

*Case Report***Abnormal Communication Between Radial and Ulnar Nerves**Sudakshina Chakrabarti^{*}, Melani Rajendran^{**}, Vikash Agarwal^{***}^{*} *Department of Anatomy, Sri Ramachandra Medical College and Research Institute, Chennai – 600 116, Tamil Nadu, India.*^{**} *Department of Anatomy, Matha Dental College and Hospital, Chennai – 600 069, Tamil Nadu, India*^{***} *Department of Neurology, Apollo Specialties, Chennai.***Key Words:** radial nerve; ulnar nerve; median nerve; communications; schwannoma

Abstract: Variations in the branching pattern of the brachial plexus is not uncommon. But the variation found in the present case in a male cadaver during routine dissection is a rarest one. A communication was found between the radial and ulnar nerves in the upper arm. In addition the median nerve was formed by three roots, one medial and two lateral roots. Knowledge of the variations of brachial plexus will provide useful information for the surgeons for doing flap surgeries and also to minimize the possible complications of regional anesthesia.

Variations of the brachial plexus in its formation, course, branching pattern and distributions are commonly reported (Kerr, 1918; Linell, 1921; Yang *et al.*, 1995; Aktan *et al.*, 2001; Utysal, 2003; Choi *et al.*, 2005; Das and Paul, 2005; Melani Rajendran and Nivedha, 2004 & 2005). Most common variations reported were the branching pattern and communications between median nerve and musculocutaneous nerves (Choi *et al.*, 2002; Loukas and Aqueelah, 2008). Absence of musculocutaneous nerve (Kosugi *et al.*, 1992; Nayak, 2007; Sathyanarayana, 2009), Martin - Gruber anastomosis (Lee *et al.*, 2005; Azhagiri, 2012), communication between radial and ulnar nerves on the dorsum of the hand (Maria Loukas *et al.*, 2008).

Case Report

During routine dissection, the variation was found in a male cadaver only

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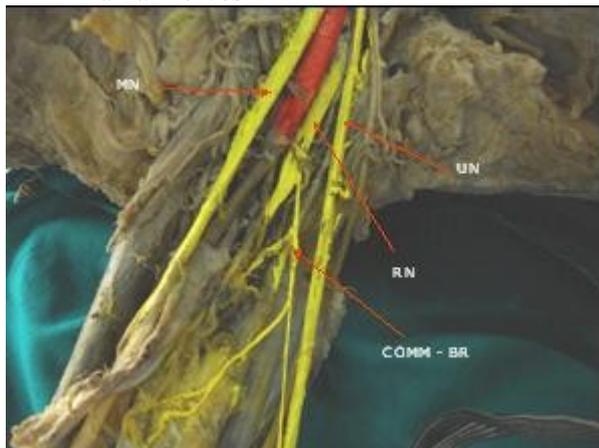
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on the right side. A communication was observed between the radial and ulnar nerves. It arose from the radial nerve before entering into the radial groove and joined the ulnar nerve about 15cms above the intercondylar line. The communication was approximately 8 cms length and it gave off branches to brachialis and medial head of triceps brachii and then joined the ulnar nerve (Fig. 1).

The ulnar nerve showed a localized solitary swelling approximately 12cms above the intercondylar line. It was ovoid in shape and measured about 3 cms x 1.5 cms. It was hard in consistency and free from the surrounding tissues and can be considered as schwannoma (Fig. 2).

