ORIGINAL RESEARCH PAPER

Volume-7 | Issue-11 | November-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

MORPHOMETRIC STUDY OF CLAVICULAR FACET OF ACROMION PROCESS IN SCAPULA OF NORTH INDIAN POPULATION

Anatomy

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ABSTRACT

BACKGROUND:- The Acromioclavicular. joint is a diarthrodial joint: it is surrounded by a capsule and has an intra-articular synovium and an articular cartilage interface. Acromioclavicular joint injuries are common in athletic populations and account for 40% to 50% of shoulder injuries in many contact sports.

METHODS:- The study was performed at Department of Anatomy, PGIMS Rohtak on 50 pairs of human scapula, out of which 30 were males and 20 were females. The length and width of clavicular facet of acromion process were recorded using vernier calipers. These parameters were compared in both sexes on both the sides.

RESULTS:- The mean length and width of clavicular facet of acromion process was observed to be 13.82 mm and 7.33 mm respectively. The mean length and width of clavicular facet of acromion process was more in males in comparison to females with statistically significant difference.

CONCLUSIONS:- Knowledge of the morphometric parameters of clavicular facet of acromion process is important for Orthopaedicians, Forensic experts and Anatomists.

KEYWORDS

Acromioclavicular, Diarthrodial, Synovium

INTRODUCTION

The scapula is a large, flat and triangular bone which lies on the posterolateral aspect of the chest wall, covering parts of the second to seventh ribs. It has costal and dorsal surfaces; superior, lateral and medial borders; inferior, superior and lateral angles and three processes, the spine, its continuation the acromion and the coracoid process. The acromion process projects forwards almost at right angle from the lateral end of the spine of scapula. It has got medial and lateral borders. It forms the highest point of the shoulder and projects over the glenoid cavity.[1]

The Acromioclavicular. joint is a diarthrodial joint: it is surrounded by a capsule and has an intra-articular synovium and an articular cartilage interface. The hyaline articular cartilage becomes fibrocartilage on the acromial side of the joint by the age of 17 and on the clavicular side by the age of 24.[2]

The distal clavicle articulates with the acromion via the medial facet, which is oriented posteriorly and laterally; the articular surface of the acromion is directed medially and anteriorly. The average size of the joint surfaces in the adult acromioclavicular joint has been found to be 9 mm (vertical) by 19 mm (anteroposterior).[3] The average width of the acromioclavicular joint ranges from 1 mm to 3 mm, and decreases with advancing age, regardless of gender.[4]

The stability of the acromioclavicular joint is primarily dependent on the acromioclavicular and the coracoclavicular ligament complexes. They are responsible for resisting translation and rotation in multiple planes when combined with glenohumeral motion.[5]

Acromioclavicular joint injuries are common in athletic populations and account for 40% to 50% of shoulder injuries in many contact sports.[6] Bicycling, skiing, lacrosse, hockey, rugby and football are sports that can result in an acromioclavicular joint injury.[7] Recent advances in the field of biomechanics and anatomy of the acromioclavicular joint has helped a lot in treatment of such injuries.

Since there is dearth of literature regarding the morphometric values of clavicular facet of acromion process in North Indian population, so, the present study was planned to study these morphometric parameters in dry scapula of North Indian population.

MATERIAL AND METHODS

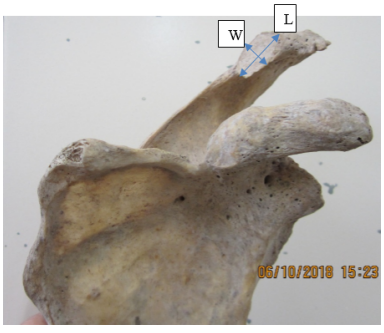
The present study was conducted on 50 pairs of dry human scapulae in the Deptt. of Anatomy, Pt. B.D. Sharma PGIMS, Rohtak (Haryana) in the year 2017-18. Out of 50 pairs, 30 belonged to males and 20 were of females. Bones with clear and intact features were included in this study. The length and width of clavicular facet of Acromion process were measured using digital vernier caliper accurate up to 0.01 mm. The parameters taken were as follows-

a) Maximum Length:- The length of articular facet was measured as the anteroposterior dimension of articular surface. (Fig.1)

b) Maximum Width:- The width of articular facet was measured as the transverse dimension of articular surface. (Fig.1)

Data obtained was analysed using SPSS 17.1 software. The Independent t-test was employed in the assessment of side and gender differences. p-value ≤ 0.05 was considered significant.

