Chapter 9
Basic Fracture Reduction Principles

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Overview

Although often perceived of as simply "straightening out the bone," fracture reduction is a complex task that should always include a thorough knowledge of the injury and the best means to realign the fragments before being undertaken. These general principles will assist with the reduction of fractures and dislocations, with specifics written throughout this text for each anatomic location.

Limit the Patient's Ability to Counteract Your Efforts

Muscle spasms due to pain and anxiety are a major obstacle to reduction. A three-pronged approach to limiting a patient's muscular forces during reduction should include chemical

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agents such as benzodiazepines or conscious sedation, positioning the patient in a manner that decreases the length of their most powerful muscles (such as flexing the knee during an ankle reduction to put the gastroc-soleus complex at a mechanical disadvantage), and fatiguing the patient with gentle axial traction for 3–5 min before attempting a reduction. While not all of these adjuncts are required before a reduction, each can assist in making the procedure easier and safer.

"Just Pulling on It" Is Not Always the Answer

Straight axial traction is often helpful, but is rarely the only technique needed for an anatomic reduction. Fractures are caused by deforming forces that include the trauma itself as well as the pull of muscles, tendons, and ligaments on each fracture fragment in a variety of directions. The forces involved should be considered and carefully reversed. In addition, using straight axial traction alone may cause iatrogenic injury. This is particularly true in digital injuries where the volar or plantar plate can be pulled into a dislocated joint, blocking reduction.

Fatigue, Recreate, and Reduce

For many injuries a pattern of "fatigue, recreate, and reduce" can be successful. This is most often taught in distal radius fractures and other forearm fractures, where the two fragments may have bony spicules interdigitating and preventing reduction. In such instances, it can be helpful to first fatigue the patient with traction and then separate the two fragments by recreating (or slightly exaggerating) the deformity. After the fragments are freed, the deformity can be reduced by realigning the fragments under traction, then releasing traction.

You Can't Win 'Em All

Not every fracture is amenable to anatomic reduction by closed means. If it were, the field of orthopedic surgery would have far less to do. It is important to understand what fractures *must* be brought into anatomic alignment and which simply cannot be. It is never worth causing iatrogenic injury to a patient simply to get an X-ray to look better if the injury will be treated in the operating room anyway.