Variant Formaion of Radial Nerve – A Case Report

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Abstracts: During the routine dissection for the undergraduate students, variant formation of the radial nerve is observed. Normally the radial nerve is the branch of the posterior cord of the brachial plexus (root value C5, C6, C7, C8 and T1). In this cadaver, the radial nerve was formed by a branch from the lateral cord, a branch from the medial cord and a branch from the posterior cord. The lateral root and the medial root pass on lateral and medial sides of the axillary artery and fused posterior to it. At this point, the radial nerve received a branch from the posterior cord – the posterior root. Hence, the radial nerve is valiantly formed by a lateral, a medical and a posterior root. These findings were observed on both right and left sides. Thus the variant formation of the radial nerve was bilateral. Once formed, the nerve had the normal course and branches. [Kshirsagar V NJIRM 2014; 5(6):120-122]

Key Words: Brachial plexus, Radian nerve, Variant formation.

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Introduction: The brachial plexus is an ordered network of large nerves through which the sensory and motor nerve supply is distributed to all structures that constitute the upper limb. It is formed by the anterior rami of C5 to T1 spinal nerves. They unite to form the upper, middle and lower trunks. Each trunk splits into anterior and posterior divisions. All three posterior divisions merge to form the posterior cord[1]. One of the branch of the posterior cord is radial nerve. The varient formation of the radial nerve is very rare though the anomalies of brachial plexus are reported.

In the present study, during the routine dissection for the undergraduate students, variant formation of the radial nerve is observed. In one of the cadaver, the radial nerve was formed by a branch from the lateral cord, a branch from the medial cord and a branch from the posterior cord. These findings are observed bilaterally.

The Case: During the dissection for undergraduate students, in one of the cadaver valiantly formed radial nerve was observed. In this cadaver, the radial nerve was formed by a branch from the lateral cord, a branch from the medial cord and a branch from the posterior cord. The lateral root and the medial root pass on lateral and medial sides of the axillary artery and fused posterior to it. At this point, the radial nerve received a branch from the posterior cord – the posterior root. Hence, the radial nerve is valiantly formed by a lateral, a medical and a posterior root. These findings were observed on both right and left sides. Thus the variant formation of the radial nerve was bilateral. The radial nerves were dissected and traced further in arm and forearm and it was observed that, once formed, the nerve had the normal course and branches.

