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**INTERNATIONAL JOURNAL OF  
 ADVANCED RESEARCH (IJAR)**

Article DOI:10.21474/IJAR01/8394  
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/8394>



### RESEARCH ARTICLE

#### ACCESSORY HEAD OF CORACOBRACHIALIS AND ITS CLINICAL USES.

**R.Raja Rajeshwari Devi<sup>1</sup>, Hirendra. R. Shah<sup>2</sup> and Dipali. J.Trivedi<sup>3</sup>.**

1. Third Year Resident, Department of Anatomy , B. J. Medical College, Ahmedabad, Gujarat.
2. Additional Professor, Department of Anatomy , B. J. Medical College, Ahmedabad, Gujarat.
3. Professor, Department of Anatomy , B. J. Medical College, Ahmedabad, Gujarat.

#### Manuscript Info

##### Manuscript History

Received: 12 November 2018  
 Final Accepted: 14 December 2018  
 Published: January 2019

##### Key words:-

Coracobrachialis, Struther's ligaments,  
 median nerve, brachial artery.

#### Abstract

Coracobrachialis is the most medial of three anterior compartment muscles of arm. In some mammals it is tricipital in origin. The lower head is usually suppressed in man. Sometimes it is represented by a fibrous band, the ligament of Struther's. During our dissection regime of 1<sup>st</sup> MBBS students in the department of anatomy, BJMC, we observed an accessory head of coracobrachialis on the right side of a male embalmed donated cadaver. The muscle was described as being functionally unimportant. However, the muscle has recently attracted interest with its potential use for contouring the infraclavicular area or covering the exposed axillary vessels specifically in postmastectomy reconstructive operations, muscle transfer for the treatment of paralysis, as a guide for axillary artery access and anaesthetic blockade of the brachial plexus.

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#### Introduction:-

##### Coracobrachialis is the most medial of three anterior compartment muscles of arm.

It arises from the tip of coracoid process in common with the short head of biceps brachii and inserted by fleshy fibres to the medial border of the middle of the shaft of humerus where the nutrient foramen of the bone is usually located. The muscle is supplied by musculocutaneous nerve, a branch from the lateral cord. It is said that the nerve pierces the muscle and supplies it before piercing. It is a weak flexor of shoulder joint. Coracobrachialis represents the adductor muscle of arm but such action is insignificant in man. In some mammals it is tricipital in origin. Upper 2 heads are fused to take origin from coracoid process and enclose the musculocutaneous nerve between them. The lower head is usually suppressed in man. Sometimes it is represented by a fibrous band, the ligament of struthers, which extends from an occasional bony projection, the supratrochlear spur, from the anteromedial surface of lower part of the humerus to the medial epicondyle. Median nerve or brachial artery may pass beneath the ligament which compress upon them producing vascular spasm or median nerve palsy<sup>2</sup>. The muscle was described as being functionally unimportant<sup>3</sup>.

However, the muscle has recently attracted interest with its potential use for contouring the infraclavicular area<sup>4,7</sup> or covering the exposed axillary vessels specifically in postmastectomy reconstructive operations<sup>5</sup>, muscle transfer for the treatment of paralysis, as a guide for axillary artery access and anaesthetic blockade of the brachial plexus<sup>4,6</sup>.

**Corresponding Author:-R.Raja Rajeshwari Devi.**

Address:-Third Year Resident, Department of Anatomy , B. J. Medical College, Ahmedabad, Gujarat.

**Case report:-**

During our dissection regime of 1<sup>st</sup> MBBS students in the department of anatomy, BJMC, we observed an accessory head of coracobrachialis on the right side of a male embalmed donated cadaver. Coracobrachialis was arising from the tip of coracoid process of scapula, in between them passed the musculocutaneous nerve. But we observed that few muscle fibres was arising from superficial fibres of coracobrachialis at its insertion and also from medial border of short head of biceps brachii muscle which was running slightly downward and medially and got blended with the medial intermuscular septum. This muscle is called accessory coracobrachialis also called third head of coracobrachialis or coracobrachialis longus. The muscle was 7.5 cm in length and 0.7cm in diameter.



**Figure 1:-**Showing Coracobrachialis muscle, Accessory belly of Coracobrachialis muscle, Median nerve and Brachial artery.

