International Journal of Anatomy and Research,
Int J Anat Res 2020, Vol 8(1.2):7342-45. ISSN 2321-4287
DOI: https://dx.doi.org/10.16965/ijar.2019.377

Original Research Article

THE STUDY OF CORACOACROMIAL LIGAMENT MORPHOLOGY AND ITS CLINICAL ASPECTS

Sowmya S *[1], Sharmada Kl [2], Meenakshi Parthasarathy [3].

[*1] Associate professor, Dept of Anatomy, Bowring & Lady Curzon Medical College & Research Institute, Karnataka, India, drsowmyanandan@gmail.com

[2] Tutor, Dept of Anatomy, Bowring & Lady Curzon Medical College & Research Institute, Karnataka, India, summijois@gmail.com

[3] Professor, Dept of Anatomy, Bowring & Lady Curzon Medical College & Research Institute, Karnataka, India, drmeenakshi65@gmail.com

ABSTRACT

Background: The coracoacromial ligament (CAL) as an integral component of the coracoacromial arch, plays an important role in shoulder biomechanics, joint stability, and proprioception thus maintains static restraint due to its dynamic interactions with ligaments, muscles and bony elements around the shoulder joint. Age-dependent changes due to chronic stress and cellular degradation cause thickening and stiffening of the CAL that may contribute to a spectrum of shoulder pathology from capsular tightness to rotator cuff tear arthropathy and impingement syndrome.

Objectives: This study conducted to observe the different types of CAL and its relationship with coracoacromial veil.

Materials and Methods: The study conducted on 50 upper limbs at Bowring & Lady Curzon medical college & research institute and Bangalore medical college & research institute. The upper limbs were dissected at the shoulder joint complex and acromion process and coracoid process were appreciated and coracoacromial ligaments were appreciated for their types and morphometry.

Results and Conclusion: Four types of CAL were observed in this study. These are Y shaped CAL in 12 (24%) upper limbs, broad banded in 8 (16%), quadrangular band shaped in 25 (50%) and multiple banded in 5(10%) upper limbs. Coracoacromial veil were observed. All the above ligaments were had normal attachments.

KEY WORDS: Coracoacromial ligament, coracoacromial arch, shoulder joint.

Corresponding Author: Dr. Sowmya S, Associate professor, Dept of Anatomy, Bowring & Lady Curzon Medical College & Research Institute, Karnataka, India.
E-Mail: drsowmyanandan@gmail.com

Access this Article online	Journal Information
Quick Response code	**International Journal of Anatomy and Research**
	ICV for 2016 90.30
	ISSN (E) 2321-4287 | ISSN (P) 2321-8967
	https://www.ijmhr.org/ijar.htm
	DOI-Prefix: https://dx.doi.org/10.16965/ijar
DOI: 10.16965/ijar.2019.377	**Article Information**
	Received: 30 Dec 2019 Accepted: 23 Jan 2020
	Peer Review: 01 Jan 2020 Published (O): 05 Feb 2020
	Revised: 22 Jan 2020 Published (P): 05 Feb 2020

INTRODUCTION

Shoulder pain occurs in up to 67% of the population at least once in lifetime. The joint is a highly mobile and complicated, connecting upper extremity and thorax [1,2]. The strong superior stabilising factor for the shoulder joint is the osseoligamentous connectivity between the acromion and coracoid process of the scapula, coracoacromial ligament (CAL) [3]. Together with the inferior aspect of the acromion and the coracoid process of the scapula, the CAL forms the coracoacromial arch

that acts to limit superior displacement of the humeral head from the glenoid. The ligament extends inferomedially from the inferior anterolateral surface of the acromion to the lateral border of the coracoid process CAL and bifurcates into anterolateral band (ALB) and posteromedial band (PMB), which are often separated by a thin membrane. A ligamentous connection between the CAL and the rotator interval capsule has been coined the "coracoacromial veil" and is thought to prevent inferior migration of the glenohumeral joint. The CAL has implicated as a factor for broad spectrum pain generator in impingement syndrome of shoulder [4].

