

**Research Article****Incidence of Accessory Head of Biceps Brachii Muscle in Chhattisgarh Population****Ravi Kiran Morampuri<sup>1</sup>, Anil Kumar Reddy Yelicharla<sup>2\*</sup>, Pooja Gangrade<sup>3</sup>**<sup>1,3</sup>Department of Anatomy, Late Shri Lakhiram Agrwal Memorial Government Medical College, Raigarh, Chhattisgarh, India<sup>2</sup>Department of Anatomy, Jawaharlal Nehru Medical College, Sawangi (M), Wardha, Maharashtra, India**\*Corresponding author**

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**Abstract:** e supernumerary heads of biceps brachii with rational and gender differences. The origin of heads of biceps brachii may vary from 3 to 7, most commonly 3 heads of biceps brachii is observed around in 10% of population. The present study was carried to find the supernumerary heads of biceps brachii muscle in Chhattisgarh population. The current study was carried on 32 formalin fixed upper limbs (16 cadavers) in department of anatomy, Late Shri Lakhiram Agrwal Memorial Government Medical College, Raigarh, Chhattisgarh. The arm was dissected carefully to find the biceps brachii from origin to insertion. The accessory head (Third head) of biceps brachii was found in 6 limbs (18.7%). The third head of biceps brachii was originated from antero-medial aspect of the humerus. The variations found in relation to the heads of biceps brachii are worthy to known during surgeries of arm.**Keywords:** Biceps brachii, Supernumerary heads, Humerus, musculocutaneous nerve.

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**INTRODUCTION**

The Biceps brachii (Biceps; Biceps flexor cubiti) muscle is one of the muscle shows common variations in relation to its proximal attachment. It's a long fusiform two headed muscle seen at the flexor compartment of arm helps for flexion and supination at elbow [1]. The Biceps brachii placed on the front of the arm, and arising by two heads, from which circumstance it has received its name [2]. The short head arises by a thick flattened tendon from the apex of the coracoid process and the long head arises from the supraglenoid tuberosity at the upper margin of the glenoid cavity. Both heads is succeeded by an elongated muscular belly, unites at the distal part of the humerus and it ends by a flattened tendon, which is inserted into the rough posterior portion of the radial tuberosity. It is innervated by musculocutaneous nerve and supplied by brachial and anterior circumflex humeral artery [1, 2].

The common morphological variations of biceps brachii muscle include presence of supernumerary or accessory heads, absence of short head or long head, origin of long head from intertubercular sulcus, doubled long head, accessory tendon and in relation its nerve supply [4]. The most common variation is in the number of heads of origin from three to seven, usually three heads [5]. A third head to the Biceps brachii is found in 10% of the cases, arising at the upper and medial part of the Brachialis, and inserted into the medial side of the tendon of the muscle. More rarely a fourth head occurs arising from

the outer side of the humerus, from the intertubercular groove, or from the greater tubercle. Other heads are occasionally found [2]. Slips sometimes pass from the inner border of the muscle over the brachial artery to the medial intermuscular septum, or the medial epicondyle; more rarely to the Pronator teres or Brachialis [6]. In previous studies, several authors reported that the occurrence of supernumerary heads of biceps brachii with racial and gender differences. The prevalence of supernumerary heads of biceps ranges from 9.1% to 22.9% [7]. The current study was carried to report the incidence of accessory heads of biceps brachii in chhattisgarh population.

**MATERIALS AND METHODS**

The present study was conducted on both upper limbs of 16 adult human formalin fixed cadavers with irrespective of age and sex during the period of 2012 – 2014 in department of anatomy, Late Shri Lakhiram Agrwal Memorial Government Medical College, Raigarh, Chhattisgarh. The findings of additional heads of biceps brachii were carried out on 32 arms of 16 adult human cadavers. The variations encountered during routine dissection of 1<sup>st</sup> year medicos, all the limbs were dissected carefully and the observations was photographed and documented.

