The evolution over the last several decades of surgery for acquired disease of the tricuspid valve is characterized by steady movement away from replacement and toward techniques that conserve the valve. Replacement of the valve has become uncommon, occurring in less than 5% of patients undergoing tricuspid valve surgery. Conservative surgery of the valve—anuloplasty, occasionally in association with commissurotomy—remains an area of some controversy, involving indications for surgery, choice of anuloplasty technique, and details of technique. In this chapter, we will illustrate two common methods of anuloplasty, the Carpentier and the DeVega, illustrate commissurotomy, and discuss valve replacement.

Anuloplasty

Indications for Surgery

Surgery of the tricuspid valve has long been a challenge. Methods of evaluating the severity of tricuspid insufficiency—whether clinical, hemodynamic, or operative—all involve a degree of subjectivity. The variable early results of valve repair or valve replacement led to differing recommendations regarding management of the tricuspid valve during mitral or mitral and aortic surgery, from doing nothing to reparative operations to tricuspid replacement in the majority of cases.

As the poor late results from tricuspid valve replacement have become more apparent and the results of anuloplasty have become more predictable and reproducible, anuloplasty has become the method of choice for management of most cases of moderate to severe tricuspid insufficiency.

Tricuspid insufficiency is usually caused by right ventricular hypertension, right ventricular enlargement, and anular dilatation, secondary to mitral and/or aortic valvular disease, commonly referred to as “functional” regurgitation. It may also be caused by rheumatic dis-
ease of the anulus, valve leaflets and subvalvular mechanism—"organic" regurgitation.

The degree of regurgitation can vary from very mild, with only a soft murmur and normal right atrial pressure, to severe, with pulsating neck veins, an enlarged and pulsating liver, and right atrial hypertension. Severe regurgitation requires operative management, whereas mild regurgitation does not. The difficult decision occurs in moderate regurgitation, where clinical signs are minimal or absent, and only a slight degree of right atrial hypertension is present. Operative assessment of severity of tricuspid regurgitation is helpful in this situation.

Digital exploration of the right atrium is performed through the appendage prior to insertion of the caval cannula. The extent, width, and strength of the regurgitant jet is determined, and the valve is palpated. Operative findings can be influenced by changes in right ventricular pressure and cardiac output secondary to anesthesia and opening the chest and must be balanced with preoperative clinical and hemodynamic assessment.

Surgical Strategy

Myocardial Preservation
The usual method of myocardial preservation is cold blood cardioplegia (Chapter 5). This provides a still, dry field for anuloplasty.

Associated Procedures
Any surgery on the mitral or aortic valve is performed prior to the tricuspid procedure.

Choice of Anuloplasty Technique
There are several anuloplasty techniques from which to choose: (1) lateral anuloplasty with obliteration of the posterior leaflet, resulting in a bicuspid valve; (2) semicircular ring anuloplasty by the method of DeVega and its modifications; and (3) Carpentier ring anuloplasty. Our preference is for the Carpentier or DeVega technique.

Surgical Anatomy

The three leaflets of the tricuspid valve are the anterior, posterior, and septal (Fig. 13-1). There are two main papillary muscles supporting the valve: the anterolateral, with chordae tendineae inserting on the anterior and posterior leaflets, and the posteromedial, with chordae inserting on the septal leaflet.

The atrioventricular (AV) node is located just medial to the orifice of the coronary sinus. The bundle of His begins as a continuation of the AV node at the right fibrous trigone, also called the central fibrous body: the confluence of the AV valves, atrial septum, membranous ventricular septum, and aortic valve ring. The His bundle pierces the membranous ventricular septum or skirts the septum posteriorly to