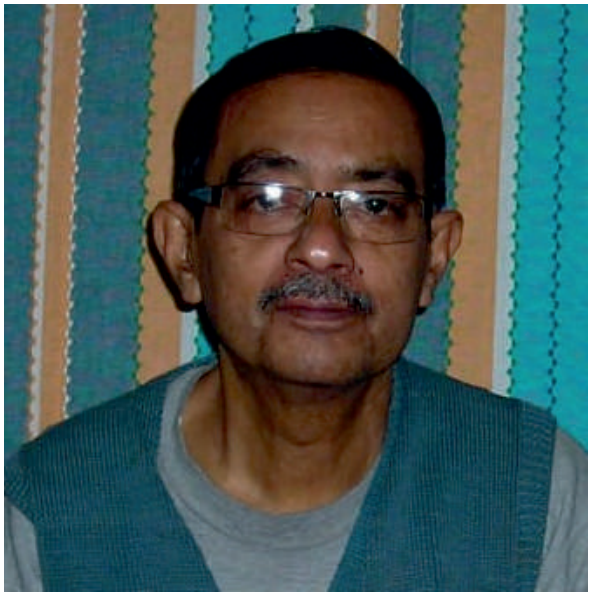
Born on : 28th February, 1938 **Died on : 16th November, 2024**



One of the best students of Medical College Calcutta joined as research officer of animal lab (dog lab) under Cardiothoracic Surgery department under Prof. A. K. Basu in newly developed IPGMER. He improved Lillehei model of machine with changes in cooling heating, oxygenator, filter components. With help from this machine Prof. A. K. Basu performed first open heart surgery in India in IPGMER in 1962. Most brilliant independent period of his works for eight years from 1973 to 1980 was in NRS Medical College. His notable works, first successful total correction Tetralogy of Fallot in India in 1974, salvage and preservation of cardiac valves from dead body for use as homographs with success, then on mitral valves in India in 1974, studies on hemodynamics, immunological abnormalities in Takayasu's disease with successful operations with vascular grafts. Last one made him Hunterian in Royal College of Surgeons in 1981. His writings in volumes and in articles in some journals on social, cultural and historical subjects are also significant. All along an innovative mind, never a blind follower, a never blind copier, a man of his own style, a doyen of cardiothoracic surgery in India, is first in many operations.

Dr. Chayan Roy

Born on : 7th July, 1946 **Died on : 22nd May, 2024**



Father's Name - Prafulla Ch. Roy

Address - Shikhba Pava, PO + PS - Bankura

M.S. in General Surery - 1984

M.Ch. - CTVS - 1987

In SSKM / IPGME&R - from - 24.11.78 to 22.6.84

In R G Kar MCH - GM - 23.6.84 upto 31.9.2006 as RMO cum Clinical Tutor, Lecturer. Assistant Professor, Associate Professor.

One of the best medical graduates from Bakura Shammilani Medical College joined rural service in Department of Health, West Bengal. Then he joined Cardiothoracic Surgery in IPGME&R /SSKM Hospital. There he passed MS. Surgery. Then he along with Prof. S. M. Sengupta was transferred out to R G Kar Medical College, Cardiothoracic Surgery. But that time in R G Kar Medical College, there was no independent Cardiothoracic Surgery department. Only a few beds in surgery wards were allotted for Cardiothoracic Surgery patients and only one table twice per week from out of the tables for General Surgery was allotted for Cardiothoracic Surgery. Dr. Roy did M.Ch in CTVS under Prof. S.M. Sengupta.

Political untouchability, arrogance, mismanagement of Health dept of state displaced some able honest persons to places where proper works could not be done. Dr. C. K. Roy is one of such victims. In last phase of his career he was offered Professorship by the Department of Health, which he refused to accept. He had angioplasty with multiple stents, but could not take any anticoagulant, antiplatelet agents, as it caused GIT haemorrhages.He continued. He was very honest, sincere and sympathetic to his patients.

Health Ministry of state has failed to use skill, sincereity, dedication of such a man for goodness of people. He never bowed down to political dictats.

Prof. Saibal Gupta, As I knew Him (from interviews)

Dr. Madhusudhan Pal

Part-1

Sir, Your Childhood days, Presidency college Period, and Medical College days - How those were? Please narrate.

I was born on 12 February 1937, but my official date of birth is 28 February 1938. This is because, when I was put into school, my age was reduced by one year. My real birth year is 1937, but my official one is 1938.

I started school very early in my life. I could not take pressure. I started showing problems which I cannot remember now. I was myopic. Before I was admitted to school in Darjeeling, my father was transferred there. When I was just two and a half year old, I developed severe diphtheria with respiratory distress. My elder sister, who was senior to me by two and half year, also developed diphtheria died. I was almost dying, and my family was on holiday.

My parents rushed me from the hills to Kolkata (then Calcutta) and admitted me to the medical college (Carmichael, now R.G. Kar Medical College). The doctors wear about to perform an emergency tracheostomy to save my life. I don't know why that was not done .I was given big injection of anti Diphtheria serum. Antibiotics weren't available at that time. No othermedicines were there.

I have got some cardiac effect from it. It was only Medical College at that time which had the first Electro cardiograph machine in Calcutta, may be in whole India. Dr. Jogesh Gupta was Head of Dept-of Cardiology, who was also our family relation I am possibly only living person, I think the only who underwent electrocardiogram (E.C.G). my ECG has some faults .They are still now. That creates confusions in minds of doctors.

I somehow survived. That is the story of my life. My father had transferable jobs, so I went through different schools—from one to another. I passed the matriculation examination in 1951 from Ballygunge Government High School, but before that, I had to stay in one rural school without electricity. When I was in class 9, I spent one year there and had the unique opportunity to learn Hindu and Christian religious studies side by side. It was a school run by the Oxford Mission, and we were taught both the Bible and the Upanishads. That has affected my major grasp on the religious life of India.

I was not very good in English because I never read English seriously. I was all along in Bengali-medium schools. When I came to look at the library at the age of 12 or 13, I read all the available books. That was my initial focus on English.

So, after passing intermediate science in St. Xavier's college, I was supposed to enter Medical College.

But I could not enter medical college for of the one year deduction from my life, I did not have the required age.

So, I was admitted to the Physiology Department (B.Sc. Honors) in Presidency College. After one year, I was admitted to Medical College as I had good marks. But I got so much interest in theoretical and practical physiology that I wanted to continue in Presidency College. So, during the second year, I was in both Calcutta Medical College and Presidency College. It was not allowed, but somehow, it remained unnoticed by the authorities. After I passed out, it was told that it was not legal.

Studying physiology strengthened my base for studying medicine. I was doing moderately well, receiving prizes and medals, also excelling in sports because I had an interest in sports too.

When I was in the 5th year, in my preclinical subjects, before my dissertation, Prof. Director of Gynecology and Obstetrics, who was also Principal of Medical College, told me to take charge unit of early detection of cancer, as I was one of the good boys in Gynecology and obstetrics. I took charge. My first paper was 'Exfoliative cytology in Early detection of cancer' It was published in journal of Medical College. It was first paper of my life. Then my life turned to different direction. I saw a news paper article, where the story was of Doctor Lilihi, who saw a new born baby with cardiac defect in Vienne. Then, the new born baby and mother was taken to surgical- complex in Vienna. Blood circulation of mother was connected to that of baby by Dr. Lilihi. This was a report in one Indian Journal by one Indian Doctor, who was then studying Neuro surgery in Vienna. (Is it Dr, Asoke Bagchi). Yes Dr Asoke Bagchi, who became Neuro surgeon in Calcutta. Thereafter, I decided to be a cardiac surgeon. That invited for me a lot of fun from my friends.

Part-2

Q: Sir, please now tell about your chapter in SSKM/ IPGMER hospital.

Answer: when I was in Medical College, in my final year, I have got involved in early detection of cancer, particularly cervical cancer, in Gynae Department. Yes, it was new at that time. That time I had no decision in which direction I shall move after my registration. That time, in one newspaper, I came across one small article written by Dr. Ashok Bagchi who was studying in Neurosurgery in Vienna, Austria The article was on fact of one baby with VSD being operated by Doctor Lillehei, after connecting the blood circulation of baby to mother circulation. I was thrilled by it. Then I decided to be a cardiac surgeon. I told my father that I need to go to Europe to learn it. My father told me, is there no one in India from whom you can get some primary training on it? I told that Prof. A. K. Basu has started one department in newly established at IPGMER/ SSKM hospital. Why not you are going to meet Professor Basu and tell him your desire, my father told me. I went to meet Professor A. K. Basu. I joined as research officer in animal lab (dog lab) newly built in this campus. In this lab to help others, in their research I had to puncture systems of animals for CSF study, to measure intracardiac pressure of dogs I had to puncture heart of dogs directly trans thoracic. Those were thrilling to me and I loved my works in dog laboratory. My main work was on improving the Lillehei model, which was already obsolete. This was a gift of Lillehei to us. I was working days and nights, in H. Mukherjee-Banerjee surgical workshop in outskirts of South Calcutta to develop a new model with heating cooling system, for oxygenation oxygenator, filter all were newly developed. Initially we used this composite machine on dogs I observed the damages in brain and other systems of dog I developed fluid composition to be used in extra corporeal circulation to minimize tissue damage. When consecutive dog experiments were successful, we used the machine for human. First case was a female with ASD, then consecutive 8 cases of ASD were successful. Then patients with complex heart diseases died. Those deaths were not for defect

of the fluid or machine but for some inadequate understanding of the complex nature of pathology inside hearts. [But, you were not allowed to publish your papers. Yes, Doctor Gupta replied]. Then I went abroad. After my exit from IPGMER, scheme of open heart surgery collapsed. And other two persons also left the Department.

Part-3

I applied for going abroad and my teachers gave recommendations to my for going to Sweden. For want of money, my going outside was being postponed repeatedly Moreover I was then working on effects of extra corporeal circulation in organs of body. As the exam was postponed, I could not submit my thesis to university. I gave three / four copies of my thesis to Prof. A. K. Basu so that he will submit the thesis when time will come. I left for Sweden & they did not know what kind of training in India in medical colleges. They asked me questions. I showed them my thesis. They were surprised to see what experiments have been done by me in our laboratory. My work was, if the extracorporeal circulation is cooled down quickly, the vascular bed in myocardium, brain and other organs get spasm and there are damages in organs. It was then conclusion that cooling must not be rapid, it should be slow, so that cells in organs can gradually adjust to changed situations of low oxygen. They could now explain why brains of their patients were getting damaged after extra corporeal circulation. They arranged to publish my thesis in one Scandinavian journal of Medical Sciences and to read my paper in Oslo in one International Conference. They asked me whether Prof. A. K. Basu had worked in these experiments. As in Scandinavia, if Professor is not already involved in works, their names are not in the list of authors of the papers. I said 'no' as Prof. Basu was not directly involved in my experiments. I was not strong in theory, but I was teaching their students with rationality, because I was taught in that way Now teaching has become mechanical.

Q:- by Prof. Ashish Mandal, Sir, hypothermia is very important in modern open cardiac surgery. In 1945 Legalo brought first to our notice the effects of fast cooling and slow cooling.

Q : Sir can you please tell us your experiences in Gothenburg University about hypothermia?

Answer:- Yes, Carolinska University published papers that hypothermia should be avoided in children. I have read that paper when I was in Calcutta. Dogs was not alive after extracorporeal circulation. On autopsy it was seen massive clots inside vascular bed in vital organs and brain. Actually clots are not causes of death of dogs. Spasm of vessels was preventing flow of blood to distant a area which was causing death of cells. Now it has been accepted all over that rapid cooling must be avoided. It was not known before that time. That is absolutely confirmed now I was called by Gutenberg University and paper was published there. Then I went to England to finish Royal College of surgeon's degree. The president of Royal College came to know that I do not like to stay in England and he did not like me to pass. So I had to go to England to be acquainted to situations of England. Government of Sweden was sending to me monthly scholarship in England so that I can continue my studies. I am grateful to Swedish government for that help I passed FRCS I worked in UK for 1 ½ year. They wanted me to stay in Manchester. Then I went to USA to learn more in Houston, which was most advanced in cardiac surgery that time. Denton Cooley, Michael Debakey all where there at that time. I had no money. They told they will not provide me any money. I sold my car in England. It gave me some money for my food in Houston for six months, taking food only once a day. Debecky was a difficult man. Denton Cooley was a fast surgeon, so I had to be as fast as Denton Cooley in surgery. He came to Calcutta to meet me Jealousy kills talents, it happens particularly in Bengal.

Q:- You came back from West and joined SSKM /IPGMER. Then how was your life in SSKM hospital?

Ans:- Well, I came back to Calcutta with $2.00 in my pocket. My mother told me, money does not matter, but I knew money matters. My father has retired. My mother wanted me to come back and work for the poor. I came back via Japan. It was an experience from USA to Japan, from Japan to Calcutta, by AIR India. It was Air India because it was the cheapest way chosen by my travel agent. Chicago to Tokyo this flight was full of USA Soldiers coming for Vietnam War. I was the only civilian in that flight. One soldier was on my side. He was very upset. He was newly married with a newborn baby. He had to leave home to fight for his country in far away land of Vietnam. He was seeking alcohol but there was no supply of it. He was trying to use after shave lotion for alcohol for consumption. I told him not to use this, as it is a poison. I do not know whether he is living or not after coming back to Calcutta. I tried to console him telling that he will come back alive to his sweet home. I thought in myself that if an American can do this service for his motherland, why can I not come back to my motherland at the call of my mother.! Igot married.

In Sweden I saw operation of pacemaker. Sweden was pioneer of pacemaker discovery and implantation.

The establishment here was hostile to me. I was surprised to see that my Prof. was performing operations of pacemaker in a very unrealistic and silly way. Each time, there was complications, infections and ultimately death of patients. Repeated operations after infection, and after infection then death. My Prof. knowing fully well that I was associated with development of pacemaker in Sweden, my Prof. never told me to perform this operation and even never took me as his assistant in the operation of pacemaker implantation. My Prof. was taking his chosen persons to assist him.

Q:- Were you pioneer in pacemaker implantation in India?

Ans: - No. I am not. I do not consider myself as pioneer. I was a poor person. Only with salary. I could not maintain my family. I needed some private practice. My Prof. told me to get transfer to NRS Medical College Hospital where I got my independent workplace and some scope of private practice whatever small. That was sufficient to maintain my family. In NRS Medical College Hospital my work was on Pulmonary hypertension. I have read my paper in conference in Barcelona where in one international conference, among surgeons in the front row was sitting Sir Ronald Ross who has come a long way to here to my paper. After conference he talked to me on the subject exclusively. It was decided that lung transplantation can be a solution in this problem. Then this has become universally accepted as a procedure. But I myself have not been able to do it in my life time for paucity of equipments. I am thankful to Ronald Ross. He came to meet me in Calcutta.

Q:- Situation compulsion made your transfer to NRS Medical College possible. Indirectly that gave you a smile. That created a situation for your private practice and your independent position to do works in your chosen ways and perform some new operations, some first in India. What are those?

Ans:- Yes, In NRS, total facilities were very small. In NRS it was not a big department. There was no place to sit. Only a big lab and one operation theatre with facility of operation only on one table. Facilities were poor. Patients had to be shifted to X-ray department which was at a distance and moreover experts in X-ray department where not acquainted with new investigations. But I jumped to work because people were very good, very cooperative, very enthusiastic to help me in all

new procedures. This was a magic thing that they all came forward to help me in the operations which even they have not seen before. That made me energetic. I used to operate whole day, even stayed at night to look after the patient operated. I could have a small private practice; that removed my poverty.

Q: - Your first successful operation in India on Fallot's Tetralogy?

Ans:- There were good number of blue babies in my outdoor. Much can be done by innovations, not much money is needed. All investigations, angiography and cardiac angiography were being done by myself. Radiology, cardiology department persons were not acquainted to all such new investigations. But they were all very cooperative to me. There was a good biochemical lab. One great person, a great learned man has developed a good laboratory. He started whole structure.

Q:- Do you mean Prof. B.P. Chatterjee?

Ans:- Yes, He is Prof. B.P.C. He was a great man. I am respectful to him. This lab had two young energetic men (Swapan Babu and Halder Babu). I taught them new techniques. They helped me a lot. Cardiologists were not taking responsibility of cardiac angiography. I was doing all these myself, but also learning myself and showing all these to cardiologists. And I progressed very fast. I performed operations on blue baby. I had never done it or seen it done in IPGMER before. I planned operation after angiography. It is a simple operation, not difficult, It was successful. I never told it to press. But somehow press got the news. It was a big “halla bulla” in the media. I never told it to press and public came to know. I was abused by persons. Some persons told that I was doing all these for my own popularity.

Q:- What was the bypass machine used?

Ans:- It was made originally in Denmark. This machine was very old model made by dens. By then, this has become obsolete and it was a gift from Denmark to Prof. B.P. Chatterjee. While I was in Denmark, I worked with it. I knew the limits of the ability of this machine. When I was in Denmark I worked with it, so I knew mistakes of this machine. I knew what problems may be created by this machine. So from before I taught the technicians, juniors how to detect wrong things and how to correct those. I could work well with this machine. I knew what mistakes this machine can do. I gave training and teaching to technicians to correct those.

Q:- Then your work was on Aotic Homograft. Patient name was Pran Krishna kundu?

Ans:- Yes, Pran Krishna kundu. I shall never forget. Before that I went to see Aotic valve surgery in London at National Heart Hospital from Prof. Ronald Ross, a perfect gentleman. He was so impressed to see me there. I stayed there for one month at my own cost. So I learned all intricate techniques there from him. But I knew that I will not be able to do it here in India because in India stents are not available, solutions to preserve and sterilize the valves are not also available. The process has to be done with preservation of viability of valves. But where is the problems, there is solutions. I need not stents if I use free stitches.

I had good house staffs.

Q:-Bimalda (Dr. Bimalendu Goswami) and Tarunda (Dr. TarunSaha)?

Ans:- A laugh, Yes Bimal and Tarun. They were enthusiastic ones. They collected valves from morgue which was close to my department, from fresh dead bodies (unclaimed), by managing the

jomaders there. They had to be very careful. There cannot be only one way of doing things. I had not solutions which were being used in London Heart Hospital. I researched out one solution to preserve homografts for 10 to 14 days definitely. If I used homograft as free grafts with free stiches, I need no stent. Gradually I learned that if some muscle fiber remains at the base of valves, it leads to early calcification. Gradually I learned how to collect valves without a single fibre of muscle, a delicate thing to perform. In London Heart Hospital they can preserve valves for longer period by their solution but I needed not to preserve for longer period because I had patients, plenty of cases of aortic valve disease were in line in my outdoor. In England they have very less number of patients.

Q:- What was the follow up period?

Ans:- 17 years. Then it developed calcification. I can give you more data. I learned a little later on how to collect valves without a single fiber of muscles. Even that time London Heart Hospital personnel did not know it. I learned it from Magdi Yakub in one World Congress. There he wanted to listen to my paper. Every time whenever I wanted to do something new, I was blocked in this great city of Calcutta. Then I placed homograft in mitral position. I wrote to university of Brazil. I cannot remember the name. It was a real good center of cardiac surgery.

Q:-by Dr. A. Mandal- Is he Adib Jatini?

Ans:- Yes, he is a famous Surgeon for Transposition of Great Vessel surgery. I knew Adib Jatini. He sent me a huge number of stents. He advised me to develop stents and valves here in India. I visited some slaughter houses of pigs and buffaloes where men were eager to help me. I wanted to build a company at my money, but that plan was washed away. I was transferred out of NRS Medical College.

Part - 6

Then your pioneering works wave on CABG with RIMA, LIMA

Answer – I was allowed to stay in NRS Medical College for eight years only. Most of my works were in those eight years, I could not complete my works. When I was thinking on coronary, why only veins from legs. There are two arteries, internal mammary arteries on two sides. Why not using those which are enough for complete vascularization of coronary bed. When I started, there were some papers on it from some unknown sources. So it is not my only original, there are some other originals without knowing each other. I do not remember the others.

Q:-In India, you are pioneer?

Answer in India nobody knew it, yes, In India I am first to do it.

Q:- Did you publish it then. Answer, no, I did not Human body is not doll. I cannot publish it, just after operation. I must see that my operation has worked and successful. I had follow up for one year, when I saw it successful. I published it. There was national conference in Bombay, along with international conference of surgeons. Every famous surgeon from all over the world attended that conference I had some other papers. But I distributed them to other juniors for presentation. I kept it only with me for presentation. I had with me operative pictures, follow up data ,and post operative angiogram to see how vessels were working. When I landed in the venue, to my surprise, I saw that it is placed in as first paper in post launch period .That is first paper after lunch. I had 19

minutes video of operation. At that time video was not at all common. My papers should have been in the inaugural session Prof. Ronald Ross was waiting to listen to my paper in the hall, but one professor of AIIMS Delhi told there is nothing important in the paper and was trying to sideline my paper. Barrett Boys rejected his lunch to listen to my paper. Doctor Parulkar of Bombay tried to stop my paper by shouting 'stop stop' I had to stop the film then again started, time was not finished, but Doctor Parulkar shouted 'stop, stop. Such are Indian scientists, such are the attitudes of the Indian scientists. If such things goes on, science cannot progress in this country.

Q: This patient you operated first, with LIMA was Kedar Singh by name.

Ans. yes, yes .

Q:-

Then your works where on Takayasu 's disease. I had no idea about this disease. I saw a case whose all peripheral pulses were absent, horrible. Name of disease; I did not know at that time. How to treat such patient. I started reading literature on it .In America they were doing angiogram by puncturing aorta at lumbar region. First patient in this series which came to me in my private chamber was a pregnant lady, first pregnancy. I told her to abort the baby, because she had to undergo angiograms. when a patient come to me, I think on problems. I cannot research on books, research should be on human body. Some Patients came with some severe pain, hypertension, distress. She had enormous lesion I did cut her neck to put graft. From her neck to Ascending Aorta, from Ascending Aorta to abdominal Aorta retro sternal and throw diaphragm, from this graft one graft to the carotid artery. She is alive Her second baby alive, now IT expert, now in USA, her third child a girl, now OK.

Q:-

Then you were invited to UK to deliver Hunterian speech.

Answer:- Yes

I had to study hemodynamics of both adults and children were presenting with heart failure. I had papers on cardiac failure, arterial damage. Those were published but I do not know the cause of the disease .Treatment of children is very difficult. I was invited to different parts of the world to give lecture on this subject but I do not know the cause of the disease it is autoimmune disease. I have read a paper in Taiwan, a complete paper. I made a chart of damages by this disease. IGM, IGG, IG A in autoimmune diseases, these are altered .IGA is seen attached to elastic layer of artery. My friends helped me. IGA. from GUT is attached to elastin of elastic layer of wall of artery. IGA is released by inflamed GUT.

I presented this paper in UK. Two months before it, I was transferred out of NRS Medical College.

Career Data of DR SAIBAL GUPTA

Date of Birth February 28, 1938

Place of birth Suri, Dist Birbhum, West Bengal, India

Academic Qualifications B.Sc.(Cal) 1955, MBBS (Cal) 1959, MS (Cal) 1966,

FRCS(Eng) 1965, FRCS (Edin) 1965, FAMS (Ind) 1983

Educational institutions of study and training -

- Siksha Sangha, Bishnupur, South 24 Pargana, W. Bengal (Oxford Mission School, taught both Bible and Upanishad in addition to school clerical
- Ballygunge Govt. High School
- St. Xaviers' College, Calcutta
- Presidency College, Calcutta
- The Medical College, Calcutta
- Institute of Postgraduate Medical Education & Research, Calcutta
- University of Lund at Malmo General Hospital, Sweden
- Royal College of Surgeons of England
- Manchester University at Baguley General Hospital
- Baylor University College of Medicine, Houston, Texas, USA

Last employment:- Professor and Head, Dept, of Thoracic & Cardiovascular Surgery, Calcutta National Medical College (Voluntary retirement, December, 1993.

