

Percutaneous Balloon Aortic Valvuloplasty

Introduction

Aortic stenosis is the narrowing of the aortic valve opening. In severe cases, it will cause acute pulmonary edema, malignant arrhythmias or even sudden death. Percutaneous balloon aortic valvuloplasty (BAV) is used to expand narrowed aortic valve by special balloons. It is performed under the guidance of X-ray, through percutaneous method.

Importance of Procedure

BAV is an alternative treatment method to the conventional aortic valve replacement (AVR) by open heart surgery or transcatheter aortic valve implantation (TAVI). BAV is not a definitive treatment method but it offers good short-term result in those patients not suitable for AVR or TAVI, such as unstable patients waiting for AVR, patients who need emergency non-cardiac surgery, and patients with other severe medical illness. Patients who refuse this method can select either AVR or medical therapies or TAVI.

Pre-Procedure Preparation

- An echocardiogram (ultrasound imaging of your heart) will be performed to assess and confirm the anatomy and functional significance of the aortic stenosis. Special attention will be taken on the feasibility of the percutaneous approach.
- You will be invited to a ward or a clinic for some preliminary tests including electrocardiogram, chest X-ray, blood tests. We will also check your allergy history. These can be performed days before the procedure or on the day of admission.
- Our medical staff will explain to you and your relatives the details of the procedure together with the possible risks and complications. This information leaflet will be provided. You and your relative will have to sign a consent form.
- Blood thinning drugs or metformin (for diabetes) may have to be stopped several days before the procedure. Drugs such as steroid may be prescribed. Antibiotic may be given as prophylaxis for the procedure.
- Fasting of 4-6 hours is required prior to the procedure. An intravenous drip may be set up. Shaving may be required over the puncture site.
- If you are a female, please provide your last menstrual period (LMP) and avoid pregnancy before the procedure as this procedure involves exposure to radiation.

The Procedure

- This invasive procedure is performed under local anesthesia in a cardiac catheterization centre. You are alert during the procedure, but we may give you sedation to calm you down.
- Electrodes are adhered on the chest to monitor the heart rate and rhythm. Blood oxygen monitor through your finger tip will be set up. Measurement of blood pressure from your arm will be taken during the examination.

- A small wound is made over the groin for access to your arteries and/or veins. Both groins may be used. Sheaths will be placed inside the arteries and/or veins.
- Catheters are advanced to the heart. Pressures within the heart are measured. Contrast maybe injected and films are taken.
- A catheter mounted with a balloon will be delivered across your aortic valve and it will be inflated to open up your narrowed aortic valve. Repeated balloon inflations may be required.
- Pressures within the heart are measured and echocardiogram is performed to ensure success of the procedure.
- Puncture of the septum separating the left and right atrium may be necessary. This will require the use of special needles.

Post-Procedure Care

- After the procedure, catheters will be removed. The wound site will be compressed to stop bleeding.
- Nursing staff will check your blood pressure, pulse and wound regularly.
- Bed rest may be necessary for 4 hours. In particular, please do not move or bend the affected limb. Whenever you cough or sneeze, please apply pressure on the wound with your hand.
- You should inform your nurse if you have any discomfort in particularly chest discomfort or find blood oozing from the wound site.
- Once diet is resumed, please take more fluid to help eliminate contrast by passing urine.
- Please follow instruction for the use of medications.

Post-Procedure Follow Up

- Usually, you can be discharged 2-3 days after the procedure.
- The wound will be inspected and covered with light dressing. Please keep the wound site clean and change dressing if wet. In general, showers are allowed after 2 days.
- Please avoid vigorous activities (household or exercise) in the first 3 days after the procedure. Bruising around the wound site is common and usually subsides 2-3 weeks later. If you notice any signs of infection, increase in swelling or pain over the wound, please come back to the hospital or visit a nearby Accident and Emergency Department immediately.
- Usually, your doctor has explained to you the results of the procedure before discharge. Should you have further questions, you and your close relatives can discuss with your doctor during subsequent follow-up.

Risks and Complications

- The procedure carries certain risks.

- Major complications include intraprocedural death (1.5-6%), stroke (2-3%), systemic embolus (2%), myocardial infarction (1-2%), vascular complication (7%), tamponade (0.3%), permanent pacemaker (1%), moderate-severe aortic regurgitation (1%) and emergency cardiac surgery (1%). (Reference 1 & 2)
- Minor complications include contrast reaction, nausea and wound complications (<5%). Bruising around the wound site is common.
- There is a high chance of residual or recurrent aortic stenosis.
- Other potential risks include air embolism resulting in death or neurological damage, retained foreign body such as guide wires.
- Device deployment complications include device dislodgement, device entrapment and wire fracture

Fees and Charges

- This procedure involves the use of consumables which are 'Privately Purchased Medical Items'. Please make financial arrangement before the procedure.
- You need to pay an estimated deposit. The final charge, however, depends on the complexity of the procedure and range of consumables required.
- After the procedure, you may need to pay the balance to or collect refund from the account office.
- Please note that the procedure may need to be staged or repeated for various reasons. Separate charging is required for each procedure.
- If you have financial difficulty, you can apply for assistance through our medical social worker.

Remarks

- It is hard to mention all the possible consequences if this procedure is refused.
- The list of complications is not exhaustive and other unforeseen complications may occasionally occur. The risk quoted is in general terms.
- Should a complication occur, another life-saving procedure or treatment may be required immediately.
- If there is further query concerning this procedure, please feel free to contact your nurse or your doctor.

Reference

1. Percutaneous balloon aortic valvuloplasty. Acute and 30-day follow-up results in 674 patients from the NHLBI Balloon Valvuloplasty Registry. *Circulation*. 1991 Dec;84(6):2383-97.
2. Ben-Dor I, Pichard AD, Satler LF, et al. Complications and Outcome of Balloon Aortic Valvuloplasty in high-risk or inoperable patients. *J Am Coll Cardiol Intr* 2010; 3:1150-6.
3. Usefulness of Balloon Aortic Valvuloplasty in the Management of Patients With Aortic Stenosis. *The American Journal of Cardiology* 2017; 120(8):1366-1372.