Docs stop blood flow in man's body for unique surgery

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AHMEDABAD: Doctors in the city recently performed a rare surgery on a 45-year-old man when they removed clots from his lung vessels by stopping blood circulation for 20 minutes and cooling his body to 18 degrees Celsius. The normal temperature is 37 degrees. The clots were being pumped into the lungs from his leg veins.

The challenging surgery, which lasted eight and half hours, was performed on Nishith Raval, an ex-defense personnel, by Cardiac Surgeon Dr Apoorva Kanhere at the Apollo Hospital, Bhat.

"The surgery is done on the heart-lung machine by cooling the body to 18 degrees and then stopping the entire blood circulation so as to get a clear field for surgery. The cast of clots that lined the right side of the pulmonary artery was removed during a blood circulatory arrest period of 17 minutes while the clots were removed from the left side by stopping the circulation for 19 minutes," said Kanhere.

Kanhere said the surgery has been successfully done for the first time in Gujarat. He had seen the surgery being performed a decade ago in Australia and decided to attempt it on Raval as his condition was critical and not responding to medication. So far, only two hospitals in Bangalore and Chennai have done the surgery in India.

Raval, father of three daughters, had almost given up mentally which caused constant breathlessness, swelling in his limbs and his stomach that protruded outwards due to accumulation of water. Even local doctors in Surendranagar had told him there was little they could do for his problem. In fact, much time was wasted in wrong diagnosis as Raval, who had undergone a varicose veins surgery 18 years ago and also another to treat Deep Vein Thrombosis (DVT), was treated for symptoms like accumulation of water in stomach and breathlessness.

That the clots shot from his legs into the lungs were clogging his lung arteries leading an abnormally high lung pressure and thus causing symptoms like acute breathlessness, swelling, water retention in stomach was diagnosed by cardiologist Dr Sameer Dani, head cardiology at Apollo Hospital.

"Life expectancy after diagnosis of chronic thromboembolic pulmonary hypertension, which Raval has, with maximum medical treatment is less than 15 per cent at 5 years. With a successful pulmonary

thromboendarterectomy, the five year survival is more than 80 per cent," said Kanhere.

Dani said that Raval will be put on life-long anti-clotting medication so that new clots are not formed. "Moreover, a filter will also be placed in his inferior vena cava to trap any small clots that may form in his legs despite anti-coagulant drugs," he said.

"I never thought I will live but it seems prayers of my wife and daughters have been answered," said Raval who is known to have a positive attitude towards life

CTEPH: chronic thromboembolic Pulmonary Hypertension.

CTEPH: A condition of high Blood Pressure in the Lung circulation caused by repeated showers of blood clots from the leg veins to the lungs. Right heart, not accustomed to generate high pressure gradually fails producing Congestive heart failure with Ascitis, Ankle swelling, shortness of breath.

Life expectancy after diagnosis of CTEPH with maximum medical treatment :less than 15 % at 5 Yrs.

If lung transplantation is done than 5 year survival is around 50% only.

Properly accomplished Pulmonary Thromboendarterectomy has 5 year survival of more than 80%

Thus PTE is the treatment of first choice for CTEPH

PTE: *Pulmonary Thromboendarterectomy* Operation.

PTE is done on Cardiopulmonary bypass (Heart lung machine) by cooling the body to 18* C and then stopping the entire blood circulation achieving Deep Hypothermic (18*C) Total circulatory arrest while pulmonary arteries are opened and the choked arteries are cleared of all blood clots.

CTEPH is A type of secondary Pulmonary Hypertension caused by recurrent attacks of thromboembolism (shower of blood clots) from the leg veins in lung circulation.

PULMONARY HYPERTENSION:

Body has two circulations for the blood to travel:

(1) systemic circulation: This transmit Oxygen rich pure blood to the entire body and

(2) Pulmonary circulation: This transmit Oxygen depleted, Carbon Dioxide rich impure blood from the entire body back to the lungs for purification .

Normal systemic circulation Blood Pressure is around 120/80 mm Hg. And Pulmonary circulation Blood Pressure is less than ¼ of systemic blood pressure.

In CTEPH due to recurrent showers of blood clots in lung vessels over a period of time, there is blockage of small blood vessels., And gradually to cope with this blockages, lung blood pressure rises.

Due to blockages of blood vessels in lung circulation there is V:Q Mismatch in lungs- The part of lung which gets oxygen is not getting enough blood for exchange Of Oxygen and Carbon Dioxide. This produces Breathlessness. Some patients need continuous Oxygen by mask due to this VQ (Ventilation Perfusion)mismatch in lungs.

SYMPTOMS of CTEPH

Weakness, Dizziness, chest pain Wt. loss

Breathlessness even at rest

Swollen ankles , Enlarged Liver and spleen,

Ascitis

Mr. N.Raval

Male 48 working in Ex Army Man .

