Research Paper

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Variations in the Coracobrachialis and Brachialis of Arm

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ABSTRACT

Muscular variations are very common in man leading to varieties of anomalies. During routine dissection we found coracobrachialis not pierced by musculocutaneous nerve and with the presence of ligament of struthers. Secondly we also noted that the medial part of brachialis muscle mingled with the fibers of medial head of triceps & finally got inserted into olecranon process of ulna.

INTRODUCTION

Coracobrachialis muscle takes origin from the tip of corocoid process in common with the short head of the biceps brachia. The fleshy fibres of this muscle gets inserted into the middle of the medial border of the shaft of the humerous. This muscle represents the adductor muscle of the arm and is weak flexor of shoulder joint. In some mammals it is tricipital in origin. Upper two heads are fused to take origin from the corcoid process and encloses the musculocutaneous nerve between them. The lower head is usually suppressed in man, sometimes it is represented by a fibrous band known as "Ligament of Struthers" or "Internal Brachial Ligament " , which extend from supratrochlear spur to medial epicondyle. In such case median nerve or brachial artery may pass beneath the ligament which might compress them producing vascular spasm or median nerve palsy [1].The ligament of Struther has found to occur in less than 2% in humans [2].

Our second variation is of brachialis muscle which is a chief flexor of the forearm or also known as the workhorse of the elbow flexors. It takes origin from the antero medial and antero lateral surfaces of the lower half of the shaft of humerous. This later forms a flat tendon to insert into anterior surface of the coronoid process and tuberosity of ulna. Most interesting feature in our case was the presence of multiple variations in the attachments of the muscles of front of the arm.

CASE REPORT

During routine dissections done for under graduates we observed the unilateral variations in the left limb of a female cadaver. In the present study we found the normal origin of coracobrachialis but near to the insertion of this muscle was the presence of ligamentous structure that extended from the level of insertion of coracobrachialis to the medial epicondyle. It measured around 15 cms in length and is known as ligament of struthers. There was small ridge like structure found at the level of origin of this ligament but supratrochlear spur was not evident. Fortunately there was no compression of median nerve or brachial artery as there were superficial to this ligament. We noted that few fibres of pronator teres originated from lower part of ligament of struthers.

Our second variation was observed in brachialis muscle. The bulky lateral part of this muscle arose from the anterolateral aspect of shaft of humerus, coursed downwards to cover anterior part of elbow joint and formed floor of cubital fossa in upper part and then got inserted into the anterior surface of the coronoid process. The medial part of brachialis originated from the lower part of anterolateral surface of humerus and then joined the medial head of tricep muscles, which in turn joined the long head of triceps and got inserted into the olecranon process of ulna.Ulnar nerve was found between medial head of triceps and internal brachial ligament , while musculocutaneous nerve was running between biceps and lateral part of brachialis as usual. Median nerve and brachial artery were found to lie on the front of the muscle.

DISCUSSION

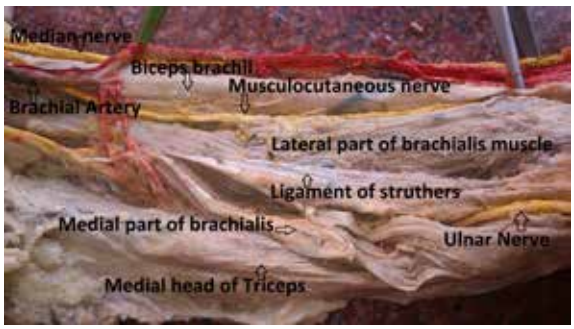
Coracobrachialis muscle is known for its morphological variations and many variations have been reported by different authors. Wood described Coracobrachialis in 3 varieties

1. Arising from the tip of the corcoid process partly tendenous and partly muscular in common with the tendon of short head of biceps.This is inserted into the middle of inner surface of humerus opposite to that of deltoid.This may be pierced by musculocutaneous nerve but not always. This was called coracobrachialis proprius which acts as an adductor and elevator of upper arm raising it inwards and forwards towards the breast and face.
2. Second variety is more fleshy and is placed medial to the latter and is connected by a lunated aponeurosis with the insertion of the pectoralis minor.This part of muscle gets inserted into medial supracondylar ridge, partly into medial intermuscular septum and also into medial epicondyle. This was called coracobrachialis longus which acts upon the arm in the same direction and also tenses the antebrachial facia.
3. This is a strong bundle of muscle fibres arising from the undersurface and outer border corocoid process. Passes downwards across the tendon of subscapularis and gets connected with the capsular ligament and gets inserted upon the neck of humerus close below the lesser tubercle. This was called Corocobrachialis Superior and it acts as external rotator of the humerus on its long axis during elevation of the arm like supinators in the forearm, assisting infraspinatus and teres minor [3].

Ogawa etal studied 13 shoulder cases and found aberrant muscles in 11 cases, where the muscle was originating from the anterior aspect of sub scapularis tendon and lesser tubercle passing between and parallel to both heads of biceps brachii [4]. Similarly Kopuz etal found an accessory coracobrachialis originating from the corcoid process and capsule of shoulder joint and inserted into antebrachial facia and medial epicondyle of humerus [5]. Ray etal in 2004 found that coracobrachialis originated from the corcoid process and then divided into 2 heads. The muscular head inserted into anteromedial part of the middle of humeral shaft while musculoponeurotic head inserted into medial intermuscular septum forming a tunnel for the passage of brachial artery [6].

Our second variation as seen in brachialis attachments are rare when compared to coracobrachialis or biceps brachii. Vadagaonkar noted a case of accessory brachialis that crossed brachial artery and median nerve and later united with the pronator teres from radial side [7]. In another case George and Nayak observed accessory brachialis merging with the superficial flexors of the forearm and partly inserting to the olecranon process [8]. Sreenivas Rao reported that the accessory brachialis arose from the medial aspect of brachialis and got inserted into the bicipital aponeurosis.This sort of attachement would probably lead to contraction of accessory brachialis in both supination

and flexion[9]. In another case Muthukumar T observed accessory brachialis originating from the lateral intermuscular septum blending with the main bulk of the muscle and getting inserted into the radial tuberosity. This could lead to minimal flexon at elbow joint [10].



CONCLUSION

The knowledge of anomalous attachment of muscles is not only important to anatomist but also for the surgeons, orthopaedicians, radiologist and physiotherapist. Coracobrachialis is used as a flap to cover the deformities of axillary and infraclavicular areas and also in post mastectnomy reconstructions. Tendons of coracobrachialis and short head of biceps are used to give stabling effect on stable and unstable shoulders. Hence it is used in modified Boytchev procedure [11].The accessory slips of muscle have been used in reconstructive and plastic surgeries. These can sometime cause neuro vascular compressions, leading to ischeamic changes and wasting of anterior compartment muscles of forearm. These accessory slips can also lead to strengthening or weakening the action on particular joints. Hence we believe much patient study has to be done to throw light on these aspects.

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