RESULTS

The study conducted on 50 upper limbs at Bowring & Lady Curzon medical college & research institute and Bangalore medical college & research institute. The upper limbs were dissected at the shoulder joint complex and acromion process and coracoid process were appreciated and coracoacromial ligaments were appreciated for their types and morphometry.

Fig. 1: The image showing broad banded type of CAL.

Fig. 2: The image showing Quadrangular type of CAL.

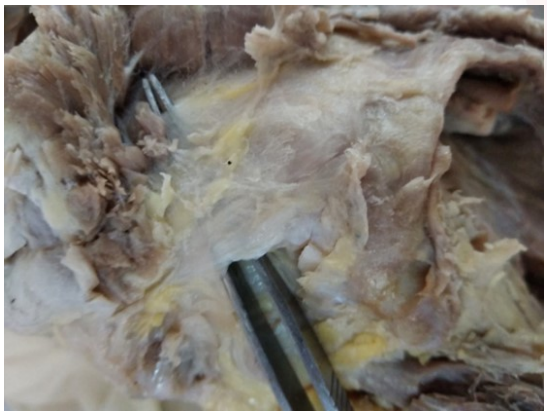

Fig. 3: The Image showing multiple banded type of CAL

Fig. 4: the image showing Y shaped CAL.

Fig. 5: The picture showing coracoacromial Veil.

Four types of CAL (Picture 1.2.3.4), (Table1) were observed in this study. These are Y shaped CAL in 12 (24%) (Pic 4) upper limbs, broad banded in 8 (16%)(Pic1), quadrangular band shaped in 25 (50%)(Pic 2) and multiple banded in 5(10%)(Pic 3) upper limbs. In most of specimens the CAL were attached to medial end of acromion (65%) and medial end of corocoid (72%).in remaining the CAL

attached to anterior end of acromion (35%) and posterior aspect of corocoid process (28%). Coracoacromial veil (Picture 5) were observed (45%) extended between coracoacromial arch to interval between superior aspect of capsule interval.

DISCUSSION

Review of literature: The function of the coracoacromial arch, coracoacromial ligament (CAL) is superior shoulder stability. CAL release with the Latarjet procedure leads to increased superior humeral translation. Conceptually, with CAL resection in the setting of a large rotator cuff tear or previous surgery, the humeral head may become prone to anterosuperior migration. Therefore, a surgical technique was developed to reconstruct the CAL during a modified Latarjet procedure [3]. Attached to the CAL, a supportive L-shaped curtain like connective tissue structure was noted in some previous studies and was noted between the posteromedial band, CAL, and rotator interval capsule. The authors termed this structure the "coracoacromial veil." Anatomical position of this veil provides a stabilizing link between the CAL and the rotator interval capsule by limiting inferior translation of the glenohumeral joint [5].

ligamentous structures connecting separate parts of the same bone and are thus immobile these ligaments are defined as False ligaments. The CAL is a false ligament which has stabilising function [6]. The CAL forms the coracoacromial arch, which serves several anatomical purposes which serves, glenohumeral joint stability by mitigating the potential for superior displacement of the humeral head. Then it helps to transmit mechanical forces exerted on the acromion by surrounding muscles and serves a sensory role. The CAL is innervated by the suprascapular nerve at the ligament's enthuses [4].

Author observed different types of CAL in the following study: In 10 cadavers (38.46%) among 26 cadavers dissected bilaterally, the ligaments on both sides were nonidentical in terms of variation. Among 16 cadavers (61.54%) involving identical ligaments on both sides, there were 6 cadavers (37.5%) with V-shaped type, three cadavers (18.75%) with quadrangular type, 3 cadavers (18.75%) with broad-banded type, 2 cadavers (12.5%) with Y-shaped type, and 2 cadavers (12.5%) with multiple-banded type CAL [6].