Present Assignment:- Consultant Cardiovascular and Thoracic Surgeon at Calcutta Medical Research Institute

Academic Activity:- Published more than 25 original scientific research papers in National and International journals - List attached. Wrote chapters in two books. Worked as Expert to the Indian Standards Institution. Carried out research with ICMR grants. Established the 1st Experimental Surgery Laboratory in Asia at the Institute of Postgraduate M3edical Education & Research, Calcutta and at NRS Medical College for experimental research in various fields, including assistance to researchers in other fields eg. Neurology, Pulmonology and in experimental research on Lung Cancer. Adviser and Reviewer to Research Projects and journals. Teacher and Examiner in Cardiovascular and Thoracic Surgery for the highest qualification of M.Ch at various Universities of India.

Academic Honours -

- Hunterian Professor to the Royal College of Surgeons of England, 1981.

- Fellow of The National Academy of Medical Sciences (India) - 1983
- Lifetime Achievement Award from Indian Association of Cardiovascular and Thoracic Surgeons - 2013.

Visiting Professor to - Medical Research Council of Great Britain's Clinical Research Unit at Northwick Park Hospital, New York State University, Manchester University Postgraduate Centre, Thai Heart Association, University of Lund, Sweden.

Academic Positions- Member, Fellowship Accreditation Committee, National Academy of Medical Sciences (India).

Honorary Overseas Life Member of the Association of Thoracic and Cardiovascular Surgeons of Great Britain and Ireland and European Association for Cardio-thoracic Surgery and National Professor to the National Board of Examinations, India.

Guest Orations -

- **Manas Roychwdhury** Memorial Oration, 1972
- **Sushruta** Oration for Sushruta Gold Medal for research in surgical Sciences, 1972
- **Sourindra Bimal** Memorial oration, 1975
- **Honourd Guest Oration** at Seventh Asian Pacific Congress of Cardiology, Bangkok, 1979
- **Huntarian Oration** at Royal College of Surgeons of England, 1981 **International College of Chest Physician** Eastern Zonal Conference **1982**

World Congress Presentations -

- Scandinavian Congress of Cardiac Surgery, 1963
- World congress of International Cardiovascular Society, Barcelona, 1973
- World Congress of Cardiology, Tokyo 1078
- First World Congress on Pediatric Cardiology, London, 1980
- First World Congress on Tropical Cardiology, Bombay, 1983
- Eighth Asian Pacific Congress of Cardiology, Taipei, 1983
- Chairman, Seminar on use of Artificial Intelligence Techniques in Pacemaker Technology. Melbourne, at the World Congress on Electrophysiology, 1987
- World Congress on Pacing and Electrophysiology, Jerusalem 1981, Tokyo 1991
- World Congress of European Association of Cardiothoracic Surgery, Hague, 1994
- World Congress of International Union of Vascular Surgery, Greece 1995 and chairman of Seminar on Inflammatory Arterial Diseases.

RESEARCH AND PROFESSIONAL ACTIVITIES

1962 - Design and making of indigenous heart lung machine at the Sursuna factory of H. Mukheijee & Banerji Surgicals after prolonged testing & research for Cardiopulmonary bypass

started cardiac surgery in 1962. All countries were similarly starting at the time.

1963-64 - Experimental research at Calcutta established Rapid Cooling of bloodstream as the cause of Brain Damage in Extracorporeal Circulation - presented at Scandinavian congress and published in 1964. The Scandinavians had published this problem but did not know the answer and did not believe our research. But today it is an accepted fact and we proved it, but the westerners never gave us the credit of discovering it.

1969-1971 - As Principal Investigator of I.C.M R. research project Dr. Saibal Gupta assisted by Dr. Raja Dandapat researched in Calcutta on Pulmonary Hypertension, particularly in children, on dogs. We got the results but could not prove it on patients as we did not have the means and the help. The results were presented at International Cardiovascular Society Congress and published in the Annals of the I.C.M.R There was extreme interest at the congress as our paper was presented and a man like Dr. Denton Cooley, sitting on the first row of the house, got up and congratulated and held long discussion on how to cure the children. The operation technique for the children are being done today in rich countries very much close to what we discovered but not in India. Everything collapsed here. Dr. Denton Cooley came to India to meet me but was depressed on the neglect we suffer and warned me with sadness. I took him to the airport in my rattling Ambassador car. He did not speak a word and warned me that I shall be thrown away very soon and he was proved right.

1974 - First successful Total Correction of Tetralogy of Fallot was done in Calcutta.

1974 - Salvage and preservation of Cadaver Heart Valve for use as homograft was done with available facilities at the NRS Medical College and first successful clinical application of homograft replacement of Aortic and Mitral valve was done at NRS Medical College but could not be continued.

1975 - Studies on haemodynamic and immunological abnormalities and techniques of surgical treatment of Takayasu's disease first operation was done and then on many and on children and ware published in Annalas of Royal College of Surgeons of England.

1985 - Experimental surgery for gastric outlet obstruction due to corrosive ingestion was first successfully cured and published in the Annals of The Royal College of Surgeons of England.

1989 - Studies on pharyngeal mechanism of swallowing and clinical reconstruction of acid bums of pharynx and oesophagus was done to save the young women who try suicide by swallowing corrosives and a number of such women are living a norms! life by God's grace.

Unpublished research

Experimental work to transplant Human Bronchogenic Carcinoma in mice

Administrative Experiences and social work

1) Head of the Dept, of Cardiothoracic Surgery, NRS Medical College, Calcutta from 1972 to 1980 and of the National Medical College, Calcutta from 1980 to 1993.

2) Examiner and Member of the Expert Committee, of the National Board of Examinations, India.

3) Honorary Director, Cardiac Surgery, Calcutta Medical Research Institute 1981-1984

4) Member and Council Member of Bengal Initiative, a Calcutta based NGO and drew up development plans in Health, Education, Industry, Foreign Relations for the Central and State Governments, joined delegations to Pakistan, Myanmar, Sri Lanka and Turkey as Council Member.

5) Vice President, Somsar Sri Ramakrishna Seva Mandir , a rural development project

6) Served the Calcutta Club as a Committee Member 1993-2003 and President of the Club from 2003-2004

7) Chairman and Settlor, Integrated Cancer Alleviation and Research Trust, a Public Charitable Trust, a Public Charitable Resear ch Trust established to build a Cancer Hospital and Research Institute for the financially marginalized that failed after years of effort and loss of money.

List of published papers

1) Gupta.S, Haq.A, Chatterji.S.K, Sengupta B, Sen. B, Islam.N, and Basu.AK. Bull (1963). Open heart surgery using cardio pulmonary bypass: a preliminary report: experimental and clinical. Inst.Postgrad.Med.Edu & Res. 5:50.

2) Gupta.S, Banetji.C and Basu.A.K.(1963). Evaluation ofprotamine and hexadimethrine bromide as antiheparin agents in extracorporeal circulation. J.Ind.M>A. 41:231.

3) Gupta S, Basu. A.K, Haq.A, and Banerji C (1963) Evaluation of heat exchangers in extracorporeal circulation. J. Ind.M.A, 40:145.

4) Gupta. S, Haq. A, Islam.N. and Basu.A.K. (1963) Hypothermic total body perfusion by the principle of haemodilution: a preliminary report: experimental and clinical. J. Ind. M,A. 41:435

5) *Gupta S and Basu A.K (1964). Rapid hypothermia and intravascular aggregation in total body perfusion. Acta Chir.Scandinav. 128:678

6) Basu A.K, Gupta S, Haq Islam, and Banerji. C, (1965) . Extracorporial Circulation J.Ind. M.A.

7) * Gupta, S (1969) The problem of severe pulmonary hypertension in association with congenital heart diseases: experimental studies on a new approach. Annals Indian Academy Med. Sciences. V:61-67. (Later presented at International Cardiovascular Society Congress at Barcelona in 1973; led to the operation for Eisenmenger Syndrome abroad. (Dr. Denton Cooley was seating on the first line of chairs of the hall when I entered and we had long discussion on that operation .1 had worked under Dr. Cooley and he visited me at Calcutta and was sad that I was virtually being pushed out of Cardiac Surgery. I reached him to airport in my rattling Ambassador car and we spoke nothing. He vanished in the crowd and I kept looking at his tall head among the crowd. When he died a phone call came to me from the USA. I am writing this story because also is science - the deep respect between the teacher and the student that does not exist in our society. I have not heard of operation for Eisenmenger Syndrome in my country.

8) *Gupta S.(1970) Total obliteration of Esophagus and hypopharynx due to Corrosives. J. Thor & Cardiovascular Surgery. 60: 264. This paper was presented at World Congress of European Association for Cardiothoracic Surgery at Den Hague. (The Journal publication of this paper was blocked from USA. I sent to the British Editor all my experimental work to device this operation which could not be shown and discussed in a conference and then it was published)

9) *Gupta S and Pa! N.C (1972) Hamartoma of the Thoracic Wall. Thorax. 27:500. (There was a difference in opinion between the surgeon and pathologist at SSKM regarding the nature of the tumour and I was sure it was a hamartoma. We argued for days and in the end it was sent as a hamartoma. He went to UK on scholarship and was congratulated profusely by colleagues for discovering it, and it has been registered at Paris World Record of Tumors. I got hearty thanks from him.

10) *Gupta S, Dandapat R and Maitra T.K. Effects of silicon antifoam on pulmonary Vasculature. J.Thor.& Cardiovascular Surg.63:714.

11) *Gupta S, Maitra TK, Viswanathan S and Basu AK. (1972) An experimental Model of secondary pulmonary hypertension. J Thor & Cardiovasc Surg.64:953

12) *Gupta S (1972) Role of pulmonary arterial -left atrial shunt in the treatment in the treatment of pulmonary hypertension. J. Thor & Cardiovasc Surg.64:949. (Helped in the treatment pulmonary hypertension but not in India so far)

13) Gupta S. Renal angiography. J.Ind.MLA 59:156

14) * Gupta S and Maitra TK.(1973) An approach to the problem of pulmonary hypertension. J Cardiovascular. Surg-Bimonthly Review, Special Issue693-697

15) Bhattacharya DK,Saha RL, Sengupta AN, Gupta S. (1973) Coagulation profile of congenital heart diseases during cardiopulmonary bypass surgery. J.Ind.MA. 64:31

16) Gupta S (1976) Benign tumours of lung. J.Ind,MA. 67:209

17) Gupta S (1977) Surgery in Pulmonary Tuberculosis. J.Ind.MA 69:233

18) Gupta S,Goswami B Sarkar S and Saha PK.(1978) Congenital and acquired coarctation of aorta. J.Ind.M.A.70:148

19) *Gupta S.(1978) Internal mammary artery-coronary artery anastomosis for bypass of coronary circulation in unstable angina. Ind.Heart Joumal.30:109

20) Gupta S, Ghosh BB and Sengupta AN(1978) Direct communication between pulmonary artery and left atrium. Report of a case with a suggested classification of the defect, in Progress in Vascular Diseases, ed. Anand&Goyal Arnold Hemberger, New Delhi pp 164-171.

21) *Gupta S(1979) Surgical and haemodynamic consideration in Middle Aortic Syndrome.Thorax 34:470-47

22) *Gupta S,Goswami B, Ghosh,DC and Sengupta AN.(1981). Middle aortic syndrome a cause of heart failure in children and management Thorax36:63-65.

23) *Gupta S(1981).Surgical and immunological aspects of Takayasu's disease. Annals Royal Coll. Surg.England. 63-325

24) *Gupta S.(1988) A technic of repairing acid bums of the stomach. Annals Royal Coll. Surg England 70:74-75

25) *Gupta S(1996). Surgical management of corrosive strictures following acid bums of upper gastrointestinal tract. Eur.J.Cardiothoracic Surgery. 10:934-940

Peer Review Journals

Literary Hobby – Published six books.

1) Amar Shomoy (Bengali -'MY TIMES'- 1998) Society Politics and Travelogue in Large Indian Civilizations of antiquity. The Past and the Present.

2) The Fallen Leaves: A **Love Story.** - 2005 - Love in Social Difference

3) **Beyond Seven Seas and Thirteen Rivers** - 2008 - A fiction built on a little known Bengali valiant young Globetrotter in 19th Century who traveled around the world from Asia, Europe and Brazil and became a valiant Army General by participating in Revolta da Armada wars in Brazil. He was rejected by his family in Bengal for marrying a Brazilian Christian girl and still has his memorial in his 'The Nathpur house, in his village in Bengal erected by his uncle. His valiant life was searched by the Author from one end to other of the world while he tested his valor and dignity and put it in a story of his own life in Brazil as he kept on searching the life of Suresh Chandra Biswas in Brazil with the help of men and women, civilian and army. He searched and found his rural home in Bengal with his memorial that was lost.

4) India in the Third Millennium CE :: An ininclusive view - 2012 - History, Philosophy, Politics, World History and Governance.

5) On the Seashore - Fiction published by Partridge India, branch of USA **Partridge Publishing.** A fiction on life of women both in India and USA - women in society. “Nations do not count, for the world is one”, wealth and property do not count for they are ephemeral in changing world, what counts is education and cultural basnd the grit to get forward and face the world:.

6) The Last Dance: Dimensions of Human Life. - 2018. Omniscriptum Publishing in Europe - available in Amazon. The journey of human knowledge is a fascinating saga in every age and every land.

CARDIOPULMONARY BYPASS WITH VS. WITHOUT TOPICAL CARDIAC HYPOTHERMIA IN CASES OF PLANNED AORTIC AND MITRAL VALVE SURGERY: A PROSPECTIVE OBSERVATIONAL STUDY FROM A TERTIARY CARE CENTRE OF EASTERN INDIA

Dr. Surajit Sarkar

Postdoctoral Trainee, Department of CTVS; IPGME&R and SSKM Hospital, Kolkata

Background and Study Objectives

- Surgery for Mitral and Aortic vave replacement is one of the major class of surgery using Cardiopulmonary Bypass with myocardial protection via cold blood cardioplegia and topical cooling of heart.
- However, topical cooling of heart in the form of ice slush/ cold saline has its own set of associated complications like Phrenic nerve injury and Pulmonary complications.
- Keeping this background in mind, the present study aims to determine:

1. To evaluate whether topical myocardial cooling by ice slush and/or cold saline provides any additional myocardial protection over and above systemic cooling and cold cardioplegia solution in planned Aortic and Mitral valve surgery involving Cardiopulmonary bypass (CPB).
2. At the same time, to also evaluate whether or not placing ice slush or cold saline intraoperatively over heart is actually detrimental to post-operative myocardial function.
3. To also evaluate the effect of said topical cardiac cooling methods on post-operative pulmonary status.

Methodology

1. STUDY TYPE: Prospective observational study.
2. STUDY PLACE: Ward, ICU and OT of Department of Cardiothoracic and Vascular Surgery, IPGMER and SSKM Hospital, Kolkata
3. STUDY POPULATION: All patients undergoing surgery for Aortic and/or mitral valve disease in the aforementioned department, keeping in mind the study period, inclusion and exclusion criteria.
4. STUDY PERIOD: One and Half year (July 2022-January 2024)

5. SAMPLE SIZE: 40 (after proper calculations).
6. INCLUSION CRITERIA: All patients presenting with aortic and/or mitral valve disease posted for surgery in the above mentioned department and study period.
7. EXCLUSION CRITERIA:

- *Any patient going in for emergency valve surgery for any cause.*
- *Any patient having concomitant coronary artery disease undergoing concomitant CABG, to rule out the confounding factor of ischemic heart disease induced rise in markers of myocardial damage.*
- *Any patient who is hemodynamically unstable preoperatively.*
- *Re-do valve surgery cases as in stuck valve or prosthetic valve endocarditis.*
- *Patients not willing to participate in the study.*
- *Patients who are declared unfit to undergo operation.*

8. PARAMETERS TO BE STUDIED*: to be compared between groups who received and did not receive topical hypothermia:*

- *Post-operative (next morning) levels of cardiac specific creatinine kinase (CK-MB) and troponin I (Trop-I).*
- *Spontaneous restoration rate of sinus rhythm when weaning from CPB.*
- *Time to restore to sinus rhythm post cross clamp removal.*
- *Post CPB need of myocardial pacing.*
- *Post-operative rate of pulmonary morbidity (clearness or haziness of lung field) studied using post-operative day 1 (POD 1) digital chest x ray films.*
- *Post operative diaphragm elevation studied using post-operative day 4 (POD 4) digital chest x ray films.*
- *Rate of immediate post operative mortality (within 5 days of operation).*

Results

- Higher number of patients had Sinus Rhythm Restored Spontenously in no Topical Cooling Group [18(90%)] compared to Topical Cooling Group [16(80%)], but this did not reach statistical significance *(p=0.37582)* [May be due to the bare minimum sample size].
- Higher number of patients needed pacing post CPB in Topical Cooling Group [5(25%)], compared to no Topical Cooling Group [2(10%)], *with odds ratio 3.000,* but this, again, did not reach statistical significance *(p=0.2188).*
- Higher number of patients had any events when coming off CPB in Topical Cooling Group

[3(15%)] compared to no Topical Cooling Group [2(10%)] *with odds ratio 1.5882*, but this was not statistically significant *(p=0.6325)*.

[All the above 3 findings show that post CPB myocardial function was better with no topical hypothermia(though it never reached statistical significance, may be due to the low sample size). But it indeed establishes the fact that topical cooling offers no added myocardial protection over and above systemic cooling with cold cardioplegic solution].

- Higher number of patients had POD4 Diaphragm elevated in Topical Cooling Group[6(30%)] compared to no Topical Cooling Group [2(10%)] *with odds ratio 3.8571*, but this, again, did not reach statistical significance *(p=0.1138)*.
- Mean TropI Level (POD1) (pg/ml) was more in Topical Cooling group [53.8505+_13.8639], compared to no Topical Cooling group [47.9175+_17.9511], but this did not reach statistical significance *(p=0.2494)*.
- Higher number of patients had Hazy POD1 Lung Fields in Topical Cooling Group [16(80%)] compared to no Topical Cooling Group [10(50%)] with odds ratio 4.000, and this was statistically significant *(p=0.0467)*.
- Mean CK-MB Level (POD1) (unit/L) was more in Topical Cooling group [89.8150+_90.1887] compared to no Topical Cooling group [45.3750+_31.4605], and this was statistically significant *(p=0.0443)*.
- Mean Time to Restore to sinus rhythm (min) was more in Topical Cooling group [6.6875+_3.8073] compared to no Topical Cooling group [3.8889+_1.6410], and this reached statistical significance *(p=0.0078)*.

Conclusion

- It becomes very clear from the above mentioned results that addition of topical myocardial cooling(in the form of cold saline and/or ice slush) with systemic cooling by cold cardioplegic solution in cases of aortic and mitral valve surgery under cardiopulmonary bypass, has no added myocardial protective effect, rather is deletarious to myocardium and the conduction system, in addition to being a major factor in post cardiac surgery pulmonary morbidity in the form of phrenic nerve injury(elevated diaphragm) and pulmonary edema(hazy lung field). Thus it is better to avoid topical myocardial cooling.
- We concluded that in patients having aortic and mitral valve surgery, no topical cardiac hypothermia during cardiopulmonary bypass is linked to a lower risk of myocardial injury, lower pulmonary morbidity, and a better outcome following surgery.
- These results establish topical hypothermia as an unnecessary addition in the management of myocardial protection during these high-risk procedures. To validate these findings and investigate the underlying processes thereof, more research is necessary.

A PROSPECTIVE OBSERVATIONAL STUDY ON ASSESSMENT OF CHANGE IN STERNAL PERFUSION FOLLOWING INTERNAL MAMMARY ARTERY HARVEST IN CABG PATIENTS USING ^{99m}Tc-MDP BONE SPECT SCAN

Dr. Shubham Singh Rawat

CTVS MCh Resident (6 yrs), AIIMS RISHIKESH

Background / Study Objective

- Coronary artery bypass grafting (CABG) is the mainstay of treatment in patients not amenable to percutaneous intervention owing to the complexity and severity of the coronary artery disease (CAD).
- Among the various conduits that have been used in CABG, the left internal mammary artery (LIMA) has emerged as the gold standard for grafting the left anterior descending (LAD) coronary artery, with 10-year patency rates going up to 90%.
- IMA can be harvested in one of three ways: pedicled, skeletonized, or semi-skeletonized. The pedicled technique has been linked to an increased risk of mediastinitis due to sternal devascularization. Skeletonization, on the other hand, better preserves sternal microcirculation, which may play a protective role in the prevention of mediastinitis.
- In this study, our aim, was to measure the change in sternal perfusion following IMA harvest using 99mTc-MDP bone SPECT (Single-photon emission computed tomography) scan. It also studied the change in the sternal vascularity associated with different techniques of IMA harvest.

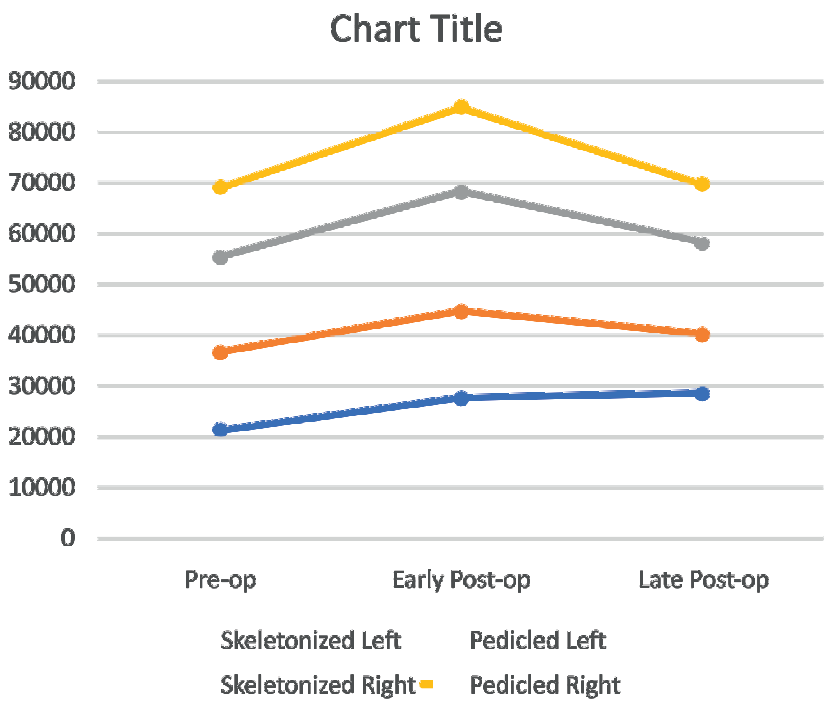
Methodology

- Study period – 1 year
- Prospective observational study
- Total no. of patients – 37
- Inclusion criteria - CABG with LIMA harvest
- Exclusion criteria - Emergency CABG, left subclavian stenosis
- Ethical clearance and informed written consent taken
- All patients underwent 99mTc-MDP SPECT scan of sternum at 3 times - pre-op, early post-op (5-7 days), late post-op (8 weeks)

- The mean number of counts/pixels (corrected for background activity) was calculated for each half of sternum, and compared statistically.