Varicose veins operated in Command hospital 18 years back.

Subsequent ulceration and swelling of veins of the operated leg required prolonged hospitalization in other hospital for a month.

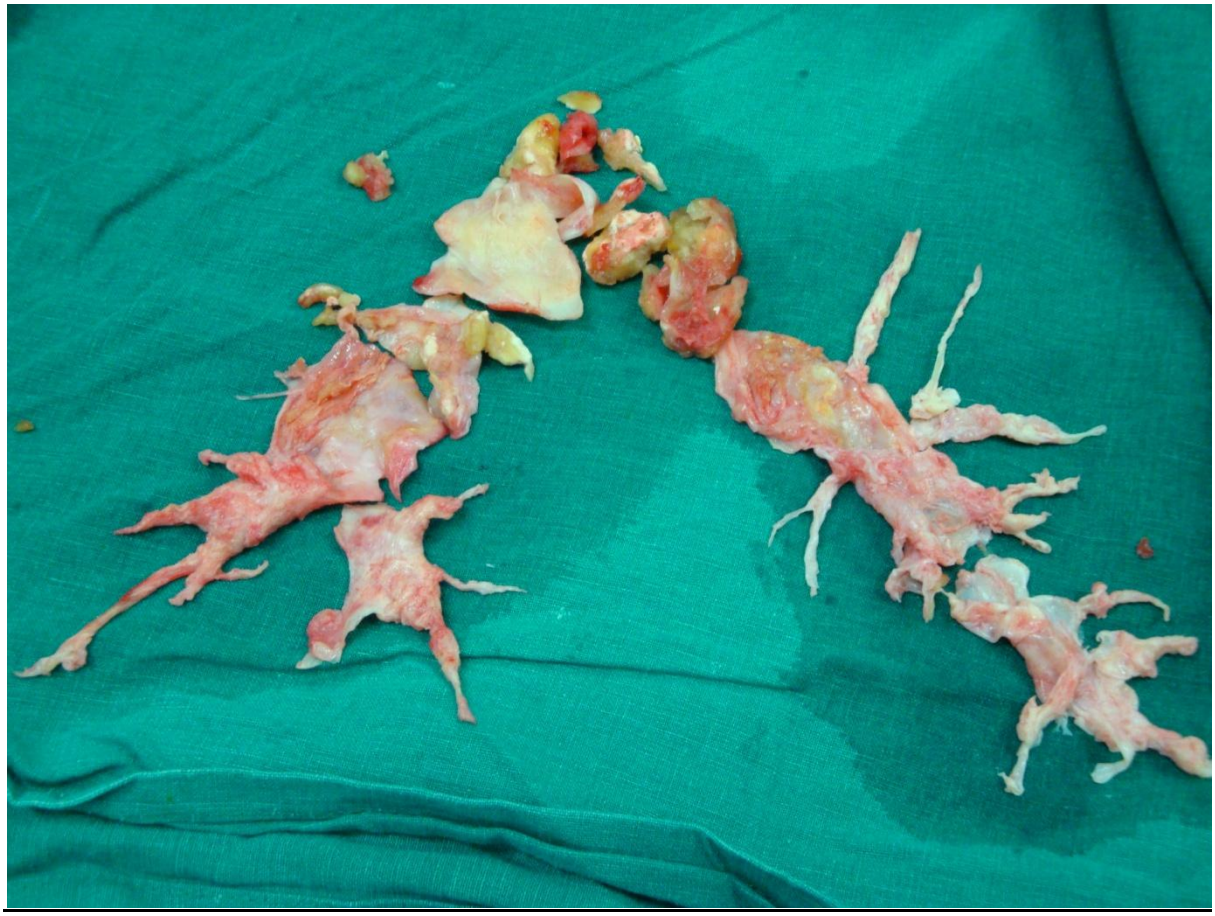
Admission with thrombosis of leg and arm veins 1 ½ year back at Apollo.

Diagnosed to have Secondary Pulmonary Hypertension due to chronic thromboembolic episodes in Lungs.

Marked Ascitis (Jalodar) accumulation of water in cavity of abdomen -due to Right heart FAILURE due to severe Pulmonary Hypertension.