Three main types were identified in the following study: quadrangular, Y-shaped, and a broad band. The multiple banded ligament had the largest coracoid attachment and it was similar to the Y form but with an additional band extending inferiorly and medially toward the base of the coracoids [7].

All five main types of coracoacromial ligaments were found: Y-shaped, broad band, quadrangular, V-shaped, and multiple-banded. The Y-shaped ligament was the most frequent type, with a frequency of 41.3%, and the V-shaped ligament (11.2%) has not been previously reported. Of the cadavers that were dissected bilaterally, 64% showed the same type of ligament. However, the coracoacromial ligaments with more than 1 bundle showed significant association with rotator cuff degeneration with a longer lateral border and larger coracoid insertion [8].

More ligaments were attached to the medial aspect of the acromion (60%) and medial end of the coracoid (75%) than those restricted to the anterior edge of the acromion (40%) and posterior aspect of the coracoid (25%). Multiple-banded ligaments attached significantly more medially at the acromion and coracoid processes, while single band ligament attachments were restricted to the anterior edge of the acromion and posterior aspect of the coracoid process [9].

Table 1: The comparison of CAL types in the current study with the types reported in the literature.

Study		Y-shaped	Broad-banded	Quadrangular	V-shaped	Multiple-banded
	N	%	%	%	%	%
Holt et al. 1995 [7]	48	42	8	48	-	2
Kesmezacar et al. 2008 [8]	80	41	23	14	11	11
Alraddadi et al. 2007 [9]	220	38	6	10	-	46
Present Study	50	24	16	50	-	10

CONCLUSION

The coracoacromial ligament plays an important role in the stability of the shoulder joint by limiting superior translation of the glenohumeral joint. This study provides a comprehensive review of the anatomy of the CAL to better understand its role in the pathophysiology and treatment of impingement syndrome and rotator cuff arthropathy. The morphology of CAL and its correlation with pathophysiology is still under study. CAL release during acromioplasty remains controversial. This study endeavour to advance the understanding of the morphology of CAL to refine clinical and intraoperative decision making regarding its management.

Conflicts of Interests: **None**

REFERENCES

[1]. Glenn CT, Thomas MC. Functional Anatomy of the Shoulder. J athletic training, 2000; 35(3);248-245.
[2]. Demir M, Güneri B. Geometric Morphology of the Coracoacromial Ligament: A Cadaveric Study. BioMed research international. 2019;2019.
[3]. M Aurich, et al. Reconstruction of the coracoacromial ligament during a modified Latarjet procedure: a case series. BMC Musculoskeletal Disord,2015,16, 238.
[4]. A Rothenburg et al.The Coracoacromial Ligament: Anatomy, Function, and Clinical Significance. Orthop J sports med. 2017;5(4).
[5]. Moorman CT et al. Anatomy of the coracoacromial veil. J Surg Orthop adv, 2008;17(2): 69-73.
[6]. M Vetter et al. "False" Ligaments: A Review of Anatomy, Potential Function, and Pathology. Cureus 2017;9(11);1853.
[7]. Holt EM. Anatomic variants of the coracoacromial ligament. J shoulder elbow surg, 1995;4(5):370-5.
[8]. Kesmezacar H et al. The coracoacromial ligament: the morphology and relation to rotator cuff pathology. J should elbow surg, 2008;17(1):182-8.
[9]. Alraddadi A. Variability in attachment of the coracoacromial ligament in relation with its morphology. Surg Radiol Anat 2017 dec;39(12):1323-1330.

How to cite this article:

Sowmya S, Sharmada Kl, Meenakshi Parthasarathy. THE STUDY OF CORACOACROMIAL LIGAMENT MORPHOLOGY AND ITS CLINICAL ASPECTS. Int J Anat Res 2020;8(1.2):7342-7345. **DOI:** 10.16965/ijar.2019.377