Results

- A total of 28 patients underwent skeletonized LIMA harvesting, while 9 patients underwent pedicled LIMA harvesting.
- Statistical analysis revealed a significant increase ($p<0.05$) in sternal perfusion on both the right and left sides during the immediate postoperative period.
- Follow-up scan showed significant reduction in the sternal flow to pre-op levels on right side, however, the perfusion on left side remained unchanged.



- On sub-group analysis (pedicled vs skeletonized), a significant difference was found in sternal perfusion on the left side in the immediate post-op period (skel>ped), however, there was no significant difference in the late post-op period.

Conclusion

- Harvest of IMA is associated with a compensatory hyperemic response in the sternum, which persists at least 8 weeks on the side of the harvest.
- This initial increase in blood flow is also observed on the opposite side as well and can be deemed to be part of natural healing response.
- Pedicled harvest of IMA, however, leads to a blunted hyperemic response in the early post-op period.
- This blunted response following a pedicled harvest can be a significant factor associated with the increased sternal complications, esp. with bilateral pedicled mammary harvest.

FOLLOW-UP WITH CT CORONARY ANGIOGRAPHY IN RECURRENCE OF ANGINA AFTER CORONARY ARTERY BYPASS GRAFTING

Dr. Unmesh Chakraborty

Dr N B CTVS resident, Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata

BACKGROUND

Recurrent angina after coronary revascularisation can be multifactorial. It has been shown to be present in up to 40% of cases at a 10 year follow up.It is most commonly seen due to graft stenosis. De novo disease progression, competitive flow, incomplete revascularisation,and non compliance with antiplatelet and other medications- can also precipitate it. It is usually diagnosed by CT Coronary Angiography (CT CAG) while functional non-invasive testing is also recommended.

METHODOLOGY

This was a retrospective, observational, single-centre study. Study period was from October 2019 to June 2023. A total of 102 patients were included, who underwent CT Coronary angiography (CT CAG) in followup period, for recurrence of angina (ROA), post Coronary artery bypass grafting (CABG). All patients undergoing emergency CABG, and combined procedures were excluded.

RESULTS

In the cohort, the mean duration of ROA from surgery was 57 months, while the mean age of the patients at surgery was 68 years. There were 21 females (20.59%) and 81 males (79.41%) in the study population. A total of 189 venous grafts and 88 left internal mammary artery (LIMA) grafts were analysed. 3.44% of these patients had presented with angina by 1 year following surgery, while 22.4% had presented by 3 years. The number rose to 51.72% on 5 years follow-up from surgery, while 98% of these patients had presented, by 10 years. 78 patients (76.47%) were found to have a normal CT CAG (Group A) while 24 patients (23.52%) were detected to have either graft stenosis or native coronary artery disease progression (Group B). In Group B, a total of 7 patients (6.86%) had a venous graft occlusion, 3 of whom were corrected by a percutaneous transluminal coronary angioplasty (PTCA) while 4 were kept on optimal medical therapy (OMT). 4 patients (3.92%) had occlusion of LIMA, among whom one was reoperated, while one underwent PTCA and the other two were managed conservatively. 13 patients (12.74%) were found to have progression of native disease. One of them got reoperated, while 5 underwent PTCA and 7 were kept on OMT.

In Group A, it was seen that 51 patients (50%) had presented after a duration of 5 years from surgery. There was no new regional wall motion abnormality detected, or decrease in ejection fraction, in these patients. A total of 9 PTCA and 2 re-do CABG were performed for patients in Group B. Both the CABGs and 7 of the PTCA were done in patients who had presented within the first 5 years. In the patients who had been kept on OMT in both groups, there were no further reinterventions or complaints of angina in followup. With respect to recurrence of angina, young age, female gender and history of unstable angina had no significant statistical importance. Use of venous grafts, and incomplete revascularisation as well, were not found to be statistically significant. There was no difference in either group, with respect to all-cause mortality. When compared with patients undergoing either PTCA or redo CABG, and those who were kept on OMT, the presence of preoperative hypertension, history of smoking, poor ejection fraction (less than 35%) and evidence of significant left main disease (>50%) were found to be significant factors.

It was seen that CT CAG helped in detection of obstructive lesions in 23.52% of the patients with ROA, with a 100% sensitivity and specificity .It helped in correctly delineating native disease progression in 13 patients (12.74%). The majority of the interventions (PTCA or redo CABG) were done on those patients in this group, who had presented within 5 years of initial CABG. All the patients (76.47%) in Group A were kept on optimal medical therapy, and it was seen that the majority of those patients (51, 65.38%) had presented after 5 years of surgery.

CONCLUSION

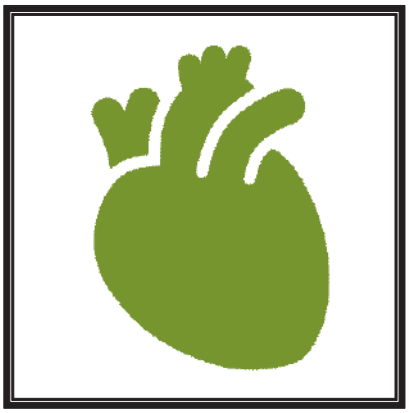
The cause of recurrence of angina in these patients can be most likely attributed to functional causes such as microvascular angina, detection of which can be done by FFR guided CT /Stress Echocardiography/PET/SPECT. In spite of that, the treatment modality is primarily conservative in such cases, and has no difference when compared to patients undergoing OMT even in presence of structural or anatomical obstructive lesions detected on CT CAG. Hence , even though CT CAG remains the gold standard in detecting graft stenosis and other obstructive disease in patients with ROA after CABG, an adjunct of a functional assessment test like Stress Echocardiography might be beneficial, especially in cases where the surgery was performed more than 5 years ago. The cost benefit, feasibility and applicability of the same, yet remains to be seen.

3RD TIME TRICUSPID VALVE REPLACEMENT IN ADULT EBSTEIN ANOMALY PRESENTATION – CHALLENGES AND DESTINATION

Dr. Soumya Guha

MS, MRCS (England), MCh CTVS (Gold Medal), FRCS C-Th (England)

CASE HISTORY



- 29 Yr old female came with shortness of breath, NYHA III, recurrent palpitations.
- History of Tricuspid valve replacement with tilting disc mechanical valve at age of 23 years. Needed epicardial permanent pacemaker implantation. Done for adult onset symptoms of Ebstein anomaly.
- Needed thrombolysis for stuck valve after 2 years.
- Again underwent Tricuspid valve replacement at age of 28 years for stuck valve.
- Redo sternotomy done, bileaflet mechanical valve implanted, epicardial pacing leads placed again as old leads got injured and pacing box place over rectus sheath.
- Unfortunately again stuck valve in 1 week, relieved with thrombolysis.
- Valve again got stuck at age of 29 years, not relieved with thrombolysis this time. She was 60-70 percentage in therapeutic INR range all thoughout last 2 years.
- On presentation, she was having mean gradient of 10 mmHg across tricuspid valve prosthesis (not reduced even after thrombolysis), RA enlarged, RV function (TAPSE 12), moderate PAH, LVEF preserved.
- The Challenge this time around : Access the heart without causing any injury and without cutting into the epicardial pacing leads which are crossing the mid line (she is PPM dependant).
- Strategy :

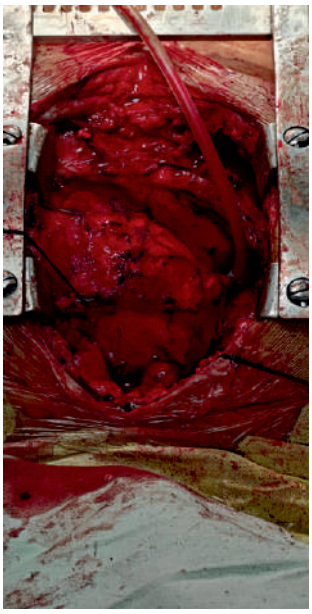
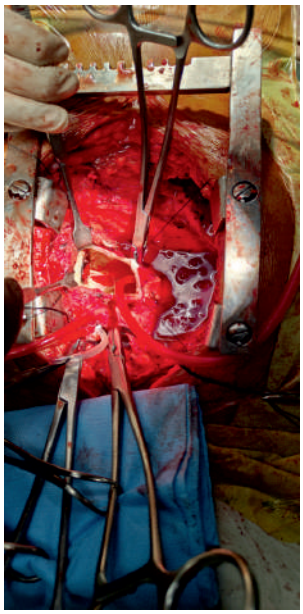
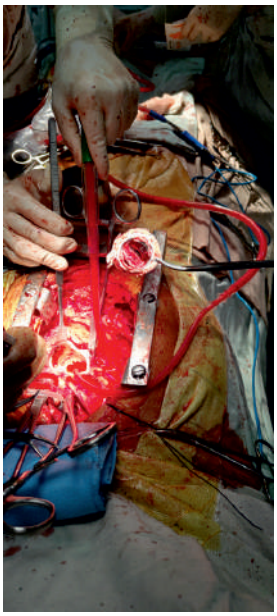
1. Fem-Fem and IJV cannulation with partial heparinisation before re-re-do sternotomy so that we can go on pump if any inadvertant injury occurs. This was very challenging as the team who had done the earlier redo surgery had accessed both groins and both IJV.
2. Use existing sternal wires as guide to prevent entering the heart or cutting into the leads, as they were very close to the sternum.

Operation turning points :

1. Left IJV central line, right femoral arterial line and radial line.
2. Right IJV to SVC cannulation, Left common femoral artery and common femoral vein cannulation after partial heparinisation.
3. Re-Re-Do Sternotomy with oscillating saw using the sternal wires as guide to prevent accidental deep cuts with the saw.
4. Dissecting extra-pleurally around RA as RA is very thin in 3rd time surgery and is densely adhered. Identifying the epicardial pacing leads and marking them with silk suture loops to prevent injury.
5. Extra care to analyse anatomy while explanting existing valve and implanting new valve.
6. Implanting tissue valve this time around.
7. Very patient haemostasis and robust sternal closure with figure of eight wires and sternal bands.

Results and Discussion :

- Patient was discharged home completely ambulatory on POD 6.
- Re-do surgeries are complex and usually avoided owing to increased morbidity and mortality. Ours was a second time re-do or third time sternotomy. Isolated right heart surgeries have an increased mortality and morbidity risk.
- Choice for tricuspid valve surgery : repair > replace, the jury is still out on whether MHV or BHV. If MHV develops thrombosis despite adequate anticoagulation, BHV needs to be implanted. BHV can be considered if patient planning pregnancy after risk-benefit explanation.



IS NEUROIMAGING GUIDED PRE OPERATIVE CANNULATION STRATEGY EFFECTIVE IN ARCH RECONSTRUCTION NEEDING DHCA?

Dr Unmesh Chakraborty

Dr NB CTVS resident, NH-Rabindranath Tagore International Institute of Cardiac Sciences

BACKGROUND

Axillary cannulation and selective antegrade cerebral perfusion(SACP) are standard for arch repair under DHCA. Adverse events are more if there is deficient cerebral circulation. In this study, we aim to assess if CT angiogram-guided cannulation strategy for ACP is effective in ensuring optimal neuroprotection.

METHODOLOGY

This was a retrospective, non-randomized single-centre study. Study period was from January 2023 to February 2024. 17 patients with aortic dissection needing arch reconstruction were evaluated. Group A(n=12) had a preoperative 256-slice CT angiogram of head and neck vessels while Group B (n=5) did not. Selective ACP and NIRS and bilateral radial artery pressure monitoring was done. All patients were followed up for 6 months post-surgery.

RESULTS

Baseline characteristics were comparable across both groups. 5 of 12 in Group A had incomplete Circle of Willis. DHCA time was significantly lesser in group A (37 min v 46 min) while CPB time and aortic cross-clamp time were similar.

Two patients in group A needed left subclavian artery cannulation for deficient posterior circulation. Left common carotid was cannulated lesser in Group A (5, 41% v 3,60%, p=0.0006). Inadequacy in arch vessel flow, dip in NIRS value and Left radial pressure decrement- all were significantly higher in Group B.Transient neurodeficit was less in Group A (1,8% v 3,60%).

Differences in all other intra- and postoperative outcomes were non-significant. There was no mortality and all patients remained asymptomatic at 6 months' follow-up.

CONCLUSION

In our study, surgical risks of additional cannulation and transient neurodeficit was more in those patients without any preoperative neuroimaging.

CT angiogram in aortic dissection can detect significant anatomical variations, stenosis, intimal flap- all of which dictate the SACP strategy. Branch vessel cannulation may have longer CPB times and adverse outcomes, if risk-benefit ratio has to be evaluated, but may be a safe and effective strategy if properly planned, gilded by preoperative neuroimaging.

PRESERVE & PROTECT ORGANS FOR TRANSPLANTATION

Mr. Saibal Tripathy

Senior Perfusionist, Medica Superspecialty Hospital, Kolkata

Organ Preservation

- Heart
- lungs
- Kidney
- Liver
- Pancreas
- Also Vein & Artery Transplant
- Multi Organ Protection Also

Type of solution

- Crystaloid : HTK (Custodiol), Perfadex
- Colloid: Blood CPG (St.Thomas, Lactate Ringers, Bermingham, Bretschnoids etc.)

HISTORY

- 1883,Sidney Ringer: Potassium is powerful heart areesting agent.
- 1950, Dr will, young &Co.:First uesd the term CARDIOPLEGIA.
- 1955, Metrose: Investigate the CPG properties of K+ citrate.
- 1964,Bretschnider:CPG solution.
- 1976,Hearse:St. Thomas solution.
- 1978, Buckberg: CPG solution.
- 1980, Bretschnider: HTK CPG solution.
- 1995, Pedro Del Nido: Del Nido CPG solution.

Administration

- Continuous : Antigrade Infusion/ Retrograde Infusion

- Intermitted : Both
- Routes : Antigrade 120-150 mm/hg (Root Injection, Through Graft, Through Coronary Ostia), Retrograde 30-50 mm/hg (Through Coronary Sinus)

DOSE

- Blood CPG : 20ml/kg (1st) - 20 mints (Adult)/ 30ml/kg (Paed)

  Intermitted: 10 ml/kg

  Maintaining Temp. 4 degree C

- Delnido CPG (4:1) : 200ml/kg- 90 mints (Adult)/ 300ml/kg (Paed)

  Intermitted: 100 ml/kg

- Custodiol CPG : 1ml/min/grm (6-8 min perfusion time), 0.5 %/kg (Adult), 0.6%/kg (Paed) - 180 mints Ischemic time

  (*During Transplantation Custodiol Stored in 2-4 Degree C)

  Kidney Protection: Temp: 5-8°C, 1.5 ml/min/grm estimated kidney weight, Time:6-8 mints

  Liver or Pancreas Protection: Temp: 0-4°C , 150-200 ml/kg, Time: 6-10 mints

- Perfadex Plus (Bufferd, Calcium containning Solution for Lung Preservation): Pulmonary artery Through Antigrade, Pulmonary Vein Through Retrograde. Total % Lit (4 lit antigrade- 1 lit retrograde)

  (For Antigrade infusion we add prostaglandin 500 mcg)

During Transplant

For Heart Transplant

SL NO	ITEMS	CODE	QUANTITY
1.	CARDIOPLEGIA Y CANNULA	[20014]	2
2.	FLOPPY		2
3.	BUSKET TIP CARDIOPLEGIA CANNULA	(30110/30212)	2
4.	10ML SYRINGE		2
5.	ICE		20 KG
6.	IV SET		2
7.	CUSTODIAL(1 lit pouch)		4 Lit
8.	PRESSURE BAG(500ML)		2
9.	UMBILICAL COTTON TAPE		4
10.	HEPARIN 25000IU		2
11.	DISPOSSIBLE PLASTIC BAG (SURGIWEAR)		5
12.	ICE CRUSHER/HAMMER		1
13	PLASTIC CLAMP		2

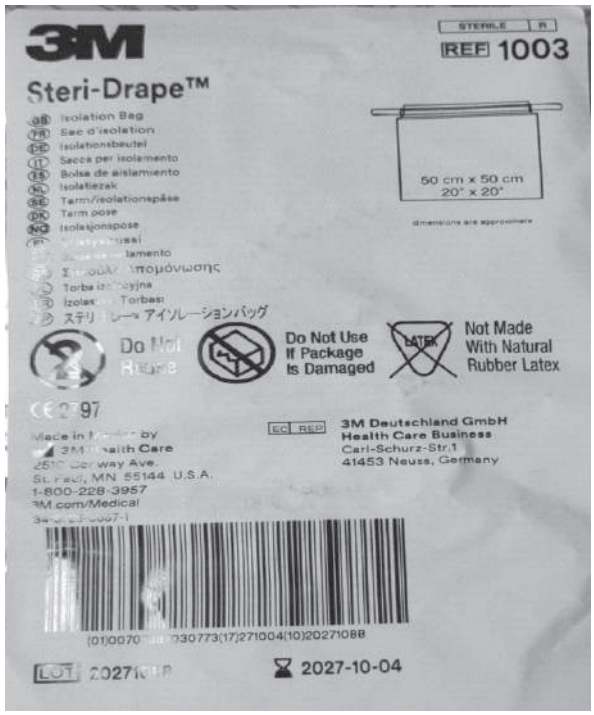
For Lung Transplant

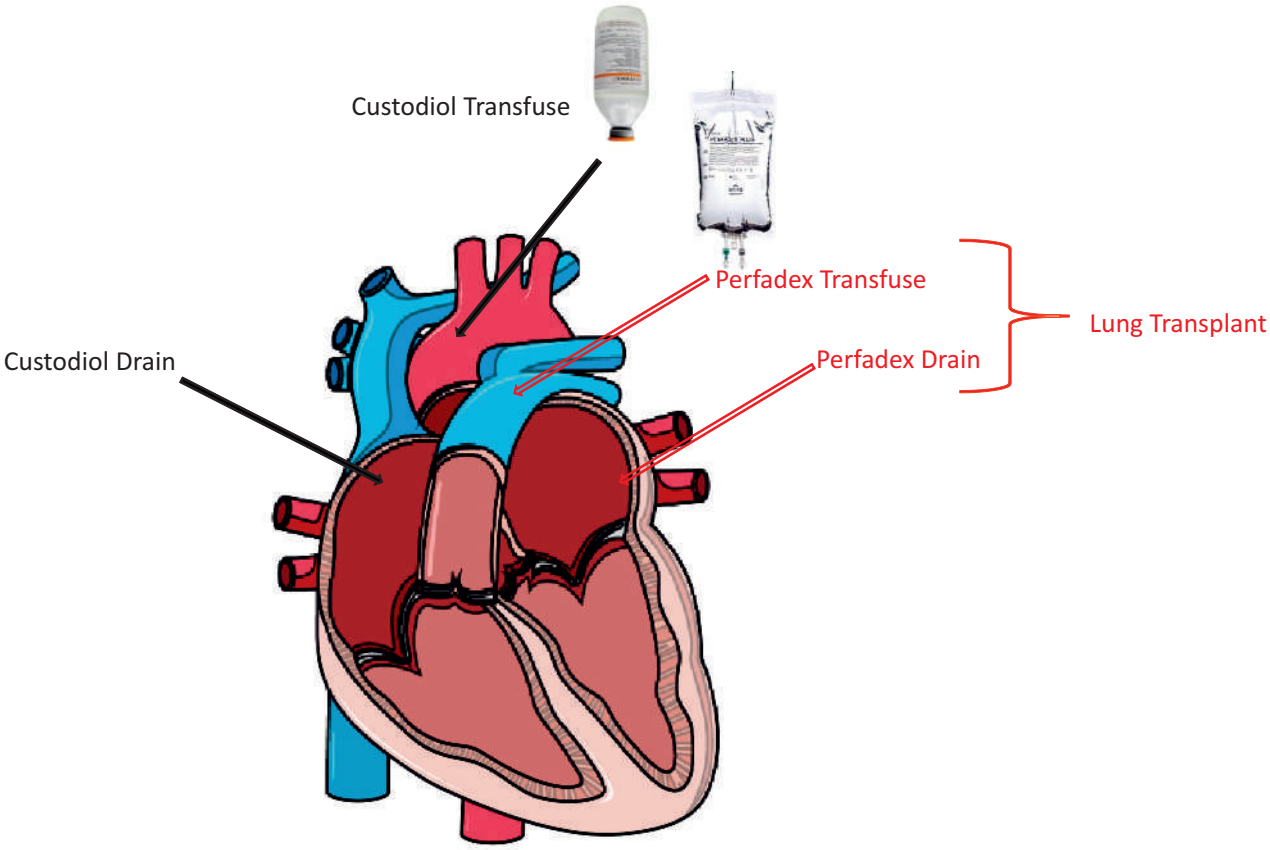
SL NO	ITEMS	QUANTITY
1.	PERFADEX (8 BAGS)	08 Lit
2.	PERFADEX CONNECTORS	
3.	PORTABLE HEADLIGHT	01
4.	PROSDAGLANINE E1 (pE1) 500mcg (1ml)	02
5.	Cacium Chloride (1g/10mL)	01
6.	THAM (3.3mmol/mL) 50mL Ampoule	01
7.	CANNULAE- 24 Fr./26Fr ST	02
8.	EOPA Cannula (18 Fr/ 20 Fr)	02
9.	Syringe (10ml)	02
10.	Insuline syringes (1ml)	02
11.	TRANSFUSION SET (T.U.R set)	02
12.	ICE 20KG (PACKS/BREAKER)	20 lit
13.	STERILE PLASTIC COVERS	04
14.	STERILE COTTON TAPE	
15.	STERNOTOMY/THORACOTOMY SET	
16.	TRANSPLANT BOX	01
17.	ICE CRUSHER	01
18.	FOLEY'S CATHETER(14 Fr,16 Fr,20 Fr)	03
19.	Clamps	

For Liver Transplant

Sl No	Equipments	Quantity	Company
1	Aortic Cannula	1	Medtronic(72120)
2	Sterile 3/8 tubing 1ft	1	
3	Connector 3/8X1/4	1	
4	Quick prime with 1/4 tubing for custodial transfusion/Romson TRP Set	2	
5	Line clamp for controling the custodial transfusion quick prime line	2	
6	Custodial	6 Liter required transfusion	
		2 Liter for dip the Liver and bring it	
7	Cell saver (CATS Puls)	1	
8	1/4 X 3/8tubing adaptor	2	
9	22 Blade	2	
10	ICE Crusher Machine sterile	1	
11	Consumption Paper	1	

- 1st Packet for Organ With Solution
- 2nd packet with ice
- 3rd packet for final
- 4 th transplant box filled with ice
- And air tight.






