

Aortic Arch Repair



By

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IJN Senior Consultant Cardiothoracic Surgeon **Prof Dato Seri Dr Mohd Azhari Yakub** explains that an aortic arch repair is the replacement of the aortic arch. This can be done either as conventional open arch repair, endovascular surgery, or a hybrid procedure that combines both techniques.

Conventional open arch repair is an open-heart surgery with a midline sternal incision. We locate the aneurysm, excise it and replace that portion with an artificial dacron graft. It sounds like a "simple go in, repair and get out" procedure, but we are dealing with crucial blood vessels here and it is a major undertaking.

"Endovascular" means that surgery is performed inside the blood vessel using thin, long tubes called catheters.

Many patients may be asymptomatic, but some may experience voice hoarseness, breathlessness, chest pain or back pain between the shoulder blades. They are more often than not middle aged or elderly males who have a history of hypertension and/or smoking.

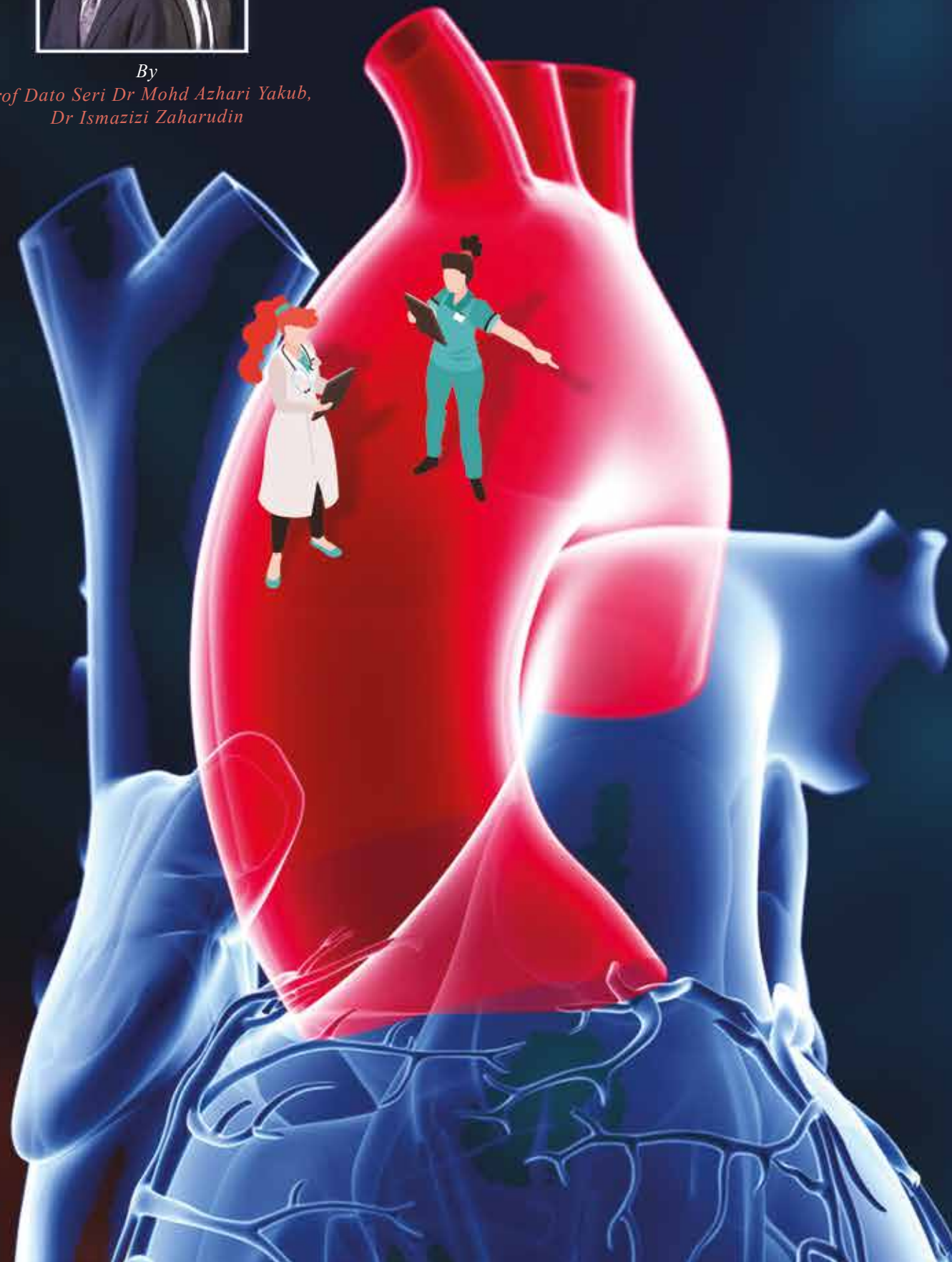
Conventional open arch repair is done in a normal operating theatre (OT), but the personnel in the OT need to be experienced, and they include the cardiothoracic surgeon, anaesthesiologist, the perfusionist that operates the heart-lung machine and the OT nurses.

