

## An anatomical study of coraco-acromial falx in Indian population

Surekha D. Jadhav<sup>1\*</sup>, Shilpa N. Gosavi<sup>2</sup>, Balbhim R Zambare<sup>3</sup>

<sup>1</sup>Associate Professor, <sup>3</sup>Professor & HOD, Dept. of Anatomy, PDVVPF, Medical College, Vadgaon, Maharashtra, <sup>2</sup>Professor, Bharati Vidhyapeeth Deemed University, Medical College, Pune, Maharashtra

**\*Corresponding Author:**

Email: drsurekhadjadhav@gmail.com

### Abstract

**Background and Objectives:** Coraco-acromial ligament is one of the causes in the development of the subacromial impingement syndrome and its morphology shows variation. Most commonly coraco-acromial ligament has two distinct ligamentous bands. Anatomically these bands are classified as an anterolateral band and posteromedial band. Anterolateral band frequently extends anterolaterally to the acromion and it is in continuity with the fibers of the conjoint tendon of short head of biceps brachii and coracobrachialis which is known as a coraco-acromial falx. Aim of our study was to find out the incidence of coraco-acromial falx and its presence with different types of coracoacromial ligament in Indian population.

**Material and Methods:** We studied one hundred- (right-50; left-50) shoulders of male cadavers for the incidence of coraco-acromial falx and type coraco-acromial ligament.

**Results:** Our observation shows out of 100 shoulders coraco-acromial falx was present in 55. Bilaterally it was present in 33 specimens out of 55. Also, we observed incidence of coraco-acromial falx was same in all three types (quadrangular, V shaped and multiple banded) of coraco-acromial ligament.

**Conclusion:** The incidence of coraco-acromial falx was found more in Indian population. Orthopedic surgeon should keep this in mind while performing surgery and clinical correlation with presence of coraco-acromial falx and rotator cuff tendon tear should be observed.

**Keywords:** Coracoacromial ligament, Coracoacromial Falx, Short Head of Biceps Brachii, Coracobrachialis, Subacromial Impingement Syndrome.

### Introduction

The coraco-acromial ligament (CAL) is one of the most important structures of the acromial arch which runs from the coracoid process to the anterior margin of acromion process.<sup>(1,2)</sup> Morphology of the CAL shows variation. Most commonly CAL has two distinct ligamentous bands. Anatomically these bands are classified as an anterolateral band (ALB) and posteromedial band (PMB). ALB frequently extends anterolaterally to the acromion and it is in continuity with the fibers of the conjoint tendon of short head of biceps brachii and coracobrachialis which is known as a coraco-acromial falx (CAF).<sup>(3-5)</sup> The CAL may be a possible cause of subacromial impingement syndrome when there is no significant bony abnormality exists in surrounding structures.<sup>(6)</sup> Alraddadi and Soames studied the incidence of CAF in UK population.<sup>(7)</sup> However, we did not come across detailed study of CAF in Indian population while searching the literature. Aim of our study was to find out the incidence of coraco-acromial falx and its presence with different types of coraco-acromial ligament in Indian population.

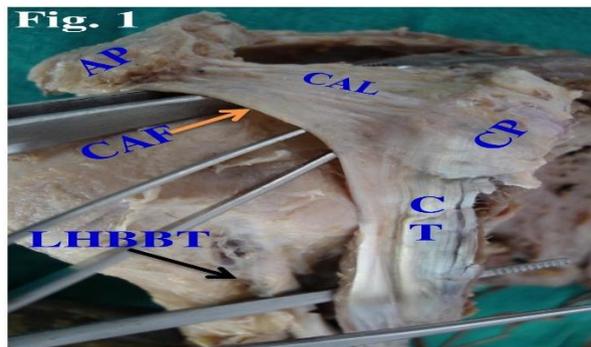
### Materials and Methods

The present study was carried out in the Department of Anatomy of our college. We studied 50 pairs of shoulders (Total number of shoulders- one hundred-right-50; left-50) of male cadavers. The mean age was 66 years (range 42 to 73). All the shoulders had well preserved coraco-acromial ligament and conjoint tendon

of short head of biceps brachii muscle and coracobrachialis muscle. Meticulous dissection of each shoulder was done and examined carefully for type coraco-acromial ligament, presence or absence of coracoacromial falx.

### Results

We observed coraco-acromial falx in 55 shoulders specimens out of 100 (Fig. 1). It was present on right side in 28 shoulders and on left in 27. CAF was present bilaterally in 33 (60%) and unilaterally in 22 (40%) specimens out of 55. We observed three types of coracoacromial ligament- quadrangular, 'V' shaped and multiple banded. We observed that, incidence of CAF was slightly higher in multiple banded CAL as shown in Table 1.



**Fig. 1:** Showing coracoacromial ligament (CAL) and coracoacromial falx (CAF)

**Table 1: Showing the incidence of Coracoacromial flax (CAF) along with different types of Coracoacromial Ligament (CAL)**

Type of CAL	Incidence of CAF (%)
Quadrangular	32.72 (n=18/55)
V shaped	32.72 (n=18/55)
Multiple banded	34.54 (n=19/55)

### Discussion

Coraco-acromial falx is a band of tissue that directly connects the fibers of anterolateral band of CAL to the conjoint tendon of the short head of biceps brachii and coracobrachialis at the lateral aspect of coracoid process.<sup>(3-5,8)</sup> Coraco-acromial ligament covers the superior aspect of the shoulder and it contributes to glenohumeral stability. CAL is one of the causes in the development of the subacromial impingement syndrome.<sup>(9)</sup> In one study the anatomic specimens of shoulder were studied to see relationships of various structures in the shoulder impingement syndrome and concluded that the CAL was more effective on impingement than acromion type.<sup>(10)</sup> Therefore, coracoacromial arch geometry has gained importance and numerous studies, mostly on cadavers, have been performed. CAL morphology in relation to acromial enthesopathy was studied and observed that the anterolateral band of CAL extended to blend with conjoint tendon of short head of biceps brachii and coracobrachialis forming CAF in 75% shoulders.<sup>(5)</sup> Alraddadi and Soames studied the incidence of the CAF and they observed it in 51% of cases but we reported slightly higher incidence.<sup>(7)</sup> Also, they observed it was present more on left side than right but we noted equal incidence on both the sides. These variations may be due to racial variations. While searching the literature, we did not come across a detailed study on this topic except Alraddadi and Soames.<sup>(7)</sup> Presence of CAF may be the one of the predisposing factor for the subacromial impingement syndrome.

### Conclusion

The incidence of CAF is higher in Indian population. Therefore, detail study should be carried out to evaluate its role in subacromial impingement syndrome with the help of new techniques ultrasound, MRI and CT scan and clinical correlation with presence of rotator cuff tendon tear should be observed which will throw light on this important topic. Orthopedic surgeon should keep this in mind while performing clinical examination and surgery of subacromial impingement syndrome patients.

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