MEDICA Hospitals
caring for life
KOLKATA
ORGAN TRANSPLANT
BOX



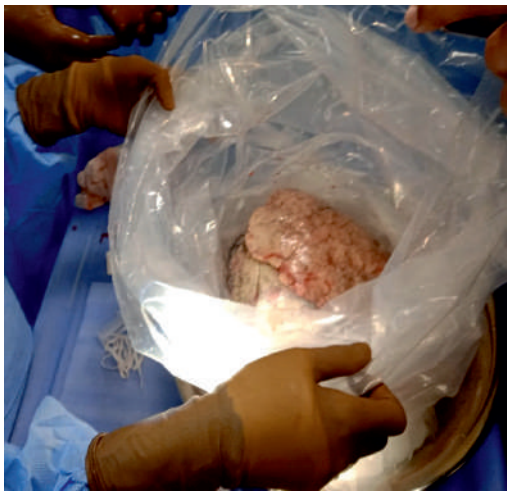

TRANSFORM PATIENT CARE WITH FAST, ACCURATE WITH-PATIENT TESTING
i-STAT

We Need


SALIENT FEATURES
ORGADOR COMES WITH







MANAGEMENT OF PATIENTS WITH PERIPHERAL VASCULAR INJURIES WITH LATE PRESENTATION (6 - 48 HOURS) IN A TERTIARY CARE CENTRE OF EASTERN INDIA

Dr. Ritik Hooda

Department of Cardiothoracic And Vascular, Surgery (CTS), IPMER & SSKM, Kolkata - 20

Study Objective

1. Time of presentation
2. Clinical evaluation of patients with peripheral vascular injuries.
3. Evaluation of extent of peripheral vascular injuries

- Doppler scan
- CT angiography

4. Surgical Management of peripheral vascular injuries -Operative details and post operative management
5. Follow up of patients.

Methodology

1. STUDY TYPE – Prospective Study
2. STUDY PLACE – Department Of Cardio Thoracic And Vascular Surgery, IPGMER AND SSKM Hospital, Kolkata
3. STUDY POPULATION-All patients with peripheral vascular injuries admitted under CTVS Department, IPGMER And SSKM Hospital Kolkata
4. STUDY PERIOD –One and Half Year (August 2022-March 2024)
5. SAMPLE SIZE – 80 cases
6. INCLUSION CRITERIA – All patients with peripheral vascular injuries presented at 6-48 hours (late presentation) from the time of injury
7. EXCLUSION CRITERIA –

- Patients with injury more than 48hours, and patients presented within first 6 hours of injury.

- Patients with injury also having gangrene or devitalization of affected limb.
- Patients with medical vascular diseases (Diabetes Mellitus, Vasculitis, etc.)
- Patients with polytrauma and critically hemodynamically compromised or on ventilator support.

8. PARAMETERS TO BE STUDIED–

1. Time of presentation (within 6 hours or later)
2. Mode of injury
3. Age at presentation & gender
4. Evaluation of site of injury &vessel involved
5. To evaluate Surgical treatment options- primary repair or repair with graft, type of graft to be used
6. To evaluate post operative and follow up

Results

- Our study shows that more (61) patients suffered blunt type of injury, than sharp injury (16), and are more likely (56.25%) patients presented with closed wound injury, than an open wound (43.75%) at vascular injury site, thus are more likely to present with a non-contaminated wound than with a contaminated wound.
- In our study, on initial clinical examination at the time of presentation following hard and soft sign indicating vascular injury were observed, 40 patients presented with absent distal pulse only, 30 presented with Neurological deficit along with absent distal pulse, 6 patients presented with absent distal pulse, neurological deficit, proximity of wound to named vessel, and 4 presented with absent distal pulse and proximity of wound to named vessel. Thus, absent distal pulse was the hallmark feature that seen in all cases irrespective of other signs that presented.
- In our study, 30 patients suffered injury to left brachial artery, 24 patients suffered injury to right brachial artery, 9 patients suffered injury to left femoral artery, 8 patients suffered injury to right femoral artery, 3 patients suffered injury to right popliteal artery, one patient suffered injury to left axillary artery and 2 suffered to right axillary, 2 patients suffered injury at bifurcation of brachial artery, and one at subclavian artery. Brachial artery is found to be most injured artery with left side even more common than the right.
- In our study, 30 patients presented and were treated in 6-12 hours of injury, 35 patients in 13-24 hours, 14 in 25-36 hours, and one in 37-48 hours. Thus, most of the patients included in this study were treated in first 24 hours (81.25%).
- In our study, 75 patients were diagnosed preoperatively by colour doppler, while 5

patients required CT Angiography after colour doppler to confirm diagnosis.

- In our study, amongst various modalities used in surgical repair, in 2 cases Dacron graft was used, in 9 cases PTFE graft was used, in 39 cases primary repair was used, while in 30 cases reverse saphenous vein graft (RSVG) was used.
- In our study, post vascular injury repair, to prevent compartment syndrome or pressure over repaired vessel due to edema, on 3 patients wound was left laid open while in 77 patients wound was closed, although underling facia was kept open and only tagging skin sutures were used in most cases.
- In our study, post vascular injury repair done, patients still suffered from some associated injuries, 66 had fracture of underlying bone (generally external fixation done before vascular intervention), 32 still had neurological deficit, 6 underwent redo surgery due to persistent vascular insufficiency, 3 had under fasciotomy later due to development of compartment syndrome post operatively, 2 patients had extensive degloving injury.
- Thus, in our study, 75 limbs that were operated upon between 6-48 hours on follow up were salvaged, while only 5 limbs were amputated.

Conclusion

- Trauma including vascular injury is a major public health problem in our country and is a major cause morbidity and disability. Based on above statistics and discussion it involves the group of population that is most productive in our country's workforce and growth, affecting this population along with poor infrastructure to help them deal with their disability can have devastating consequences on their families as many of them may be the sole bread earner for their family.
- Even if the limb is salvaged by vascular intervention some if not most of the neurological deficit remains and it is a very long recovery period with poor results due to which most of the patients are not able to continue with a job, they have spent a lot of years to gain the skillset and with little to no alternative job with their current skillset.
- Although first 6 hours post vascular injury is considered the golden period to get best results, in our current scenario, post injury to referral to a trauma centre from a peripheral centre, and then primary survey and evaluation to orthopaedic intervention to stabilize the limb and then vascular intervention, this golden period is lost in almost all cases, but then “how useful the vascular intervention is these patients?”, that is where our study is useful, and clearly states that chances of limb salvageability are still around 94% and vascular intervention can be attempted in all cases of delayed presentation up to 48 hours provided patients limb is salvageable and not gangrenous with favourable mangled extremity severity score. Therefore, an “extended golden period” up to 48 hours can be made by extending this study to multiple centres in different regions of the country with a greater number of cases and long term follow up of these cases to document and morbidity better.

- To reduce this delay in referral and diagnosis of vascular injuries, healthcare staff at peripheral care centres need to be trained to identify the Hard and Soft signs of vascular injury and need a robust transport system for early referral to adequate closest centre for early treatment. Protocols for management of vascular injury and other injuries associated with it should be established in all referral centres to avoid delay in treatment.
- There is also significant need for post intervention physiotherapy and disability management centres which are easily accessible to patients and good quality prothesis for those who underwent amputation or are suffering from neurological disability to help them join back their work as per their skillset.
- **In our study, there was no conflict of interest.**
- **Our study did not receive any funding/commercial sponsorship.**

A COMPARATIVE STUDY TO ASSESS ROLE OF TOTAL BODY PERFUSION IN AORTIC ARCH REPAIR IN PEDIATRIC POPULATION

Apu Saha[1], Susovan Halder[1], Bharath S[1], Shubham Gupta[1], Sufina Shales[1], Patralekha Das[1], Rhitojyoti Sengupta[2], Sukanta Kumar Behera[1], Pradeep Narayan[1]

1. *Department of Cardiac Surgery, NH Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata*
2. *Department of Paediatric Cardiology and Intensive Care Unit, NH Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata*

Aims : Surgical correction of aortic arch interruption in pediatric population demands organ protection and bloodless surgical field. Different strategies had been adopted over time to reduce the incidence of end organ damage including neurological and renal dysfunction. Antegrade cerebral perfusion is practiced in most of the centers. Currently total body perfusion can be achieved by additional descending thoracic aorta perfusion. This study aimed to compare the early postoperative outcomes of total body perfusion with antegrade cerebral perfusion.

Materials and methods : This is comparative study, where data collected retrospectively. All infants who required aortic arch repair from September 2015 to June 2023 were included for the study. The primary endpoint was the incidence of adverse events that includes post-operative creatinine, need for peritoneal dialysis and in-hospital mortality. The secondary end-points include cardiopulmonary bypasstime, aortic cross clamp time, on pump urine output.

Results : Twelve childrenwere included in the study (mean age 4.35 months, mean body weight3.37 Kg). Interrupted aortic arch and hypoplastic aortic arch were primary pathology in sevenand six children respectively. Along with arch repair, nine children required as additional procedures, where ventricular septal defect closure was done in five cases. As per surgical strategies, all children were categorized in two groups -selective antegrade cerebral circulation and total body perfusion with descending thoracic aorta cannulation. Mean cardio-pulmonary bypass time and mean aortic cross clamp time were higher in ACP group. Mean on pump urine output was higher in DTA group. Postoperative mean serum creatinine level was lower in DTA group. Total 16.678%children required postoperative peritoneal dialysis in ACP group. No neurological event was documented. Overall, in hospital mortality was 41.67%, contributed by ACP group (25%) and DTA group (16.67%), where severe low cardiac output state wascause of deaths in all cases.

Conclusion : Total body perfusioncan be practiced safely for aortic arch repair in children even with additional procedures using sub-optimal monitoring system with acceptable clinical outcome. Larger randomized control trial is required to assess role of total body perfusion in pediatric arch repair.

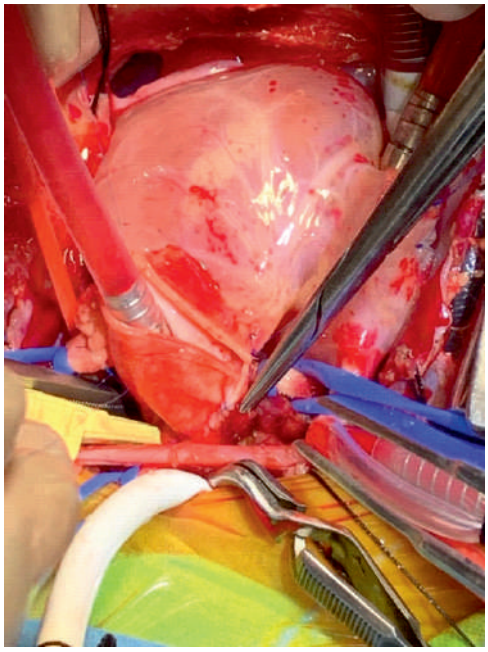
Clinical Significance : Total body perfusion technique can provide acceptable clinical outcomes in children undergoing aortic arch repair.

SELECTIVE ANTEGRADE CEREBRAL PERFUSION AS A NEUROPROTECTIVE STRATEGY FOR AORTIC ARCH REPAIR WITH CONGENITAL HEART DISEASE

Swagatam Atorthy
Debasis Das, Nilanjan Dutta, Shubhadeep Das, Manish Sharma, Shivani Gajpal

Narayana Hospital, Howrah, Kolkata

BACKGROUND/ STUDY OBJECTIVE



- Selective antegrade cerebral perfusion (SACP) is a standard alternative for neuroprotection during surgeries on aortic arch in congenital heart diseases(CHD).
- In addition to use of deep hypothermic circulatory arrest (DHCA), SACP has emerged a viable alternative with some advantages. In our unit, SACP is used in all cases of aortic arch repair associated with CHD.

Objective:

1. To collect the data of all aortic arch repair using SACP at the cardiac surgery department, NSH in last 4 years.
2. To analyse the demographic data, aetiology, in-hospital outcomes, and early follow-up data.

METHODOLOGY

- STUDY PERIOD (2018-2022)
- Retrospective observational study
- NUMBER OF PATIENTS 32

Research objectives/ end points;

- Surgical outcomes of arch repair using SACP: in hospital mortality
- Neurological complications if any

Eligibility criteria:

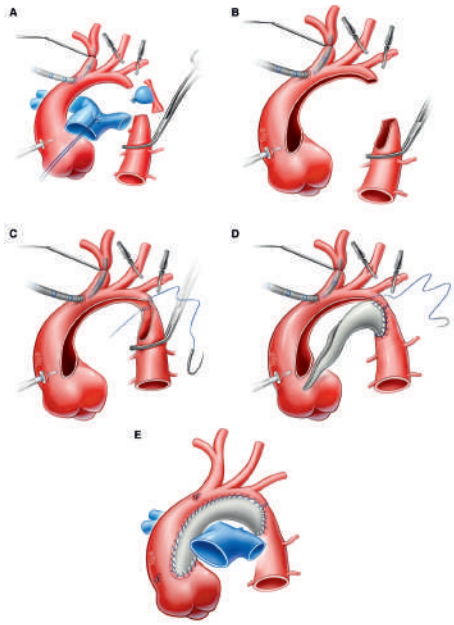
- All aortic arch repairs in CHD patients.

Methodology:

- This study aims to collect the anonymised data from our hospital to evaluate the outcomes of aortic arch repair in CHD using SACP as the neuroprotective strategy.
- Data collected of such procedures from 2018 to 2022 and analysed

RESULTS

Patient Data	N
TOTAL PATIENTS	32
AGE (MONTHS)	2.2± 2 (0.06-11) OUTLIERS: 2YR/ 12 YR/14 YR
NEONATES < 30DAYS	18/32 (56.2%)
WEIGHT(KGS)	4.75± 1.05 , RANGE :2-22
CPB TIME (MINS)	184.5±82.4 , RANGE :93-486
ACC TIME (MINS)	109± 52 , RANGE :43-209
SELECTIVE ANTEGRADE PERF TIME(MIN)	36.9 ± 19.8 , RANGE : 14-81
NEUROLOGICAL COMPLICATIONS	STROKE 2/ 26 (7.6%) SEIZURES 4/ 26 (15.3%) OTHERS NIL
IN-HOSPITAL MORTALITY	2/32 (6.2%)



CONCLUSION

- Selective antegrade cerebral perfusion is a safe neuroprotective strategy for aortic arch repairs in CHD
- Our preference is Selective Antegrade Cerebral Perfusion/ with an innominate graft
- We prefer to avoid end to side configuration especially in neonates to avoid Gothic arch
- Autologous Pericardium is the first patch choice
- Cerebral NIRS/ Radial artery pressures and nasopharyngeal plus rectal temp monitoring
- Close follow up with imaging to intervene early if residual issues

SURGICAL OUTCOMES OF TETRALOGY OF FALLOT WITH ABSENT PULMONARY VALVE SYNDROME

Shivangi Jain
Debasis Das, Nilanjan Dutta, Shubhadeep Das, Manish Sharma
Shivani Gajpal

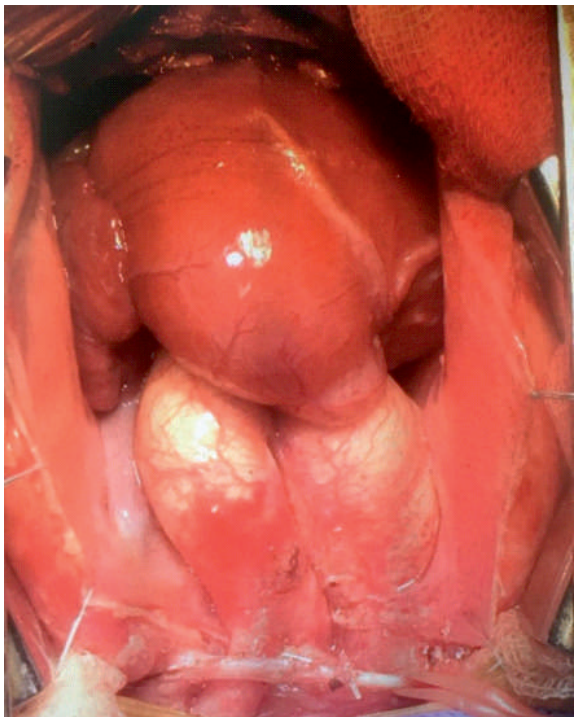
Narayana Hospital, Howrah, Kolkata

BACKGROUND/ STUDY OBJECTIVE



Background/ Rationale:

- Tetralogy of Fallot (TOF) with absent pulmonary valve(APV) occurs in 3-6% of patients with TOF
- Physiologically distinctive from other forms of TOF, due to tracheobronchial compression resulting from massive dilatation of the main pulmonary artery and branches, and from the abnormal branching of segmental arteries.
- One-stage early primary repair is the method of choice.
- Surgery must address the dilated pulmonary arteries in order to minimize the incidence of bronchial compression and peripheral lung damage.



Research objectives/ end points:

- To analyse the surgical outcomes of this challenging subset of TOF at our centre using the various described surgical strategies: In - hospital mortality
- Morbidity data: ICU stay, hospital stay, complications
- Follow – up data

METHODOLOGY

- Study period : January 2018- December 2023
- Retrospective Observational Study
- Number of patients: 28

Eligibility criteria:

- All TOF APV patients undergoing surgery

Methodology:

- Anonymised data from our hospital to evaluate the outcomes of repair of TOF with APV.
- Data collected of such procedures from 2018 to till 2023 analysed in detail.

Duration:

- Retrospective data from May 2018 to December 2023
- Follow up : 22 months

RESULTS

Demographic Data	
Age	30days – 19 years
Weight	3.5 kg – 39 kg
In Hospital mortality	1/ 28 (post ECMO, weaned, sepsis)
Neonates/ Infants	6/28 (21.4%)
Ventilation >72hrs	5/ 28 (17.8%)
Reintervention	1/28 (3.5%)

Surgical Procedure	28
Total number (n)	28
Branch PA reduction	21/28 (75%)
Valveless Transannular patch	5/28 (17.8%)
Valve with Transannular patch	12/28 (42.8%)
Repair With Lecompte's	6/28 (21.4%)
Repair with valved conduit	5/28 (17.8%)

CONCLUSIONS

- TOF APV is a challenging subset of tetralogy of Fallot
- A host of surgical techniques are available and has to be tailored individually to the patient
- Earlier presentation/ Respiratory symptoms need aggressive approach
- Imaging/ symptoms should guide the surgical approach to get good outcomes
- Respiratory care is paramount in post op care
- Good outcomes are achievable with proper planning and care.

PULMONARY ARTERIOVENOUS MALFORMATION - AN UNCOMMON ENTITY

Dr Nilotpal Behuria, Mentor- Dr S S Mahapatra

Dept of CTVS, IPGMER and SSKM Hospital

HISTORY

- 9 yr old child/ no co-morbidities
- Chief complaints
    - SOB
    - Cough with haemoptysis
    - Frequent Abdominal pain
    - Loss of appetite
    - Anorexia

  — 2yrs
- Insiduous onset, gradualy progressive
- Sought treatment mainly due to recurrent attacks of coughing with frank blood - approx ½ cup/day
- No significant past or family history

CLINICAL EXAMINATION

- General Examination
    - Avg built
    - Clubbing +
    - sPO2 at room air 82-88 %
    - No pallor/icterus/lymphadenopathy/edema
- Systemic Examination
    - Respiratory System
    - Diminished Vesicular breath sounds Rt Mammary and scapular regions
    - Rest regions- B/L Vesicular Breath Sounds
- P/A
    - Soft / Non tender/ Mild Hepatomegaly+/BS-WNL
- CVS : S1/S2 Normal. No Murmur

