



## Variations of the proximal attachment of the biceps brachii muscle in a Nigerian population

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### ABSTRACT

Various types of variations have been associated with the proximal attachment of the biceps brachii muscle (BBM). The bulk of the reports, been studies done on Caucasian subjects. This is a case report on the supernumerary and variant heads of the proximal part of BBM in three young male adult Nigerian cadavers. Supernumerary occurrence of the head of BBM noted was that of 3 heads and this occurred unilaterally. Another variation noted in another subject was that of the origin of the short head of biceps brachii (SHB) from the acromion and from the supraglenoid tubercle, which also occurred unilaterally. These findings were compared with other documented reports. © IJAV. 2009; 2: 91–92.

**Key words** [gross anatomy] [variations] [biceps brachii] [supernumerary head]

### Introduction

Biceps brachii muscle (BBM) is one of the most variable muscles in the human body, in terms of number and morphology [1,2]. It normally originates from two heads; the long and the short heads. Various forms of variations with differing prevalence have been noted in the various reports on various races and ethnicities. Amongst the supernumerary heads of BBM reported is the presence of 3 to 7 heads [1-4]. The absence of the long or the short head of BBM [1], and variation in its insertions [5,6], have also been reported. In literature, the prevalence of supernumerary heads of biceps ranges from 9.1% to 22.9% [7,8].

In this case report, we report the variations of the proximal attachment of BBM in three Nigerian subjects, and also compare the findings with previous studies.

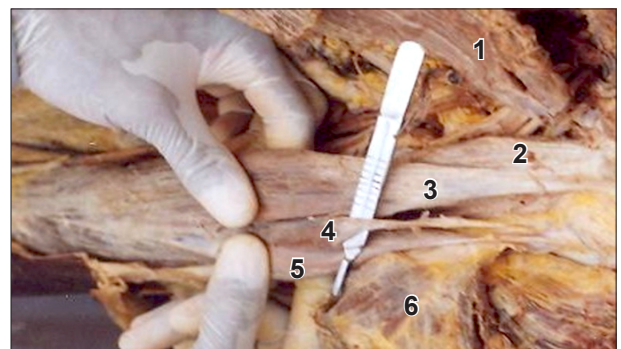
### Case Report

During a supervised dissection of 3 adult male formalin fixed Nigerian cadavers by the medical students of the Department of Anatomy University of Nigeria, some variations in the proximal attachment of the BBM were noted. The dissection procedure was as directed in Cunningham's Manual for dissection [9]. Further dissections were carried out by the authors and the variations were photographed and documented.

In the first two cadavers, a supernumerary occurrence of the heads of BBM was noted. The supernumerary occurrence in this study was in the form of the third

head. In both cases the occurrence was unilateral; the third head was lying between the long and short heads. On both occasions, the third head was running within the capsule of the shoulder joint along the bicipital groove to pick origin from the supraglenoid tubercle of the humerus (Figure 1).

In the third cadaver, the variation was on the origin of the short head of BBM: from the acromion and also the supraglenoid tubercle. This gave a picture of a short head of BBM having two heads, as superficial and deep. The superficial head extending to the supraglenoid tubercle



**Figure 1.** The photograph of the third head of the biceps brachii. (1: *pectoralis minor*; 2: *coracobrachialis*; 3: *short head of biceps brachii*; 4: *third head of biceps brachii*; 5: *long head of biceps brachii*; 6: *cut edge of pectoralis major*)

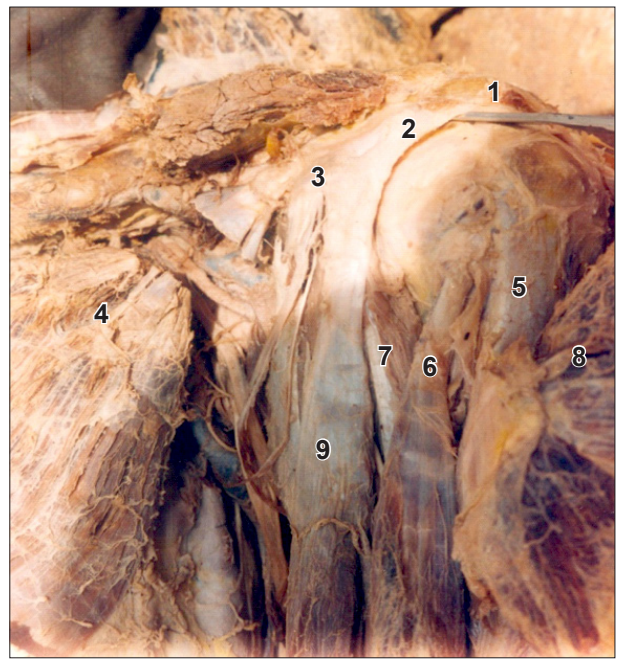
was running medial and slightly deep to the long head of biceps. The deep head was running obliquely medial to the superficial head and lateral to the tendon of the coracobrachialis. After fusing with the tendon of coracobrachialis, it extended to the coracoid process and attached to it. This attachment extended posteriorly to the acromion of scapula via a ligamentous extension (Figure 2).

