

Abstract

Upper limb is a very important part of the human body designed for carrying out functional activities of daily living. The upper limbs and its nerve supply are the areas of interest in the field of anatomy, embryology, anthropology, orthopaedics, neurology, physiotherapy, hand, and reconstructive surgery. In this regard, a thorough knowledge of the standard course of the nerve in anatomic structure, dimensions of nerve with bony landmarks and understanding pattern of the major nerves in upper extremity is important to avoid diagnostic confusion and surgical errors.

Objectives:

The aim of this study was to generate a morphometric Malaysian cadaveric based database with respect to the relation, branching pattern and variations of nerves of the upper extremity.

Methodology:

The present study was performed on 70 properly embalmed and formalin fixed and dissected adult upper limb specimens (cadaveric and disarticulated) on the selected major peripheral nerve, (median, musculocutaneous, radial and ulnar nerves) without age or sex differentiation of different ethnicity. The parameters done on the selected nerves, median nerve (width of medial and lateral root of MN, width of MN at the level of origin and cubital fossa, length of the MN at the arm and forearm region and distance between MHE and MN). Musculocutaneous nerve, (width of the lateral cord of brachial plexus and the MCN at the level of origin, length of the lateral cord of brachial plexus and MCN in the arm region). Radial nerve, (width of the posterior cord of brachial plexus, width of the RN at the level of origin and at spiral groove, length of the posterior cord of brachial plexus and the RN at the spiral groove, bifurcation of the RN below and above the LHE, distance from MHE to enter of RN in spiral groove, distance from LHE to exist of RN from spiral

groove and distance between MHE and RN). Ulnar nerve, (width of medial cord of brachial plexus and UN at the level of origin, length of the medial cord of the brachial plexus, distance between the tip of MHE to the UN and distance between the medial border of FCU tendon and the medial border of the UN), in the Unit of Anatomy, AIMST University, and Department of Anatomy, Universiti Kebangsaan Malaysia (UKM) between June 2018 and February 2019.

Results:

The results from this study provided a Malaysian cadaveric morphometric database of the major peripheral nerve (median, musculocutaneous, radial and ulnar nerves) anatomy within the upper extremity such as width, length and some dimensions according to the bony landmarks. In addition, reported the statistical different between 22 upper right and left limbs among the parameters studied of 11 cadavers. Moreover, reported a rare variation in sequence of the contents of the cubital fossa which represent (1.4 %) of the entire 70 upper limbs studied, a supplementary branches between medial cord of brachial plexus and medial root of median nerve which represent (5.7%), anastomosis between the musculocutaneous nerve and median nerve which represent (5.7%) and the also reported that the musculocutaneous nerve does not pierce the coracobrachialis muscle which represent (2.8%) of the entire sample used in Malaysian cadavers.

Conclusion:

Cumulatively, the result provided a Malaysian cadaveric morphometric database of the major peripheral nerve within the upper extremity that would be standard reference values for future studies on Malaysian cadavers. In addition, these measurements can use to improve the success rate of loco-regional anesthesia. Moreover, these documented data in this work would be great valuable for Malaysian surgeons and anatomists when performing their procedures. Consequently, the findings and observations of this work

would be valuable to use to support surgical guidelines, advisories in anesthetic procedures and various clinical practice standards as well.