

AN ACCESSORY HEAD OF THE BICEPS BRACHII - A CASE STUDY

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ABSTRACT

As the term Biceps brachii indicates, the proximal attachment of this fusiform muscle usually has 2 heads. However, approximately 10% of people have a third head to the biceps. The usual 2 heads of the biceps arise proximally by tendinous attachments to processes of the scapula; their fleshy bellies unite just distal to the middle of the arm. When present, the 3rd head extends from the supero-medial part of the Brachialis. A variation of Biceps brachii has been found during the routine PG dissection in the department of Shareera Rachana, SDMCA, Udupi. There were three heads in the muscle. Third head originated from the antero-lateral aspect of the shaft of the right Humerus just above the origin of the Brachialis. The findings were observed keenly and reported. Such variations are important not only for anatomist but also for surgeons as well as orthopedicians.

Keywords: *Biceps brachii, 3rd head of Biceps brachii, variation*

INTRODUCTION

Of the four major arm muscles, three flexors (Biceps brachii, Brachialis & Coracobrachialis) are in the anterior compartment. Although the Biceps is located in the anterior compartment of the arm, it has no attachment to the Humerus. The Biceps is “three-joint muscle”, crossing and capable of effecting movement at the gleno-humeral, elbow and radio-ulnar joints, although it primarily acts at the latter two.¹

Classically thought to be as a two headed muscle, there exists an anatomical variation in which the biceps brachii has a third head, most often humeral in origin.²

Origin – Short head arises with Coracobrachialis from the tip of the coracoid process. Long head arises from the supra glenoid tubercle of the scapula and from the glenoidal labrum. The tendon is intra-capsular. Both heads expand into fusiform bellies which lie side by side & do not join until about 7 cm above the elbow joint, where a flat tendon is formed.

Insertion – The tendon passes through the cubital fossa, undergoes twisting so that the anterior surface becomes lateral & inserted into the posterior part of the radial tuberosity; a bursa separates tendon from the anterior part of the tuberosity. Before insertion, the medial border of the tendon presents a fibrous expansion, the bicipital aponeurosis, which extends

downward & medially across the brachial artery & is attached to the upper part of the subcutaneous posterior border of the ulna by way of the deep fascia of the forearm.

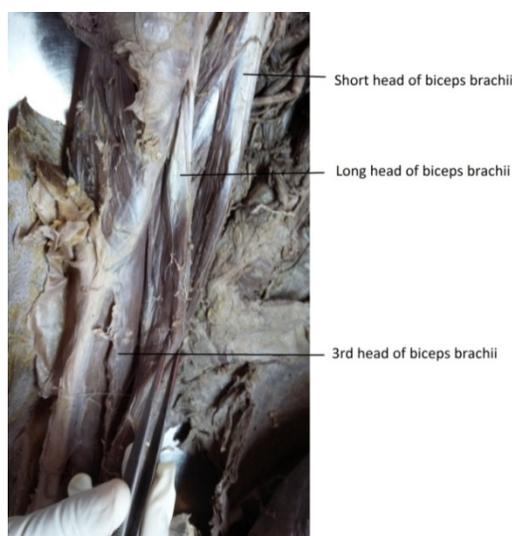
Nerve supply – It is supplied by Musculo cutaneous nerve.

Actions – It is powerful supinator of the forearm, flexor of the elbow joint by 'spurt action' & flexes best in supinated position. Through the bicipital aponeurosis it pulls the ulna along with the radius during flexion. Long head of the biceps keeps the humeral head in contact with the glenoid fossa during abduction of the shoulder joint by the deltoid.³