### Discussion

Among the reports of the various studies on the origin of the BBM, the occurrence of supernumerary head has been the most prevalent variation. Within numerous reported cases of supernumerary heads of BBM, the third head of BBM was the most common [4]. Within the reported prevalence range of 9.1% to 22.9% of the supernumerary head of BBM [4], a prevalence range of 7.5% to 18.3% has been reported for the third head of BBM.

In agreement with the reports of Kosugi et al. [4], and Nakatani et al. [2] on the rarity of the bilateral occurrence of the supernumerary heads of this muscle, in our report we did not note bilateral occurrence in the sampled population. Kosugi et al. [4] and Asvat et al. [10] stated that there are no clear gender and racial differences in the occurrence of the supernumerary head of the biceps.

The documented variant origins of the short head of BBM from the acromion and supraglenoid tubercle are rare cases that have not been documented in literature yet. The extension of the origin of BBM to the acromion is a feature that will add more stability to the shoulder joint. It will also add an undue force to the protraction of the scapula during contraction of this muscle, thereby making this variation very beneficial for people interested in activities such as boxing.



**Figure 2.** The photograph of the variant origin of the short head of biceps brachii. (1: acromion; 2: ligamentous extension of the short head of biceps brachii to the acromion; 3: coracoid process; 4: pectoralis minor; 5: long head of biceps brachii; 6: tendon of the short head of biceps brachii to the supraglenoid tubercle; 7: tendon of the short head of biceps brachii running to fuse with that of coracobrachialis; 8: reflected head of pectoralis major; 9: coracobrachialis)

### References

- [1] Bergman RA, Thompson SA, Afifi AK, Saadeh FA. *Compendium of human anatomic variation*. Baltimore, Urban & Schwarzenberg. 1988; 139–143.
- [2] Nakatani T, Tanaka S, Mizukami S. Bilateral four-headed biceps brachii muscles: the median nerve and brachial artery passing through a tunnel formed by a muscle slip from the accessory head. *Clin Anat*. 1998; 11: 209–212.
- [3] El-Naggar MM, Zahir FI. Two bellies of the coracobrachialis muscle associated with a third head of the biceps brachii muscle. *Clin Anat*. 2001; 14: 370–382.
- [4] Kosugi K, Shibata S, Yamashita H. Supernumerary head of biceps brachii and branching pattern of the musculocutaneous nerve in Japanese. *Surg Radiol Anat*. 1992; 14: 175–185.
- [5] Reina-de la Torre F, Nebot-Cegarra J, Perez-Berruazo J. Biceps brachii muscle attached to the extensor carpi radialis brevis muscle: an unreported anatomical variation in humans. *Ann Anat*. 1994; 176: 319–321.
- [6] Ozan H, Ataserver A, Sinav A, Simsek C, Basar R. An unusual insertion of accessory biceps brachii muscle. *Kaibogaku Zasshi*. 1997; 72: 515–519.
- [7] Kopuz C, Sancak B, Ozbenli S. On the incidence of third head of biceps brachii in Turkish neonates and adults. *Acta Anat Nippon*. 1999; 74: 301–305.
- [8] Rodriguez-Niedenfuhr M, Vazquez T, Choi D, Parkin I, Sanudo JR. Supernumerary humeral heads of the biceps brachii muscle revisited. *Clin Anat*. 2003; 16: 187–203.
- [9] Romanes GJ. *Cunningham's Textbook of Anatomy*. 15th Ed., London, Oxford University Press. 1991; 67–89.
- [10] Asvat R, Candler P, Sarmiento EE. High incidence of the third head of biceps brachii in South African populations. *J Anat*. 1993; 182: 101–104.