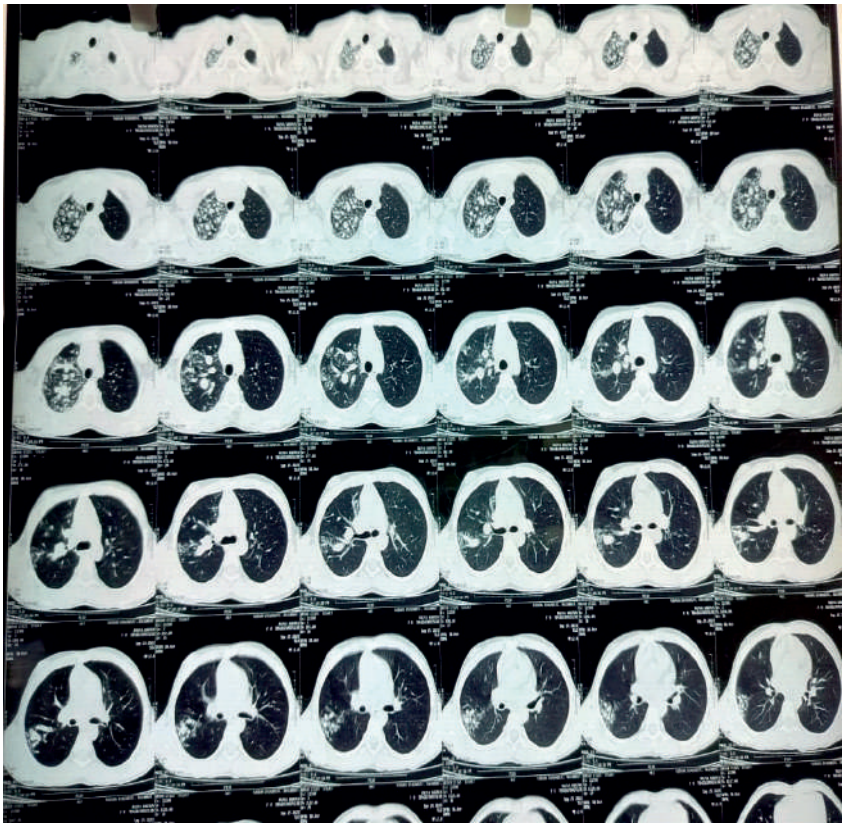
- CNS : No sensorimotor deficit

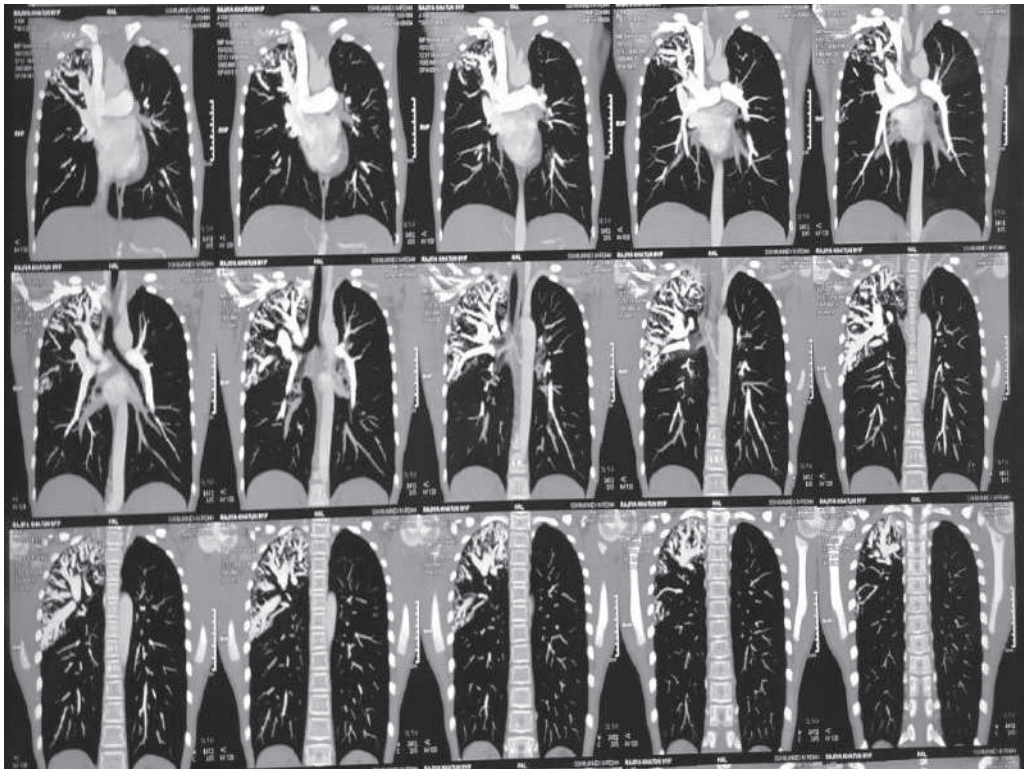
CXR

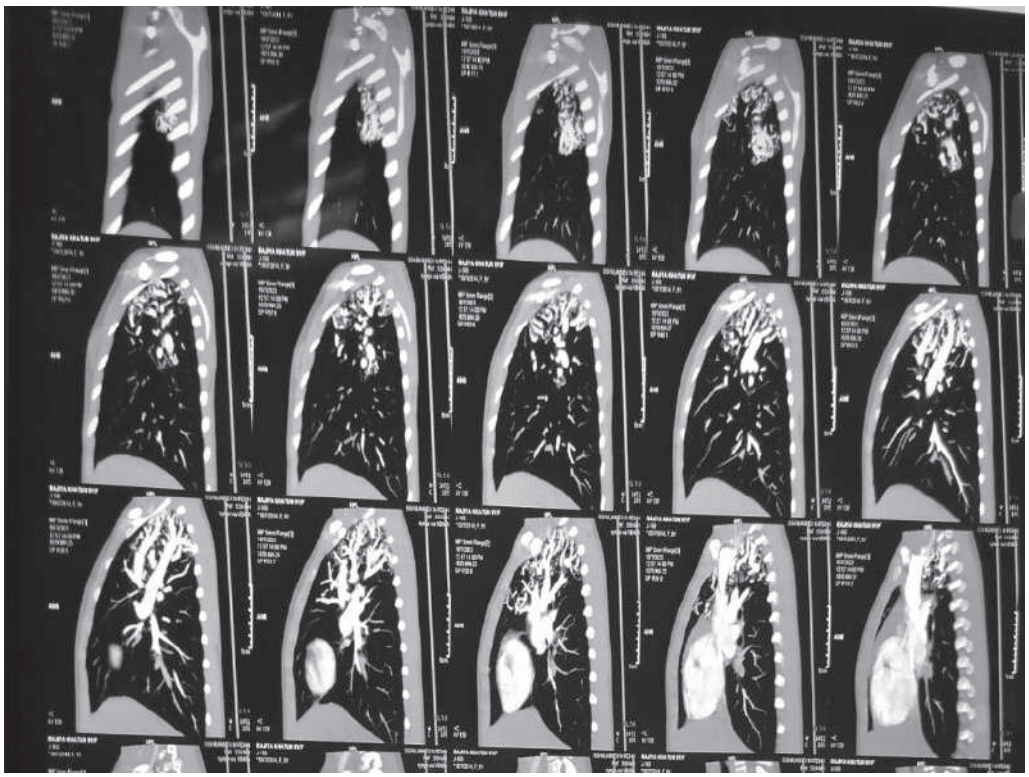


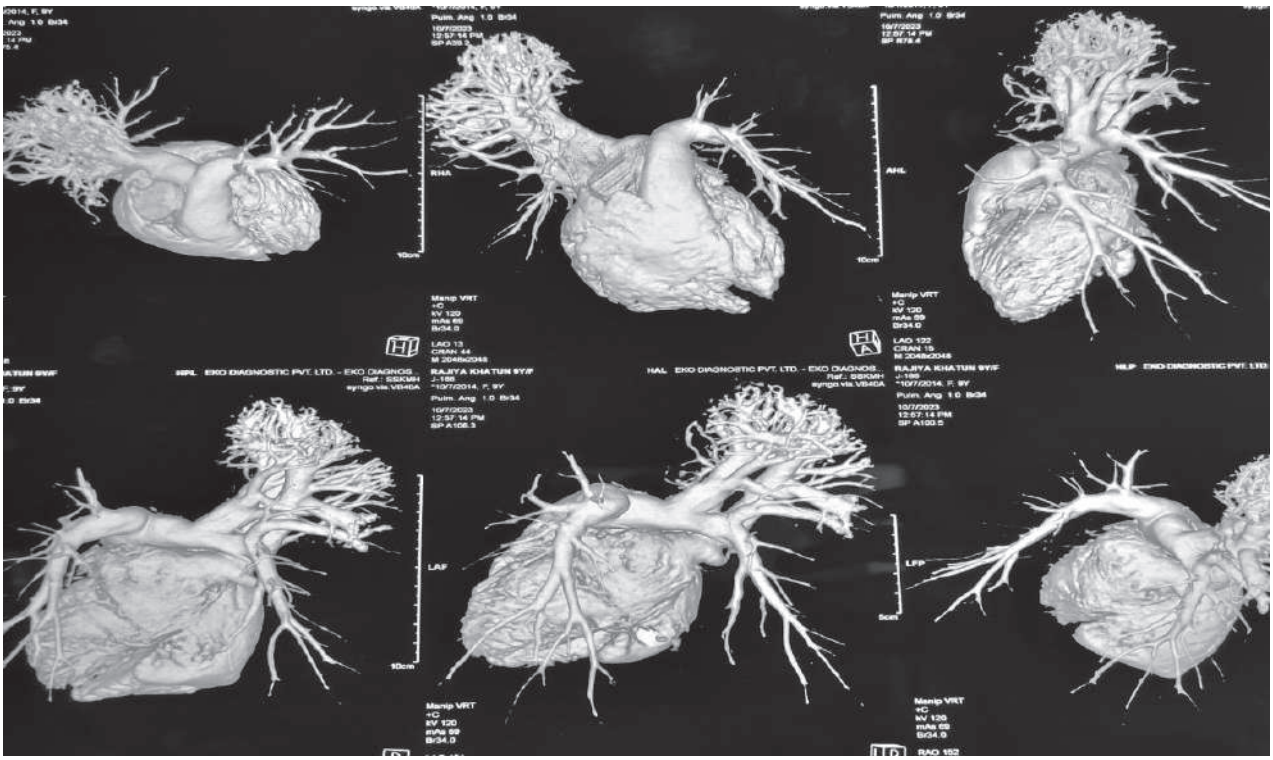
HRCT CHEST

Dilated vessels in Rt Upper Lobe with mild perivascular ground glass haziness





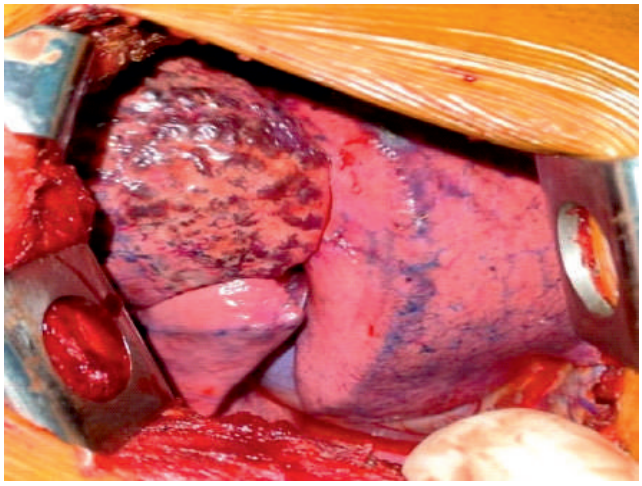




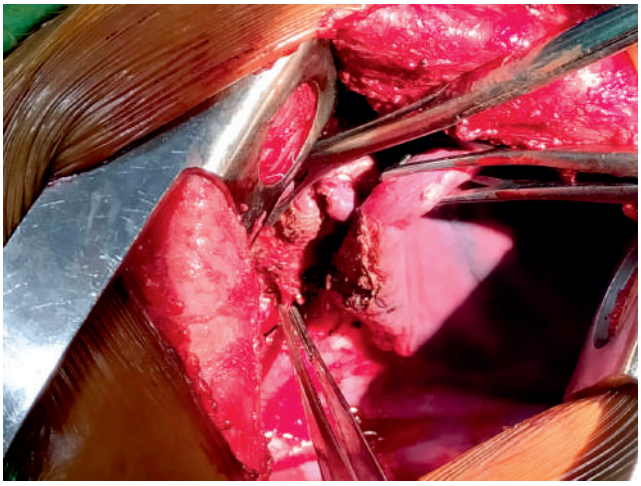
MDCT PULMONARY ANGIOGRAM
Tortuous and anamolous dilated vascular channels in Right Upper Lobe
An AVM in posterior segment of Rt Upper Lobe with ill defined nidus and large draining vessels dilated Rt Superior Pulmonary Vein

TREATMENT

- Right Muscle sparing Posterolateral Thoracotomy + Right Upper Lobectomy
    - In view of the extensive extent other minimally invasive interventions not feasible
- Intra-op Findings-
    - Bluish/blackish/punctate discoloration with abnormal vasculature of Right Upper Lobe
    - Extensive aberrant vessels/ 3 large vessels from RPA supplying Right Upper Lobe AVM



Bluish/blackish /punctate discoloration with abnormal vasculature of Right Upper Lobe



Large aberrant vessel from RPA supplying Right Upper Lobe AVM

SURGICAL CONSIDERATIONS / POST OP

- Cautious and careful dissection
    - High vascularity of lesion
    - Multiple aberrant vessels
- **PATIENCE**
- Post op recovery was uneventful/discharged on POD_4

INTRODUCTION

- Rare vascular anomalies of the lung, in which abnormal dilated vessels provide a right-to-left shunt between the pulmonary artery and vein
- Also known as pulmonary arteriovenous fistulae, pulmonary arteriovenous aneurysms, cavernous angiomas of the lung and pulmonary telangiectases
- First described by T.Churton in a 12 year old boy with epistaxis and hemoptysis -1897

Review › Ann Thorac Surg. 1983 Aug;36(2):231-9. doi: 10.1016/s0003-4975(10)60465-1.

Arteriovenous fistula of the lung

R L Prager, K H Laws, H W Bender Jr

PMID: 6349562 DOI: 10.1016/s0003-4975(10)60465-1

Abstract

Pulmonary arteriovenous fistula is an unusual but not rare abnormality with more than 450 cases reported in the literature. Studies during the last 30 years have established the effective prevention of morbidity and relief of symptoms by operative excision. During the last 25 years, the Vanderbilt University Affiliated Hospitals have seen 7 patients with pulmonary arteriovenous fistula. This experience prompted a review of the literature. Particular emphasis is placed on current means of diagnosis and therapy.

PubMed Disclaimer

Pulmonary Arteriovenous Malformations, Aneurysms and Reflections

Almost 100 years have elapsed since Churton described the anatomic findings in a 12-year-old boy with multiple pulmonary arteriovenous aneurysms (PAVA).[1] Since then, about 500 cases have been reported in the literature.[2] Notwithstanding this experience, basic questions concerning terminology, etiology, diagnosis, optimal management and natural history still deserve consideration.

trast echocardiography and perfusion lung scintigraphy are useful screening procedures since a negative result excludes the presence of right-to-left shunting and a positive result confirms the diagnosis without risk to the patient. Scintigraphic examination has the advantage of providing a quantitative estimation of the magnitude of the shunt. One of these procedures should be performed prior to angiographic study in all cases and may be an important diagnostic clue in those rare patients with microscopic arteriovenous connections. Nevertheless, pulmonary angiography still remains the diagnostic gold standard for PAVA. In surgical candidates, angiographic examination is mandatory not only to establish the diagnosis, but also to exclude

1. Burke CM, Safai C, Nelson DP, et al. Pulmonary arteriovenous malformations: a critical update. Am Rev Respir Dis 1986;134:334-9.

- They are generally considered direct high flow, low- resistance fistulous connections between the pulmonary arteries and veins.
- Important consideration in the differential diagnosis of common pulmonary problems, including hypoxemia, pulmonary nodules, and hemoptysis.
- Mostly congenital in nature however they may be acquired due number of secondary causes.

EPIDEMIOLOGY

- Female predilection - 1.5 to 1.8:1 though more common in the male infants in neonatal age
- The estimated incidence : 2-3 per 100,000
- Around 10 percent of cases of PAVM - identified in infancy or childhood, followed by a gradual increase in the incidence through the fifth and sixth decades.

- Approximately 70% of the cases of PAVM are associated with HHT.

ETIOLOGY

- Mostly congenital in nature and due to HHT in majority of cases
- Most common acquired cause is hepatic cirrhosis
- They are also associated with surgeries for CHD including classic Glenn shunt
- HHT has an autosomal dominant inheritance
- Endoglin, the most abundant TGFb binding protein that is found on endothelial cells,has been identified as the HHT gene mapping to locus 9q3, and is presently referred to as the gene for HHT1.
- Hereditary hemorrhagic telangiectasia
- Hepatic cirrhosis
- Penetrating chest trauma
- Mitral stenosis
- Schistosomiasis
- Actinomycosis
- Fanconi's syndrome
- Metastatic thyroid carcinoma
- Status post surgery for congenital heart disease
- Idiopathic

PATHOLOGY

- PAVMs - supplied by pulmonary arteries (95 percent of cases) and usually drained by pulmonary veins;
    - occasionally be fed by systemic arteries(i.e the bronchial artery) and/or drain in to the left atrium or inferior vena cava
- When PAVMs are fed by systemic arteries, hereditary hemorrhagic telangiectasia(HHT) is usually not the cause of the PAVM

PATHOPHYSIOLOGY

- Contrast to systemic AVM- PAVMs do not affect cardiac haemodynamics
- Cardiac output, cardiac index, pulmonary capillary wedge pressure, heart rate, blood pressure, and the electrocardiogram - WNL
- Degree of shunt determines - clinical effects on the patient
- Peripheral oxygen saturation - low and as expected does not normalize with 100 percent oxygen

CLINICAL FEATURES

- Pulmonary symptoms- 20 to 65 percent (approx 40 percent) and the remainder are asymptomatic
- Typically found incidentally on chest imaging
- MC pulmonary symptoms- dyspnea and hemoptysis
- Patients with underlying HHT - also epistaxis and mucocutaneous telangiectases
- PAVMs is seen in almost all patients who have associated clubbing
- Dyspnea are sometimes strikingly minimal when compared with associated signs such as cyanosis and clubbing
- Platypnea
- This phenomenon is secondary t0 decrease in blood flow through PAVM in the dependent portions of the lungs upon assuming the supine position.
- Epistaxis- caused bybleeding from mucosal telangiectases
- Bleeding from telangiectases on the skin and in the GIT - patients with PAVM and HHT
- Gastro intestinal hemorrhage in HHT - 15 to 30%
- Neurological symptoms- headache, vertigo, paresis, numbness, paresthaesia, syncope,orconfusion can be found
- Common physical findings - cyanosis, clubbing, and pulmonary vascular bruit

INVESTIGATIONS

- CXR
- CT Thorax
- 2D Echo (Bubble contrast 2D echo)
- CT Pulmonary Angiography
- 3D CEMRI +MRA Thorax

TREATMENT

- Surgical resection
    - Lung preservation approach
- Percutaneous embolization
    - Percutaneous embolization is now preferred modality of choice
    - Balloon embolization
    - Coil embolization.

BRANCH-FRST TECHNIQUE WITH CONTINUOUS PERFUSION IN AORTIC ARCH REPAIR—OUR INITIAL EXPERIENCE

Dr Unmesh Chakraborty

Dr NB resident, NH Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata

BACKGROUND

The branch-first technique (BFT) for aortic arch replacement eliminates deep hypothermia and global circulatory arrest, reducing cardiopulmonary bypass and ischemic time. It involves the sequential clamping and reconstruction of each supra-aortic trunk (SAT) and subsequent resumption of perfusion. It provides a landing zone for future interventions as needed.

We describe our initial experience in three such cases.

METHODOLOGY

Three patients with varied aortic pathology were evaluated in this case series. It is a retrospective, single-instituional experience. Case 1, a 53-year-old gentleman had severe aortic regurgitation, dilated root, ascending aorta and arch. Case 2, a 42 year old gentleman, with chronic Type A Aortic dissection and dilated root. Case 3,a 67 year old gentleman with ascending aorta and arch aneurysm.

SATs were tackled first with the trifurcated TAPP graft and Innominate anastomosis is performed on CPB (femoral art+RA cannulation) without any additional direct perfusion support, basing the cerebral protection on natural anatomic collateral vessels. That then serves as the additional antegrade flow channel to the cerebral circulation, while the other two SATs are subsequently anastomosed to the perfusing graft. This technique allows meticulous anastomosis in an unhurried manner in an unobstructed surgical field, ensuring complete cerebral and distal organ perfusion.No special intraoperative cerebral monitoring modalities were used. The perfusion circuit was modified to create an upper body perfusion circuit (UBPC), using a dedicated pump head, to enable cerebral perfusion independent of the lower body. During the branch first technique, perfusion at 12–15 ml/kg/min for the head vessels was maintained meticulously while observing the pressures in the circuit and left and right radial lines.

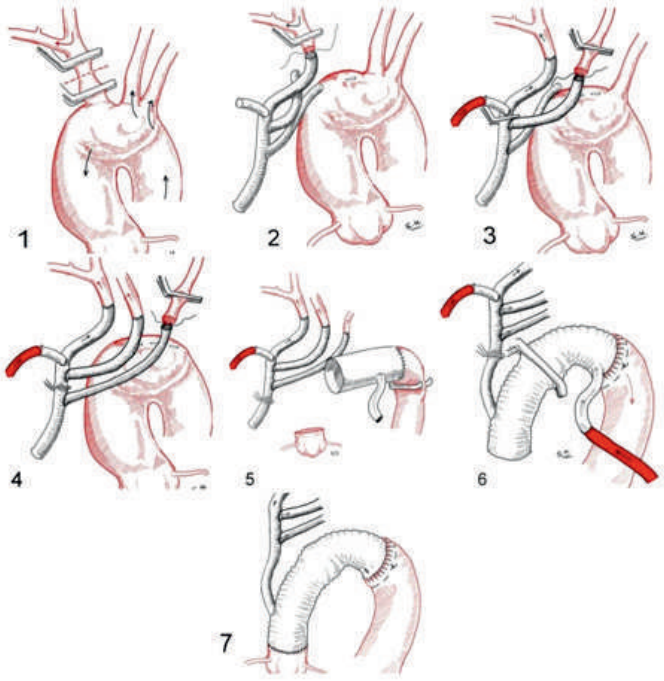


Illustration of the different steps of the branch-first aortic arch repair

RESULTS

The mean CPB time was 211 min while the mean aortic cross clamp time was 101 min. Two patients underwent a Bentall procedure, while one had an additional RCA graft. In the third case, only interposition graft was used for replacement, along with arch repair. Its aortic cross-clamp (ACC) time was 57 min. The patients were extubated on the first post operative day, with a mean mechanical ventilation time of 475 min. There were no strokes, paresis or neurodeficit or other complications in the postoperative period. Total stay in the intensive therapy unit (ITU) and total hospital stay were 3 days and 7 days respectively. Postoperative echocardiography was normal. All three were discharged uneventfully in a hemodynamically stable condition and are currently doing well on follow-up at 6 months.

CONCLUSION

Our initial experience, even though in a very small pool of patients, has been promising. There have been no perioperative complications, or need for deep hypothermia or global circulatory arrest. SATs are clamped individually for reconstruction anastomosis for a maximum of 6 min each, in our experience and the substantial collateral network helps in maintaining cerebral perfusion.

BFT minimises the prolonged periods of cardiopulmonary bypass, myocardial and distal organ ischemia, as well as the risk of embolisation. Total cerebral circulatory arrest is avoided. The surgeon does not face additional time constraints, and meticulous anastomosis can be performed with access to an enhanced surgical feld. While initial results are promising, comprehensive evaluation of BFT in aortic arch surgeries requires data from randomised studies, with extensive cohorts.

ISOLATED OFF PUMP CABG VIA MINIMALLY INVASIVE APPROACHPOST FAILED RCA PLASTY

Dr. Niket Arora

INTRODUCTION:

In Coronary Artery Bypass Graft (CABG) surgeries, the left anterior descending artery (LAD) is typically the primary focus for revascularization, given its critical prognostic importance. The literature also reports cases of isolated CABG) for non - LAD lesions. However, these were often in the setting of re-do surgeries or in patients with isolated right sided coronary lesion and coexisting valvular heart disease. Less invasive surgical techniques have improved outcomes, reducing morbidity and recovery time, and making surgical revascularization a more favourable option. We describe a case of novel surgical revascularization via minimally invasive approach for isolated severe right coronary artery (RCA) disease. The patient had a large dominant RCA supplying significant myocardial territory and had required revascularization, but had unsuccessful percutaneous coronary intervention (PCI) as a result of challenging coronary anatomy.

CASE REPORT:

A 61year old gentleman presented to us with post prandial angina for 4 months which progressively worsened over the last 2 weeks.Baseline blood investigations were within normal limits.Echocardiogram showed an ejection fraction of 60% with no regional wall motion abnormality.



Fig. 1: Coronary angiogram depicting the lesion and the failed percutaneous intervention

Coronary angiogram was performed on 23/04/2024.It revealed significant right coronary artery disease with 50-60% ostioproxmal,70-80% distal followed by 100% lesion in the Posterior Descending Artery along with a 40% lesion in the Left Anterior Descending Artery. PTCA was attempted butin view of overwhelming anatomical and technical challenges, it was not successful. The RCA was the culprit vessel responsible for the patient's coronary syndrome, affecting a sizeable area of myocardium. It had resulted in the patient developing multiple episodes of unstable angina,hence it was decided to address the lesion surgically.

The risks and benefits of the surgery were explained in details to the patient and his family members and after obtaining informed consent, he was taken up for off pump CABG on 05/09/2024.

The approach was via a right antero-lateral mini thoracotomy (RAT) and a subcostal incision.Saphenous vein was harvested endoscopically(EVH) and anastomosed distally to the Posterior Descending branch of the Right Coronary Artery via the subcostal approach and the proximal anastomosis to the aorta was performed through RAT.

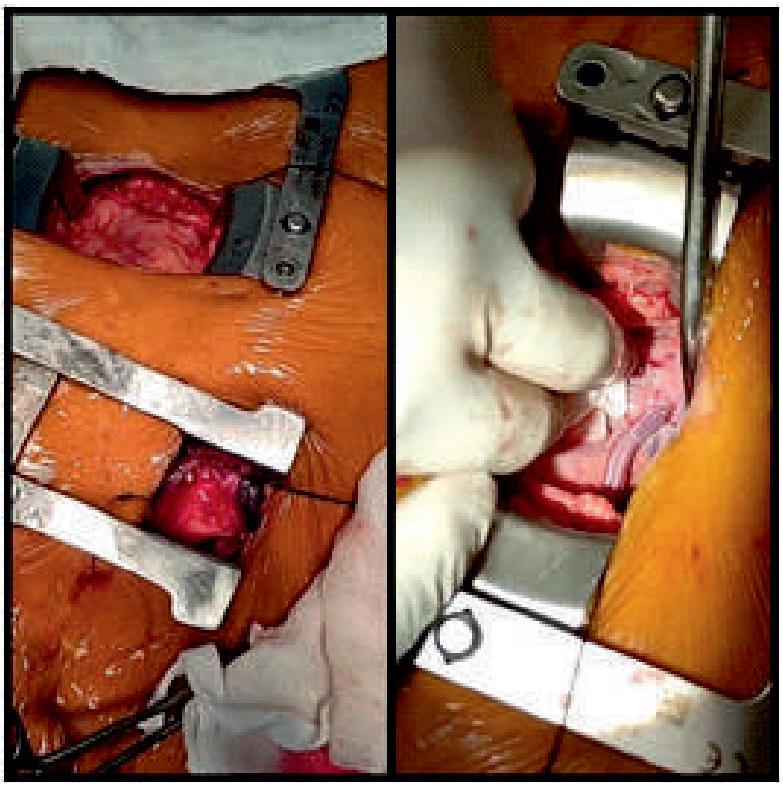


Fig. 2: The approach to minimally invasive off pump bypass graft of isolated posterior descending artery

The intraoperative period was uneventful and the patient was shifted to the CT ICU with minimal inotrope support which was subsequently tapered and he was prepared for fast track extubation. He was weaned and taken off mechanical ventilation 3 hours post-surgery. He was mobilised and started on chest physiotherapy promptly. He was down staged on the 1st post operative day.

