

# Biceps Brachii with Third Head: A Case Report

Pushpa NB<sup>1</sup>, Roshni Bajpe<sup>2</sup>

<sup>1</sup>Post Graduate, Department of Anatomy, Kempegowda Institute of Medical Sciences, BSK II Stage, Bangalore, India

<sup>2</sup>Professor, Department of Anatomy, Kempegowda Institute of Medical Sciences, BSK II Stage, Bangalore, India

**Abstract:** *The biceps brachii is known to show variations in the number of heads. Unilateral three headed biceps brachii was found in the right upper limb of adult cadaver. The muscle was innervated by a branch from musculocutaneous nerve. Accessory head may provide additional strength to the biceps during supination of the forearm and elbow flexion. Understanding of such variations is helpful in preoperative diagnosis and surgery of upper limb.*

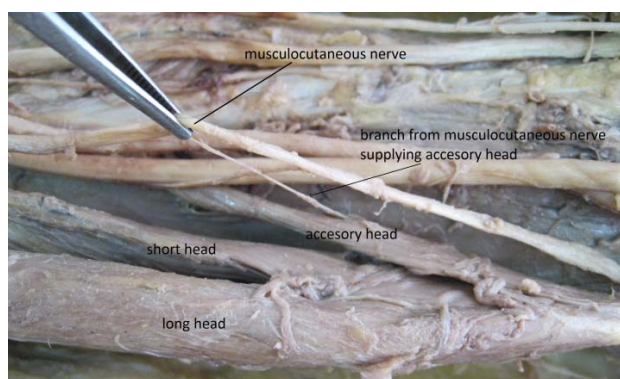
**Keywords:** Biceps brachii, third head, flap surgery, musculocutaneous nerve.

## 1. Introduction

Biceps brachii derives its name from its two proximally attached parts or heads. The short head arises by a thick flattened tendon from the coracoid apex together with coracobrachialis. The long head starts within the capsule of the shoulder joint as a long narrow tendon, running from the supraglenoid tubercle of the scapula at the apex of the glenoid cavity, where it is continuous with the glenoidal labrum. The two tendons lead into elongated bellies that although closely applied, can be separated to within the 7 cm or so of the elbow joint. At this joint they end in a flattened tendon, which is attached to the rough posterior area of the radial tuberosity; a bursa separates the tendon from the smooth anterior area of the tuberosity. Biceps brachii is innervated by musculocutaneous nerve, C<sub>5</sub> and C<sub>6</sub> with separate branches passing to each belly. It is a powerful supinator, flexes the elbow, most effectively with forearm supinated. In 10% of cases third head arises from the super medial part of brachialis and is attached to the bicipital aponeurosis and medial side of the tendon of insertion [1].

## 2. Case report

During routine dissection classes of upper limb, in the department of Anatomy, Kempegowda Institute of medical sciences, Bangalore, India, we came across the muscle Biceps brachii with third head in the right upper limb of an adult male cadaver (Figure 1).



**Figure 1:** Showing third head of biceps brachii

## 3. Observations

In the present case of biceps brachii, it was found that the third head was arising from the antero-medial surface of humerus at the point where coracobrachialis is inserted. Both long head and short head have their normal origins and insertions. The accessory head was medial to both heads and joined the common biceps brachii tendon for insertion. It was innervated by a branch of musculocutaneous nerve.

## 4. Discussion

According to their locations, Rodriguez – Niedenfuhr classified the supernumerary heads of biceps brachii muscle as superior, infero-medial and infero-lateral heads [2]. In the present case the accessory third head of biceps brachii mainly arose from antero-medial surface of shaft of humerus just lateral to the insertion of coracobrachialis. The incidence of supernumerary heads of biceps brachii range from 9.1% - 22.9%. Out of this the third head is reported in 7.5% - 18.3% cases [3] and it is relatively rare in Indian population [4].

