Surgical anatomy

Surgical anatomy

Heart valves serve to maintain pressure gradients between cardiac chambers, thus ensuring a unidirectional flow of blood through the heart. The aortic valve is tricuspid, with semilunar leaflets attached to the aortic wall at the annulus, the aortic sinuses being above the base of each leaflet, two of which form the origin or ostium of the coronary arteries. The intrinsic shape of the aortic semilunar valve allows blood to leave the ventricle during systole and prevents regurgitation during diastole. If disease leads to disruption of the leaflets or the annulus, valve function will be a ff ected. The mitral valve is bicuspid; the anterior cusp is larger in area and lies between the orifices of the mitral and aortic valves. The leaflets, like those of the aortic valve, are attached to an annulus. T he leaflets join at two commissures and are supported by a subvalvular apparatus, consisting of chordae tendinae and papillary muscles. The papillary muscles con tract in ventricular systole, pulling the cusps towards the atrio ventricular orifice and holding blood within the ventricle. The proper functioning of the mitral valve depends on the integrity of the annulus, leaflets, chordae and papillary muscles. If sur gical re pair is required, these structures should be preserved whenever possible (Figure 59.9). Dwight Harken , 1910–1993, American surgeon. In June 1948, in Boston, MA, USA, Harken successfully introduced a cardiovalvulotome through the left atrial appendage and into the heart of a 27-year-old with severe mitral stenosis. In 1950, he developed and implanted the first stainless steel cage prosthesis in the aortic position. Albert Starr , b. 1926, formerly Professor of Surgery , The University of Oregon, OR, USA. Inventor of the world’s first durable artificial mitral valve; winner of Lasker award in 2007 – an award given by the Lasker Foundation in the USA to a person (or persons) who has made major contributions to medical science or who has performed public service on behalf of medicine. The decision to either repair or replace a valve depends on the underlying pathology , severity of disease and quality and/ or involvement of the supporting structures. Generally , repair is favoured when possible in mitral valve disease, particularly in degenerative mitral regurgitation, where it has been shown to have good long-term outcomes. Repair is the operation of choice in tricuspid valve disease, but aortic valve surgery generally involves replacing the diseased valve (Table 59.2). Important factors in selecting the procedure and prosthe - - sis include patient choice, age, existing comorbidities and the need for anticoagulation. Because of uncertainties about its longevity , most surgeons use a bioprosthetic (biological) valve in patients o ver 60 years. The need for anticoagulation with warfarin may have an impact on choice of valve, particularly in women of childbearing age, the elderly , the presence of con - genital or acquired bleeding diathesis and when there is the need for further major surgery .

Pulmonary valve Aortic valve Tricuspid Mitral valve valve Figure 59.9 Four valves of the heart.

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