A UNILATERAL VARIANT OF MUSCULOCUTANEOUS NERVE

Authors: Mehra Simmi*, Chowdhary D.S.** and Ghulyani Tuhin***
(*Associate Professor **Professor & head ***Resident,
Department of Anatomy, M.G. Medical College, Jaipur)

ABSTRACT

Variations in the origin, course, branching pattern, termination and connections of the musculocutaneous nerve (MCN) are not uncommon. These variations have clinical significance during surgical procedures, in brachial plexus block and in diagnostic clinical neurophysiology. In the present case, we have reported unilateral variation of musculocutaneous and radial nerves on the right side in a male cadaver. The MCN trifurcated after piercing coracobrachialis and innervated biceps brachii and brachialis muscles and the third branch descended along lateral border of forearm terminating at the proximal phalanx of the right thumb. The superficial branch of radial nerve (RN) was found to be missing. The structures on the left limb were found to be normal. Knowledge of such variations helps in the management of shoulder and arm traumas, nerve grafting and diagnosing peripheral neuropathies.

INTRODUCTION

The musculocutaneous nerve branches out from the lateral cord of brachial plexus. It pierces coracobrachialis muscle (CB) to innervate it and biceps brachii muscle. It then descends inferolaterally between the biceps brachii and brachialis muscles, giving a branch to the latter and continues as the lateral cutaneous nerve of forearm without exhibiting any communication with any other nerve (Gray's). Variations of MCN and its branches have been reported in the past (Linell 1921, Bergman et al 1988,
Chitra 2007. Rao and Choudhary (2001) and Song et al (2003) have reported the absence of MCN.

Radial nerve (RN) arises from the posterior cord of brachial plexus. It passes obliquely across the back of humerus supplying the triceps and then it pierces intermuscular septum and enters the anterior compartment of the arm descending between brachialis medially and brachioradialis and extensor carpi radialis longus muscles laterally. On reaching the front of lateral epicondyle, it divides into terminal rami, superficial and deep. The superficial branch of the RN descends along the front of the lateral side of the upper 2/3 of the forearm and then about 7 cm above the wrist passes deep to brachioradialis, winds around the radius and divides into 4-5 digital nerves.

Yogesh et al (2011) have reported a case in which MCN has substituted for the course and distribution of RN below the arm. In the present case, we have observed a different kind of variation of the musculocutaneous and radial nerves.

**CASE REPORT**

The present variation was observed in the right upper limb of male cadaver, during routine dissection in the anatomy department of our college.

The musculocutaneous nerve took origin from the lateral cord of brachial plexus and descended to pierce coracobrachialis muscle. After emerging from coracobrachialis (fig. Arrow–a) the nerve gave a branch to biceps brachii and divided into two. One supplying the brachialis muscle and the other passing between brachialis and biceps brachii descended along the lateral border of forearm to give multiple cutaneous branches in the lower part of forearm (fig. Arrow–b) and to lateral border of palm before
terminating along the lateral border of the proximal part of the thumb. (fig. Arrow–c)

The course of radial nerve was observed to be normal till it pierced supinator. The superficial branch of RN was observed to be missing. The RN continued with the course and distribution as that of its deep branch.

DISCUSSION

In this case report the superficial branch of RN has been replaced by MCN. Review of literature shows reporting of many variations of brachial plexus especially that of MCN and Median nerve (MN). Le Minor (1992) classified the variation of MCN and MN into five types.


Joshi et al (2008), Bhattarai (2009), Jamuna and Amudha (2011) have reported cases where MCN fibres join with those of MN after piercing coracobrachialis muscle. Tsikaas et al (1983) have reported origin of MCN from MN unilaterally in a male cadaver.
But there is paucity of literature concerning variations or connections between MCN & RN. Tryfonidis et al (2004) reported the piercing of brachioradials by the superficial branch of radial nerve. Yogesh et al (2011) have reported a case where ied brachioradialis, extensor carpi radialis longus & brevis muscles are supplied by MCN instead of RN. They have reported MCN supplying coracobrachialis, biceps brachii & brachialis muscles and giving off the lateral cutaneous nerve of forearm. MCN in their case bifurcated into a superficial and a deep branch 7 cm distal to medial epicondyle. The course & distribution of these branches were similar to those of RN. Hence, MCN replaced the distal part of radial nerve. However, in our case it trifarcated after piercing CB muscle and continued as that of the course of superficial branch of the radial nerve.

From clinical point of view comprehension of such variations is of great importance during flap dissections, post traumatic evaluations of the arm, nerve grafting and neurophysiological evaluation for diagnosing peripheral neuropathies.

Coracoid process grafting, shoulder dislocations and fragment arthroscopies may damage the MCN as well as muscles in these regions (Flatow et al, 1989).

The existence of the variation described in our case report may be attributed to the altered signaling between mesenchymal cells and neuronal growth cones or circulatory factors at the time of gene controlled sight specific fission of brachial plexus cords.

The motor axons arrive at the base of developing limb bud (Moore & Persaud, 2003) in the 5th week of Intra Uterine Life. They mix to form growth cones which form brachial plexus in the upper limb. This advancement of growth cones is regulated by the expression of chemo-attractants and chemo-repulsants in a specific fission. (Larson, 2001). It is
at this point that altered signaling can take place leading to variants in nerve patterns.

REFERENCES


