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Original Research Article

AN ANATOMICAL VARIATION IN THE ORIGIN OF BICEPS BRACHII MUSCLE

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Abstract
The biceps brachii muscle is the muscle situated in the flexor compartment of the arm. It is known to show variations in the number of heads of its origin. This study was performed to evaluate the variations in the origin of the biceps brachii muscle.

Keywords: Biceps brachii muscle, origin, nerve supply

Introduction

The origins of the biceps brachii muscle are classically described as being a long head from the supraglenoid tubercle and a short head from the coracoid process of the scapula (Gray, 1973). Distally the 2 bellies of the muscle unite to form a common tendon inserting into the radial tuberosity and the bicipital aponeurosis which extends from the medial side of the tendon and attached to ulna. Occasionally, human posse's a third head of biceps brachii, a condition which is also shown in other mammals (Dobson, 1881; Le Double, 1897; Primrose, 1899; Sonntag, 1923, 1924). In man, the occasional presence of a third head has been reported with varying frequency according to the population from which cadavers are sampled; Chinese 8 %, European white 10%, African black 12 % and Japanese 18 % (Bergman et al. 1984). In most of the cases, the third head inserted together with the other 2 heads of biceps brachii into the bicipital aponeurosis and the radial tuberosity. The third head receives its innervation from the musculocutaneous nerve, as do the other 2 heads of biceps. Sometimes there is partial innervation from the axillary nerve is possible since the fibres of the third head may intermingle with those of the deltoid.

Materials and Methods

The study was done in the Department of Anatomy, Apollo Institute of Medical sciences. Both extremities of 20 formalin fixed cadavers (n = 40) were studied for abnormal heads of biceps brachii muscle. The flexor compartment of the arm was

dissected and the attachments of the biceps brachii muscle were studied in detail. Appropriate photographs were taken.

Results

Among forty upper limbs studied, we observed three heads of biceps on both sides of a male cadaver aged 56 yrs. The two heads of the biceps originated from its usual position but the anomalous third head took its origin from the lower part of antero medial surface of the humerus (Fig No 1). The third head was found to fuse with the common belly of the muscle well before the bicipital tendon and its aponeurosis. Bilaterally this third head was supplied by a twig of the musculocutaneous nerve. No other abnormalities relating to the biceps were observed in any of the sides of the other cadavers.The median nerve and brachial arteries were running above this third head of biceps brachii. A small twig of median nerve is seen below this head (Fig No 2).

Fig No 1 – Origin of third head of Biceps brachii muscle

Fig No 2 – Median nerve course

Discussion

Bergman et al. (1984) reported a 10% incidence of the third head of biceps brachii in white Europeans and a 12% incidence in black Africans. The percentage incidence in South African black populations is comparable with the 21.5 % incidence reported by Grieg et al. (1952) in American populations. In Turks it is 15% by Bergman et al. (1988) and 2% in Indians by Soubhagya (2006). In the present study there was a 5% incidence of third head of biceps brachii muscle. Because of the wide variety of origins for the third head of biceps brachii and its sexual dimorphism, it may follow that there is no specific functional explanation for this anomaly. The dual origin of the third head may contribute to supination of the forearm, as the muscle origin is in a lateral position relative to the rotational axis of the arm. In addition to allowing elbow flexion independent of

shoulder joint position, the third head of biceps brachii may enhance the strength of elbow flexion (Sweiter & Carmichael, 1980). In those cases in which the third head arises from the insertion area of coracobrachialis, it is possible that it represents a remnant of the long head of coracobrachialis, the ancestral hominoid condition (Wood, 1870; Primrose, 1899; Sarmiento 1899; Sonntag 1923, 1924). Cheema et al (2011) found three unilateral supernumerary heads in biceps brachii muscle out of 63 adult cadavers in North Indian Population. Two of the supernumery heads had their origin from the shaft of the humerus near the insertion of coracobrachialis and one had its origin near the origin of brachialis. Their insertion was into the muscle belly in two cases and into the bicipital aponeurosis in one. The supernumery heads were innervated by a branch from musculocutaneous nerve

Conclusion

Our study revealed that the incidence of third head of biceps brachii may be approximately 5% but larger studies are needed to confirm this fact. The third head of biceps brachii may be an incidental finding at autopsy or during routine anatomical dissections. Unless symptomatic, the third head of biceps brachii may not be detected in clinical studies. Knowledge of the existence of the third head of biceps brachii may become significant in preoperative diagnosis and during radiodiagnostic procedures and surgery of the upper limb. Because of the association of the third head with unusual bone displacement subsequent to fracture, such variation has relevance in surgical procedures (Sweiter and Carmichael, 1980).These variations sometimes result in the nerve compressions. In conclusion, these variations are not rare and are interesting not only for anatomists but also to orthopaedic surgeons, plastic surgeons, traumatologists, physiotherapists, doctors dealing with sports medicine and radiologists.

References

- Bergman RA, Thompson SA, Afifi AK (1984) Catalogue of Human Variation, pp. 27-30. Munich: Urban and Schwarzenberg.
- Bergman RA, Thompson SA, Afifi AK et al. Compendium of Human Anatomic Variations. Baltimore: Urban & Schwarzenberg, 1988: 10-2. DOBSON GE (1881) Notes on the anatomy of Cercopithecus callithrichus. Proceedings of the Zoological Society, London, pp. 812-818.
- Cheema P, Singla R. Low incidence of the third head of biceps brachii in the North Indian Population. JCDR journal. 2011; 5(7): 1323-1326.
- Gray H (1973) Anatomy of the Human Body, 29th American ed (ed. C. M. Cross), p. 460. Philadelphia: Lea and Febiger.
- Grieg HW, Anson BJ, Budinger JM (1952) Variations in the form and attachment of the biceps brachii muscle. Quarterly Bulletin, Northwestern University Medical School 26, 241-244.
- LE Double AF (1897) Traite des Variations du Systeme Musculaire de rHomme et de leur Signification au Point de Vue de rAnthropologie Zoologique. Paris: Schleicher Freres.
- Primrose A (1899) The anatomy of the orang-utang (Simia satyrus). Transcripts of the Royal Society, Canadian Institute 6, 507-598.
- Sonntag CF (1923) On the anatomy, physiology and pathology of the chimpanzee. Proceedings of the Zoological Society, London 23, 323-429.
- Sonntag CF (1924) on the anatomy, physiology and pathology of the orang-outang. Proceedings of the Zoological Society, London 24, 349-449.
- Sweiter MG, Carmichael SW (1980) Bilateral three headed biceps brachii muscles. Anatomische Anzeiger 148, 346-349.

- Soubhagya R, Nayak, Latha V, Prabhu et al. Third head of biceps brachii: a rare occurrence in the Indian population. Ann Anat 2006; 188:159-61.
- Wood J (1870) On a group of varieties of the muscle of the human neck, shoulder and chest. Philosophical Transactions of the Royal Society, London 160, 83-116.