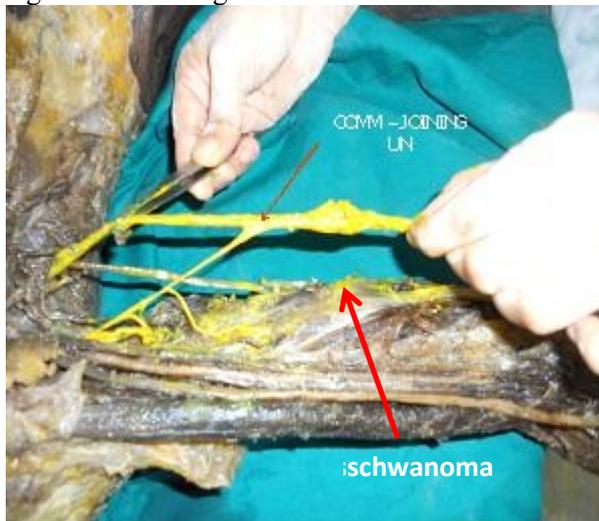
Besides these observations, in addition, the median nerve was formed by three roots i.e., two roots from the lateral cord and one root from the medial cord. The additional root from the lateral cord was given off at the level of origin of musculocutaneous nerve and joined the median nerve at a lower level anterolateral to the third part of the axillary artery. The medial root was shorter from the medial cord which had normal course and relations (Fig. 3).

Fig. 1 Communication between radial and ulnar nerves



(RN-radial nerve UL-ulnar nerve MN-median nerve com.br-communication br -giving branches to brachialis and medial head of triceps brachii)

Fig. 2 Illustrating schwannoma



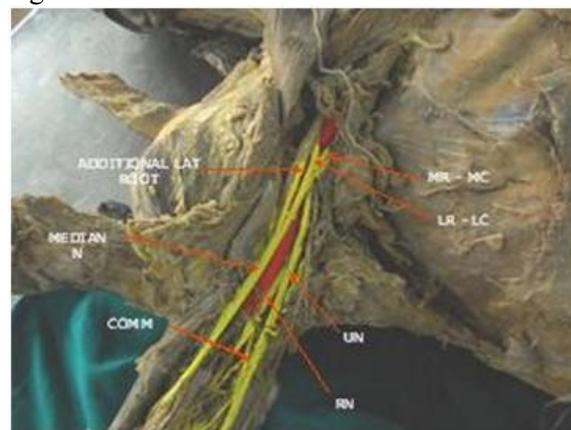
Discussion:

The variations in the formation of the median nerve may not affect the limb functioning but gains importance in clinical, neurosurgical and orthopedic procedures. Variation between the radial and ulnar nerves is rare and the percentage value is missing in the literature.

Variations in the branching pattern and communications between the median and musculocutaneous nerves are reported by many authors (Kerr,1918). Among the variations, the communication between the median and musculocutaneous nerves are also reported (Sarikeioglu *et al.*,2001; Choi

et al., 2002; Loukas and Aqueelah, 2008; Ozguner *et al.*, 2010) viz.communication between the median and ulnar nerves were also reported (Kazakos *et al.*,2005); Martin-Gruber anastomosis (Azhagiri and Melani Rajendran,2012); communication between the radial and ulnar nerves in the dorsum of the hand (Leucas *et al.*,2008;16% cases (Leis and Wells, 2008). Although the communication between the radial and ulnar nerves in the dorsum of the hand reported, the communication between these nerves in 6th arm is not reported in the literature and this is a rare variation. These communications can cause inappropriate nerve blockage in anaesthesia.

Fig. 3 Additional lateral root of median nerve



(LR LC- lateral root MR MC-medial root UN-ulnar nerve MN-median nerve)

The presence of two lateral roots of median nerve was reported by many others. Ischemic pain or variable arterial insufficiency due to occlusion of the axillary artery by such variant additional roots of the median nerve during certain postural maneuvers of shoulder joint (Saeed and Rufai, 2003)

Embryology

In humans, the muscles of the upper limb develop from the mesenchyme of the paraxial mesoderm during the fifth week of embryonic life(Larsen,1977) and the neurons proliferate into the mesenchyme in different directions.Probably, the neurons of the nerve in this observation would have also taken such aberrant course.

Conclusion

Variation in nerves with abnormal origin, course and distribution are usually more prone to iatrogenic injuries and entrapment neuropathies (Roberts, 1992). Knowledge of such variations will also aid proper diagnosis of sensorimotor symptoms (Pontell *et al*, 2011), in any trauma of the arm and reconstructive repair surgery.

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