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Anatomy and Biomechanics of the Elbow 141
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The elbow is a complex, highly constrained joint that provides critical range of motion to the upper extremity needed for performing the normal activities of daily living. The elbow is protected by a fortress of individual static and dynamic constraints that function together to provide stability. Knowing the identity and specific functions of each stabilizing structure facilitates appropriate diagnosis and treatment of the acutely injured elbow.

Acute Elbow Dislocations 155
Michael A. Kuhn and Glen Ross

The elbow is the second most commonly dislocated major joint in the adult age group and the most commonly dislocated major joint in the pediatric population. The mechanism of injury and resultant ligamentous disruption pattern have been investigated and noted. Classification of elbow dislocation is well described, and allows for appropriate treatment and rehabilitation. For stable reductions, an aggressive early ROM protocol emphasizing active motion has been helpful for maximizing final range of motion and minimizing extension loss. Associated injuries with elbow dislocation are common and can result in significant morbidity if not diagnosed and treated.

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M. Wade Shrader

Elbow fractures in children are extremely common, making up approximately 15% of all fractures in pediatric patients. The unique radiographic anatomy of the pediatric elbow, along with the potential for neurovascular compromise, often provokes anxiety in orthopedic surgeons. A thorough understanding of the anatomy and treatment principles makes the care for these children more straightforward, however. The distal humerus makes up approximately 85% of all elbow fractures in children. The most common fractures of the distal humerus in children are supracondylar humerus fractures, lateral condyle fractures, medial epicondyle fractures, and transphyseal humerus fractures. Each of these fractures is discussed in detail, outlining their radiographic features, principles of treatment, and potential complications.

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or attenuation of the lateral ulnar collateral ligament. Posterolateral rotatory instability is diagnosed on the basis of careful history taking and specific physical examination techniques. Reconstruction of the lateral ulnar collateral ligament with repair of the surrounding soft tissue structures is recommended in patients who have symptoms of recurrent lateral instability. Open and arthroscopic reconstruction techniques have resulted in improvement of elbow function and satisfactory results in most patients, although mild limitation in terminal extension of the elbow is a common finding.

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Christian J.H. Veillette and Scott P. Steinmann

Approximately 10% of fractures about the adult elbow consist of fractures of the olecranon process of the ulna and range from simple nondisplaced fractures to complex fracture-dislocations of the elbow. Several treatment options for internal fixation have been described, including tension-band wiring, plate fixation, intramedullary screw fixation, and triceps advancement after fragment excision. The method of internal fixation is chosen based primarily on fracture type. Because olecranon fractures are all intra-articular injuries, they require anatomic or essentially normal surface reduction and trochlear notch contour for predictable outcomes. In addition, fixation must be stable enough to permit early mobilization to avoid significant elbow stiffness. Given the variability in fracture patterns, the complex anatomy, and associated injuries, treating surgeons must be familiar with multiple treatment methods and follow a systematic surgical strategy to avoid complications and achieve reliable outcomes.

Distal Biceps Rupture

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Augustus D. Mazzocca, Jeffrey T. Spang, and Robert A. Arciero

Recognition and treatment of distal biceps tendon ruptures is increasing, likely because of greater clinical awareness and the greater activity and demands of the middle-aged population. This article focuses on the proper evaluation and treatment of distal biceps tendon ruptures with special attention focused on recently developed techniques. A review of the recent clinical literature will accompany an overview of pertinent biomechanical studies and an explanation of the risks and benefits of the most popular surgical techniques for distal biceps repair.

Soft Tissue Coverage of the Elbow: A Reconstructive Algorithm

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Mark Jensen and Steven L. Moran

Soft tissue defects can occur for various reasons, but they are primarily due to trauma, tumor, and infection. Coverage choices may include primary closure, skin grafting, local cutaneous flaps, fasciocutaneous transposition flaps, island fascial or fasciocutaneous flaps, muscle or myocutaneous pedicled flaps, and microvascular free-tissue transfer. Despite the multitude of options for coverage, the authors have found four flaps to provide reliable coverage for most elbow deficits within their practice; these flaps are the latissimus dorsi flap, the radial forearm flap, the anconeus flap, and the free anterior lateral thigh flap. This article provides an overview of treatment options for elbow coverage, with specific emphasis on the use of these four specific flaps.

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