

BILATERAL SUPERNUMERARY HEADS OF BICEPS BRACHII

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ABSTRACT

The Biceps brachii is a muscle of flexor compartment of the arm. The biceps brachii muscle shows variation in the number of heads, with an estimated 9–22% of all people having a supernumerary head. The most common variation is third head, but four, five, or even seven heads have been reported. Although supernumerary heads of the biceps brachii muscle have been frequently reported, bilateral asymmetric occurrence of supernumerary heads is relatively rare. During a routine cadaveric dissection at the Department of Anatomy, National Medical College, Birgunj, Nepal, we encountered bilateral supernumerary heads of the biceps brachii muscle; Three heads on the right arm and four heads on the left arm in a 68 year old male cadaver. These additional heads were supplied by branches from the musculocutaneous nerve. No additional anomalies were found on the remainder of both upper limbs of the same cadaver. It may cause compression of surrounding neurovascular structures or it may lead to variation of normal mechanical actions and also can cause erroneous interpretation during routine surgeries.

KEY WORDS: Biceps brachii, Supernumerary heads, Coracobrachialis, Musculocutaneous nerve.

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INTRODUCTION

The Biceps brachii is a muscle of flexor compartment of the arm. The biceps brachii muscle shows variation in the number of heads, with an estimated 9–22% of all people having a supernumerary head [1]. The most common variation is third head, but four, five, or even seven heads have been reported [2-4]. The supernumerary heads of the biceps brachii muscle have clinical importance, as they may confuse a surgeon who performs a procedure on the arms or they may cause compression of neurovascular structures in the upper limbs [5]. Although supernumerary heads of the biceps brachii muscle have been frequently reported, bilateral asymmetric occurrence of supernumerary heads is relatively rare. We recently observed

an interesting variation of the biceps brachii muscle during our routine cadaveric dissection.

CASE REPORT

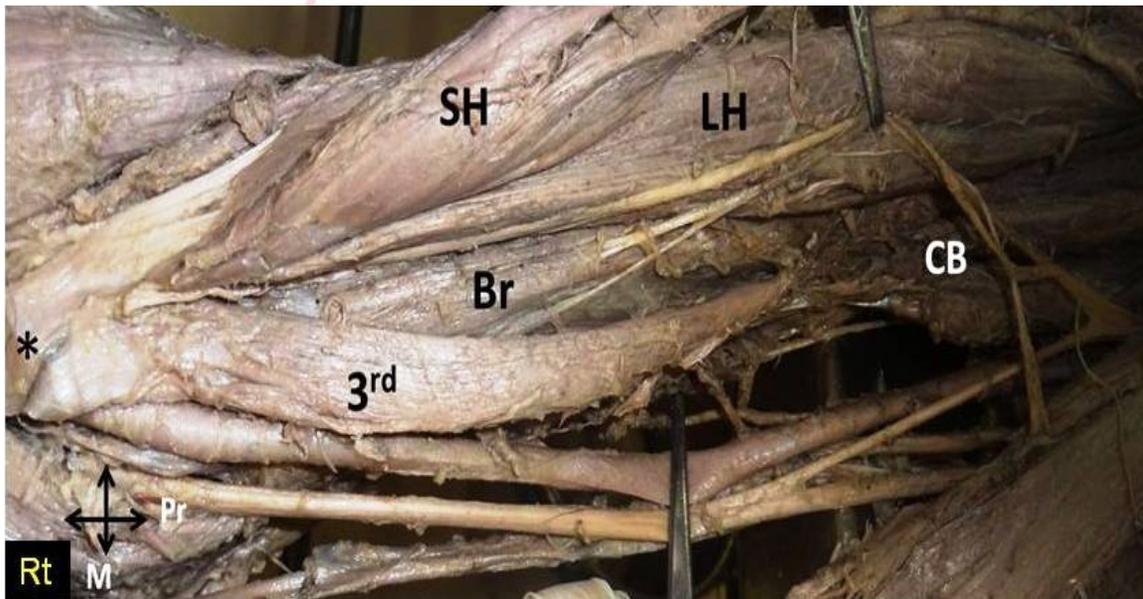
During a routine cadaveric dissection at the Department of Anatomy, National Medical College, Birgunj, Nepal, we encountered bilateral supernumerary heads of the biceps brachii muscle; Three heads on the right arm and four heads on the left arm in a 68 year old male cadaver. The arm was dissected carefully to display the full length of the biceps muscle from proximal to distal attachment. All other related structures were also exposed. The additional heads were examined for the origin, course and insertion. Appropriate photographs were taken. Long and short heads of biceps brachii did not .

show any variation in origin, insertion and innervations bilaterally

RESULTS

In this case, one accessory head of the biceps brachii muscle was observed on the right arm. This head originated from the antero-medial surface of the shaft of the humerus at the insertion site of the coracobrachialis and also few fibres from the medial intermuscular septum and inserted into the Bicipital aponeurosis. We also observed that the musculocutaneous nerve had a characteristic branching pattern between the long head and third head (Fig. 1).