**Discussion:-**

The coracobrachialis muscle is more important morphologically than functionally<sup>9</sup>.

Three distinct parts of the coracobrachialis muscle are described in amphibians, reptiles, and monotremes:- Coracobrachialis brevis (profundus), which is inserted into the humerus superior to tendon of latissimus dorsi, Coracobrachialis medius (proprius), which is inserted into the humerus inferior to tendon of latissimus dorsi, and Coracobrachialis longus (superficialis) or Wood's muscle, which extends inferiorly on the shaft of humerus bridging the median nerve and brachial artery. Some apes and prosimians have coracobrachialis muscle composed of two parts, which is equivalent to coracobrachialis brevis. The coracobrachialis in man is formed of one muscular part that probably represent the persistence of coracobrachialis medius of lower animals or the fusion of two heads of that muscle which are observed in apes and prosimians, trapping the musculocutaneous nerve between them<sup>10</sup>.

The origin of morphological variation of the coracobrachialis may be explained on the basis of the embryogenesis of the muscles of the arm. The intrinsic muscles of the upper limb differentiate in situ from the limb bud mesenchyme of lateral plate mesoderm. At a certain stage of development, the muscle primordia within the different layers of the arm fuse to form a single muscle mass. Thereafter, some muscle primordia disappear through cell death. Failure of muscle primordia to disappear during embryologic development may account for the presence of the accessory belly of coracobrachialis muscle reported in this case<sup>11,12</sup>.

In cats and some monkeys, sometimes the supracondylar process forms an arch that is homologous to the bony arch observed in the inferior part of the humerus. In the cat, this opening is formed completely by an arch of bone leaving and again joining the lower part of medial aspect of the shaft of the humerus<sup>7,13,14</sup>.

Wood (1867) reported that when the internal brachial ligament is well developed, it may pass entirely superficial to and across the brachial vessels and median nerve, forming an aponeurotic opening for them which is known as the supracondylar opening. Occasionally a fibrous strip usually passes from the tendon, near its humeral insertion, to the long head of triceps; occasionally muscular, it is homologue of the dorso-epitrochlearis brachii of apes<sup>1, 15</sup>.

Koizumi & Sakai<sup>18</sup> found that musculocutaneous nerve pierces coracobrachialis muscle in Chimpanzee, but not in Gorilla or Gibbon.

Tonic contraction of the two heads of the coracobrachialis muscle may have an important role in fixing the tendon of the short head of biceps brachii during the movement of supination of the forearm and flexion of the elbow<sup>17</sup>.

Mesdagh et al<sup>25</sup> reported a subcoracoid impingement caused by an accessory coracobrachialis treated by simple resection.

The coracoepitrochlearis muscle could also cause confusion when different imaging modalities are used, and it could restrict the abduction of the arm<sup>16</sup>.

Any injury of ulnar nerve in axilla may hamper the extension of this elbow if the variant belly was supplied by ulnar nerve<sup>9</sup>.

Carpal tunnel syndrome, pronator teres syndrome and anterior interosseous syndrome are three well described entrapment syndromes involving the median nerve or its branches. But compression of the median nerve and brachial artery by accessory muscle of coracobrachialis slips leading to clinical neurovasculopathy has also been reported<sup>19,20</sup>.

These muscles should not be mistaken for tumors on evaluation of computed tomography (CT) and magnetic resonance (MR) imaging<sup>24</sup>.

Coracobrachialis has been used as a transposition flap in deformities of infraclavicular and axillary areas and in postmastectomy reconstruction<sup>4,8</sup>.

It is also used as stabilisation treatment for recurrent dislocation and subluxation of the shoulder joint<sup>6</sup>.

Coracobrachialis has also been used as vascularised muscle graft in the treatment of longstanding fascial paralysis<sup>15</sup>.

A rare case of proximal coracobrachialis tendon rupture with subscapularis tendon rupture and medial dislocation of long head of biceps tendon in an adult after a traumatic anterior shoulder dislocation was also reported<sup>22</sup>.

Coracobrachialis myofascial flap was used recently for management of synovio-cutaneous fistula following rotator cuff repair<sup>23</sup>.

Also there are cases of musculocutaneous nerve schwannoma within coracobrachialis muscle<sup>21</sup>.

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