Conventional open arch repair is usually indicated if you have an aortic arch aneurysm greater than 5cm or an aortic dissection.

The surgery is a highly complex procedure that is performed under circulatory arrest. First, we have to cool the patient's core body temperature to 18°C; then, we suspend blood circulation. After this, the arch repair and replacement must be done as quickly as possible as blood circulation can only be stopped for a maximum of 40 minutes. Meanwhile, blood flow to the brain can be maintained by antegrade cerebral circulation, a special cannulation procedure to supply blood only to the brain.

Once the repair is completed, we need to warm up the blood, restore circulation and bring the body temperature back to normal. The entire surgical process would take about 4 to 6 hours.

Recovery for aortic arch surgeries take some time. You probably need to stay about a week in the hospital and would continue feeling weak or sore for another one or two weeks. The sternum would take about six weeks to heal, and while you may be able to get back to your usual activities after this, total recovery would probably take about 2 to 3 months.



Meanwhile, after IJN expanded its vascular services and appointed a fully trained vascular and endovascular surgeon, more aortic arch repair cases have been treated endovascularly.

IJN Consultant Vascular Surgeon / Endovascular Surgeon **Dr Ismazizi Zaharuddin** shares that this is especially when it involves the more proximal component of the aortic arch, adding that the endovascular method for aortic arch repair has been around since 2006.

Endovascular surgery is done via small incisions made in the groin or arm, with wires and catheters used to guide and deliver a stent graft through the blood vessels to the site of the aortic arch. The stent graft is then deployed in the diseased segment of the blood vessel (aortic arch) and acts as a sleeve to divert blood flow away from the aneurysm.

An endovascular stent graft consists of a fabric tube supported by metal wire stents (also called a scaffold) that is used to reinforce the weak spot in the aorta. By sealing the area tightly, with your artery above and below the aortic aneurysm, the graft allows blood to pass through it without pushing on the aneurysm.

There are several approaches and techniques to endovascular procedures in the aortic arch region. The chimney graft technique is where multiple stent grafts are deployed with the chimney grafts in between the aortic wall and the main body stent graft.

Thus, blood is simultaneously directed through the main body stent graft and the chimney graft to achieve aortic and branch vessel perfusion.

Conventional open arch repair remains the gold standard for all patients. Still, it carries a high morbidity and mortality rate, even in the hands of an expert, compared to endovascular repair. Many patients with aortic arch aneurysms can be treated endovascularly, either via total endovascular or hybrid repair.

No surgery, however, is without risk. Potential complications and problems for endovascular repair include endoleaks - inadequate sealing of the ends of the stent graft - long-term device durability, device alignment, stroke, aortic valve issues, and mortality.

Surgeons who deal with endovascular aortic arch repair have to undergo intensive training in endovascular procedures as it deals with very complex anatomy.

At the end of the day, your surgeon will decide which option is best for you. Leave it in his hands.