Figure 1: Right Axilla

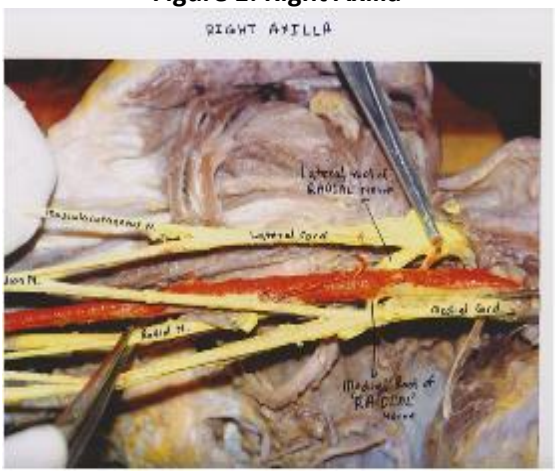

Figure 2: Left Axilla

Figure 3: right Axilla

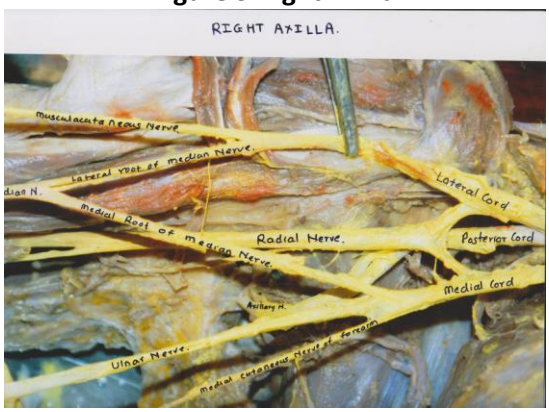

Figure 4: Left Axilla

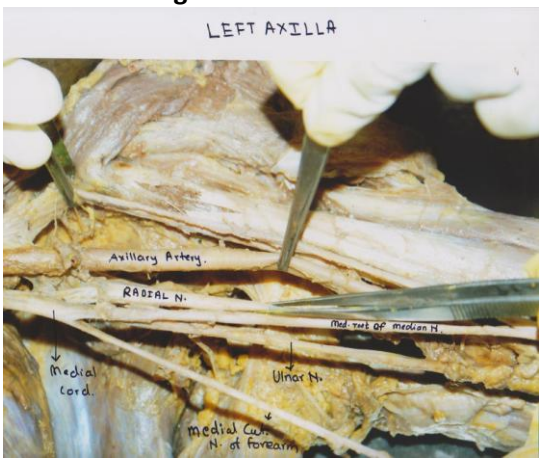

Figure 5: Left Axilla

Discussion: The anomalies of formation of radial nerve are reported. Kumar Megur has reported that the posterior cord divided into two roots, enclosing the sub scapular artery and the two roots fused to continue as radial nerve. The anomalies of brachial plexus are reported by Gupta et al and Bertha et al[2]. Pandey and Shukla[3] also had reported absence of the posterior cord in 3.5% of cadavers. In the present case, the variant formation of the radial nerve does not coincide with the earlier reports. Here the radial nerve is having three roots medial, lateral and posterior each arising from the respective cords.

The presence of this variation may be due to factors which influence the formation of limb muscles and peripheral nerves during embryonic period. Embryologically, the brachial plexus appears as a single radicular cone of axons of spinal nerves, growing distally to reach the muscles and skin of the upper limb; later these axons divide to form ventral and dorsal divisions. Sannes et al[4]. Suggested that the guidance of the developing axons is regulated by expression of chemo-attractants and chemo-repulsants in a highly coordinated site-specific fashion.

Clinical Significance: Anatomical brachial plexus variation knowledge is helpful for shoulder joint traumatology, axilla and shoulder repair operations, radical neck dissections and for the therapy of humerus fracture and displacements[5]. It is also important to be aware of these variations during infraclavicular brachial plexus block.

References:

1. Grey's Anatomy, 37 Edn Churchill Livingstone, pp.1131.
2. Gupta M, Goyal N, Harjeet. Bilaterally anomalous formation and distribution of posterior cord of brachial plexus, Nepal Med. Col. J. 2004 Dec;6(2):133-5.
3. Pandey SK, Shukla VK. Anatomical variations of the cords of brachial plexus and the median nerve. Clin Anat. 2007; 20: 150–156.
4. Sannes HD, Reh TA, Harris WA. Development of the nervous system: Axon growth and guidance. New York, Academic Press. 2000; 189–197.
5. Oluyemi KA, Adesanya OA, Ofusori DA, Okwuonu CU, Ukwenya VO, Om'iniabohs FA, Odion BI. Abnormal pattern of brachial plexus formation: an original case report. The Internet Journal of Neurosurgery. 2007; Volume 4: Number 2.

6. Jamuna M. A rare variation in the mode of termination of posterior cord of brachial plexus, International Journal of Anatomical Variations (2010) 3: 95–96.
7. Benjamin A, Hirschowitz D, Arden GP, Blackburn N. [Double osteotomy of the shoulder joint (author's transl)] Orthopade. 1981; 10: 245–249.
8. Bertha A, Kulkarni NV, Maria A, Jestin O, Joseph K. Entrapment of deep axillary arch by two roots of radial nerve - an anatomical variation. J.Anat Soc India. 2009; 58: 40–43.
9. Bhat KMR, Grijavallabhan V. Variation in the branching pattern of posterior cord of brachial plexus. Neuroanatomy. 2008; 7: 10–11.
10. Kerr, A.T. (1918): The brachial plexus of nerves in man, the variations in its formation and branches. American Journal of Anatomy. 23: 285-395.

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