Before Surgery, his Pulmonary pressure was similar to Systemic Blood Pressure and Pulmonary vascular Resistance was in the range of 800-900 Dyne,sec/cm5 (Normal less than 250)

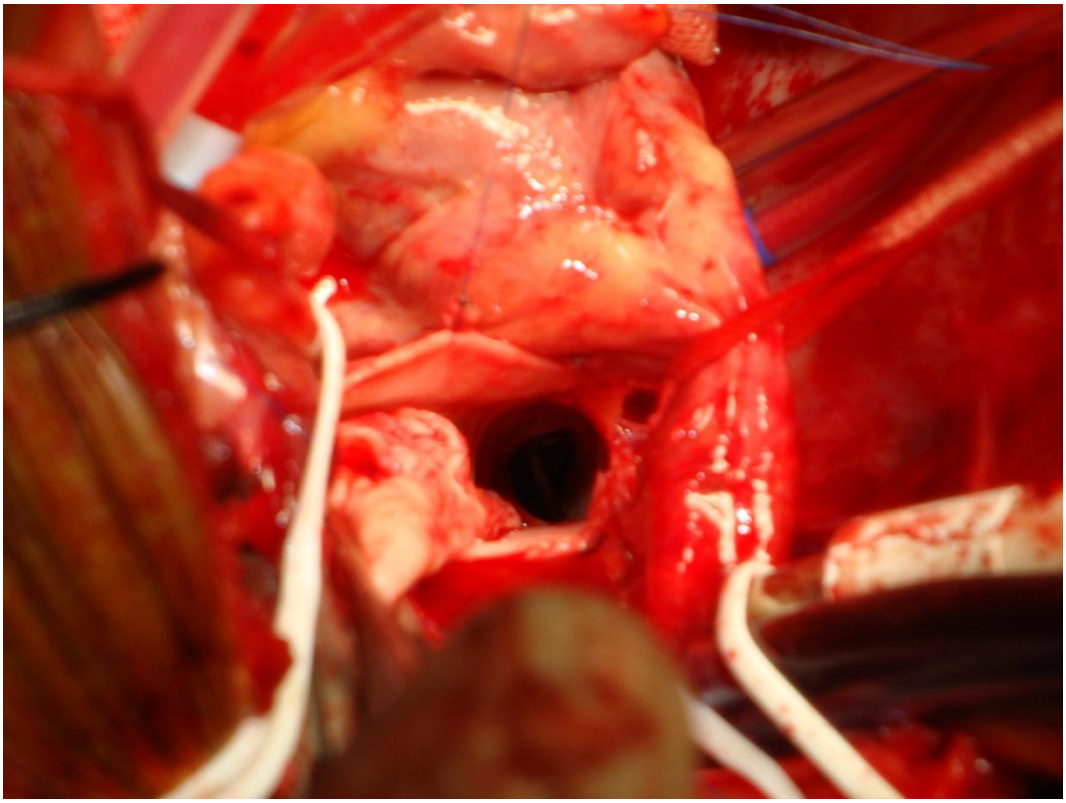
(***This was the First time this operation was done in Gujarat by our team @ Apollo Leaded by Dr. Apoorva Kanhere, Cardiac Surgeon.. Only one or two units in India- Bangalore / Madras- have done this procedure successfully before****……..)*



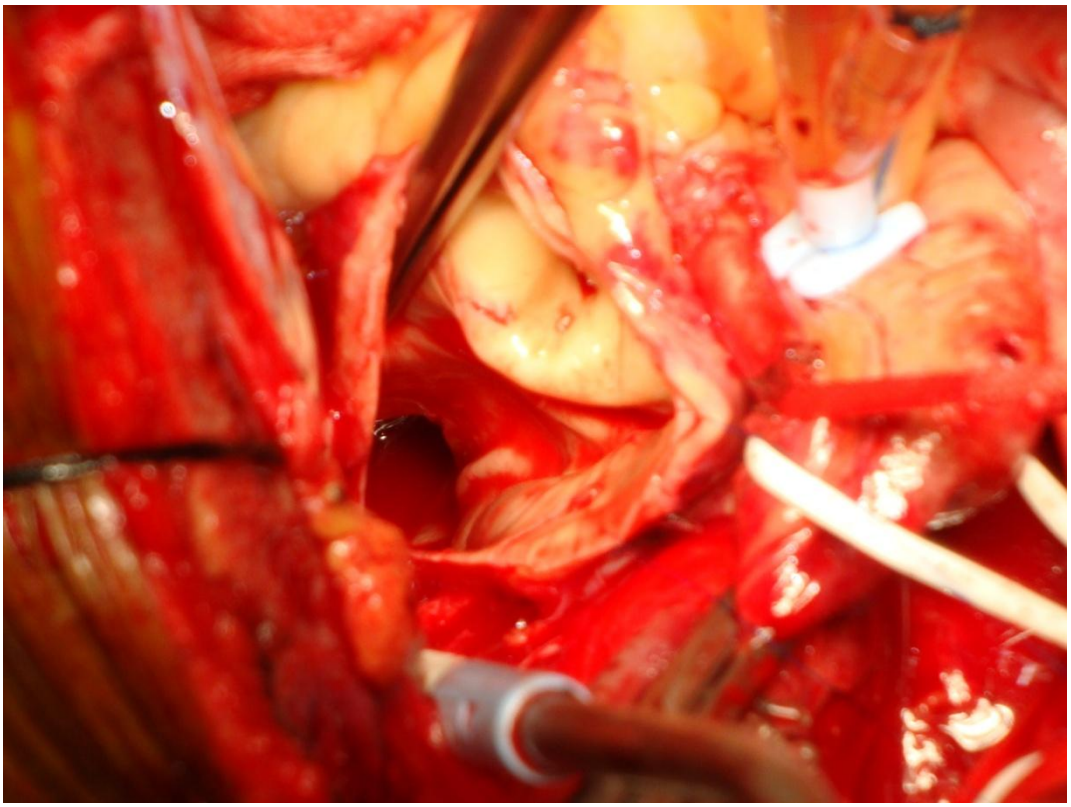
Properly removed blood clot cast looks like a root with branches representing branches of Pulmonary artery.*Surgically removed thromboembolic Cast from Lung Blood Vessels of Mr. N.R on 15.03.2010 @ Apollo Hospital, Ahmedabad Operation lasted for 8 ½ Hours. Circulatory arrest period at less than 19* C temperature for right side pulmonary Artery was 17 minutes and same for left side was 19 minutes*