**RESULTS**

Out of 32 upper limbs, 6 biceps brachii (18.7%) muscles have accessory head (third head), 4 on the right arm (12.5%) and 2 on the left arm (6.2%). In

the first two cadavers, accessory head was bilateral, next two cadaver's accessory head was unilateral and it was observed on left arm. In the first two cadavers third head is very bulky and it was originated from antero medial part of the humerus along with brachialis muscle, remaining arms the thirds head originated from the insertion point of coracobrachialis muscle. Most of

the cadavers the third head has joined with the long head, in some joined with main bulk of the muscle, in some cases joined with tendon. It was observed that the tendon formed by all the heads inserted to the posterior part of the radial tuberosity. In all the cases the third head along with long and short heads supplied by musculocutaneous nerve.



**Fig. 1: Photograph of Anterior compartment of right arm showing main bulk of the biceps brachii with third head from lower part antero-medial surface of humerus. (MBB: Main Bulk of Biceps brachii, TH: Third Head, MCN: Musculocutaneous Nerve, TB: Tendon of Biceps brachii)**



**Fig 2: Photograph of Anterior compartment of right arm showing short, long and third head of biceps brachii with its nerve supply. (SH: Short Head, LH: Long Head, TH: Third Head, MCN: Musculocutaneous Nerve, TB: Tendon of Biceps brachii)**



**Fig 3: Photograph of Anterior compartment of left arm showing short, long and third head of biceps brachii with its nerve supply. (SH: Short Head, LH: Long Head, TH: Third Head, MCN: Musculocutaneous Nerve, TB: Tendon of Biceps brachii)**



**Fig 4: Photograph of Anterior compartment of left arm showing third head of biceps brachii from antero-medial part. (SH: Short Head, LH: Long Head, TH: Third Head, MCN: Musculocutaneous Nerve)**

#### DISCUSSION

Anatomically the biceps brachii is an extremely variable muscle in reference to its number and morphology of heads. A not uncommon anomaly of the biceps is for it to present a third head, a muscular slip that usually arises in the region of insertion of the coracobrachialis (Wolf – Heidegger) [2]. Muscles with four or more heads have also been reported. In present study we found third head of biceps brachii in 6

(18.7%) formalin fixed cadavers, four or more heads are not encountered and the insertion was typical. In all the cadavers the accessory head along with common bulk of biceps brachii innervated by the branches of musculocutaneous nerve.

Greig, Anson, and Budinger found variation in 28 (21.5%) of 130 biceps muscles studied, an accessory head from the middle third of the humerus representing

the commonest type [2]. De Palma and his co-workers reported a case of doubling of the intra-articular part of the long head [2]. The labial and pectoral heads of accessory heads of biceps brachii was reported by Testut [8]. In another embryological study by Testut [9], described the variation as a portion related to the brachialis where its distal insertion has been translocated from ulna to radius. This explains the hypothesis of functional adaptation. Kosugi *et al.* [10] studied on accessory head of biceps, they reported that the supernumerary head of biceps arises from the humerus between the insertion of coracobrachialis and upper part of origin brachialis and from medial intermuscular septum. In few cases of their study the biceps brachii was originated from the tendon of the pectoralis major, the deltoid, the articular capsule or the crest of greater tubercle.

Rodriguez *et al.* [11], reported the presence of a third head in 27 of 350 (7.7%) cadavers. In 31 of 350 (9%) arms the third head arises from infero-medial part of humerus, in one (0.3%) arm third head originated from infero-lateral part of the humerus. The attachment of third head was differently described by Kopuz *et al.* [12] and Abu Hijleh [13]. They reported that third head frequently arises from anterior surface and antero medial surface of humerus distal to the insertion of coracobrachialis. Based on the results reported by Schoenleber and Spinner [14], the supernumerary head of the biceps brachii originated from the deltoid muscle. The presence of third head is due to the passage of musculocutaneous nerve through the brachialis and thus it produces the accessory head. The morphological variations of biceps brachii are may be due to genetic composition, an inheritance carried over from ancient origins, some are errors of embryologic developmental timing or persistence of an embryologic condition [15]. The strength of the muscle may or may not elevate with accessory head but these are crucial while operating surgical procedures of the arm. Sometimes the accessory head may increase the strength of the muscle if it is relatively large. The innervations and vascularisation of the third head of biceps brachii is same as typical muscle and thus it agrees with normal embryologic development of the related dermatomes and myotomes [16].

## CONCLUSION

Presence of supernumerary head of biceps brachii may compress the neurovascular structures because it's close relation to the median and brachial artery. It is worth to observe in preoperative diagnosis and surgeries of the upper limbs.

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