Intercostal drains and urinary catheter were removed on the 2nd post operative day after which he was shifted to ward. He was discharged home on the 3rd post operative day in a hemodynamically stable condition.



Fig. 3: The incisions post surgery

DISCUSSION:

The key point of this report is to demonstrate the need to customize revascularization strategies to each patient's unique clinical profile and coronary anatomy which is crucial for optimal outcomes.Dominant RCAs with severe disease can confer a high burden of morbidity on patients, underscoring the need for timely revascularisation.In the appropriate patient population, anterior mini-thoracotomy with a subcostal incision for isolated RCA bypass is a viable therapeutic option, particularly in failed or non-stentable RCA stenosis.

INFECTIVE ENDOCARDITIS SURGICAL ASPECTS- A CASE SERIES

Prof. S. S. Mahapatra[1], Dr. Surajit Sarkar[2]

[1]Professor, [2]Third year Resident, Department of CTVS, IPGMER & SSKM&H, Kolkata

Background

- We present 13 cases here, who needed open heart surgery for Infective Endocarditis done recently in the department of Cardiothoracic and Vascular Surgery, IPGMER & SSKM Hospital, Kolkata.
- These cases were referred to us by either of ID department, Department of Medicine or Department of Cardiology. One case came from Rheumatology department.
- Our cases are mainly of Native valve endocarditis, with 3 case of lead endocarditis added in.

Study Objective

Objectives for which these cases were taken up for surgery:

1. Acute severe heart failure due to valve dysfunction, taken up as Emergency surgery.
2. Post appropriate antibiotic therapy and negative blood culture, taken up as an elective case.
3. Persistent bacteremia and fever lasting for more than 5-7 days, despite adequate antibiotic therapy.
4. To remove infected permanent pacemaker lead.
5. In case of large mobile vegetation, emergent surgery to reduce the chances of embolic stroke/septic pulmonary embolism.

Methodology and Results

- We present here a tally of 13 cases of IE done over the last 2 years in the department of CTVS, IPGMER & SSKM Hospital, Kolkata. This study has a retrospective nature.
- Among these, 10 were native valve endocarditis, and 3 were lead endocarditis cases.
- We had no cases of prosthetic valve endocarditis in this time period.
- 2 of the 3 lead endocarditis cases also involved tricuspid valve.
- 8 cases were taken up in emergency due to refractory heart failure, while 5 cases were done in an elective fashion.
- Of the 13 cases, 12 involved some or the other native heart valve.

- 6 cases involved the tricuspid valve, 3 in Mitral, 2 in Aortic, and 1 in pulmonary valve.
- Among the 6 TV cases, surprisingly, only 1 was a known IV drug abuser.
- Our focus was to try to repair the valves in all cases.
- However, 8 cases were decided for repair after the initial inspection and excision of vegetation. 7 of them succeeded, while 1 resulted in moderate residual MR and valve was replaced.
- 5 cases were decided for replacement to begin with.
- All patients went home, with no in hospital mortality.
- On follow up also, all patients are doing fine with no recurrence.

Conclusion

- Infective endocarditis, though a dreaded disease with high morbidity and mortality, can be managed effectively.
- With good operative planning, pre and post operative management, good outcomes can be obtained even in a resource constrained public set up.
- Most important point to save lives came out to be the timing and the decision of operation, with 8 of 13 of our patient taken up for emergency operation under CPB.
- This goes well in hand with latest ESC (2023) and AATS (2019) guidelines for management of IE, both of which forbids delaying of operation under any context.

OPERATIVE MANAGEMENT OF TRACHEAL STENOSIS - EXPERIENCE OF A TERTIARY CARE CENTRE

Dr. Nabarun Mallick

BACKGROUND

Tracheal stenosis following prolonged intubation or tracheostomy is one of the most common causes of tracheal stenosis. Although there are various modern modalities available for management of the said condition, surgical correction remains the gold standard modality. This study aims at giving a brief sketch of our experience in tracheal surgery following iatrogenic tracheal stenosis.

AIM

To analyze the characteristics and results of tracheal resection and reconstruction in patients presenting with post-intubation or post tracheostomy tracheal stenosis.

METHODOLOGY

STUDY TYPE: Prospective observational study.

STUDY PLACE: of Department of Cardiothoracic and Vascular Surgery, IPGMER and SSKM Hospital, Kolkata

STUDY POPULATION AND SAMPLE SIZE: All patients undergoing surgery for tracheal stenosis in the aforementioned department, keeping in mind the study period, inclusion and exclusion criteria. Total number of operated patients included in the study- 14.

STUDY PERIOD: two year(June 2022-June2024)

STUDY DESIGN: Prospective observational study

INCLUSION CRITERIA:

- All patients presenting with tracheal stenosis posted for surgery in the department of CTVS, IPGMER & SSKM Hospital, in the above mentioned study period.

EXCLUSION CRITERIA:

- Acute laryngotracheal injury
- Trachea esophageal fistula
- Tracheal tumor

DESCRIPTION OF SURGICAL STEPS: a collar incision was made 2 cm above the sternal notch. Skin flap was mobilised from thyroid cartilage to sternal notch. Stomal site was included within the skin incision. Sharp dissection was used to expose the trachea of adequate length. Strap muscles were splitted, and if division was required then cut was made at the lower region to preserve it for future flap coverage. Trachea was divided at the lowest border of the stenosis and cross field ventilation was initiated. The entire length of the stenosis was dissected with fine scissor, staying as close as possible to the diseased trachea. This technique and avoidance of

using cautery prevented recurrent laryngeal nerve damage. If cricoids was involved, the anterior part of the cricoids cartilage was resected keeping the postero-lateral membranous part intact, as recurrent laryngeal nerve pierces trachea at this level. Proximal trachea was divided at the upper border of stenosis, keeping a healthy rim of cartilage. Distal trachea was freed from paratracheal fascial upto carina by blunt dissection. Dissection was strictly restricted in antero-posterior plane. Lateral dissection jeopardizes blood supply of trachea. Proximal trachea was routinely freed in similar fashion. Once adequate length was achieved and tension free anastomosis could be possible, then interrupted sutures were placed posteriorly starting from midline and going laterally on each side. After placing sutures, the sand bag was removed, neck was partially flexed and sutures were tightened. Once posterior anastomosis was completed, ET tube was passed through the oral cavity and beyond the suture line. Anterior anastomosis was completed over the ET tube. In case of longer length of resection, additional two stay sutures were placed on the both side of trachea adjoining the two resected margin and tightened so that the anstomosis remains tension-free. In case of release preocedure, suprahyoid release was done by a separate incision directly over the hyoid bone and dividing the lesser cornu from the main body ad dividing all its aneterior muscle attachment. Laryngeal release was done dividing all the sling muscle so that the proximal part of the trachea and larynx could drop down further. In 12 cases we had used polygalactin (4-0) and in two cases we had used polydiaxanon (4-0) as suture material. Anastomosis is covered with the strap muscles. And skin and fasical was closed with one suction drain insitu. 3 point guardian sutures were placed and neck in kept in flexd condition with chin touching the chest

RESULT

Among 14 cases 2 (14.3%) patients were Female and 12 (85.7%) patients were Male. Mean age of this group was 36.57± 15.38. In our study, 2 (14.3%) patients were <20 years of age, 4 (28.6%) patients were 20-30 years of age, 2 (14.3%) patients were 30-40 years of age, 3 (21.4%) patients were 40-50 years of age and 3 (21.4%) patients were >50 years of age.

2 (14.3%) patients had both intubation and tracheostomy as cause of lesion, 7 (50.0%) patients had intubation and 5 (35.7%) patients had tracheostomy as cause of lesion.

In our study, total 3 patients had received previous treatments before obtaining for surgical management. 2 (14.3%) patients had dilatation and1 (7.1%) patient had dilatation+stenting in previous treatment. Most of the patients upon diagnosis of complex or long segment stenosis were directly referred to our surgical department without any prior treatment

All the patients were given general anesthesia initially and later cross field ventilation was used, except in one case where peripheral cardiopulmonary bypass was used to initiate anesthesia. In rest of the 13 cases, 10 (71.4%) cases were induced by endotracheal tube and 3(21.4%) were induced via tracheostomy site. In single case where CPB was used, the lesion was complete long segment stenosis which could not be managed with endotracheal tube and tracheostomy was not possible under local anesthesia due to the location of stenosis segment. Among 3 trachesotomy cases, one tracheostomy was done under local anesthesia on table and in rest of the 2 cases tracheostomy was already in situ. The gold standard is to place the endotracheal tube distal to the stenotic segment to retain airway control.

11 (78.6%) patients had cervical, i.e. only tracheal and 3 (21.4%) patients had associated subglottic location of stenosis. Among those three patients with subglottic stenosis 2(14.3% of

total study group) patients needed anterior part of cricoids cartilage resection to remove the entire involved segment and anastomosis was done with cricothyroid membrane. In the other cases anastomosis was done at the lower border of cricoids cartilage after curetting the posterior stenotic tissue

2 (14.3%) patients had laryngo-tracheal anastomosis and rest 12 (85.7%) had tracheo-tracheal anastomsis. Among all three laryngo -tracheal anastomosis, 2 patients had length of resection within 3-5 cm and one patient had >5cm length of resection. Association between type of anastomosis and length of resection was found to be statistically significant(p=0.0373).

1 (7.1%) patient had suprahyoid release, 1 (7.1%) patient had hyoid release+laryngeal release and 1 (7.1%) patient had laryngeal release. Total 3 patients out of needed additional release process apart from routine antero-posterior release of tracheal segment from pre and para tracheal fascia.

In our study, 2 (14.3%) patients had <3 cm, 11 (78.6%) patients had 3-5 cm and 1 (7.1%) patient had >5cm length of resection. Laryngeal+ supra hyoid release was used in the single case where length of resection was more than 5 cm. one case where hyoid release was used, the length of resection was more than 3 cm but less than 5 cm. only laryngeal sling muscles were divided in one case where length of resection was 3-5 cm. Association of Length of resection with Release procedure was found to be statistically significant (p=0.0249). We had also studied association between mode of delivery of anesthesia with length of resection. We have found that cases where tracheostomy was used to give general anesthesia, length of resection was either within 3-5 cm or more than 5 cm(one case), whereas out of total 10 cases where ET tube was used to deliver anesthesia, 8 cases had length of resection within 3-5 cm and 2 cases had <3 cm. although statisticall significance could not be demonstrated because of small study population, we have experienced that length of resection can be longer in case of trachesotomy patients as the stomal site needs to be resected along with the stenosed segment and often the stomal sites were associated with damaged cartilages and unhealthy granulation tissue.

Regarding intraoperative time, in our study, 7 (50.0%) patients had <3 hours, 5 (35.7%) patients had 3-4 hours and 2 (14.3%) patients had >4 hours in intraoperative time. Mean intraoperative Time (hours) (mean±s.d.) of patients was 3.3214± .9728. We have found out that patient with subglottic involvement had longer surgical time. 2 patients with subglottic stenosis had intraoperative time more than 4 hours. Association between location of stenosis with intraoperative time was found to be statistically significant(p=0.0098). This can be because of additional release maneuvers, more complex anastomosis. Similary patients who needed longer segment of resection had relatively prolonged intraoperative time, although association between length of resection and intraoperative time could not be found to be statistically significant (p=0.0735). This can be again because of small number of study population

Mean hospital stay (days) (mean±s.d.) of patients was 8.2857± 2.0913. Minimum stay in our study was 6 days and maximum hospital stay was 10 days. Release procedures had no impact on hospital stay. Most patients were shifted to step down from ICU within 48 hours of surgery. Clear liquid was started in most of the cases after 24 hours and subsequently if tolerated soft diet was given. No patient had complications of aspiration while initiation of feed in post operative period. Patients were discharged once clinically stable, ambulated and after removing guardian stitches. Guardian stitches were kept in all cases for 7 days

In our study, 1 (7.1%) patient suffered from death in immediate post operative period, 11 (78.6%) patients had good and 2 (14.3%) patients had satisfactory immediate outcome. Among 2 patients with satisfactory outcome, in one case protective tracheostomy was kept as the anastomosis was between thyrohyoid membrane and trachea(laryngo-tracheal anastomosis). In the same case there was associated hoarseness of voice, which gradually improved by 3rd post operarive week. Another patient also had transient difficulty in deglutition and inability to perform incentive spirometry with full effort. In the said case difficulty in deglution resolved within first 7 days of surgery. One patient had died because of sudden bleeding from surgical site on post op day three probably due to trachea-innominate fistula. The same patient underwent redo anastomosis on post op day 2 as there was anastomotic dehiscence. Possibility of anastomotic tension could not be excluded in the said case. The above mentioned patient had laryngo tracheal anastomosis in the first surgery. From that experienced our unit has considered protective tracheostomy in all cases of long segment resection of more than 5 cm with high up laryngo tracheal anastomosis where cricoid ring is resected. Extensive release maneuver was considered as well. In follow up of one month, in our study, 1 (7.7%) patient required dilatation and 12 (92.3%) patients had good result. The one case which required tracheal dilatation in 1 month follow up was a case of trachea-tracheal resection and mode of delivery of anesthesia was via ET tube. Immediate outcome of that patient was satisfactory where there was inability to perform spirometry with full effort. Inadequate resection during primary surgery as one of the probable cause of the re-steosis could not be excluded. No statistically significant date could be derived from association between length of resection and outcome or association between type of aastomosis and outcome due to small sample size.

CONCLUSION

- Any patient with more than 24 hours intubation presenting with dyspnea should be screened for tracheal stenosis.
- High grade of suspicion is required to diagnose post intubation trachesl stenosis.
- Accurate description of stenosis, such as its length, extent, location, distance from vocal cord aid in surgical planning
- Anesthetic planning is crucial. Good liaison with anesthesia team is mandatory. Peripheral bypass can be kept as last resort.
- Supra hyoid release is a safe and effective release manoeuvre and easy to perform.
- Stay sutures should be tied at the two sides of trachea as and when required to release tension on the anastomosis.
- Protective tracheostomy can be considered when anastomosis is between thyro hyoid membrane and trachea and length of resection is more than 5 cm.
- Anastomosis should be covered with strap muscle flap
- Compartmentalisation between trache and innominate artery should be done with help of strap muscles to prevent trachea-innominate fistula
- Guardian stitches should be kept for 5-7 days. Patient is encouraged not to induce cough. Chest physiotherapy is encouraged.
- Montegomery T tube can be a good bail out option when the trachea can not be reconstructable or risk of re-stenosis is there.

AORTIC VALVE REGURGITATION: TO REPAIR OR REPLACE?

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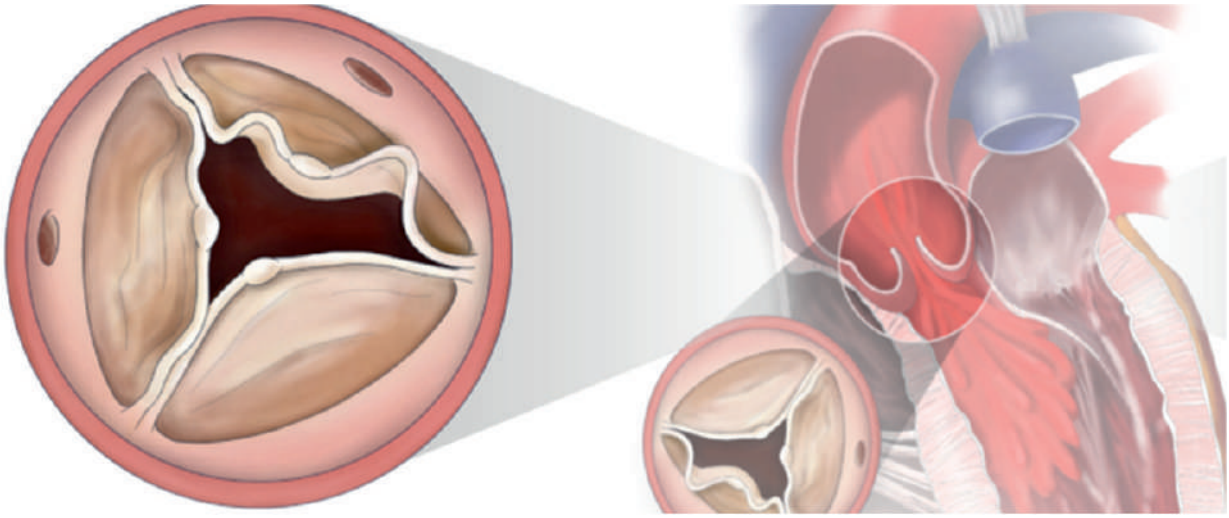
Background & Study Objective

- AVr provides several potential benefits over conventional AVR with mechanical valves including avoidance of anticoagulation-related complications, infective endocarditis, stuck leaflets and better durability compared to bioprosthetic valves and feasibility in pregnancy and in the paediatric population.



- Although technically challenging, outcomes have been reported equivalent to AVR.
- v Excellent long or very long-term outcomes of AVr of up to 20 years.
- Aim- to compare early outcomes between aortic valve repair and replacement done for aortic regurgitation in a tertiary health care centre in eastern India.

Methodology

- Prospective observational study.
- Study period: One and half years (July 2022-January 2024) at Department of Cardiothoracic & Vascular Surgery, IPGMER and SSKM Hospital.
- Sample size: 80 patients having moderate to severe single/ mixed aortic valve disease, predominantly aortic regurgitation. Exclusion criteria: Patients with end organ failure, neurological disease, infective endocarditis, associated coronary artery or other valve disease, previous cardiac surgery, and emergency surgery were excluded.

- Method: Preoperative evaluation was done based on echocardiographic parameters and valve pathology along with intra- operative parameters like cardiopulmonary bypass (CPB) and cross clamp times, intraoperative findings and events during weaning from CPB. Post operative complications like low cardiac output, blood transfusion requirement, re-exploration, pulmonary, neurological or infective complications, icu stay, mortality in hospital, paravalvular leak in valve replacement and degree of residual aortic regurgitation in patients who underwent aortic valve repair were analysed. Echocardiographic assessment was done at one month. Data was analysed using SPSS for Windows Version (version 27.0; SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5.

Results

Most of the patients in our study belonged to the age group of 51-60 years (27.5%) and most of the patients were male (76.3%). However, age and co-morbidities were comparable in both the repair and replacement groups. BSA of the patients in repair group was found to be significantly higher than in the replacement group. All other parameters and routine examination were found to be comparable in between these two groups. Most of the patients in repair group had RHD (37.5%) with 10% of the patients having aortic root dilatation, and prevalence of congenital bicuspid and degenerative aortic valve disease was comparable in both the groups. Most of the patients with valve prolapse underwent repair and those with calcification and commissural fusion underwent replacement. For repair group, there was significant decrease in both LVIDD and LVIDS post surgery, and for replacement group, there was slight decrease of LVIDD and increase of LVIDS post surgery. Ejection fraction reduced for both the groups post operatively. Thus, improvement in LV condition was found to be marginally better in the repair group. Mean CPB time, blood transfusion requirement and hospital stay were more in the repair group whereas paravalvular leak was a complication in the replacement group. Aortic valve repair was adequate and satisfactory in most of the patients. Symptomatic improvement was comparable in both the groups. There was no mortality except for one patient in the repair group.

Conclusion

We can conclude that comparable death and complication rates, aortic valve replacement and repair are equally effective treatments for aortic regurgitation. When compared to valve replacement, valve repair seems to provide marginally better LV function and eliminates anticoagulation and prosthetic valve related complications with long term durability if done with proper expertise. These results validate valve repair as the better and first choice in expert hands when anatomically possible, specially in the younger population, but the intervention of choice should be ultimately tailored according to patient's need and choices.

PULMONARY ARTERIOVENOUS MALFORMATION IN A YOUNG ADULT MALE- A CASE REPORT

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INTRODUCTION

Pulmonary arteriovenous malformation is a rare condition of the lung characterized by abnormal connection between pulmonary artery and pulmonary vein leading to abnormal right to left shunt. Initially described by Churton in 1897, these lesion also known as arteriovenous fistulae, aneurysm, pulmonary hemangiomas etc. these lesion latterly identified in relation with hereditary hemorrhagic telangiectasia, also known as Osler-Weber- Rendu syndrome.

Significant portion of the affected individual may remain asymptomatic but may eventually develop ischemic stroke, cerebral abscesses, myocardial infarction, hemoptysis and hemothorax. Despite rare in incidence it should be considered an important differential diagnosis in patients with epistaxis, hemoptysis, exertional dyspnea.

We are presenting a case of pulmonary arteriovenous malformation in a young adult with exertional dyspnea and repeated hemoptysis.

CASE REPORT

A 15 year boy presented with chief complaint of repeated dry cough with hemoptysis since last 1 year, initially the episodes of cough and hemoptysis was infrequent but since last 3 month episodes become more frequent, the boy was admitted in the department of cardiothoracic and vascular surgery at IPGMER and SSKM hospital, Kolkata for further management.

On Physical examination he was comfortable at room air with saturation of 98% having good nutritional status and good built, having no skeletal deformity with no clubbing and cyanosis, on auscultation there is decrease air entry in right lower portion of the lung rest lung field appears normal and rest cardiovascular examination is normal.

On blood investigation his hemoglobin levels are 10.8 gm%, echocardiography and abdominal ultrasound reveals no abnormal findings.

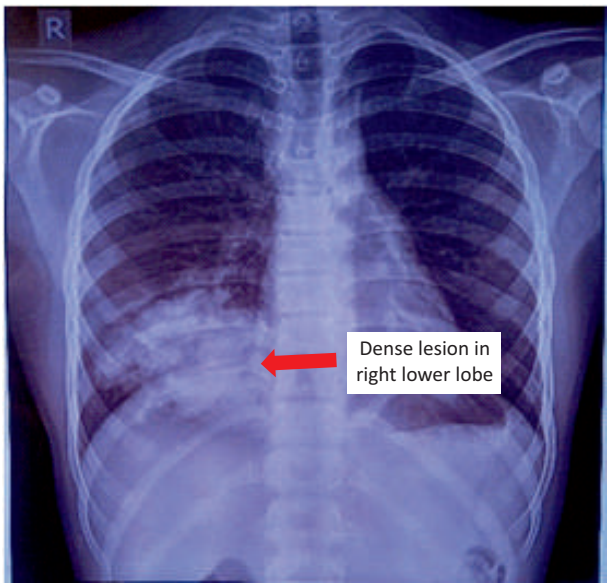

Fig 1. X-ray chest shows a dense lesion in right lower lobe

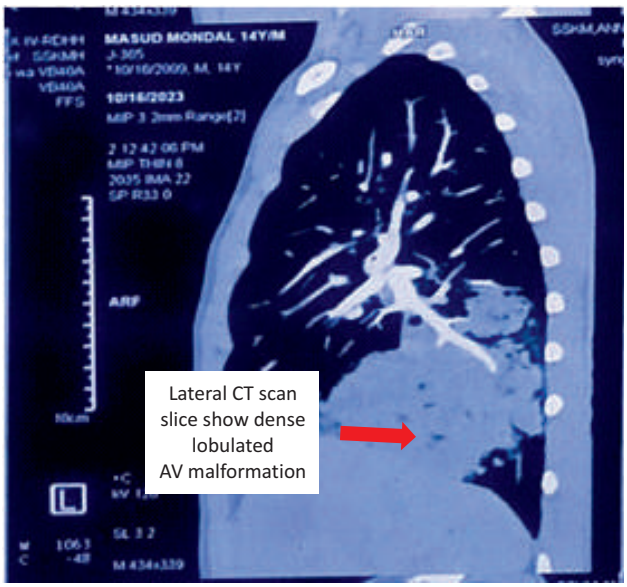

Fig 2. Lateral CT scan slice shows lobulated arteriovenous malformation

Operative management

After discussion with the anesthesia team patient is posted for operative intervention under general anesthesia via right posterolateral thoracotomy using single lung ventilation and chest cavity was entered via 5th intercostal space for better exposure 6th rib was electively excised and whole of the hemithorax was inspected there was no adhesion and whole of the lung can be inflated except the right lower lobe which on palpation feels like bag of worms, right lower lobectomy was performed, post lobectomy remaining lung was fully inflated and thoracotomy incision was closed in layers and a single intercostal drain was given. Specimen send for histopathology examination.

