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Bilateral Accessory long and Short Heads of Biceps Brachii-A Case Report

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Abstract: **Introduction:** The biceps brachii muscle is a prominent fusiform muscle located in the anterior compartment of the arm. Anatomic variations in bicep brachii particularly the presence of supernumerary heads are the most frequently observed variation. **Method:** The upper limbs of an embalmed 70 years old male cadaver were dissected for undergraduate medical teaching in the Department of Anatomy, Punjab Institute of Medical Sciences, Jalandhar. **Result:** During dissection, bilateral Accessory long and short heads of bicep brachii were observed. These heads had nerve supply and blood supply from branches of musculocutaneous nerve and brachial artery respectively. **Conclusion:** The presence of accessory heads may confer a mechanical advantage by increasing the strength of elbow flexion and forearm supination on one side but on other side such variations may contribute to shoulder pain either independently or in association with other pathologies.

Keywords: Bicep brachii, Accessory heads, Supernumerary heads, Supraglenoid tubercle, Coracoid Process.

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INTRODUCTION

Anatomic variations in the upper limbs particularly the presence of supernumerary heads, are the most common finding [1,2]. The biceps brachii is one of the most frequently affected muscles [3].

The biceps brachii muscle is a prominent fusiform muscle located in the anterior compartment of the arm responsible for flexion and supination of the forearm and flexion of the shoulder [4-8] .It is classically described as having two proximal heads: the long head, which originates from the supraglenoid tubercle of the scapula, and the short head, which arises from the coracoid process [7]. These heads typically unite to form a common tendon that inserts into the radial tuberosity and the bicipital aponeurosis [8]. While most individuals possess the standard two-headed configuration, accessory heads are not rare, with an estimated prevalence ranging from 9% to 22% in various populations [7]. Supernumerary third head of Biceps brachii is frequently reported in literature though cases involving up to seven heads have been reported in the literature [9]. Understanding these variations is of critical importance for surgeons, radiologists, and anesthetists. Accessory muscle bellies can mimic soft tissue tumours or cause neurovascular compression, leading to motor or sensory deficits if the musculocutaneous nerve or brachial artery is compromised [8]. This case report details a unique presentation of multiple heads of the biceps brachii, contributing to the existing anatomical literature and highlighting the clinical implications of such variants.

CASE REPORT

The upper limbs of an embalmed 70 years old male cadaver were dissected for undergraduate medical teaching in the Department of Anatomy, Punjab Institute of Medical Sciences, Jalandhar. Dissection was initiated by removing the skin and superficial fascia from both upper limbs. The muscles of the anterior compartment of the arm and the associated neurovascular structures were identified, and each muscle was carefully separated and isolated along its fascial planes. Adjacent neurovascular structures were also traced along their anatomical course to identify any possible areas of compression by the variant musculature.

During dissection, bilateral accessory long and short heads of bicep brachii were observed. The accessory

long head originated by a tendinous slip from the supraglenoid tubercle of the scapula and was located medial to main long head of bicep brachii . The accessory short head originated from the coracoid process of scapula; its origin was muscular and it was situated posterior to main short head of the biceps brachii (Fig.1).

These accessory heads united with normal heads to form a common tendon, which inserted into the radial tuberosity and gave rise to the bicipital aponeurosis. It was observed that the accessory heads were innervated by the muscular branches of musculocutaneous nerve, similar to the main heads .Their vascular supply was derived from branches of the brachial artery (Fig.2).

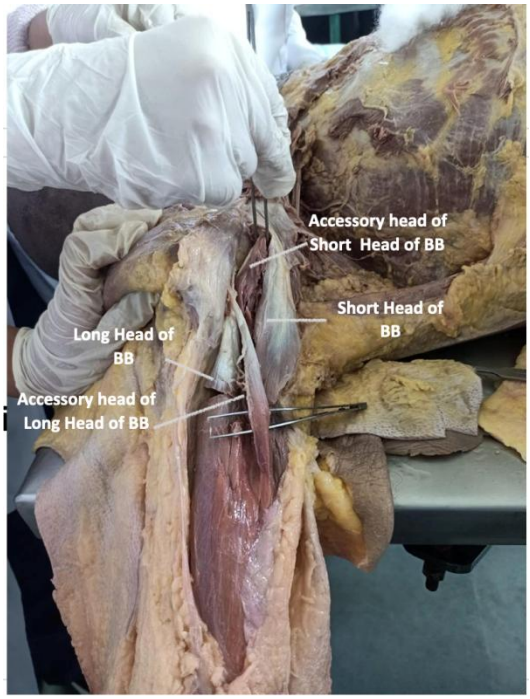

Fig-1: Accessory heads of long and short heads of Biceps Brachii (BB)

