



VARIATION IN FORMATION OF MEDIAN NERVE AND PROFUNDA BRACHII ARTERY

Anatomy

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ABSTRACT

INTRODUCTION: Median nerve is formed in axilla by the union of medial root of median nerve and lateral root of median nerve. The medial root crosses downward and laterally in front of the third part of axillary artery and joins with lateral root. Profunda brachii artery is a large branch arising from the posterior surface of the proximal part of the brachial artery and follow the radial nerve to enter the spiral groove.

AIM AND OBJECTIVE: To study the variation in formation of median nerve and anatomical variations in arterial formations – profunda brachii artery because knowledge of such variations is important in clinical practice for evaluation of injuries without misinterpretation of clinical symptoms and during surgeries of limbs to prevent accidental injuries to nerves and vessels.

MATERIAL AND METHODS: This study was conducted in Department of Anatomy of Osmania medical college, koti, Hyderabad. During routine undergraduate dissection on 22 formalin fixed human cadaver 20 males & 2 female (44 upper limbs); were dissected for the study. The cadavers with visible trauma, pathology or prior surgeries were excluded from the study. Routine dissection of the axilla and upper limb was followed. After removal of skin, loose connective tissue, fat and lymph nodes of axilla the cords of brachial plexus were identified and the median nerve was identified & carefully dissected, and also axillary artery and brachial artery identified and dissected. At first, the origin is confirmed and then they were traced down. Any variations found were noted and photographed. The results were analysed and compared to previous studies.

RESULTS: Low level of formation of median nerve in arm, profunda brachii artery arising from third part of axillary artery and its passage between medial root of median nerve and lateral root of median nerve was identified in one cadaver on right side. The percentage of low level formation of median nerve in arm and passage of profunda brachii artery in between medial root of median nerve and lateral root of median nerve is 2% among 44 upper limbs.

CONCLUSION: The knowledge on median nerve variations and upper extremity vasculature variations is essential for medical practitioners, anatomists, radiologists, anaesthetist, neurosurgeons and orthopaedic surgeons during surgical operation of the upper limb and is essential to prevent injury and post operative complications particularly in patients requiring dialysis or undergoing arteriography. Also, it is also important for those patients who need arteriovenous bypass

KEYWORDS

Median Nerve, profunda Brachii Artery, Variations, Medial Root And Lateral Root Of Median Nerve.

INTRODUCTION

Median nerve is formed in axilla by the union of medial root and lateral roots. The medial root is derived from the medial cord of brachial plexus and conveys the fibers from ventral branches of ventral rami of C₈ and T₁; it crosses downward and laterally in front of the third part of axillary artery and joins with lateral root. The lateral root is continuation of lateral cord of brachial plexus and conveys fibers from ventral branches of ventral rami of C₅, C₆, C₇. After originating from the brachial plexus in the axilla the median nerve descends down the arm, initially lateral to the **brachial artery**. Halfway down the arm, the nerve crosses over the brachial artery, and is situated medial to it. The median nerve enters the anterior compartment of the forearm via the cubital fossa.

Profunda brachii artery is a large branch arising from the posterior surface of the proximal part of the artery and accompany the radial nerve to enter the spiral groove on the posterior surface of humerus between the long head and medial head of triceps. It divides into the radial and medial collateral branches. **Hence study of this nerve, artery and its variation is important in clinical and surgical aspects.**

MATERIAL AND METHODS

This study was conducted in Department of Anatomy of Osmania medical college, koti, Hyderabad. During routine undergraduate dissection on 22 formalin fixed human cadavers - 20 males & 2 female (44 upper limbs); were dissected for the study. The cadavers with visible trauma, pathology or prior surgeries were excluded from the study. Routine dissection of the axilla and upper limb was

followed. After removal of skin, loose connective tissue, fat and lymph nodes of axilla the cords of brachial plexus were identified and the median nerve was identified & carefully dissected and also axillary artery and brachial artery identified and dissected. At first, the origin is confirmed and then they were traced down. Any variations found were noted and photographed. The results were analysed and compared to previous studies.

RESULTS

Low level of formation of median nerve in arm and profunda brachii artery arising from third part of axillary artery and its passage between medial root of median nerve and lateral root of median nerve was identified in one cadaver on right side. The median nerve and lateral root of median nerve is 2%. FIG.1.

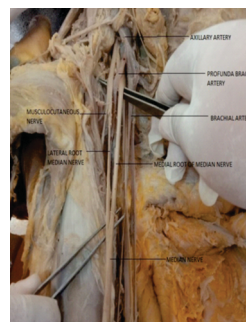


FIG 1

DISCUSSION

In the present study low level of formation of median nerve in arm and profunda brachii artery arising from third part of axillary artery and passage between medial root of median nerve and lateral root of median nerve was identified in one cadaver on right side.

There are several case reports on numerical variation of the roots of the Median nerve. The commonest numerical variation is the formation of the median nerve by three roots instead of two and there are number of case reports on such median nerves (Ibrahim et al., 2005; Surendran et al., 2013; Herath et al.; Patil et al., 2016)¹⁻⁴. Formations of the median nerve by four roots also been reported by few authors (Uzun & Seelig; Satyanarayana et al., 2009; Meshram et al.)⁵⁻⁷. Median nerve is also formed by five roots very rarely (Natsis et al.)⁸. There are several reports on formation of the median nerve at different sites of the axilla and arm with different relation to the axillary artery or to the brachial artery (Badawoud; Satyanarayana et al., 2009; Channabasanagouda et al.; Bala et al.; Bharti et al.)⁹⁻¹². Several authors have reported variations in vessels of the upper limb presenting some interesting cases¹³. Variations in the origin, branching and course of the main arteries of the human upper limb are common and have long attracted the attention of anatomists and surgeons^{18,19}. Variations of the brachial artery and its branches are common and they are sometimes associated with an anomalous arrangement of the nerves of the brachial plexus^{20,21}. The profunda brachii artery, which arises from the brachial artery at a point distal to the level of the teres major muscle, and its terminal branches are the blood supply to the posterior compartment of the arm. The profundabrachii artery accompanies the radial nerve into the radial sulcus of the humerus²². The profunda brachii artery is the largest branch of the brachial artery and it shows considerable variation in its origin. In a previous study 55% of the cases, it arises as a single trunk at the level of the tendon of the teres major muscle. It may arise from the axillary artery (in 22% cases), as a common trunk with the superior ulnar collateral artery (in 22% cases) or as a branch of the circumflex humeral artery (in 7% cases)²³. Shetty et al. (2012) have reported the two branches of the profunda brachii; the radial collateral and the middle collateral arteries originating from a common trunk, which also gave origin to the superior ulnar collateral artery²⁴. Anatomical variations in arterial and venous formations are common, mainly due to wrong embryological formation²⁵.

CONCLUSION

The knowledge on median nerve variations and variations in the upper extremity vasculature is essential to medical practitioners in dealing with surgery around axilla in order to prevent post-operative complications. The knowledge of these variations may be helpful for the anatomists, radiologists, anaesthetist, neurosurgeons and orthopaedic surgeons during surgical operation of the upper limb and is essential to prevent injury, particularly in patients requiring dialysis or undergoing arteriography. Also, it is also important for those patients who need arteriovenous bypass with thigh autogenous access or with grafts, especially when there is the need of axillary-axillary one for hemodialysis^{26,27}.

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