

Bloodless heart transplant, a milestone in modern medicine



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In the modern medicine, even an ordinary surgery needs transfusion of blood for a patient. But a heart transplant has been performed without blood transfusion in India, cheering up the heart transplant surgery field. For the first time in Asia, the doctors at Marengo CIMS Hospital at Ahmedabad have made this breakthrough. This development in surgery is considered as quite significant as it has not involved any blood transfusion, avoiding the customary complications likely in a blood transfusion.

Cardiac surgery

Chandraprakash Garg, 52, of Jodhpur, was suffering from what is called in medical jargon ischemic dilated cardio myopathy and had his heart dilated, blocking the supply of blood to the sinews of heart. He had been under medication for years and had cardiac arrest twice. Last month he was in an end-stage heart failure. When he consulted the Ahmedabad doctors, they suggested heart transplant as the only solution. At the same time, they decided to perform the surgery without blood transfusion. That led them to perform what is now hailed as Asia's first bloodless heart transplant.

Expertise needed

Heart transplant is generally a complicated procedure. There are several complications. For instance, the heart being transplanted must be suitable for the patient. At any stage, it should not be rejected. During the surgery, the patient may lose blood and so bottles of blood must be got ready for instant use. And then the blood transfusion should not create problems like allergy to the patient. Hence, a heart transplant's success depends on the expertise of the doctors concerned. But a bloodless heart transplant demands more expertise and attention on the part of the doctors. The patient must keenly be monitored and his disease rightly assessed. He must properly be anesthetized during surgery so that loss of blood is avoided and blood transfusion not needed.

So far, only 10 famous heart surgery hospitals in the world have successfully performed bloodless heart transplant. To perform the 11th surgery, the Ahmedabad hospital got permission from Chandraprakash Garg and fitted in him the heart of a 33 year-old

man who had died in a road accident. How was the breakthrough possible?

AI that came in handy

Dr. Dhiren Shah, director, Heart Transplant Program, who had led the team in the surgery, said, “This achievement was possible thanks to the developing medicine technology. Particularly, the Artificial Intelligence has helped much in this scientific feat. Chandraprakash Garg’s health condition was monitored through the AI-powered computer before and after surgery. The main component of this program was controlling the patient’s blood pressure and watching out for clotting of blood. There are over 10 blood clotting factors including fibrinogen and thromboplastin which are involved in chain reactions. These factors’ activities must be right like an uninterrupted current of electricity so that there is no blood clotting and no blood loss either during surgery. Even if one of the factors goes awry, the whole system will collapse. It is AI which shows the movement of each of these factors in every 10 minutes. All these seamless monitoring and testing were not possible in the old procedures. Even the minutest defect in the blood clotting factors will be shown by the AI technology that can also show the possibility, if any, of blood loss. We will accordingly act and set right the blood clotting factors, preventing the patient during surgery from losing blood. We were done with it all within one hour after the new heart to be transplanted reached our hands.”

Anaesthetist’s vital work

Dr. Dhiren Shah further said that an anaesthetist’s work too is vital in the surgery: “Before surgery, the patient’s nutritional level

and things like anaemia should be monitored and handled suitably. It is an anaesthetist's vital work to select suitable anaesthetics that ensure avoidance of blood loss and to inject the necessary dose into the patient.”

He continued to say, “Normally a heart transplant patient stays in the hospital for 21 to 24 days. But this bloodless surgery avoids the usual short-term/long-term complications that the patient faces such as allergy and inflammation and also reduces the duration of the stay in hospital. Chandraprakash Garg has been discharged nine days after the bloodless heart transplant.”

What are the benefits?

In India one and half crores of bottles of blood are required annually in surgeries, accident cases and deliveries. There are four crore eligible blood donors. But what is available is just less than 10 lakh bottles of blood annually. The main reason for this is the lack of sufficient awareness among the people about blood donation.

Against this background, scientific achievements such as this bloodless heart transplant will be immensely helpful in other surgeries too in future when the need for blood transfusion will be obviated.

In countries such as the U.S., Australia, European nations and so on, the medicine practitioners are trained in performing surgeries without 90 per cent blood transfusion, using the method known as Goal-directed Bleeding Management (GDBM). This technology can also be launched in India too.

So, there's no iota of doubt that the innovative bloodless heart transplant performed with the help of the AI by the Ahmedabad doctors is a major milestone in the annals of the modern medicine.

Translated by V. Mariappan.