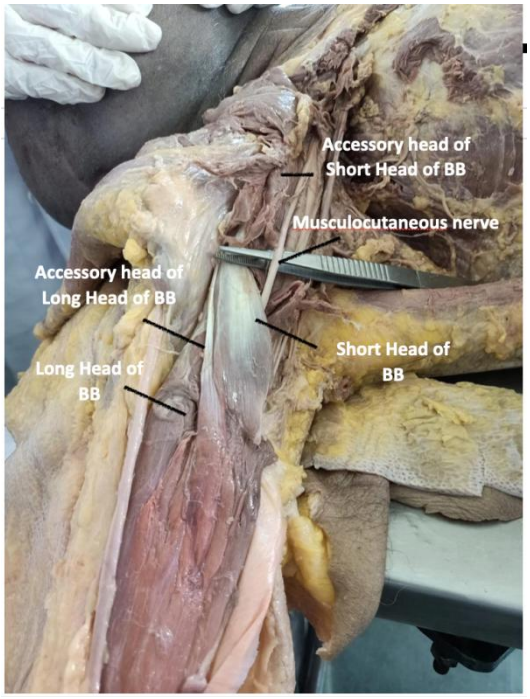

Fig-2: Nerve supply of Accessory heads of Biceps Brachii (BB)

DISCUSSION

Variations in the number of heads of the biceps brachii muscle, particularly supernumerary heads, have been attributed to genetic factors, phylogenetic persistence from the ancestral patterns and disturbance during embryological development. Such variations may arise due to incomplete differentiation or persistence of embryonic muscle primordia. The reported incidence of supernumerary heads of the biceps brachii ranges from 9% to 22% in the general population muscle [11-14].

Lira-Bandeira *et al*. examined 249 upper limbs and identified accessory heads of the biceps brachii in 10.4 % of cases and most commonly, a single additional head was present (84.6 %) [15]. According to Bergman, in approximately 12 % of arms, an additional humeral head may be found alongside the typical short (coracoid) and long (glenoid) heads, as also noted in our case.

Variants with more than two heads are relatively frequent, with reported prevalence of about 8 % in Chinese populations, 10 % in white Europeans, 12 % in Black Africans, and up to 18 % in Japanese [16].

In another study done by Manjatika *et al.*, the third head of the biceps brachii was found in 20.2 % of cases, with a slightly higher prevalence in males (22.2 %) compared to females (18.2 %) [17].

Accessory heads of the biceps brachii muscle do not usually cause any symptoms and are mostly encountered as incidental findings [18].

From a functional perspective, the presence of accessory heads may confer a mechanical advantage by increasing the strength of elbow flexion and forearm supination [8]. However, the potential clinical implications often outweigh these functional benefits.

Recognition of abnormalities involving the biceps brachii and its tendon is clinically significant in order to avoid misdiagnosis of various disorders which may contribute to shoulder pain either independently or in association with pathologies of the rotator cuff, glenoid labrum or adjacent structures [18].

In addition bulky supernumerary heads may predispose to compression of the musculocutaneous nerve, which can result in paresthesia, muscle weakness, or wasting of the affected limb [8].

Further Accessory heads can mislead surgeons during procedures such as shoulder arthroscopy or fracture fixation of the humerus, potentially leading to iatrogenic injuries Small caps for and in Radiological. Misinterpretation, these variants may be mistaken for tumors or displaced bone fragments on MRI or CT scans [8].

CONCLUSION

The presence of the accessory heads is considered asymptomatic, it is still speculated whether the accessory heads may have physiological and functional consequences. Generally, the most common variation is the presence of a single accessory head originating from the anterior surface of the humerus. Variant biceps brachii muscle constituting four heads is a rare finding.

Such muscular variations may also pose clinical risks, including compression of adjacent neurovascular structure. So, understanding of these variations is not merely an academic exercise; it carries significant clinical and surgical weight:

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