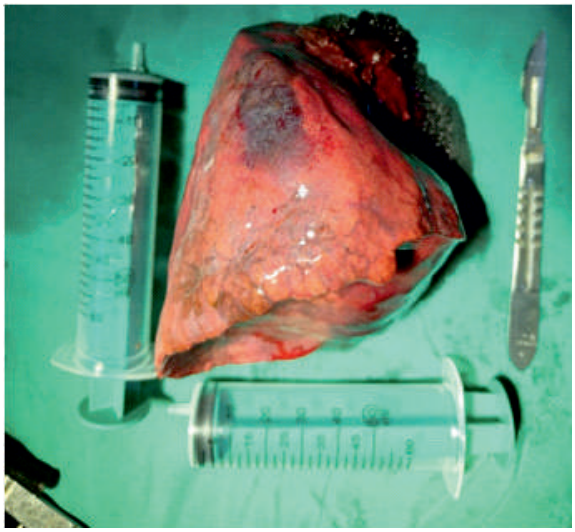

Fig 3. Excised right lower lobe with congested and dilated vessels.

On table extubation was done and shifted to intensive care unit where patient was stayed for next 24 hours with drain output around 200 ml with no air leak. Drain was removed after 2 days and discharged after 5 days in stable condition.

Patient followed up after 1 week wound was healthy stitch removal done at 2nd post-operative visit.

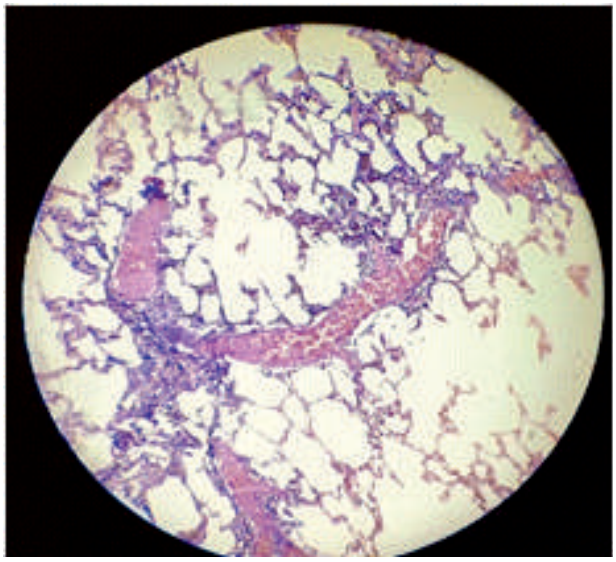

Fig. 4 (a) Large dilated congested blood vessel in lung parenchyma

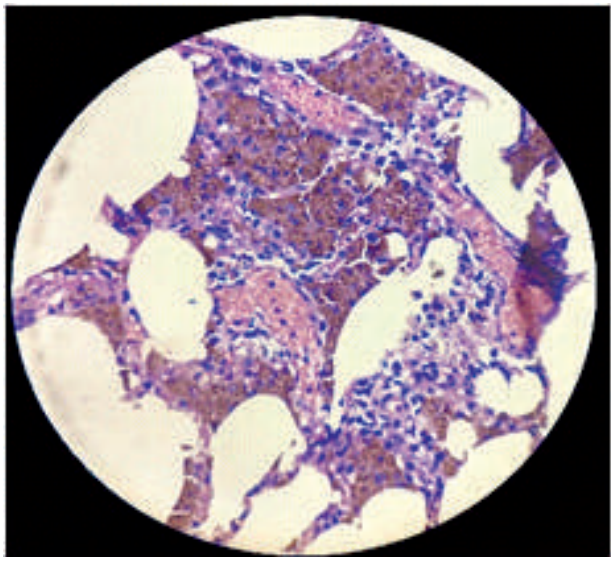

Fig. 4 (b) Hemosiderin laden macrophages and lymphoid aggregates

Histopathological examination shows small and large dilated congested blood vessels occupying lung parenchyma along with hemosiderin laden macrophages and lymphoid aggregates, hilar lymph nodes show reactive lymphoid hyperplasia.

DISCUSSION

Pulmonary arteriovenous malformation are abnormal connection between a pulmonary artery and pulmonary vein. They are significant part of the differential diagnosis of pulmonary like hypoxemia and lung nodules although most cases are congenital, Surgery with a multidisciplinary approach remains the first choice in cases where treatment of the embolization cannot be done or has not become successful in symptomatic and complicated patient with pulmonary arteriovenous malformation.

This is the first case operated in our hospital and surgical intervention was proved to be successful in terms of outcome.

CONCLUSION

This is a first case report operated in our hospital with successful surgery and patient was remain stable and free from symptoms after 7 month of follow up, a multidisciplinary individualized approach should be opted for good patient outcome.

PATIENT CONSENT

Informed written consent was taken from the patient for case report.

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TO DETERMINE IMPLICATION OF INTRAOPERATIVE LEVELS OF $PaCO_2$, PO_2, NIRS AND DIFFERENCE BETWEEN JUGULAR VEINOUS OXYGEN AND RADIAL ARTERY OXYGEN LEVELS IN POST OPERATIVE NEUROLOGICAL OUTCOME IN PATIENTS UNDERGOING CARDIAC SURGERY- A RANDOMIZED CONTROL STUDY

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INTRODUCTION

- Neurological problems have been a significant area of concern throughout the historical development of cardiac surgery. Advancements in technology and technique have led to the development of open, minimally invasive, and endovascular therapeutic approaches for the treatment of vascular, valvular, and cardiac disorders. The safety of coronary artery bypass grafting (CABG) and percutaneous coronary interventions (PCI) has significantly improved in recent times.
- Notwithstanding these developments, it is noteworthy that neurologic sequelae, such as ischemic stroke, delirium, and cognitive loss, continue to manifest with high frequency following cardiovascular surgery.
- The occurrence of neurological complications following cardiac surgery is a significant indicator of morbidity and mortality in patients, regardless of their prior history of stroke.[5-7] During the postoperative period, these neurological insults can manifest in various forms, such as changes in consciousness, cognitive dysfunction, and focal neurological deficits.
- Neuro-cognitive dysfunction has been observed in a range of 15-66% of patients at the time of discharge, and it may continue to remain in around 40% of individuals even after 5 years following surgery. [12.13] The incidence of stroke is reported to be between 1.2-6%, with a higher risk observed in the older population.
- Numerous studies have been conducted to assess the risk factors associated with the development of neurological complications in patients following cardiac surgery. However, the findings of these studies have been inconclusive and incomplete, primarily due to limited interventions and a restricted number of variables. While certain studies have demonstrated a correlation between prolonged cardiopulmonary bypass and postoperative stroke, other studies have raised doubts regarding this association.
- Therefore, the objective of this study is to ascertain and assess the impact of various patient, procedural, and biochemical factors on the occurrence of postoperative

neurological complications subsequent to cardiac surgery.

MATERIALS AND METHODS:

- STUDY SITE: Study underwent in the department of cardio vascular and thoracic surgery, IPGMER & SSKM Hospital, KOLKATA.
- STUDY POPULATION: Patients requiring cardiac surgery under cardio pulmonary bypass support.
- STUDY DESIGN: This is a randomized control study.
- STUDY DURATION: Study is taking for a period of one year between august 2023 to August 2024
- SAMPLE SIZE: As per OT registry expected cases who underwent surgery requiring cardio pulmonary bypass support will be 100. Our sample size will be 80 with 95% CI
- (www.calculator.net/sample -size-calculator.html)

INCLUSION CRITERIA:

Patients undergoing cardiac surgery on cardio pulmonary bypass between age 15-65 years.

EXCLUSION CRITERIA: Patients who have

- Liver disease
- Renal disease
- Bleeding diasthesis
- Pre -operative infection
- Pre -operative anemia
- History of stroke
- History of brain trauma
- History of psychiatric disorders
- History of alcohol abuse
- History of neuro-psychotropic drugs intake

METHODOLOGY:

- Following inclusion and exclusion criteria patients are divided into two groups
- Patients undergoing cardiac surgery on cardio pulmonary bypass surgery as cases.
- Patients undergoing cardiopulmonary and vascular surgeries under general anesthesia without cardio pulmonary bypass support as controls.

PREOPERATIVE STUDY VARIABLES:

- Gender

- BSA
- Blood urea and creatinine levels
- Blood glucose levels
- Pre- operative mini mental state examination(MMSE)

INTRAOPERATIVE STUDY VARIABLES:

- Pre pump blood glucose levels
- CPB time
- Cross clamp time
- Minimum temperature attained during CPB
- Po_2, PCo_2 levels
- Brain NIRS temperature intropeative
- Jugular vein oxygen saturation
- Radial artery oxygen saturation
- Difference between jugular venous and radial artery oxygen stauration
- Total operative time
- Estimated blood loss
- Post pump glucose levels

POSTOPERATIVE STUDY VARIABLES:

- PRE EXTUBATION PERIOD:
- PCo_2, PO_2 levels on 6 hourly ABG monitoring
- Jugular venous and radial artery oxygen saturation and their difference
- Blood Ph levels on 6 hourly ABG monitoring
- Estimated fluid intake and urine output 6 hourly

v Blood glucose levels 6 hourly

- Total time on ventilator support

POST EXTUBATION PERIOD:

- MMSE
- Jugular venous and radial artery oxygen saturation 12 hourly and their difference
- Ph, PCo_2, PO_2 on 12 hourly ABG monitoring
- Fluid intake and urine output monitoring 12 hourly

- Blood glucose monitoring 12 hourly

AFTER 3 MONTH FOLLOW UP:

- MMSE

AFTER 6 MONTH FOLOW UP: MMSE

RESULTS

- No statistically significant difference was observed between 2 groups in pre-operative MMSE value
- Statistically significant difference of Po_2, Pco_2, Radial artery oxygen level, jugular venous oxygen level and difference of Radial artery and jugular venous oxygen levels
- 6hr post -operative value of Po_2 and PCo_2 shows statistically significant difference but not difference between $RA0_2$ and JVo2 levels
- Statistically significant difference of total time of ventilation between two groups.
- Post extubation MMSE shows no significant difference.
- 12hr post -operative difference of RAo_2 and JVo_2 is statistically significant.

v While after 3month of follow up significant difference MMSE is present but after 6 month no significant difference of MMSE present

CONCLUSION

With the growing use of cardiopulmonary bypass in cardiac surgery neurological outcome should be an important aspect in patient recovery and use of simple tools like estimation both venous and arterial oxygen saturation, their difference and NIRS can provide handy information for future neurocognitive outcome however in this study we have found that most of the neurocognitive dysfunction are short lived and may resolve with time.

OESOPHAGEAL LUNG : A TYPE OF COMMUNICATING BRONCHOPULMONARY FOREGUT MALFORMATION - A RARE PHENOMENON

Dr. Dipayan Biswas, Dr. Surajit Sarkar, Prof. (Dr.) S. S. Mahapatra

INTRODUCTION:

Oesophageal lung is an extremely rare type of communicating bronchopulmonary foregut malformations. There is a patent communication between respiratory tract and GI tract (Oesophagus or stomach). In oesophageal lung usually part of the main stem bronchus (usually the right)is abnormally connected to the oesophagus.

CASE REPORT:

In this particular case this 7 month old male child presented in our department with history of recurrent pneumonia and episodes of respiratory distress following food intake since birth. There was history of multiple hospitalisation.

At presentation the child had a weight of 5kg which was below than normal for his age group.

On inspection the right hemithorax was somewhat smaller than the left one.

On auscultation breath sounds were normal on the left, but on the right it was absent. On palpation the apex beat of the heart was on the right parasternal region in 5th inter costal space.

Chest X-ray revealed normal bronchovascular markings on the left, while it was hazy on the right. Cardiac shadow was shifted to the right.

Contrast enhanced CT scan of thorax showed complete collapse of right lung with over inflation of the left lung. There was a suspicious communication of visualised right airway with distal oesophagus.

CECT mentioned marked hypoplasia of right main pulmonary artery. Right main bronchus was not visualised in CT.

OPERATIVE FINDINGS:

Exploration through right postero-lateral thoracotomy revealed a small and shrunken right lung. Right lung was not expanding and there was no aeration. It was adhered to diaphragm and surrounding structures.

A connection was found between right lung and lower part of the oesophagus.

There was was no cartilaginous structure palpated in this connection.

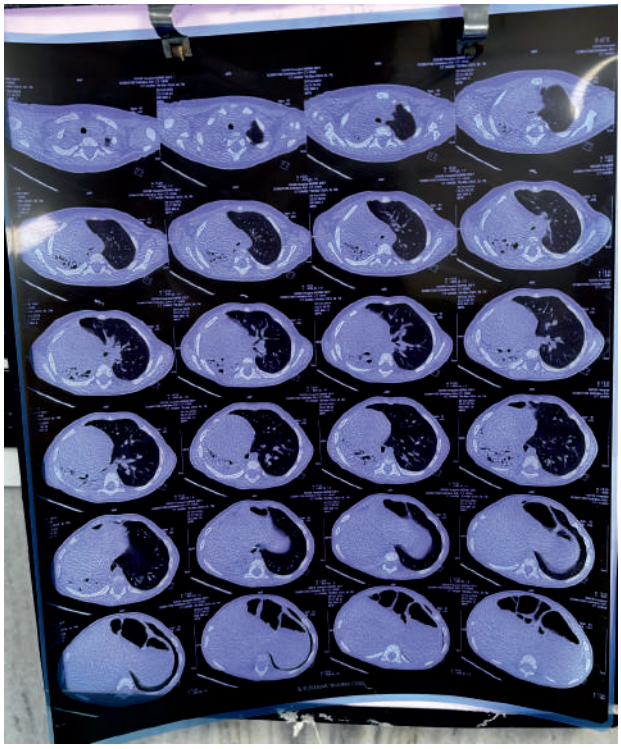
There was no right main bronchus.

Right pulmonary artery was found hypo plastic.

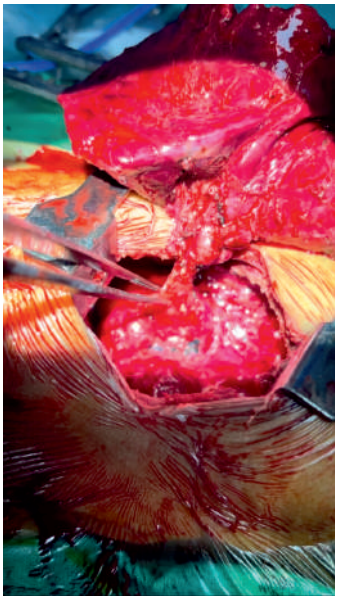
Multiple large lymph nodes was there.



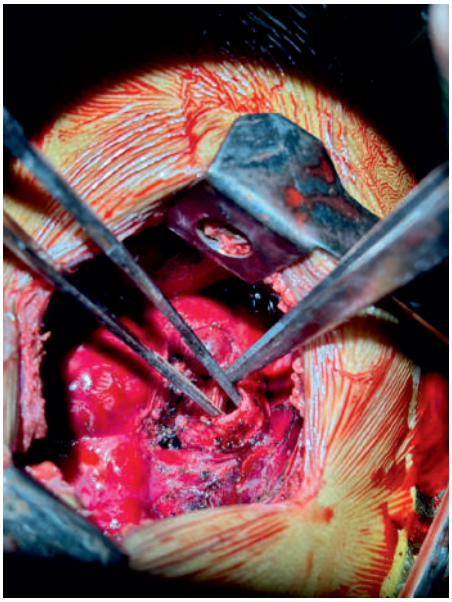
Right pneumonectomy was done followed by repair of oesophageal rent



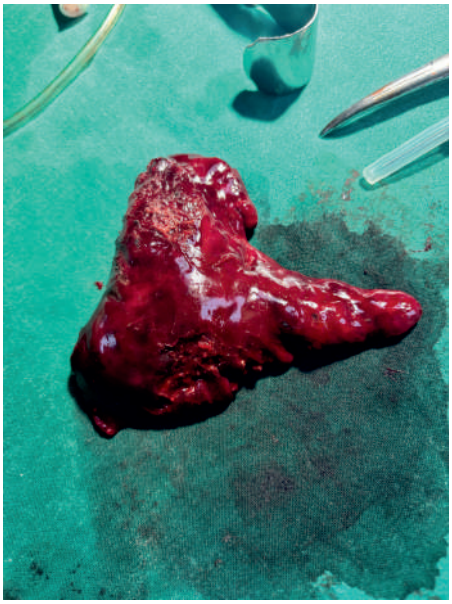
Post operative course was uneventful



Intra operative photo showing communication of right lung and oesophagus



Oesophageal rent after lung removal



Resected hypo plastic right lung

DISCUSSION:

While the most common congenital communication between the airway & foregut is tracheo-oesophageal fistula, the communication between part of a segment or lobe or an entire lung with the oesophagus is a much rare entity.

Among them "Oesophageal lung" is an extremely rare variety of communicating bronchopulmonary foregut malformation (CBPFMs). CBPFMs can be classified into 4 groups-it is based on part of lung bud joining oesophagus. This four group classification was proposed by Srikanth et.al.

1. In the 1st group there is Oesophageal atresia with distal gastro oesophageal tract arising from trachea. Single lung/lobe/segment can arise from distal oesophagus.
2. In 2nd variety one entire lung arises from the oesophagus. Majority (90-95%) of Oesophageal lung are right sided. It is characterised by absence of main bronchus. This group is also termed as "Oesophageal Lung".
3. In 3rd group one single lobe or segment originates from oesophagus or stomach5. This malformation is also termed as "Oesophageal Bronchus".
4. In the last variety a simple communication runs between bronchial tree and oesophagus.

Majority of patients of CBPFMs will present with recurrent pneumonia. Cough and hemoptysis are other frequent symptoms. These are mainly due to chronic bronchopulmonary infection.

There might be choking episodes while swelling liquids. Presence of food particles in sputum has also been reported.

Diagnosis can usually be made by an esophagogram. CT Scan helps to delineate the exact anatomy of the communication along with other lung pathology. Fibre optic bronchoscopy may also be used.

Mainstay of management is resection of the affected lung, lobe or segment (particularly when they can not be reimplanted to the bronchial tree) along with oesophageal rent repair.

Successful reimplantation of lung to trachea has been reported for those cases that was diagnosed earlier in neonatal period.

Oesophageal lung can be confused with pulmonary sequetration.

While the former involves the entire lung,the latter has only segmental involvement. In oesophageal lung the blood supply is from pulmonary artery, while in case of sequestration it is supplied from systemic circulation, often from the aorta.

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14	LM	L/14/1998	Dr	Bhabatosh	Biswas	9831021617	bhabatos@yahoo.co.in, bhabatos@gmail.com
15	LM	L/15/1998	Dr	Siddhartha	Mukhopadhyay	9339779468	dr_sidm@yahoo.com
16	LM	L/16/1998	Dr	Ganes Chandra	Ray	9830071490	ganes_ray@yahoo.co.in
21	LM	L/21/1998	Dr	Debabrata	Mittra	9831086175	mittrad@gmail.com
22	LM	L/22/1998	Dr	Susheela	Mittra	9831801122	mittrad@gmail.com
23	LM	L/23/1998	Dr	Barun Chandra	Roy	9831091954	barunchandra_roy@yahoo.com
24	LM	L/24/1998	Dr	Srirup	Chatterjee	9830041378	srirup@vsnl.net.in
25	LM	L/25/1998	Dr	Satyajit	Bose	9830023695	s.bose@vsnl.com, drsatyajit@man.com
26	LM	L/26/1998	Dr	Ashok	Bandyopadhyay	9830030503	
27	AM	A/27/1998	Dr	Mayukh	Chatterjee		mayukhchat@yahoo.co.uk
28	LM	L/28/1998	Dr	Sushan	Mukhopadhyay	9830030509	drsushan1964@hotmail.com, drsushanmukho@hotmail.com
30	LM	L/30/1998	Dr	Lalit	Kapoor	9874523000	drlalitkapoor@gmail.com, lolly@cal.vsnl.net.in

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32	LM	L/32/1999	Dr	Uday Narayan	Sarkar	9830059128	drudaysarkar@yahoo.com
33	LM	L/33/1999	Dr	Kallol	Dasbaksi	9830321432	kalloldb@yahoo.com
35	AL	A/35/1999	Dr	Dibakar	Das	9432226064	dbkrdas@gmail.com
36	LM	L/36/1999	Dr	Anjan Kumar	Das	9831086359	
37	AM	A/37/1999	Dr	Saikat Debiprasad	Sengupta	9830179539	
40	AM	A/40/1999	Mr	Sudhakar J	Rao	9831345057	sudhaxg@gmail.com
44	LM	L/44/1999	Dr	Chandan Kumar	Saha	9433123799	csaha15@gmail.com
46	LM	L/46/1999	Dr	Mrinal Bandhu	Das	9831010985	krishnakoli@yahoo.co.in
48	LM	L/48/1999	Dr	Tapas	Raychaudhuy	9830029041	tapasrc@gmail.com
50	AM	A/50/1999	Dr(Ms)	Arati	Dasgupta		artidasgupta@gmail.com
52	LM	L/52/1999	Dr	Siddhartha	Chakraborty	9830030020	sid_ctvs@yahoo.co.in
53	LM	L/53/1999	Dr	Arup Kumar	Ghosh	9230144038	kgarup@hotmail.com
58	LM	L/58/1999	Dr	Amarnath	Ghosh	9903015409	anghosh_4@yahoo.co.in
59	AL	A/59/1999	Mr	Pradip Kumar	das		
60	AL	A/60/1999	Mr	Pranay Kumar	Das	9831622045	pranaykrdas771@gmail.com
61	LM	L/61/1999	Dr	Subrata	Dey	9831223408	subratadey61@yahoo.co.in
62	LM	L/62/2000	Dr	Kishore C	Mukherjee	9830070853	
64	LM	L/64/2000	Dr	Ajay	Kaul	9830025356	kaul@cal3vsnl.net.in
66	LM	L/66/2000	Dr	Amitabha	Chakrabarti	9830022758	amitetal@gmail.com
69	LM	L/69/2001	Dr	Dilip Kumar	Saha	9830056435	
70	AL	A/70/2001	Mr	Debasis	Ray	9831125018	raydeb_per@yahoo.com
71	AL	A/71/2001	Dr	Rajkumar	Ghosh	9831039137	rajkumarghosh@yahoo.com
72	LM	L[72/2001	Dr	Subhasish	Guha	9830321446	drsubhasishguha@gmail.com
73	LM	L/73/2001	Dr	Indrani	Guha	9830032465	tinkee812@yahoo.com
74	LM	L/74/2001	Dr	Prakash Kumar	Sanki	9831061979	prakashsanki@gmail.com
75	LM	L/75/2002	Dr	Jahar Lal	Banerjee	9830251477	