Fig.1 : Maximum Length (L) and Maximum Width (W) of clavicular facet of Acromion process



RESULTS

Following observations were made:-

1. Maximum length of clavicular facet of acromion process :- The mean length of clavicular facet of acromion process was observed to be 13.82 mm in the present study. It was more in males in comparison to females with statistically significant difference (Table No. 1). The mean length was more on right side in comparison to left side in both sexes, but the difference was statistically significant only in females (Table No. 2).
2. Maximum width of clavicular facet of acromion process :- The mean width of clavicular facet of acromion process was observed to be 7.33 mm in the present study. It was more in males in comparison to females with statistically significant difference (Table No. 1). The mean width was more on right side in comparison to left side but the difference was statistically insignificant (Table No. 2).

Table No. 1 COMPARISON OF THE PARAMETERS BETWEEN MALES AND FEMALES ON BOTH SIDES WITH p VALUE

S.No.	Parameter	Mean ± SD		p-value
		Males n=30	Females n=20	
1.	Length (R)	14.68 ± 3.98	12.8 ± 1.8	**0.03**
	Length (L)	14.51 ± 3.64	11.31 ± 1.42	**0.00**
2.	Width (R)	8.08 ± 1.78	6.61 ± 1.08	**0.00**
	Width (L)	7.71 ± 1.8	6.36 ± 0.99	**0.00**

Table No. 2 COMPARISON OF THE PARAMETERS BETWEEN RIGHT AND LEFT SIDES IN BOTH MALES AND FEMALES WITH p VALUE

S.No.	Parameter	Mean ± SD		p-value
		Right	Left	
1.	Length (M)	14.68 ± 3.98	14.51 ± 3.64	**0.52**
	Length (F)	12.8 ± 1.8	11.31 ± 1.42	**0.01**
2.	Width (M)	8.08 ± 1.78	7.71 ± 1.8	**0.43**
	Width (F)	6.61 ± 1.08	6.36 ± 0.99	**0.44**

DISCUSSION

Various studies have been conducted on the morphology and morphometry of the acromion process of the scapulae. The association between acromial morphology, shoulder impingement, and rotator cuff tears has been well documented.[8] But there is shortage of literature on morphometry of clavicular facet of acromion process and that too in north indian scapula of known sex.

1. Maximum length of clavicular facet of acromion process :- The mean length of clavicular facet of acromion process was observed to be 13.82 mm in the present study. Our findings are very close to the findings of Gosavi et al in Maharashtrian population according to which, mean length was 13.81 mm. But Gosavi et al found mean length on left side higher in comparison to that on right side, which is contrary to our findings.[9]
2. Maximum width of clavicular facet of acromion process :- The mean width of clavicular facet of acromion process was observed to be 7.33 mm in the present study. Our findings are close to the findings of Gosavi et al in Maharashtrian population according to which, mean width was 7.69 mm. Also Gosavi et al found mean width on right side higher in comparison to that on left side, which matched our findings.[9]

CONCLUSION

In the present study on 100 scapulae, the mean length and width of clavicular facet of acromion process was more in males in comparison to females with statistically significant difference. Though both the parameters have higher values on right side in comparison to left side but the difference was statistically significant only in case of mean length of clavicular facet in females. The above data may not only help the orthopaedic surgeons during surgical repair of the acromioclavicular joint injuries but also may be of interest to the forensic experts in determination of gender from these parameters.

DECLARATIONS

Funding: *None*
Conflict of interest: *None declared*
Ethical approval: *Not required*

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