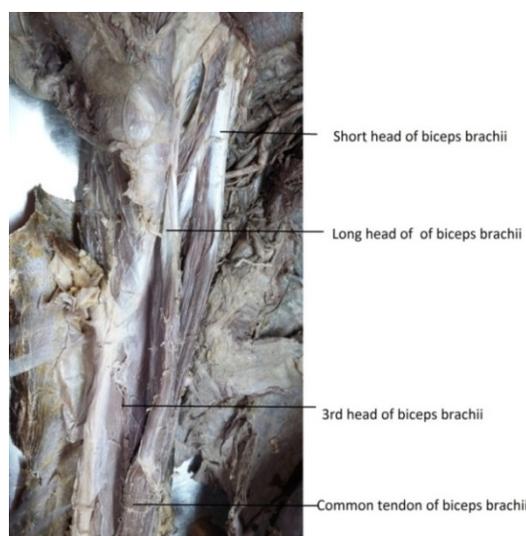
CASE REPORT:

During routine PG dissection in department of Shareera Rachana, SDM college of Ayurveda,

Udupi, Karnataka, we observed Biceps brachii muscle with three heads in a 54 year old male cadaver in the right upper limb. The third head was arising from the antero-lateral aspect of the shaft of the right Humerus, above the origin of Brachialis muscle, at the midpoint of shaft of humerus. It was around 4 inch long, 1 & ½ inch broad, ¼ inch thick. The third head was supplied by a branch of Musculo cutaneous nerve. This accessory head merged with the common tendon of Biceps brachii, just above the cubital fossa. The other heads were taking origin from the normal site. Thus the three heads of the muscle were having common tendon for their insertion. In the left upper limb Biceps brachii muscle had only 2 heads (long & short). There were no accessory head.



(a)



(b)

Figure 1: Anterior view of right arm showing variation in the origin of Biceps Brachii muscle, (a) Shows origin of humeral head of biceps brachii, (b) shows insertion of 3 heads of biceps brachii as in common tendon of insertion.

DISCUSSION

The Biceps brachii muscle presents a wide range of variations. Supernumerary heads of the biceps brachii muscle have been widely studied regarding their origin, insertion and innervations. Several articles have reported the incidence of this kind of variations. Within numerous reported cases supernumerary heads of Biceps brachii, 3rd head of biceps was

most the common⁴. Earlier in 1860s, Calori noted an inconsistent incidence of occurrence a third head of biceps brachii, and described its musculocutaneous nerve innervations⁵. Recently Rodriguez-Niedenfuhr et-al studied on series of 350 arms & classified the Supernumerary heads of the biceps brachii muscle into 3 different types. Superior, infero-medial & infero-lateal humeral head.⁶

Rates of incidence for a third biceps head differ based on several factors. Race is the most frequently reported factor known to impact prevalence rates, in Indian populations its (3.3%).⁷

Variations of 3rd head of Biceps may present as group of accessory fascicles arising from the coracoids process, the Pectoralis major tendon, head of the Humerus, articular capsule of the Humerus or from shaft of Humerus itself.⁸

In the present case report the 3rd head of Biceps brachii aroused from antero-lateral aspect of the shaft of the right Humerus, above the origin of Brachialis muscle.

Embryologically during the 5th week of development mesoderm invades the upper limb bud to further condense into ventral & dorsal muscle masses. The Triceps & Biceps musculature is derived from the dorsal & ventral muscle masses of the upper limb bud respectively. It would be during this period of development that accessory muscle may have formed.⁹

The presence of additional muscle may cause compression of the neurovascular structure and may lead to variation of normal mechanical action.¹⁰ Third head of biceps muscle may provide an additional force for supination and flexion of the forearm or it may cause unusual displacement of the fragments of humerus after fracture.¹¹ Such variations have relevance during surgical procedures.¹² Generally additional heads are asymptomatic and present an incidental findings encountered through imaging and surgery.¹³

CONCLUSION

Among all the variations of the Biceps brachii, presence of the 3rd head is the most common one. Muscle action may be predicted from knowledge of their attachment & this is of considerable importance in the diagnosis of muscle paralysis - an essential element in determining the presence, site, degree of injury to nerves. Therefore surgeons should be aware of this anatomical variation in surgical procedures.

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