Surgery of PTE (Pulmonary Thromboendarterectomy) The Body is cooled down to 17-18*C temperature AFTER going on Cardio Pulmonary bypass. At this temperature, Circulation can be stopped at a time completely for the period of 20 minutes safely so that Right and left branches of pulmonary artery can be cleaned of all the blockages in a still, blood less field.

Surgeon with the Team at work with Perfusionist on Heart Lung Machine Helping.



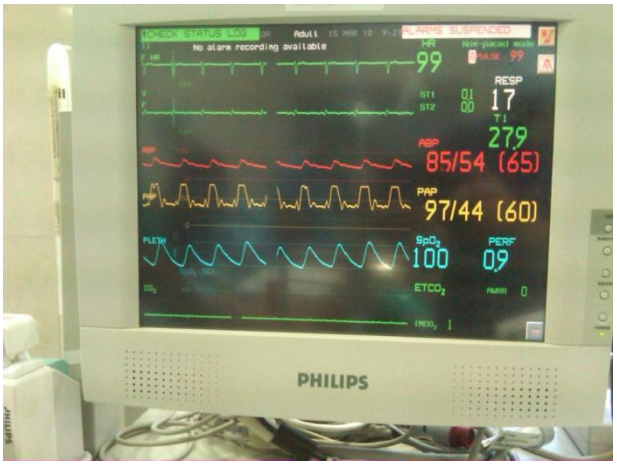
Thromboembolic Cast being removed from right side: note the clean vessel in the depth.



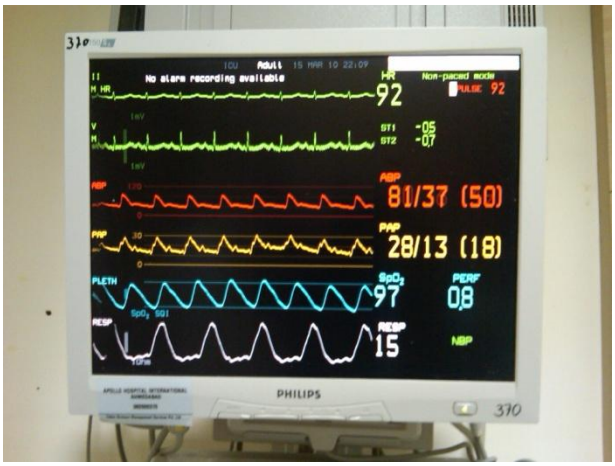
Left Pulmonary artery cleared off of the blood clot cast .

Total circulatory arrest: temp 17.8*c, pressure 0

Comparison of pulmonary Blood pressure (yellow) with systemic blood pressure before and after



High PA pressure **Before surgery**



Normal PA pressure **After Surgery**

Next morning Patient was awake. Then even on the Ventilator machine he signed for a piece of paper and pencil to write…. "What is my role now?" – A highly motivated patient with very positive frame of mind indeed…

Post op Echo has demonstrated normal Heart function with normalization of pulmonary blood pressure.

Mr. NR has been discharged for home today.

He will require life long Oral Anticoagulant medication so that new clots don't form again. A filter will be placed in his Inferior Vena Cava at next follow up to trap any small clots that may form in his legs again despite of anticoagulants..

Dr. Apoorva S. Kanhere

MS, FRCS, MCH, DNB (CVTS)

Consultant Cardiac Surgeon,

APOLLO Hospital Ahmedabad.

Ask4cardiacsurgery@live.com

Mobile: 9825005998