ORIGINAL RESEARCH PAPER

Anatomy

KEY WORDS:

MORPHOMETRIC STUDY OF CORACOID PROCESS OF SCAPULA

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Introduction-:

Coracoid process is a bird's beak like projection arising from the superior border of the scapula [1]. The body of coracoid process is bent sharply so as to project forwards and slightly laterally. It forms a short, curved cantilever fixed to the scapula at its base. Pectoralis minor is attached to the superior and medial aspects of the coracoid process. The tip of the coracoid process gives attachment to coracobrachialis on its medial aspect of deep surfaces and to the short head of biceps brachi on its lateral side and superficial aspect. On the dorsal aspect of the coracoid process, at the point where it changes direction, a rough impression gives attachment to the conoid portion of the coracoclavicular ligament. The trapezoid portion of the coracoclavicular ligament is attached to the upper aspect of the horizontal part of the process, anterior to the conoid part. The medial, end of the coraco-acromial ligament is attached to the lateral border. The coracohumeral ligament is attached to the root of the coracoid and inferior aspect of the coracoid process is otherwise smooth and saddle-shaped [2].

One of the most fundamental principles of shoulder surgery is to embark on an approach that is lateral to the coracoid process, to avoid the vital neurovascular structures that run medially, such as the brachial plexus and branches of the axillary artery and vein [3].

The coracoid process forms an important part of the scapular glenoid construct and is involved in many surgical procedures on the glenohumeral joint. Its detailed morphometry is useful in many surgical procedures [4]. The subcoracoid space is occupied in vivo by several soft tissue structures, such as the articular capsule of the gleno-humeral joint, the subscapularis tendon and the subacromial bursa. The shape and size of this space depends on its limiting skeletal structures so aanatomical morphometric studies of coracoid process may provide information as to the etiology of the subcoracoid impingement syndrome [5]. Few patients had idiopathic impingement, which appeared to be caused by a long coracoid process projecting more laterally than normal[6] The study aims to determine the morphometric parameters of coracoid process.[7]

Materials and Methods.

The study was performed on 70 adult human scapulae 35 right and 35 left side of unknown sex obtained from the Department of Anatomy of Medical Colleges in Mumbai. The side of the scapulae for the study was identified and labeled with suffix R (right) or L (left). The parameters recorded were Maximum length, Maximum breadth, Maximum thickness and Maximum height by using digital vernier calipers with accuracy of 0.01mm. Shape of coraco-glenoid space was also noted.

Maximum length: Distance between most anterolateral to most posteromedial extension of coracoid process. (Figure 1).

- Maximum breadth: Distance from lateral border to medial border of coracoid process. (Figure 2).

- Maximum thickness: Measured in superoinferior direction 1cm posterior to tip of coracoid process. (Figure 3).

- Maximum height: Distance between supraglenoid tubercle to top of ascending portion of coracoid process. (Figure 4).

These parameters were compared on both the sides and statistical analysis was done.

Results

Table-1 Showing different shapes of coraco-glenoid space

Shape	Total	Percentage %
Round bracket	32	45.71 %
Square bracket	29	41.42 %
Fish hook	09	12.85 %

Table-2 Observations of different morphometric parameters of coracoid process.

Parameter	Range of measurements in mm		Mean _+SD in mm		Averag
	Right(n=35)	Left (n=35)	Right(n=35)	Left(n=35)	(n=70)
Maximum Length	33.85-45.61	34.72-45.32	39.10_+3.33	39.48_+3.20	39.29_+3.25
Maximum Breadth	9.60-17.65	9.21-15.02	12.77+_1.62	12.95_+1.23	12.86_+1.43
Maximum Thickness	5.36-10.60	5.20-9.85	7.76_+1.43	7.60_+1.21	7.68_+1.33
Maximum Height	17.99-24.76	15.66-25.73	20.91_+1.72	19.61_+2.36	20.26_+2.15

Type of coraco-glenoid space: High incidence of Type I - Round bracket (45.71%) followed by type II -square bracket (41.42%) and low incidence of Type III -Fish hook (12.85%) coraco-glenoid space was observed in the present study

Maximum Length of coracoid process: The mean length of coracoid process was observed to be 39.48_+3.20 on left side while on, right 39.10_+3.33 in the present study. The mean length was more on left side in comparison to right side but the difference was statistically insignificant. The average mean length is 39.29_+3.25

Maximum Breadth of coracoid process: The mean breadth of coracoid process was observed to be 12.77+_1.62 mm on right, 12.95_+1.23 left in the present study. The mean breadth was more on left side in comparison to right side but the difference was statistically insignificant.

The average mean breadth is 12.86_+1.43

Maximum Thickness of coracoid process: The mean thickness of coracoid process was observed to be7.76_+1.43 mm on right and 7.60_+1.21 mm left in the present study. It was more in right side in comparison to left side but the difference was statistically insignificant

The average mean thickness is 7.68_+1.33

Maximum Height of base of coracoid process: The mean height of base of coracoid process was observed to be 20.91_+1.72 mm right,19.61_+2.36 mm left in the present study. The mean height was more on right side in comparison to left side but the difference was statistically insignificant. The average mean height is 20.26_+2.15

Discussion-:

The present study demonstrates the analysis of various morphometric parameters of coracoid process. Coracoid process is a part of scapula and plays important role in functions of scapula Various ways of open surgical and arthroscopic access to the shoulder involves the coracoid process. So, its morphometry is of pivotal importance in surgical procedures of the shoulder joint like drill hole placement, hardware fixation and prosthetic positioning [4]. Morphology of the coracoids process also plays an important role in understanding impingement syndrome and pathogenesis of rotator cuff diseases.

Type of coraco-glenoid space: In present study we observed highest incidence of Type I - Round bracket (45.71%) followed by type II -square bracket (41.42%) and low incidence of Type III -Fish hook (12.85%) coraco-glenoid space was observed in the present study. Our results were close to those of Usha Verma et al which was 45%.

Maximum length of coracoid process: The mean length of coracoid process was observed to beon left side 39.48_+3.20, on right side 39.10_+3.33mm in the present study. Our findings are very close to the findings of Manal Fathi et al in Asian Indian population according to which, mean length was 39.19 ± 1.38 mm.

Maximum breadth of coracoid process: The mean breadth of coracoid process was observed to be 12.86 mm in the present study. Our findings are very close to the findings of Rajan et al in North Indian population according to which, mean breadth was 13.77 mm. While Piyawinijwong et al reported mean breadth to be 13.5 mm in Asian population.

Maximum thickness of coracoid process: The mean thickness of coracoid process was observed to be 7.68 mm in the present study. Our findings are very close to the findings of Coskun et al in Turkish population according to which, mean thickness was 7.83 mm. P Ahuja and Singh reported mean thickness to be 7.4 mm in Indian population.

Maximum height of coracoid process: The mean height of coracoid process was observed to be 20.26 mm in the present study. Our findings are closer in comparison to Usha Verma et al (20.1mm). Rajan et al reported highest value for maximum height of coracoid process i.e. 15.6 mm in North Indian population

Conclusion-: It will help the orthopedic surgeons to operate the gleno-humeral joint during impingement syndrome, rotator cuff rupture and for shoulder prosthesis in total shoulder arthroplasty. The study of the dimensions of coracoid process helps the radiologists to interpret any pathological conditions associated with it. The above data may not only help the orthopedic surgeons while understanding etiopathogenesis of the subcoracoid impingement syndrome but also during the surgical management of this syndrome.

References-:

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