Minimally invasive aortic valve replacement

Background

The aortic valve is the exit point for blood being pumped to the rest of the body, regulating the single-directional flow of blood out of the heart. If the valve cannot open completely (aortic stenosis), the heart is forced to pump harder against the narrowed opening. Conversely, if the aortic valve does not close completely (aortic regurgitation or insufficiency), blood can leak back into the heart, causing strain on the heart. If left untreated, both pathologies will eventually lead to heart failure and reduced life expectancy.

Surgical options

When the aortic valve is too diseased, surgical replacement is necessary to reduce symptoms and improve life expectancy. There are two main minimally invasive approaches:

- Mini-sternotomy approach: a small 5-8 cm (2-3 inch) vertical incision is made along the upper part of the sternum only. All surgical steps are made through this smaller incision using long and refined instruments. The heart and lung machine is employed.
- Mini-thoracotomy approach: a small 5-8 cm (2-3 inch) horizontal incision is made on the right side of the chest below the collar bone. Through this, access to the aorta is achieved. However, in this approach a rib is divided and usually a small cut in the groin is required to establish cardiopulmonary bypass.

Suitability

The suitability for minimally invasive aortic valve replacement is assessed on an individual basis. Approximately 85-90% of patients are suitable for a minimally invasive approach. Often it depends on the heart function, chest anatomy and co-existing medical conditions. Another important issue that needs to be considered is whether a mechanical or a tissue valve is more suitable for the patient. A mechanical valve is very durable, but it requires blood-thinning medication (warfarin) for lifetime. A tissue valve does not require warfarin, but may only last for 7-15 years.

Benefits

Benefits of minimally invasive mitral valve surgery may include:

- Reduced blood loss
- Reduced risk of sternal complications
- Faster recovery and shorter hospital stay
- Less scarring and better cosmetic appearance.

Risks

Some risks associated with this type of surgery remain the same as those for conventional aortic valve replacement. These include stroke, mortality and risks associated with cardiopulmonary bypass. However, these are specialized procedures with a learning curve. The results are better in institutions specializing in minimally invasive cardiothoracic surgical procedures. The rates of these risks also depend on individual patient pathology and comorbidity. As with all surgical interventions, the potential risks need to be weighed against the benefits and discussed with your surgeon.

For more information, visit the following websites:
http://www.nlm.nih.gov/medlineplus/ency/article/007407.htm
http://www.sts.org/patient-information/valve-repair/replacement-surgery/aortic-valve

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