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Original Research Article

Study of Morphometry of Coracoid Process of Scapula in South Indian Population

Dr. J. Senthil Kumar, Dr. B. Ramkumar*
Assistant Professor, Govt Stanley Medical College, No. 1, Old Jail Rd, Old Washermanpet, Chennai, Tamil Nadu 600001, India

***Corresponding author:** Dr. B. Ramkumar
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Abstract

Very little literature has been published about the morphometry of the coracoid process of the scapula. The coracoid process along with acromian process and coraco-acromian ligament stabilizes the shoulder joint and gives structural integrity for the shoulder joint. In the present study, the length, breadth, thickness and the height of the coracoid process of the scapula is measured in 50 human dry scapula bones of adult size after careful excluding of abnormal morphology and variation. The pattern of coraco-glenoid space is also studied and the percentage is calculated. The results are compared with the previous studies and the significance of the morphological values of the coracoid bone is stated as it is an gateway for laproscopic and open shoulder surgeries.

Keywords: Superficial veins of face and neck, retromandibular vein, anterior facial vein, lingual vein, superior thyroid vein.

INTRODUCTION

The scapula is one of the bone of the shoulder girdle. It is triangular in shape, flat bone and it is situated in the postero-lateral part of the chest wall overlapping the second to the seventh rib [1]. The coracoid process (also called ravens beak) resembles a bent finger is a small hook that project upwards from the lateral part of the superior border of the scapula just above the glenoid cavity. Along with the acromian process, it stabilizes the shoulder joint [2]. The corocoid process is palpable in the deltopectoral groove and the tip of the corocoid process gives origin to the coracobrachialis medially and short head of biceps brachii laterally. The acromian process, corocoid process and the coracoacromian ligament provides the structural stability of the shoulder joint [3]. The variation in the length, breadth and thickness of the coracoid process alters the stability of the shoulder joint in normal and pathological conditions [4]. Further, the morphological values of the corocoid process is helpful in surgical procedures and also in determining the gender of the individual in forensic medicine.

MATERIALS AND METHODS

The study was conducted in the Department of Anatomy in Stanley Medical College. 50 human dry scapula bone with no significant anatomical or morphological variations was taken for the study and the bones with the abnormal features were excluded from the study. Measurements were taken in vernier caliper and photographed and the results were tabulated.

The following parameters were taken up for the study [3, 5].

- The maximum length of the coracoid process: It is the distance measured from the medial most extension to the lateral most extension of the coracoid process (Fig-1).
- The maximum breadth of the coracoid process: It is the distance measured between the lateral border to the medial border of the coracoid process (Fig-2) [3].
- The maximum height of the coracoid process measured from the superior aspect of the tip to the supraglenoid tubercle of the scapula (Fig-3).
- The maximum thickness of the coracoid process measured from superior to the inferior direction of the coracoid process (Fig-4).
- Type of the coracoglenoid space:According to it is classified into 3 types [6]:
  - Type I(round bracket)
  - Type II(square bracket)
  - Type III(fish hook appearance)

OBSERVATIONS AND RESULTS

S.no	Maximum length(in mm)	Maximum breadth (in mm)	Maximum height (in mm)	Maximum thickness(in mm)
1	34.21	14.12	18.02	7.01
2	40.23	14.86	18.72	7.44
3	35.02	14.16	17.91	7.46
4	41.12	13.13	17.88	6.24
5	36.23	13.08	19.86	5.09
6	32.23	14.22	20.66	7.08
7	37.41	14.16	17.82	4.19
8	37.64	14.02	18.88	7.46
9	38.02	14.74	18.62	7.08
10	39	14.32	18.44	7.46
11	35.84	14.26	18.62	7.88
12	36.24	13.86	18.55	7.42
13	39.24	14.02	17.62	7.80
14	37.71	13.44	19.01	6.18
15	33.49	14	16.00	5.12
16	40.13	14.79	16.19	8.18
17	42.28	14.88	17	7.92
18	38.41	15.55	18.68	6.19
19	38.45	14.86	18.72	7.62
20	37	14.76	18.60	7.22
21	39.86	14.82	18.18	7.16
22	34.62	14.01	17.02	7.01
23	35.41	14.66	17.88	7.48
24	33	13.04	20.10	7.86
25	31.44	13.08	17.92	6.56

