The physical aspect of surgery is at least as important as the intellectual aspect. The surgeon who knows what to do and when to do it is obviously ineffective, in fact dangerous, if he or she cannot physically do it. Although technical excellence is obviously admired and valued, the basics of surgical technique (which are essential components of technical excellence) are absent from many standard surgical textbooks.

The multiple coordinated and precise movements that result in technical excellence require not only a steady hand and smooth motion, but also knowledge of the most atraumatic and efficient motions to accomplish a specific physical action.

Knowledge of the fundamentals of how surgical instruments are held and moved is essential to accomplish smooth surgical movements. Surgery is also an art, requiring a continuing ability to create and accommodate. Nevertheless, the basics are required before the art is possible.

This chapter describes some of these fundamentals as they relate to the techniques of dissection and suturing as well as describing the mental and physical preparation that enhances surgical technique.

**Dissection**

Most cardiac operations do not involve a lot of tissue dissection. Some, such as repair of a patent ductus arteriosus, consist predominantly of tissue dissection. In other procedures, such as reoperation, tissue dissection may be the most challenging and potentially dangerous portion of the entire operation. Fundamentals of tissue dissection are therefore important for the cardiac surgeon.

**Scissor Dissection**

Most tissue dissection in cardiac surgery is accomplished sharply with scissors. The majority of dissection involves freeing blood vessels for clamping or suturing. This can usually be accomplished by cutting the connective tissue that attaches to the adventitia of the vessel. The assistant’s retraction of the tissue layer over the vessel stretches and tenses this connective tissue, displaying its numerous tiny fibers. These fibers can be cut with the tips of the scissors, the scissors being held at right angles to the tissue being cut. The scissors should be held with the thumb and ring finger in the rings and the index finger extended down the handle to provide stabilization and balance (Fig. 3–1).
Scalpel Dissection

The scalpel can be superior to scissors for dissection in close quarters and for cutting through tissue that is particularly adherent to other tissue, such as mediastinal tissue which may be stuck to the back of the sternum at reoperation.

The scalpel is also used for incision of epicardium and exposure of coronary arteries. Gentle stroking or “painting” of the tissue overlying the coronary artery frees the artery wall for precise incision. Once the epicardium is incised, the strands of tissue connecting the epicardium and the coronary artery can also be divided by “shaving” the surface of the artery, exposing the artery and separating the epicardium and subepicardial fat so that the latter is not included in the suture line.

Suturing

Almost all cardiac operations involve suturing, passing a needle and suture material through tissue and often through material such as valve sewing rings or grafts. A coronary artery operation can involve 200 or more such passes of needle and suture material. The accuracy, smoothness, and efficiency with which suturing is accomplished are the major determinants of the success or failure of most cardiac operations. For this reason the way a needle is placed in the needle holder, the way the needle holder is held in the hand, and the motions of the hand, wrist, arm—indeed the entire body—are fundamental to cardiac surgery.