

## THE VARIATIONS OF THE MEDIAN NERVE Nervus medianus' un varyasyonları

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### Özet

**Amaç:** Bu çalışmanın amacı n. medianus'un oluşum varyasyonlarını belirlemektir.

**Gereç ve Yöntem:** Bu çalışmada, 22 kadavranın üst ekstremitesindeki n. medianus'lar disekte edilerek incelendi.

**Bulgular:** İncelediğimiz 22 vakanın 17'sinde n. medianus klasik kaynaklarda belirtildiği gibi fasciculus medialis ve lateralis'den gelen iki kökün birleşmesinden oluşmakta idi. N. medianus varyasyonu görülen beş vakada ise ya fasciculus lateralis'den ya da n. musculocuteneus'dan gelen üçüncü bir kök n. medianus yapısına katılmaktaydı. Varyasyonlu beş vakanın dördünde üçüncü kök n. musculocuteneus'dan doğuyor ve n. medianus yapısına katılıyordu. Beş vakanın birinde üçüncü kök fasciculus lateralis'in terminal dallarını verdiği yerden doğuyor ve n. medianus'un iki kökünün birleştiği yerin distalinde bu sinire katılıyordu.

**Sonuç:** Sonuç olarak, aksillar bölge cerrahisinde n. medianus varyasyonlarının bilinmesinin aksiller bölge ameliyatı sırasında cerrah için faydalı olacağını umuyoruz.

**Anahtar Kelimeler:** Anatomi, Nervus medianus

### Abstract

**Aim:** The aim of this study was to determine the variations of formation of the median nerve.

**Materials and Method:** Median nerves on the upper extremities of 22 cadavers were investigated using dissection technique.

**Results:** The median nerve was formed by two roots which were coming from medial and lateral cords in 17 of 22 cases as it has been described in classical texts. In five cases which had variations, a third root was joining the median nerve. The third root was arising either from the lateral cord or the musculocutaneous nerve. In four of the five cases with variations, the third root was arising from distal part of the musculocutaneous nerve and joining the median nerve. In one of the five cases, the third root was arising from the part where the lateral cord was giving the terminal branches out and it was joining the median nerve distally after the joining point of two main roots.

**Conclusion:** We conclude that it might be more useful if the surgeon knows about these variations during the surgery of the axillary region.

**Key Words:** Anatomy, Median nerve

The median nerve is formed by two roots from both the medial and the lateral cords. The lateral root of the median nerve and its medial root join anterior to the third part of the axillary artery to establish the median nerve (1,2). It has been reported that some fibers from all branches of the brachial plexus could join to form the median nerve (3).

Previous reports have showed that the variations might be in the numbers of the median nerve roots and between the median and musculocuteneus nerve

connections (4,5). The lateral cord shows more variations in origin (3,6). Some of the fibers of the median nerves lie with musculocutaneous nerve before joining the median nerve (3,7,8). Sometimes the lateral root of the median nerve might be partially or completely absent (9). Some authors have reported that while the median nerve usually consists of two roots (2,3), sometimes it has a third one (4). It has also been reported that two roots of the median nerve could arise directly from superior and middle trunks (5,10).

During a dissection for demonstration to medical students in the anatomy laboratory of Erciyes University Medical Faculty a variation of the median nerve in the right brachial plexus was found in a 50

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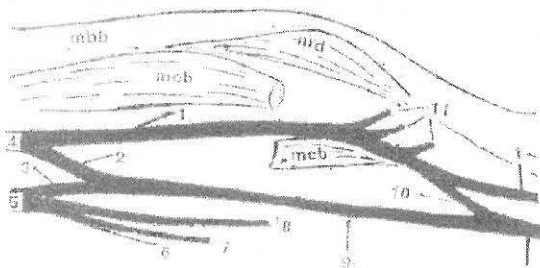
year old male cadaver (8). After that, we investigated the variations in the formation of the median nerve in 22 brachial plexus of 22 cadavers in our laboratory collection.