S.no	Maximum length(in mm)	Maximum breadth (in mm)	Maximum height (in mm)	Maximum thickness(in mm)
26	40.16	13.66	19.86	7.19
27	37.82	13.48	16.08	6.02
28	38	15.86	18.62	4.33
29	35.21	11.10	18.27	7.88
30	36.71	14.26	18.01	7.32
31	35.12	14.86	17.44	7.41
32	38.41	15.72	17.01	7.68
33	35.25	10.25	16.42	7.46
34	32.41	11.28	17.48	6.68
35	40.28	13.82	18.19	7.52
36	43	13.42	18.65	6.46
37	35.28	13.07	18.72	6.92
38	36.49	13.32	20.92	7.52
39	30.83	14.88	18.76	7.98
40	36.02	14.76	18.66	7.03
41	37.84	13.82	18.72	7.66
42	38.28	13.19	18.67	7.42
43	32.84	13.14	17.12	7.76
44	33.29	14.06	18.86	5.72
45	37.43	13.16	18.72	5.23
46	32	13.58	18.91	7.08
47	35.35	14.01	14.82	4.82
48	39.24	13.18	14.91	7.80
49	36.28	13.19	18.47	7.78
50	34.24	14.62	18.82	7.56

The mean length was 36.62mm, the mean breadth was 13.88mm, the mean height was 18.16mm and the mean thickness measured was 6.96mm in the present study. The various parameters were measured using vernier caliper, thread and measuring scale and all the specimens were photographed and the results were tabulated.

Parameters	Mean measurements (in mm)
Mean length of the coracoid process	36.62
Mean breadth of the coracoid process	13.88
Mean height of the coracoid process	18.16
Mean thickness of the coracoid process	6.96

Fig-1: Measurement of length of coracoid process

Fig-2: Measurement of breadth of coracoid process of the scapula

Fig-3: Measurement of height of the coracoid process

Fig-4: Measurement of thickness of the coracoid process

Fig-5: Round bracket type of coraco-glenoid space

Fig-6: Square bracket type of coraco-glenoid space

The percentage of various types of coraco-glenoid space is tabulated

S.no	No.of specimens	Percentage
Type 1	32	64%
Type 2	18	36%
Type 3	-	-

In our study, we did not encounter any fish hook pattern of coraco-glenoid space.

DISCUSSION

The coracoid process serves as an important surgical landmark in various surgeries and it is considered as the 'lighthouse of the shoulder' by [7]. The morphology of the coracoid process of the scapula bone varies from one another and it creates numerous paths for open and laproscopic surgeries related to the shoulder joint [3].

The mean length of the coracoid process in our study is 36.62mm. Our finding were close to Usha Verma *et al*., [3], Piyawinijwong *et al.*, [8] and Gumina *et al*., [5]. The mean breadth of the coracoid process in our study is 13.88mm which was comparable to Usha verma, Rajan *et al*., [4]. The mean height of the coracoid process in the present study is 18.16mm which was comparable to Usha Verma *et al*., [3]. The mean thickness of the coracoid process is 6.96 mm which was comparable to Piyawinijwong *et al*., [8].

Comparison Table:

Study	Population	Mean length(in mm)	Mean Breadth (in mm)	Mean height (in mm)	Mean thickness (in mm)
Usha Verma *et al*., [3]	North Indian	35.54	14.50	20.10	7.95
Piyawinijwong *et al*., [8]	Thailand	37.50	13.50	8.5	6.6
Rajan *et al*., [4]	North Indian	40.43	13.77	15.6	7.03
Present study	South Indian	36.62	13.88	18.16	6.96

CONCLUSION

Very few studies related to the morphology of the coracoid process has been documented in the literature. Coracoid process serves as an surgical landmark in various open and laproscopic surgeries and variations in the morphology of the coracoid process is of great importance to the orthopaedic surgeons. The knowledge of these variations is also useful in understanding various diseases related to the shoulder joint, understanding shoulder joint dynamics and during treatment.

Conflict of Interest: None

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