

## Case Report

# ACCESSORY BRANCH OF MEDIAN NERVE: AN ANATOMICAL VARIATION IN THE INNERVATION OF BRACHIALIS MUSCLE WITH ITS CLINICAL IMPLICATIONS

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## ABSTRACT

The median nerve (MN) is widely known among Anatomists to innervate the forearm. It usually gives out a branch to the Pronator Teres muscle as it enters the arm, while the muscles of the anterior compartment of the arm are majorly innervated by the musculocutaneous nerve (MCN). An accessory branch of MN was noticed in the left arm during student's dissection of a male cadaver to innervate the lower part of the Brachialis muscle (BM). The branch was given out at the infero-lateral side of the nerve and it coursed lateral to the lateral brachial vein and after small distance it disappeared into the Brachialis muscle to supply it. It is in view of the above that we are advocating that surgeons, neurologists and anaesthetists should also be conscious of these variations and be meticulous in their efforts to interpret some of the symptoms induced by nerve lesion. This branch could be vital in reduce Brachialis muscle palsy in event of damage to MCN.

**KEY WORDS:** Accessory, Innervation, Variation, Nerve, Brachialis.

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## INTRODUCTION

The median nerve (MN) is the major nerve supplying the anterior compartment of the forearm and the chief innervator of the muscles of the thenar eminence and three and half of the fingers of the ulna side of the hand [1]. The median nerve is referred to as the "labourers' nerve" because of its control of the course of movement of the hand and the forearm muscles [1, 2]. The nerve is formed by the union of lateral and medial roots from their respective cords of the brachial plexus [3]. This nerve presents multiple forms of variations in its formation, communication and distribution satvarying level of the upper limb as it labours

to complete its work of supplying the hands [4]. As reported in other literatures, median nerve is associated with several variations such as abnormal communications with other nerves like musculocutaneous and ulnar nerves [5], splitting of the median nerve [6] and unusual innervation of flexor muscles of the arm by the median nerve [7]. Variations of superficial nerves are clinically necessary because knowledge of such is very vital for appropriate planning of surgeries and clinical imaging based on the report of Gracek, [8] and Samarawickrama, [4]. In the case of nervous compression or entrapment in the muscles at any level in the body

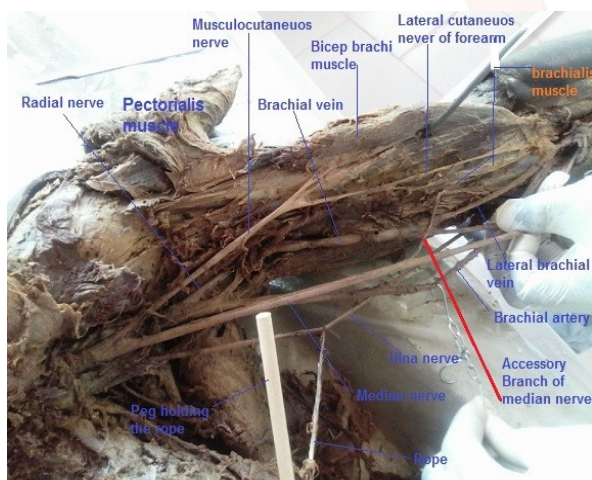
with unexplained symptoms, these multiple variations may be a very good insight to their interpretations.

## CASE REPORT

A rare case of an accessory branch of the left median nerve innervation to the Brachialis muscle (BM) was encountered during a routine gross anatomy dissection for undergraduate anatomy students of the Federal University Ndufu-Alike, Ikwo (FUNAI). The cadaver that was being dissected for the educational and research purposes was in his early 30's. The discovery was made due to the meticulousness/carefulness of the demonstrators and students involved in the dissection. Immediately the discovery was made, the skin as well as the fasciae of the left axilla and part of the arm were carefully and meticulously incised and reflected in order to have a better view of the underlying muscular, vascular and neural elements.

After a careful dissection of the anterior compartment, we observed a single branch originating from the infero-lateral part of the median nerve which coursed laterally to the lateral brachial vein and after a short distance it disappeared into the BM. The musculocutaneous nerve was present along with three twigs, the branches that innervated the Coracobrachialis, Brachialis, Bicep Brachi muscles and its continuation as the lateral cutaneous branch of the forearm.

**Fig. 1:** The left upper limb of dissected cadaver showing other structures.



## COMMENTS

The anterior compartment of the arm is composed of three muscles which include

Coracobrachialis (CM), the Brachialis muscle (BM) and Bicep Brachi muscle (BBM) [1]. The BM is the flexor of the forearm at the elbow joint either in the prone or supine position and whether or not there is a resistance to the movement [7, 9]. There have been several reports in the last few decades that the BM is solely innervated by only the musculocutaneous nerve (MCN) [7, 10]. Meanwhile, the last two decades have witnessed a massive boost and turn around in the research world when many researchers shifted their focus from what is assumed to be normal to ascertain the reality of the BM innervation [7]. It was discovered that BM has multiple innervations from MCN, RN and rarely from MN as the case may be.

Specifically, many authors have been able to show that the infero-lateral part of the BM is innervated by branches from the RN with higher prevalence of between 66.7-100% [11, 12, 13, 14]. There are great variations concerning the prevalence of BM's innervation by RN and most of the times linked to dissection procedures, ethnicity or the size of nerve branch [7].

According to Carlson, [15]; Paraskevas *et al.*, [7]; the double innervation might be as a result of the BM's embryonic origin. The muscle is formed as a result of the fusion of two muscular primordial, the extensor or dorsal embryonic pre-muscular mass and the flexor or ventral embryonic pre-muscular mass.

The absence of MCN may lead branches of MN on a very rare occasion to innervate the BM either directly or through branches from the lateral root of the brachial plexus [16, 17, 18].

The incidence ranging from 1.4 to 15% of the absence of MCN has been reported in literatures [7, 19].

This variation may have been as a result of some disturbances occurring during development [7]. According to Hur *et al.*, [20]; branch from the superior edge of median nerve supply the infero-medial part of BM, while Won *et al.*, [21] reported that 15% of the populace have lower border of their BM innervated by MN branches while 5% of the specimens presented uppermost quarter supply of BM.

In this present case, the accessory of the median nerve was given from the infero-lateral

part of the median nerve. This branch descends downward and laterally in a position it equally relates with the median brachial vein.

In conclusion, surgeons should be careful to avoid damage to this branch while performing humeral surgery using anterior compartment approach. If this median nerve is damaged above this point there may be a reduction in the flexion of the elbow which is vital to the neurologists and anesthetists.

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**Conflicts of Interests: None**

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