## MATERIALS AND METHOD

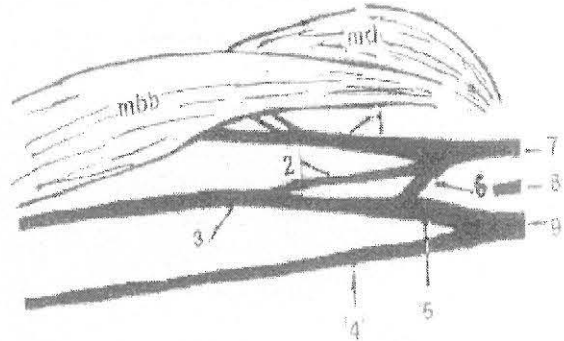
The brachial plexus of 22 upper extremities from both sides were dissected and the variations of the roots of median nerve were investigated. If there was any variation in number and position of the roots, their figures were drawn. The findings were evaluated according to the literature.

## RESULTS

The normal median nerve was seen in 17 (77.3%) out of the 22 cases. These were formed by the fusion of two roots; one of them from the medial cord, another from the lateral cord. There were median nerve variations in five cases (22.7%). The median nerves were formed by the connection of three roots in these cases. In four of the five cases (18.2%), the third root was arising from the musculocutaneous nerve after muscular branches and joining the median nerve at the distal part (fig 1). In one case (4.5%), the third root was arising from the lateral cord between the musculocutaneous nerve and the lateral root. This root was joining the median nerve at the distal part (Fig 2).



**Figure 1.** The variation of the left brachial plexus: m. biceps brachii (mbb), m. deltoideus (md), m. coracobrachialis (mcb); musculocutaneous nerve (1), lateral root of the median nerve (2), medial root of the median nerve (3), lateral cord (4), medial cord (5), medial cutaneous nerve of brachii (6), medial cutaneous nerve of forearm (7), ulnar nerve (8), median nerve (9), the varied second branch coming from the musculocutaneous nerve to the median nerve (10), the innervating nerve fibers of biceps brachii (11).



**Figure 2.** The variation of the right brachial plexus: m. biceps brachii (mbb), m. deltoideus (md); musculocutaneous nerve (1), the second varied branch coming from the lateral cord to median nerve (2), median nerve (3), ulnar nerve (4), medial root of the median nerve (5), lateral root of the median nerve (6) lateral cord (7), posterior cord (8), medial cord (9).

## DISCUSSION

In classical texts, it has been reported that the median nerve is formed by two roots, medial and lateral (1-3). However, there is some information about variations of this nerve (5,11-15). It has also been reported that the lateral root of the median nerve might be completely or partially absent (6).

It was reported that most of the variations were seen in the peripheral branches of brachial plexus (3,6-8,10,14). The incidence of median nerve variations were reported between 8-36% (3,14). It was found to be 22.7% in this study. In the cases that have peripheral nerve variations, some nerve fibers go together with a neighbouring nerve temporarily and join the original nerve at the distal part (6). It was reported that some nerve fibers usually arose from the musculocutaneous nerve after passing through the coracobrachial muscle and join the median nerve. (3,6-8,11,14). There were similar variations in four cases (18.2%) in the present study. Sarsilmaz et al., (7) and Sargon et al., (4) reported that the median nerve is formed by three roots, two of them from the lateral cord and one from the medial cord. Only in one case (4.5%), we found a median nerve with three roots, two of which were coming from the lateral cord, while the third was coming from the medial cord.

It has been reported that the anatomy of brachial plexus could be important in the surgery and treatment of the axillary region (14, 15). Moreover, it could also be important to know about nerve variation incidence in this area. Any surgical operation without sufficient knowledge about nerve variations could cause nerve damage. For this reason, during the dissection and reconstruction of the axillary region, it is also necessary to take the median nerve variations into consideration.

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