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Short Communication

Scapula: Clinical Implications for Orthopedic and Anatomical Significance

Xiao Lei*

Department of Orthopedics, Yang-En University, Fujian, China

DESCRIPTION

The scapula, also known as the shoulder blade, is a triangular bone located in the upper back, playing an important role in shoulder mobility and stability. It serves as an attachment point for numerous muscles, contributing to arm movement and shoulder girdle function. This article briefly reviews the anatomical features of the scapula, its functions in the upper extremity, and its clinical relevance in trauma, surgeries, and common pathological conditions.

The scapula is a flat, triangular bone situated in the upper back, with its apex pointing laterally and its body forming part of the shoulder girdle. Despite its critical role in upper limb movement and stability, the scapula is often overlooked in clinical practice due to its deep positioning and complex anatomical relationships. Understanding the anatomy and function of the scapula is essential for diagnosing and treating shoulder-related injuries and conditions, including fractures, rotator cuff disorders, and shoulder instability.

Anatomical features

The scapula has several key components: The body, spine, acromion process, coracoid process, glenoid cavity, and the suprascapular notch. These features serve as attachment sites for muscles and ligaments involved in shoulder movement [1].

Body and spine: The body of the scapula is a flat, triangular surface that forms the main structure of the shoulder blade. The spine of the scapula runs diagonally across its posterior surface, leading to the acromion process [2].

Acromion process: The acromion is an extension of the scapular spine, forming the highest point of the shoulder. It articulates with the clavicle at the Acromioclavicular (AC) joint, facilitating movement in the shoulder girdle.

Coracoid process: Located on the anterior surface, the coracoid process serves as a lever for muscle attachments, including the short head of the biceps and coracobrachialis muscles [3].

Glenoid cavity: The glenoid cavity, a shallow depression on the lateral side, articulates with the head of the humerus to form the glenohumeral joint, allowing for a wide range of arm movements.

Suprascapular notch: Located near the base of the coracoid process, this notch serves as a passage for the suprascapular nerve and vessels.

Functional role of the scapula

The scapula is essential for the proper functioning of the shoulder, acting as a stabilizing platform for various muscles that control upper limb movement [4]. These muscles include the rotator cuff group (supraspinatus, infraspinatus, teres minor, and subscapularis) and the muscles responsible for scapular motion, such as the trapezius, levator scapulae, rhomboid, and serratus anterior. The scapula's motion provides a stable foundation for these muscles to move the humerus through a wide range of motion. The movements of the scapula include:

Elevation and depression: Elevation occurs when the scapula moves upward, as seen during shoulder shrugging. Depression involves moving the scapula downward [5].

Protraction and retraction: Protraction refers to the forward movement of the scapula, while retraction involves moving the scapula toward the spine.

Upward and downward rotation: Upward rotation occurs when the inferior angle of the scapula moves away from the midline, which is essential for overhead arm movements. Downward rotation involves the opposite motion [6].

Clinical relevance

The scapula is integral to several clinical scenarios, particularly in trauma, surgery, and rehabilitation. Some of the most significant clinical concerns include scapular fractures, rotator cuff injuries, and shoulder instability [7].

Scapular fractures: Although relatively rare, scapular fractures often result from high-impact trauma, such as motor vehicle accidents or falls from height. These fractures may involve the body, glenoid, acromion, or coracoid process, often requiring surgical intervention, particularly when the glenoid is fractured.

Correspondence to: Xiao Lei, Department of Orthopedics, Yang-En University, Fujian, China, E-mail: 73546886980@qq.com

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The clinical presentation includes pain, swelling, and limited arm movement, with the management typically involving immobilization or surgery, depending on the fracture type [8].

Rotator cuff injuries: The rotator cuff muscles, which stabilize the glenohumeral joint, attach to the scapula. Injuries to these muscles, such as tears or tendinitis, are common causes of shoulder pain and dysfunction. Rotator cuff disorders are frequently seen in athletes, especially those involved in overhead activities, and can lead to long-term functional impairment if not properly treated [9].

Shoulder instability: Scapular dyskinesis, or abnormal scapular motion, is often associated with shoulder instability. This condition can arise from repetitive stress, poor posture, or muscle imbalances. In cases of scapular instability, physical therapy focusing on scapular stabilization and strengthening exercises may be beneficial. Severe cases may require surgical intervention [10].

Scapulothoracic dysfunction: This condition occurs when the normal motion of the scapula against the thoracic rib cage is disrupted. It can lead to pain and dysfunction and is often associated with overuse or improper muscle coordination. Corrective exercises targeting the scapulothoracic rhythm are critical in rehabilitation.

CONCLUSION

The scapula, although frequently underappreciated, plays a vital role in shoulder mechanics and upper limb function. Its complex anatomical structure and the range of movements it facilitates are critical for daily activities and athletic performance. Understanding the anatomy and function of the scapula is essential for diagnosing shoulder disorders, managing traumatic injuries, and devising effective rehabilitation strategies. Given its pivotal role, continued research into scapular biomechanics and pathology is necessary to advance clinical practices and improve patient outcomes.

REFERENCES

1. Yeshurun R, Yaroshevich A. Bone projectile injuries and Epipaleolithic hunting: New experimental and archaeological results. J Archaeol Sci. 2014;44:61-68.
2. Taylor JR, Schrumpf MA, Shea KE, Kelly II JD. Distal clavicle autograft augmentation for glenoid bone loss in revision shoulder arthroplasty: Results and technique. J Shoulder Elbow Surg. 2020;29(10):86-93.
3. Tokish JM, Fitzpatrick K, Cook JB, Mallon WJ. Arthroscopic distal clavicular autograft for treating shoulder instability with glenoid bone loss. Arthrosc Tech. 2014; 3:475–481
4. Richards RR, An KN, Bigliani LU, Friedman RJ, Gartsman GM, Gristina AG, et al. A standardized method for the assessment of shoulder function. J Shoulder Elbow Surg. 1994;3(6):347-352.
5. Mathiowetz V. Reliability and validity of hand strength evaluation. J Hand Surg. 1984;10:321-327.
6. Uhl TL, Kibler WB, Gecewich B, Tripp BL. Evaluation of clinical assessment methods for scapular dyskinesis. Arthroscopy. 2009;25(11):1240-1248.
7. Kwon YW, Powell KA, Yum JK, Brems JJ, Iannotti JP. Use of three-dimensional computed tomography for the analysis of the glenoid anatomy. J Shoulder Elbow Surg. 2005;14(1):85-90.
8. Garcia GH, Liu JN, Degen RM, Johnson CC, Wong A, Dines DM, et al. Higher critical shoulder angle increases the risk of retear after rotator cuff repair. J Shoulder Elbow Surg. 2017;26(2):241-245.
9. Hohmann E, Tetsworth K. Glenoid version and inclination are risk factors for anterior shoulder dislocation. J Shoulder Elbow Surg. 2015;24(8):1268-1273.
10. Konrad GG, Markmiller M, Jolly JT, Ruter AE, Sudkamp NP, McMahon PJ, et al. Decreasing glenoid inclination improves function in shoulders with simulated massive rotator cuff tears. Clin Biomech. 2006;21(9):942-949.