Sl. No.	Type	Memb. No.	Status	First Name	Last Name	Mobile	Email
77	AM	A/77/2002	Dr	Ajoy Kumar	Hazra	9830051856	hazraajoy00064@rediffmail.com
79	AM	A/79/2002	Mr	Loknath	Tiwari	9831497490	aloktp@yahoo.com
80	AM	A/80/2002	Dr	Somnath	Ganguly	9830062013	drsganguli@yahoo.co.in
81	LM	L/81/2002	Dr	Santanu	Dutta	9830808666	santanudutta05@yahoo.com
82	LM	L/82/2002	Dr	Rajarshi	Basu	9830269850	rajarshibasu72@yahoo.com
83	LM	L/83/2002	Dr	Ashim Kumar	Dey	9830792092	drashimdey@yahoo.com
84	LM	L/84/2002	Dr	Kayapanda Muthana	Mandana	9831112359	kmmandana@yahoo.co.uk
87	LM	L/87/2003	Dr	Sushila	Sripad	9433904407	drssripad@gmail.com
88	LM	L/88/2003	Dr	Ratan Kumar	Das	9831987675	ratan_k_das@yahoo.com
90	AM	A/90/2003	Dr	Saibal Roy	Chowdhury	9903571751	doc_saibal@rediffmail.com
93	AM	A/93/2003	Mrs.	Babita	Das	9831949590	pranaykrdas771@gmail.com
94	AM	A/94/2003	Mrs.	Rekha	Banerjee		
96	LM	L/96/2003	Dr	(Ms) Mrinmayi	Ray	9830014773	raymrinmayi@gmail.com
97	LM	L/97/2003	Dr	Atanu	Saha	9830029679	dratanusaha@gmail.com
98	LM	L/98/2003	Dr	Sukanta Kumar	Behera	9831040083	drsukantabehera@gmail.com
99	LM	L/99/2003	Dr	Sadhan Chandra	Ray	9830045577	sadhan.ray@gmail.com
100	AM	A/100/2004	Dr	Tarun Kumr	Saha	9830254416	sahadr.tarun@yahoo.in
101	LM	L/101/2003	Dr	Ashutosh	Raghuvanshi	9830035456	vc_rtiics@rediffmail.com
102	LM	L/102/2004	Dr	Ramesh	Seshadri	9831257836	drrseshadri@gmail.com
103	LM	L/103/2003	Dr	Manoj Kumar	Daga	9748291111	drmanojdaga@gmail.com
104	LM	L/104/2004	Dr	Madhu Sudan	Pal	9434160970	mspalmch@yahoo.co.in
105	AM	A/105/2004	Dr	(Ms) Sudipta	Mukherjee		sid_ctvs@yahoo.co.in
106	AM	A/106/2004	Dr	Narayan Chandra	Garai	9433175321	narayangarai27@gmail.com
107	AM	A/107/2004	Dr	Kali Sankar	Das	9433223554	dr.kali@vsnl.net
108	AM	A/108/2004	Dr	Jyotirmoy	Bandyopadhyay	9831314027	drjyoti0301@gmail.com
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110	LM	L/110/2004	Dr	Binay Krishna	Sarkar	9433334159	binayskr@hotmail.com
111	LM	L/111/2004	Dr	Javid Veqar	Sadique	9830702701	drjavidvsadique@yahoo.co.in
113	LM	L/113/2005	Dr	Sarajit Kumar	Das	9831450531	sarajitdas@yahoo.com
114	LM	L/114/2005	Dr	Sujay Kumar	Shad	9831888409	
115	LM	L/115/2005	Dr	Mrinalendu	Das	9433095440	dasmrinalendu@hotmail.com
118	AM	A/118/2005	Mr	Radhanath	Samal	9831192992	rnsamal2002@rediffmail.com
119	AM	A/119/2005	Dr	Rabindranath	Chattopadhyay	9433574325	rabindranchatto@gmail.com
123	AM	A/123/2005	Mr	Subodh	Pradhan	9339431402	pradhan.subodh@ymail.com
124	AM	A/124/2005	Mr	Indrajit	Das	9903342006	indrajit003@gmail.com
125	LM	L/125/2005	Dr	Kunal	Hazari	9433146929	drkhazari1@rediffmail.com
126	AM	L/126/2006	Mr	Durgaprassana	Dash	9433146294	durga.dash@nhhospitals.org
127	LM	L/127/2006	Dr	Saptarshi	Roy	9830365395	drsaptarshiroy@yahoo.com
128	AM	A/128/2006	Dr	Manmohan		9331836811	
129	AM	A/129/2006	Mr	Tarun Kumr	Patra		
130	LM	L/130/2006	Dr	Nimish	Rai	9748026608	nimishrai@yahoo.com
131	LM	L/131/2006	Dr	Dhaemendra Kumar	Srivastava	9433831991	
132	LM	L/132/2006	Dr	Anshuman	Mandal	9434331459	anshuman.ctvs@gmail.com
133	AM	A/133/2006	Dr	Dinabandhu	Chatterjee	9830808772	chatterjeed788@gmail.com
134	AM	A/134/2007	Mr	Chittaranjan	Dash	9831979766	chittaranjandash27@yahoo.co.in
135	AM	A/135/2007	Mr	Deblal	Pandit	9831160077	perf_pandit@yahoo.co.in
136	AM	A/136/2007	Mr	Debabrata	Chakraborty	9732087537	deb.perf@gmail.com
137	AM	A/137/2007	Dr	Sudhansu Sekhar	Chatterjee	9830266075	
138	AM	A/138/2007	Mr	Rajib	Das	9830881884	
139	AM	A/139/2007	Mr	Manab	Mitra	9831936139	
140	AM	A/140/2007	Dr	Asis	Mandal	9433074786	dr.asis.mandal.ctvs@gmail.com
141	AM	A/141/2007	Mr	Saurav	Sengupta	9831171219	saurav.srijaa@gmail.com

Sl. No.	Type	Memb. No.	Status	First Name	Last Name	Mobile	Email
142	AM	A/142/2007	Mr	Gautam	Bose		g.bose1963@gmail.com
143	LM	L/143/2007	Dr	Subhendu Sekhar	Mahapatra	9433283336	apurasm@yahoo.co.in
144	AM	A/144/2008	Mr	Kali Sankar	Jana		kalisankarj@yahoo.com
146	AM	A/146/2009	DrMrs.	Chaitali (Dasgupta)	Sen	9330483007	chaitali03@rediffmail.com
147	AM	A/147/2009	Dr	Mrs. kakali	Ghosh	9339748242	gkakali354@gmail.com
148	LM	L/148/2009	Dr	Sanjay	Singh	9836442735	sansingh7@gmail.com
149	LM	L/149/2009	Dr	Kanak Narayan	Bhattacharya	9936131148	kanaknarayan@rediffmail.com
150	LM	L/150/2009	Dr	Sudip	Chowdhury	9007762412	sudipdolly@gmail.com
151	LM	L/151/2009	Dr	Suranjan	Haldar	9836045090	dr.suranjan.haldar@gmail.com
154	AM	A/154/2009	Mr	Tanweer Khursheed	Ahamad	9836325123	tanweerkahrned15@gmail.com
155	AM	A/155/2009	Mr	Tapas	Mondal	9830952003	
157	AM	A/157/2009	Mrs.	Patrisia	Joseph (James)	9831423019	patriciajames29@gmail.com
159	AM	A/159/2009	Mr	Randolf Anto	Vanjour	9230500148	
161	AM	A/161/2009	Dr	Mrs. Reeta	Neogi		
162	LM	L/162/2009	Dr	Debasis	Das	9831852211	dasdeba@yahoo.com
165	AM	A/165/2009	Mr	Soumik	Majumder	9163020767	soumikkolkata@yahoo.com
166	AM	A/166/2009	Mr	Subhasish	Bera	9231978210	subha.perfusion@gmail.com
167	AM	A/167/2009	Mr	Prasanta Kumar	Patra	9007807675	
168	AM	A/168/2009	Mr	Neshat	Alam	9874829984	nazar062@gmail.com
169	AM	A/169/2009	Mr	Subrata	Patra	9831483603	spatra.perf@gmail.com
170	AM	A/170/2010	Mr	Shyamashis	Mitra	9874683054	shyamashis.mitra.55@gmail.com
171	AM	A/171/2010	Dr	Debasis	Dasadhikari	9239331332	d.dda@rediffmail.com
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175	AM	A/175/2010	Mrs.	Shila	Chatterjee	9830807364	abikhit1994@gmail.com
176	AM	A/176/2010	Dr	Suchindran	Bandyopadhyay	9830073866	s4cida@yahoo.co.in
177	LM	L/177/2010	Dr	Mrs. Tripti	Talapatra	9038018759	ttalapatra@yahoo.co.in

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182	LM	L/182/2010	Dr	Zahid Mohammad	Hossain	9804121115	zahidhossain577@gmail.com
183	AM	A/183/2010	Mr	Tanmay	Acharia	9831671725	tanmay_05@yahoo.com
184	AM	A/184/2010	Mrs	Minakshi	Mondal	9748178566	
185	LM	L/185/2010	Dr	Sumanta	Das	9836230551	drsumantadas@yahoo.co.in
186	AM	A/186/2010	Mr	Kamal	Das	8013485762	kamaldas86@gmail.com
187	AM	A/187/2010	Mr	Sanjay	Das	9830177458	sanpiku_joy@yahoo.com
188	LM	L/188/2010	Dr	Bhaskar	Das	9231674673	doctorbhaskardas@rediffmail.com
189	AM	A/189/2010	Dr	Mrs. Sanjukta	Ray	9433054563	dr.sanjuktaray@hotmail.com
190	AM	A/190/2010	Dr	Subhendu	Sarkar	9831171162	sarkar_suhendu@yahoo.com subhendusarkar757@gmail.com
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193	LM	L/193/2011	Dr	Dipayan	Ghosh	9433041995	dipayanghosh291@yahoo.co.in
194	AM	A/194/2011	Mr	Raghunandan	Raghavan	8293450097	
195	AM	L/195/2011	Dr	Kaushik	Mukherjee	8420966115	drmukherjeekaushk@yahoo.com
196	AM	A/196/2011	Dr	Sandip	Sardar	9831054978	dip.ctvs@gmail.com
197	LM	L/197/2011	Dr	Arunansu	Dhole	9477058388	dhole.arunansu@rediffmail.com
198	LM	L/198/2011	Dr	Kuntal	Roy Chowdhuri	9932868298	kuntalroychowdhuri@mail.com
201	LM	L/201/2011	Dr	Rupesh	Kumar	9883690388	rkctvs@gmail.com
202	AM	A/202/2011	Dr	Poornima	Sivakumar	9163889213	poornima.sivakumar@gmail.com
203	AM	A/203/2011	Dr	Biswajeet	Mohapatra	8017368144	drbiswa135@gmail.com
204	AM	A/204/2011	Mr	Edison Vijayaraj	Charles	9831390035	edison_charles@yahoo.co.in
205	AM	A/205/2011	Mrs.	Arpita	Nag	9874694063	nag_arpita@rediffmail.com
206	AM	A/206/2011	Dr	Ashutosh	Samal	9438326402	samalashutosh16@gmail.com
207	LM	L/207/2011	Dr	Sudhir	B. V.	8023435465	
208	AM	A/208/2011	Dr	Biswajt	Bandyopadhyay	9831115304	bisban@rediffmail.com

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209	AM	A/209/2011	Ms.	Baby	Das	9836646694	
210	LM	L/210/2011	Dr	Manujesh	Bandyopadhyay	9874430370	manujeshbandyopadhyay@gmail.com
211	AM	A/211/2011	Dr	Asif	Iqbal	9836850632	aifanesthesia@gmail.com
212	AM	A/212/2012	Dr	Jayita	Chakrabarti	9477174869	jayitachakrabarti@yahoo.com
213	LM	L/213/2012	Dr	Pradeep	Narayan	8017249115	pradeepdoc@gmail.com
214	LM	L/214/2012	Dr	Ashis	Haldaer	9051141356	drashishalder@gmail.com
215	LM	L/215/2012	Dr	Amanul	Hoque	9477074046	dr.amanul.hoque@gmail.com
216	AM	L/216/2012	Dr	Debabrata	Biswas	9239036876	drdeba07@rediffmail.com
217	LM	L/217/2012	Dr	Sudipto	Bhattacharya	9007212232	dr.sudiptob@gmail.com
218	AM	L/218/2012	Dr	Md. Rashid	Zeya Ayubi	7890259539	rash_kmc03@yahoo.com
219	AM	L/219/2012	Dr	Soumyajit	Ghosh	9830374458	drsghosh1982@gmail.com
220	AM	A/220/2012	Dr	Amar Nath	Shaw	9432894392	dr_amarnath2002@yahoo.co.in
221	AM	L/221/2012	Dr	Abhijit	Sengupta	9831332625	vsg1167@gmail.com
222	AM	A/222/2012	Dr	RS Arun	Visvarajan	8442980911	arunvisvarajan@gmail.com
223	LM	L/223/2012	Dr	Prasanta	Das	8013215248	prasantadas700061@yahoo.com
224	AM	A/224/2012	Dr	Surendra Singh	Yadav	8192101106	drsurendrayadav21@gmail.com
225	LM	L/225/2012	Dr	Swarnendu	Datta	9477837608	swarnendudatta@yahoo.co.in
226	LM	L/226/2013	Dr	Ushnish	Chakrabarti	9433801924	dr.u.chakrabarty@gmail.com
227	AM	L/227/2012	Dr	Subhash	Minda	9903999453	mindasubhash@gmail.com
228	LM	L/228/2013	Dr	Nilanjan	Dutta	9836720202	dr.duttanilanjan@rediffmail.com
229	LM	L/229/2013	Dr	Dipankar	Ganguly	9804000400	drdipankar_g@apollohospitals.com, dipu_joy@hotmail.com
230	LM	L/230/2013	Dr	Amit	Banerjee	8582894477	dramitbanerjee@gmail.com
231	AM	A/231/2013	Dr	Anton Prem	Thilak	9843910265	premthilak87@gmail.com
232	AM	A/232/2013	Dr	Devika	Thacker	8895391210	devikathacker@gmail.com
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234	AM	A/234/2013	Dr	Santosh Kumar	Pandey	9163680789	drpandey2005@yahoo.com
235	AM	A/235/2013	Dr	Manoj	Bhargava	9617078999	pscmulthan@gmail.com
236	LM	L/236/2013	Dr	Pradip Kumar	Sarkar	9051419540	sarkarp2000@yahoo.co.uk
237	LM	A/237/2013	Dr	Dhiraj	Barnan	9674578441	drdhirajbarman@gmail.com
238	AM	A/238/2013	Dr	Krishnendu	Chakrabarti	9432228326	krishnendu_chakrabarti@rediffmail.com
239	LM	L/239/2013	Dr	Devraj	Kumar	8420063897	medico.dev@gmail.com
240	AM	A/240/2014	Mr	Sukanta	Maity	9433456389	sukantamaity002@gmail.com
241	AM	A/241/2014	Mr	Debasis	Das	9831807794	dedoplus@gmail.com
242	AM	A/242/2014	Mr	Arkaprabho	Das	8961201909	arkaprabho@gmail.com
243	AM	A/243/2014	Dr	Shilpa	Basu Roy	9831480813	drshilpa@aol.com
244	AM	A/244/2014	Dr	Debi Prasanna	Ghosal	9830185509	debiprasannaghosal@gmail.com
245	LM	L/245/2014	Dr	Mohammed Wasim	Khan	8017251181	drwazimkhan@gmail.com
246	AM	A/246/2014	Mr	Ritesh Kumkar	Choudhary	8013242845	riteshchoudhary.pas@gmail.com
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248	AM	A/248/2014	Mr	Jit	Adhikary	9830440356	jit.adhikary@nhhospitals.org
249	AM	A/249/2014	Mr	Shyamal Kumar	Maiti	9830729483	shyamalmaiti.pa@gmail.com
250	AM	A/250/2014	Mr	Tanmoy Kumar	Kandar	9836015855	tanmoy.india.pa@gmail.com
251	AM	A/251/2014	Mr	Subhadeep	Datta	9748620466	dattasubhadeep13@gmail.com
252	AM	A/252/2014	Mr	Sandip	Paul	9883219224	sandippaul61@gmail.com
253	LM	L/253/2014	Dr	Arijit	Datta	9830427104	drarijitdatta@gmail.com
254	AM	A/254/2014	Dr	Dipanjan	Chatterjee	9903476445	drdipanjan@gmail.com
255	LM	L/255/2014	Dr	Soumik	Pal	9477522682	drsoumikpal@gmail.com
256	AM	A/256/2014	Mr	Sushovan	Das	9143396284	das_sushovan@ymail.com
257	AM	A/257/2014	Dr	Shruti	Banerjee	9674346173	drshrutibanerjee@gmail.com
258	LM	A/258/2014	Dr	Biswarup	Purkayastha	9854029812	biswarup2001@gmail.com
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264	AM	A/264/2014	Dr	Arnab	Maity	9748544330	mailadoctor@gmail.com
265	AM	A/265/2014	Dr	Debajyoti	Mandal	9433892340	debajyoti.mandal@gmail.com
266	AM	A/266/2014	Dr	Harish K	Sinha	8274945078	harishsinhakmc@gmail.com
267	AM	A/267/2014	Mr	Biswajit	Jana	9732492749	biswajit.jana69@gmail.com
268	AM	A/268/2014	Mr	Sumanta	Ghosh	8670858525	sumantoghosh491@gmail.com
269	LM	L/269/2014	Dr	Saibal	Gupta	9831015774	drsaibalgupta@hotmail.com
270	LM	L/270/2014	Dr	Siddharth	Pahwa	9007508980	siddharthpahwa@gmail.com
271	AM	A/271/2014	Dr	Bhubandeep	Mukhopadhyay	9432015168	bhubandeep@gmail.com
272	LM	L/272/2015	Dr	Tinni	Mitra	9831010012	drtinnimitra@rediffmail.com
273	AM	A/273/2015	Dr	Sanjit Kumar	Mondal	9007703800	mondaldrsanjitkumar@yahoo.in
274	LM	L/274/2015	Dr	Suraj Kumar	Pradhan	9002499261	surajprdhan@yahoo.co.in
275	AM	A/275/2015	Dr	Ravi	Ambastha	8981948597	ambastha7@gmail.com
276	AM	A/276/2015	Dr	Raja	Lahiri	9935615903	rajalahiri.imsbhu@gmail.com
277	LM	A/277/2015	Dr	Shravan	Kumar	9749150999	shravank10@gmail.com
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280	AM	A/280/2015	Ms.	Jui	Upadhaya	8017138741	shortcuttojui@gmail.com
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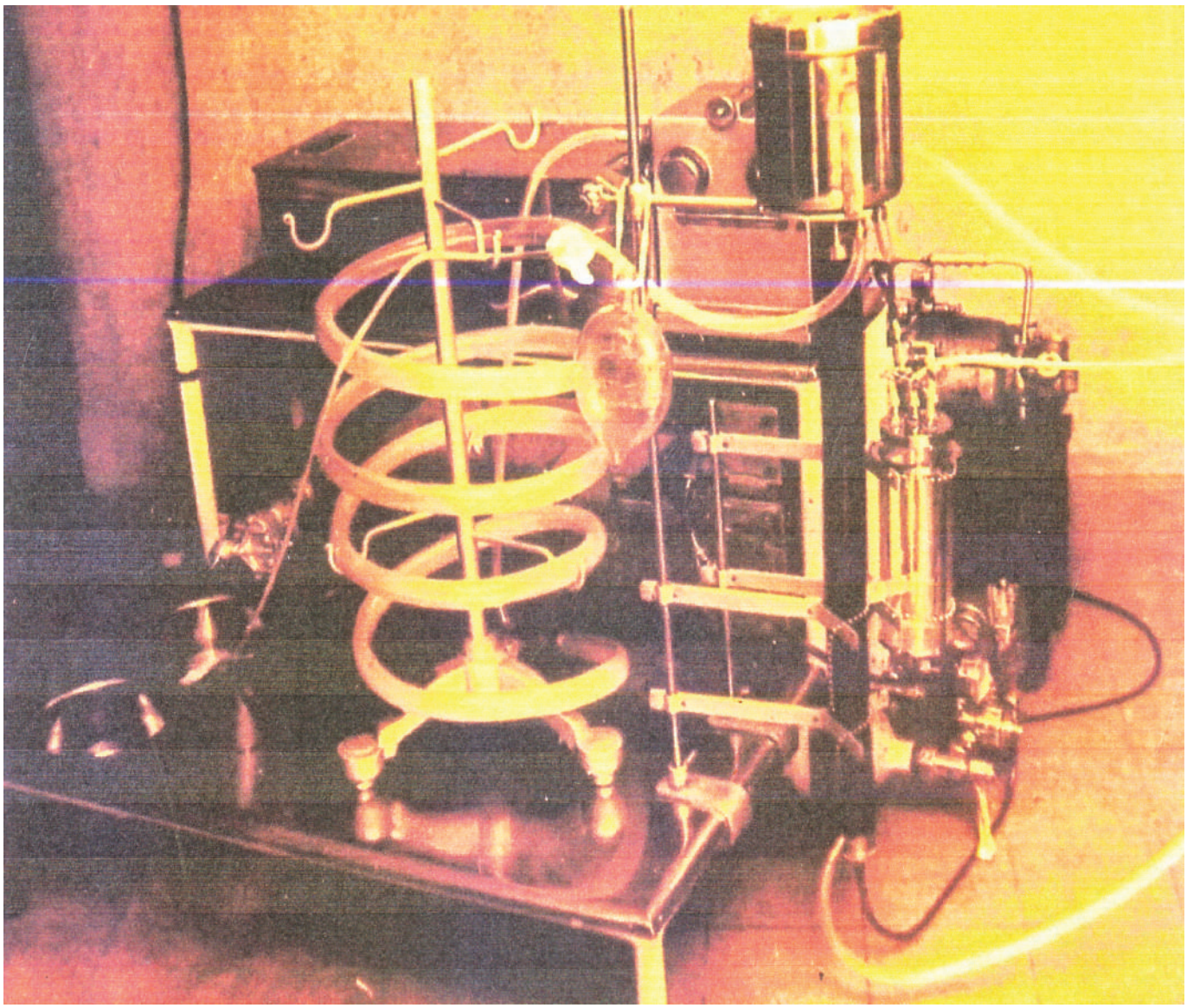
Thank you all.



Calcutta Heart Lung Machine 1962

First successful open heart surgery in India was done in August, 1962 using this indigenous Heart Lung Machine designed and make in Calcutta by Dr. Saibal Gupta, then Research Officer, experimental Surgery Research Laboratory, at the Institute of Postgraduate Medical Education and Research under Prof. A. K. Basu, Head of Surgery. Surgical team was composed of Prof. A. K. Basu and Dr. Chinmoy Banerjee, Senior Cardiothoracic Surgeon.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