



**VARIANT FORMATION OF MEDIAN NERVE-  
A REVIEW OF LITERATURE**

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**ABSTRACT**

Anatomical variations of median nerve are frequent. Anomalies of the brachial plexus and its terminal branches are also common. An extra lateral root was observed arising from the lateral cord of brachial plexus, in the left axilla of a male cadaver during the course of undergraduate gross anatomy dissections. This anomalous root had a very oblique course over the axillary artery. The application and significance of our finding vis-à-vis current research in basic & clinical medicine, is discussed.

**KEYWORDS :** brachial plexus branches, median nerve variation, median nerve anomaly



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## INTRODUCTION

The Median nerve (C 5,6,7,8,T1) is formed in the axilla by one root each from the medial cord and lateral cord of the brachial plexus.<sup>1</sup> Generally the medial root joins with the lateral root after crossing the front of the third part of the axillary artery.<sup>2</sup> Knowledge of variable anatomy of the nerve could help to avoid iatrogenic injuries during surgery, e.g. in radical neck dissection. Sometimes an extra abnormal root may compress the blood vessels in the axilla, leading to diminished blood supply. This case report deals with the formative variation of median nerve by an extra lateral root, in relation with the axillary artery.

## CASE REPORT

During routine dissection classes of first MBBS curriculum, at Osmania Medical College, Hyderabad, India, an anomalous formation of median nerve was observed in the left axilla of one male cadaver. Here the median nerve was formed by the union of three roots: two from lateral cord and one from medial cord. Ultimately these three roots united anterior to the third part of axillary artery. The median nerve thus formed, continued down anteriorly along the brachial artery until the cubital fossa where the nerve came to lie on its medial side. The remaining course and distribution of median nerve was as usual, as in literature.

## OBSERVATION

An extra lateral root arose from the lateral cord, along with the lateral root of median nerve.



## DISCUSSION

Awareness of anatomical variations of peripheral nerves is important in repair of traumatic injuries and in treatment of compression syndromes. Newer techniques like microsurgery employ tissue flaps anchored on a vessel and/or nerve, which need to be re-sutured accurately to gain useful function e.g. in traumatic Thumb amputation, Great toe composite free flap is employed; <sup>3</sup> unexpected nerve anomaly in the recipient site would then seriously impact such a repair. Anomalies of the brachial plexus and its branches like median nerve are frequently reported in literature. Badawoud<sup>4</sup> reported a communicating branch from upper part of a lateral root to lower part of the medial root of median nerve, in 1 out of 4 anomalies found in a series of 48 limbs. Nene et al<sup>5</sup> reported a rare posterior union of the two roots, with the thus-formed median nerve coursing behind the axillary and brachial arteries till the cubital region. Haviarova et al<sup>6</sup> found anomalies in both upper limbs of the same cadaver: right axilla showing a posterior union of median nerve roots, and left side showing the brachial artery coming anterior through the "fork" of the median nerve and coursing anterior to the nerve entirely distally. Several studies report communicating branches, especially between musculocutaneous (C5,6,7) and median nerves<sup>7</sup>. Uyaroglu et al<sup>8</sup> claim a rarer anastomotic branch arising from median nerve and running distally to join with a branch of the musculocutaneous in the arm. Further down in the forearm and at the wrist, anomalies of median nerve have been precisely described by earlier authors, and classified by Lanz<sup>9</sup> into 4 types: motor branch variations, distally arising accessory branch, high division, and proximally arising accessory branch. Sundaram et al<sup>10</sup> report a split median nerve 5cm proximal to the flexor retinaculum, a rare phenomenon [incidence 1-3%], and they

suggest more proximal placement of the electrode, in the sensory conduction velocity testing for functional evaluation in entrapment-like presentations. Stancic et al<sup>11</sup> carried out an anatomical study at operations (75 cases) for carpal tunnel entrapment, together with dissections (25 cadavers), and found that Group 2 Lang variation (accessory thenar branch in distal carpal tunnel) happened in 20% of cadaver-anomalies compared to only 3.1% in the living operated upon. A case of bifid median nerve where the radial-side branch was located in its own compartment within the carpal tunnel was reported by Mitchell et al.<sup>12</sup> Returning to the axillary region anomalies, a large series (196 limbs) has been reported more recently by Budhiraja et al<sup>13</sup> where three-root union similar to our study was seen in 22.4%, of which the third root came from lateral cord in 14.2% and from medial cord in the remaining 8.16%. The authors discuss possible embryological factors which might be causal to these anomalies and also surgical implications, such as failed nerve-block to infra-clavicular part of the brachial plexus.

## CONCLUSION

One variation in the formation of median nerve was reported, and compared with numerous other patterns culled from old and new literature. Proximity of unusual root to the axillary artery may impact the blood supply by compressing the vessel under certain circumstances. Knowledge of variations especially in relation to the neighboring structures is of value, to take necessary preoperative precautions and to formulate a strategy while planning a surgery in the axilla region.

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