According to de Burlet HM et al., phylogenetically, the variations of the biceps muscle were explained as a remnant of a “tuberculoseptale” head, that together with the short and long heads, is present in hylobates, but is a product of regression in humans and anthropoids. Sonntag described the third head of the biceps brachii as a remnant of the long head of the coracobrachialis, an ancestral hominoid condition, particularly in those cases where the third head arose from the insertional area of the coracobrachialis [5], as has been in the present case.

According to Arey LB, embryologically, the intrinsic muscles of the upper limb differentiate in situ, opposite the lower six cervical and upper two thoracic segments, from the limb bud mesenchyme of the lateral plate mesoderm. The formation of muscular elements in the limbs takes place shortly after the skeletal elements begin to take shape. At a certain stage of development, the muscle primordia within the different layers of the arm fuse to form a single muscle mass. Langman stated, however, that some muscle primordia disappear through cell death despite the fact that cells within them have differentiated to the point of containing myofilaments as quoted by Sawant SP. Failure of muscle primordia to disappear during embryologic development

may account for the additional insertion of brachialis muscle in to the bicipital aponeurosis [6].

The medial humeral origin of the third head may provide additional strength to the biceps during supination of the forearm and elbow flexion irrespective of shoulder position as quoted by Vallora VR et al. The presence of the third head may cause unusual bone displacement, subsequent to fracture; such variations have relevance in surgical procedures [7]. Knowledge of the existence of the third head of the biceps brachii may become significant in preoperative diagnosis and during surgery of the upper limbs [4]. According to Mas N et al., Biceps brachii has a very important role in plastic surgeries and an additional head has added value in flap surgeries as quoted by Amudha et al., [8] and according to Sargon MF et al., unilateral variations in the biceps brachii can cause asymmetry between two arms and hence, can be confused with pathological conditions such as tumours as quoted by Cheema P et al [5].

## 5. Conclusion

Although the variation of this type is of interest to anatomists, knowledge of supernumerary heads of biceps brachii is important to surgeons who undertake procedures on the arm and clinicians too.

## References

- [1] Standring S, Borley NR, Collins P, Crossman AR, Gatzoulis MA, Healy JC, et al. Gray's Anatomy: The Anatomical Basis Of Clinical Practice. 40th edition, London: Elsevier Ltd., 2008: 825-826.
- [2] Sawant SP, Shaikh ST, More RM. Case report: Variant two separate heads of biceps brachii muscle observed during routine dissection in K.J.Soumaiya Medical College, Mumbai. Indian Journal of Basic & Applied Medical Research, 2012; 2(5):450-453
- [3] Sunitha V, Narasingarao B. Bilateral three headed Biceps brachii –A case report. People's journal of scientific research, 2011; 4(2):53-54
- [4] Rai R, Ranade AV, Prabhu LV, Pai MM, Prakash. Third head of biceps brachii in an Indian population. Singapore Med J, 2007; 48(10):929-931
- [5] Cheema P, Singla R. Low incidence of the third head of the biceps brachii in the North Indian population. Journal of clinical and diagnostic research. 2011; 5(7):1323-1326
- [6] Sawant SP. Morphological study of the insertion of brachialis muscle and its clinical significance. International journal of analytical, pharmaceutical and biomedical sciences. 2013; 2(1):14-16.
- [7] Vollala VR, Nagabhooshana S, Bhat SM, Potu BK, Rakesh V. Multiple accessory structures in the upper limb of a single cadaver. Singapore Med J. 2008; 49(9):254-258
- [8] Govindarajan A, Meenakshisundaram J. Additional head of biceps brachii in elderly female cadaver. International journal of anatomic variations. 2011; 4:112-114

## Authors Profile



**Dr. Pushpa NB** received her MBBS degree from Government Medical College (MMC), Mysore, India. Presently she is pursuing MD in Anatomy, at Kempegowda Institute of medical sciences, Bangalore, India.



**Dr. Roshni Bajpe** is working as professor of Anatomy in KIMS Bangalore since August 2007. She is a recognized P.G teacher and guide. She is interested in research in all branches of Anatomy and Dermatoglyphics.