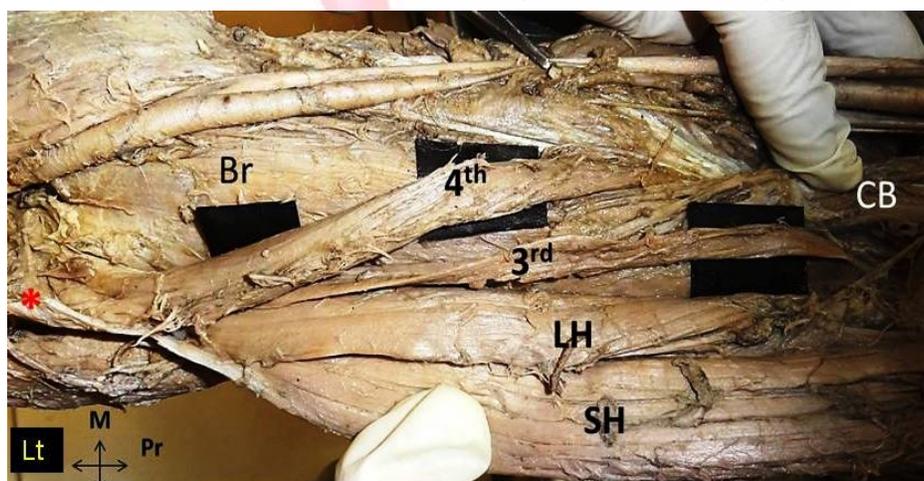
Fig 1: showing 3rd head of biceps brachii in Right (Rt) upper limb.



LH- Long head , SH- short head of biceps brachii, 3rd -additional head of biceps, CB – coracobrachialis, Br- brachialis, * bicipital aponeurosis

In addition, an anomalous third and fourth head of the biceps brachii muscle was observed on the left arm. The third head originated from the junction of insertion site of the coracobrachialis and origin of brachialis muscle on the humerus and the fourth head originated from antero-medial surface of humerus distal to the insertion of coracobrachialis and also few fibres from the medial intermuscular septum. These two heads (third & fourth) fused with the common bulk of the muscle, well before the bicipital tendon and its aponeurosis are inserted. These additional heads were supplied by branches from the musculocutaneous nerve (Fig. 2). No additional anomalies were found on the remainder of both upper limbs of the same cadaver.

Fig. 2: showing 3rd and 4th heads of biceps brachii in Left (Lt) upper limb.



LH- Long head of biceps brachii , SH- short head of biceps, 3rd – third head of biceps, 4th – fourth head of biceps
CB- coracobrachialis, Br- Brachialis, * bicipital aponeurosis.

DISCUSSION

The biceps brachii muscle presents a wide range of variations. This anomaly varies among populations, such as Chinese, 8%; European white, 10%; African black, 12%; Japanese, 18%; South African blacks, 21%; South African whites, 8%; and 38% in Colombians [6]. The anomalies can manifest as a cluster of accessory fascicles arising from the coracoid process, pectoralis minor tendon, proximal head of the humerus, or articular capsule of the humerus [7]. The most common variation is the muscle arising from the shaft of the humerus itself, also known as the humeral head or the third head of the biceps brachii muscle [8]. The presence of a supernumerary head of the biceps brachii muscle might increase its kinematics. The biceps is known for its powerful elbow flexion action (secondary to brachialis) when the forearm is supinated. It also acts as powerful supinator in flexed elbow. Anatomists consider that additional biceps heads, as observed in this case, may increase the power of flexion and the supination component of the elbow. However, no attempt to amalgamate the relationship between additional heads and muscle strength has been made. Embryological observations by Testut described this type of variation with the third head of the biceps brachii as a portion of the brachialis muscle supplied by the musculocutaneous nerve, in which its distal insertion has been translocated from the ulna to the radius [9]. However, in the present case, additional heads of both sides originated from the anteromedial surface of the humerus distal to the insertion site of the coracobrachialis muscle. Therefore considering their origin they may be remnants of the long head of the coracobrachialis muscle, an ancestral hominoid muscle [10]. Variations in the heads of the biceps brachii muscle have already been reported. It may cause compression of surrounding neurovascular structures or it may lead to variation of normal mechanical actions and also can cause erroneous interpretation during routine

surgeries. The branching pattern of the musculocutaneous nerve is clinically important, as the nerve is subjected to compression by these accessory heads.

CONCLUSION

The knowledge of such variations may be important for surgeons operating on the arm and for clinicians diagnosing nerve impairment. We report a peculiar origin of bilateral asymmetric supernumerary heads of the biceps brachii muscle in the present case.

Conflicts of Interests: None

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