

# Variation Between Median And Musculocutaneous Nerves

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## Abstract

We report a unilateral variation between median and musculocutaneous nerves in the arm of a 48 years old male cadaver. The median nerve is normally formed by the two roots from the medial and lateral cords. It enters the arm at first lateral to the brachial artery and descends medial to it without receiving any other branch. In this case, the median nerve originated normally from brachial plexus but received a branch from musculocutaneous nerve on its way to the cubital fossa. The abnormal branch from the musculocutaneous nerve coursed an oblique pathway to join the median nerve. These types of variations of the nerves of the arm should be considered prior to traumatic evaluations and reconstructive interventions.

## INTRODUCTION

The median nerve has two roots from the lateral (C(5),6,7) and medial (C8,T1) cords, which embrace the third part of the axillary artery and unite anterior or lateral to it. The median nerve enters the arm at first lateral to the brachial artery. Near the insertion of coracobrachialis it crosses in front of the artery descending medial to it to the cubital fossa without receiving any other branch. The musculocutaneous nerve (C5,6,7) comes from the lateral cord as one of the terminal branches opposite the lower border of the pectoralis minor and usually pierces the coracobrachialis and descends laterally between the biceps brachii and brachialis to the lateral side of the arm<sub>1,2,3,4</sub>. Studies by Nakatani et al. revealed three variations in which the musculocutaneous nerve did not pierce the coracobrachialis<sub>5</sub>.

## CASE REPORT

We report an unusual unilateral variation between the median and musculocutaneous nerves that was found during the dissection of the arm of a 48 years old male cadaver. The median nerve was originating normally from the brachial plexus but on its way to the cubital fossa it received an accessory branch from the musculocutaneous nerve. The communicating branch was about 2.5 cm long and had an oblique course between the two nerves (Figure 1). The other courses and branches of the two nerves in the arm, forearm and hand of this side were normal in every aspect, as were the courses and branches of the median and musculocutaneous nerves of the contralateral side.

## Figure 1

Figure 1: Anatomical view of the nerves



\*: Abnormal branch; MC: musculocutaneous nerve; M: median nerve; U: ulnar nerve.

### DISCUSSION

Several abnormal branches between the median and musculocutaneous nerves have been well described by many authors. Kerr found that a branch from the musculocutaneous nerve to the median had been reported in 8.1% to 36.19% of different series and estimated its incidence as somewhat less than the 24% found in his series.<sup>1</sup> Le Minor described a case in which the lateral fasciculus first pierced the coracobrachialis muscle and then one of its terminal branches joined the medial root forming the median nerve.<sup>6</sup> Iwamoto et al. reported a communicating branch from the median nerve to the musculocutaneous.<sup>7</sup> Sargon et al. stated a variation of the median nerve which is formed by the union of three roots, two of them coming from the lateral cord.<sup>8</sup> Venieratos and Anagnostopoulou reported three types of communications between median and musculocutaneous nerves considering the coracobrachialis muscle as the reference point. In type one the communication was proximal to the entrance of the musculocutaneous nerve into coracobrachialis, in type two the communication was distal to the muscle and in type three the nerve and the communicating branch did not pierce the muscle.<sup>9</sup> Tsikaras et al. showed that the musculocutaneous nerve arises from median nerve unilaterally of a male cadaver.<sup>10</sup>

In our case, the lateral root of median nerve from the lateral cord was significantly normal and the abnormal communicating branch was significantly thick. It is not particularly uncommon to find out a nerve trunk of considerable size leaving the musculocutaneous and passing distally and medially to join the median nerve. This is a result of median nerve fibers from the lateral cord passing into the musculocutaneous rather than into the lateral root of the median and then rejoining the median nerve at a lower level. When this occurs, the lateral root of the median nerve is typically abnormally small.

Such variations have also clinical importance especially in post-traumatic evaluations and exploratory interventions of the arm for peripheral nerve repair and to some extent during flap dissections. After a trauma to the arm, signs of median nerve injury could be observed in a patient with an intact median nerve if such a variation is present and the fibers coursing in the musculocutaneous nerve are damaged. Result of an exploratory intervention of the arm for peripheral nerve repair in a patient with these variations can

be successful only if the surgeon is aware of such variations of peripheral nerves and specifically looks for their presence. Additionally, during flap dissections, unexpected nerve damages could arise especially by surgeons who are familiar with routine course of peripheral nerves and their relationship with neighboring structures but inexperienced in variations. Any injury to musculocutaneous nerve in a patient with this kind of variation presents as double nerve injury, which makes the diagnosis more problematic. Finally, although anterior approach for internal fixation of humeral fractures seems to be safer than the posterior approach because of high risk of radial nerve damage in posterior approach, again the surgeon should be familiar with the neurovascular variations in arm not to cause an iatrogenic damage to these structures during their retraction for exposure of fracture line.

### CONCLUSION

In conclusion, such variations of peripheral nerves noticed in an autopsy or in cadaver dissections should be included into the surgical training programs even if it is not necessarily included in the routine anatomy education in medical schools.

### References

1. Hollinshead WH, (1969) *Anatomy For Surgeons*. 2nd Ed. Harper & Row, Publishers, Inc., New York, pp 373-375
2. McMinn RMH, (1994) *Last's Anatomy*. 9th ELBS Ed. Churchill Livingstone, Singapore, p 68
3. Snell RS, (1992) *Clinical Anatomy For Medical Students*. 4th Ed. Little, Brown and Company, Boston, pp 442-447
4. Williams PL, Bannister LH, Berry MM, Collins P Dyson M, Dussek JE, Ferguson MWJ (1995) *Gray's Anatomy*. 38th Ed. Churchill Livingstone, London, pp 1266-1272
5. Nakatani T, Mizukami S, Tanaka S (1997) Three cases of the musculocutaneous nerve not perforating the coracobrachialis muscle. *Kaibogaku Zasshi* 72(3): 191-194
6. Le Minor JM (1990) A rare variation of the median and musculocutaneous nerves in man. *Arch Anat Histol Embryol* 73: 33-42
7. Iwamoto S, Kimura K, Takahashi Y, Konishi M (1990) Some aspects of the communicating branch between the musculocutaneous and median nerves in man. *Okajimas Folia Anat Jpn* 67(1): 47-52
8. Sargon MF, Uslu SS, Celik HH, Aksit D (1995) A variation of the median nerve at the level of brachial plexus. *Bull Assoc Anat (Nancy)* 79(246): 25-6
9. Venieratos D, Anagnostopoulou S (1998) Classification of communications between the musculocutaneous and median nerves. *Clin Anat* 11(5): 327-331
10. Tsikaras PD, Agiabasis AS, Hytioglou PM (1983) A variation in the formation of the brachial plexus characterized by the absence of C8 and T1 fibers in the trunk of the median nerve. *Bull Assoc Anat (Nancy)* 67(199): 501-505

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