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Inter-Communication between Cords of Brachial Plexus: A Case Report

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Abstract: Inter-communications between peripheral nerves deserve special attention in view of their clinical significance. Variations of the median and musculocutaneous nerve at the level of brachial plexus are common. The present report pertains to a case displaying one site of communications between median and musculocutaneous nerves and another site of communication between lateral and median cords. The communication at the cord level was given before the cord gives any branch. Such type of communication is very rare. It is important to be aware of this variation while planning a surgery in the region of the axilla or arm, as these nerves are more liable to be injured during operations.
Keywords: Median nerve, Musculocutaneous nerve, Inter communication, Cords, Plexus

INTRODUCTION

Variations in the formation and branching pattern of the brachial plexus are common and have been reported by several investigators [1, 2]. Although communications between the nerves in the arm are rare, the communication between the median nerve (MN) and musculocutaneous nerve (MCN) were described earlier. The lateral root of the MN carries fibres that may pass through the MCN, and a communicating branch from the later usually joins the MN in the lower third of the arm [3]. In the arm, the MCN passes through the coracobrachialis muscle and innervates the muscle as well as the brachialis and biceps brachi and continue as the lateral cutaneous nerve of the forearm without exhibiting any communication with the MN or any other nerves. The fibres from the MN may accompany the MCN as it transmits the coracobrachialis muscle [4, 5], but very rarely the lateral cord pierces the coracobrachialis and then divide into MCN and the lateral root of the median nerve [6].

In the present case, we recorded two communications between MN and MCN and between lateral cord and medial cords. Such incidence of communicating branches between cords or brachial plexus is uncommonly reported in the literature [7, 8] and present great variability. In the present article we have discussed the topography, morphology and clinical aspects of these variations.

CASE REPORT

During routine educational dissection of embalmed cadaver in the Department of Anatomy, RIMS, Imphal, it was observed in the infraclavicular part of the brachial plexus of right upper limb of a 60 years old male cadaver that musculocutaneous nerve gives a communicating twig which communicate with the median nerve. The length of this communicating twig was 8 cm and it unites with the median nerve 19cm from the tip of the coracoids process. MCN gives a communicating twig to MN from its branch to brachialis. This communicating branch was given just after the MCN coming out of the coracobrachialis after piercing the muscle. This communicating branch was present obliquely over the brachial artery from lateral to medial direction.

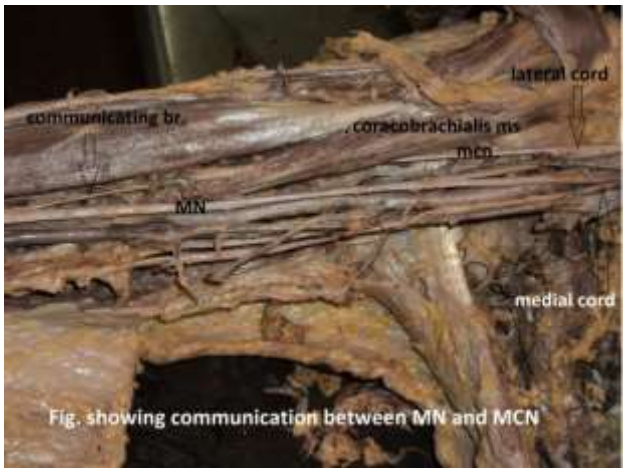

Fig 1: showing the communication between median nerve and musculocutaneous nerve

Also in the same cadaver, we found communication between lateral cord and medial cord on the right side before the cord gives any branches. There

were 3 small communications from lateral cord to medial cord. All the other adjacent nerves were normal. The remaining course of the MCN was unremarkable. The median nerve and ulnar nerve did not innervate any muscle of the anterior compartment of the arm as usual. The formation of both median and musculocutaneous nerves were normal in both sides. The ulnar nerve supplied the medial two lumbricals and median nerve supply the lateral two lumbricals and there was no interchange in innervations of the lumbricals although there is a chance of the same when there is a communication.

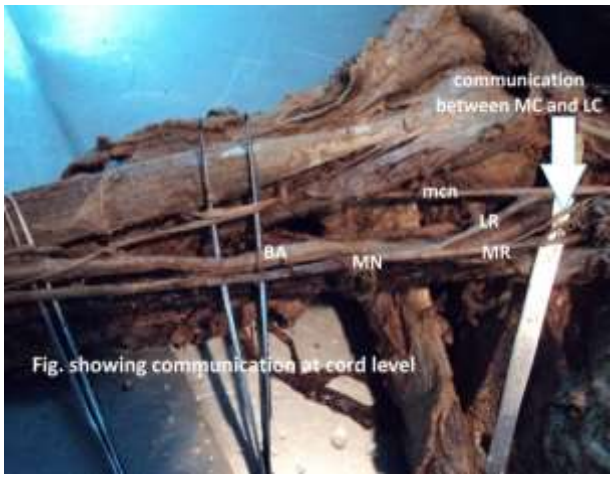

Fig 2: showing the communication between median cord and lateral cord

DISCUSSION

The communications between MN and MCN have been classified by earlier workers [6, 9]. In the most recent observations recorded by Choi *et al*. [10], such communications have been broadly classified into 3 patterns. In pattern 1, the MCN and MN were fused. In pattern 2, there was one connecting branch between MCN and MN. In pattern 3, two connecting branches were present between the MCN and MN. The incidence of this variant was 6.8%.

The pattern of communication recorded in the present case can be placed in type 2 of classification advocated by Choi et al, since there was one communication between the MN and MCN. However in our case the communicating branch was from the MCN to MN. Such connections in this direction are rarely found [11-13].

Arora *et al*. [14] describe 2 communicating branch between MN and MCN, among this communication, one was from MN to MCN and another was n MCN to MN direction. Chuhan R and Roy TS [15] also report 3 roots of Median Nerve, where one root was medial and two were lateral among which one was coming from MCN.

The incidence of communicating branches between MN and MCN has been reported as the most uncommon pattern with great variability wing to the number of possibilities of origin, length and direction of supplementary branches [10]. The presence of such communications may be attributed to random factors influencing the mechanism of formation of limb muscles and the peripheral nerves during embryonic life. Significant variation in nerve patterns may be a result of altered signalling between mesenchymal cells and neural growth cones [16] or circulatory factors at the time of fusion of brachial plexus cords [9].

If the surgeon finds it necessary to isolate and trace the MN and MCN distally, it is essential to be alert to communications that may occur between them. The clinical relevance of such variations might be correlated to entrapment syndromes. Entrapment of MCN is rare and has its origin either in physical activity or in violent movement of the arm and forearm [17]. If this situation co exists with anastomosis to MN, it may give rise to symptoms of MN neuropathy [18]. This knowledge may prove useful for clinicians in order to avoid an unnecessary carpal tunnel release. To prevent unwanted outcomes of operations conducted on MCN, it is suggested that the presence of MN and MCN communications should be ruled out.

CONCLUSION

Communication between the cords of the brachial plexus and main nerves of the plexus do exist and they deserve special attention in view of their surgical importance and possible injury due to abnormal course of the communication.

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