

Anatomical Study of the Brachial Plexus Variations in Iraqi Cadavers

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ABSTRACT

The brachial plexus of sixty upper limbs belongs to thirty Iraqi cadavers were examined searching for variations. This study documents some variation which have not been reported by previous workers.

INTRODUCTION

Human organs in anatomy textbooks are described in the usual common form in which they exist in the body (Halk-Crages, 1985). The term variation can be defined as simple departure from the common description (AlHubaity et al., 1991), and the majority of these variations are compatible with normal life and go unrecongized until discovered in cadavers (Keen, 1961 and Al-Hubaity, 1995).

Most of the texts are devoid of any description of variations in the brachial plexus, although variations in the rot fibres which the branches of the brachial plexus contain are clinically more important than the variations in sites where nerves arise (Hollishead, 1958), but still knowing and realizing these variations are important for neurologists, surgeons and practicing physicians who work in these fields. There are only a few reports on variations of the brachial plexuses. (Kerr, 1918; Linel, 1921 and Bergman et al., 1984).

We would like to report our experience on brachial plexus variations. A preliminary part of this work has been presented to the meeting of the Anatomical Society of Great Britain and Ireland at Masstricht-Holland (Al-Hubaity et al., 1990). This study was based on careful examination of the brachial plexus in sixty upper limbs.

Materials And Methods

In this study we have examined the brachial plexus in sixty upper limbs belongs to thirty Iraqi cadavers. The material used in this study were a collection of upper limbs after being dissected by first year medical students in Anatomy lab. of Mosul College of Medicine during the period 1988-1992 and the preserved limbs in the laboratory stock of previous years. The plexus in each upper limb was carefully inspected and finally all variations noticed and some of them were photographed.

The Results And Discussion

The gross anatomy of the origin and formation of the trunks or cords of the brachial plexus was found to correspond accurately with the description mentioned before (Williams and Warwick, 1989). The present study shows that in 4 cases (7.5%), one or two direct muscular branches to coracobrachialis muscle were given off by the lateral cord of the brachial plexus, in addition to that given off by the musculocutaneous nerve. To the best of our knowledge this variation has not been reported before.

The musculocutaneous nerve presents frequent variations (Bergman et al., 1985; Williams & Warwick, 1989). The present study shows that in 3 cases (5%) a musculocutaneous trunk containing fibres destined to join the median nerve; these fibres were given off in a bundle to join the median nerve at a variable distance down the arm (see Fig. 1), similar observation has been reported before. (Bergman et al., 1984). On the other hand 1-2 muscular branches were reported to be given off to coracobrachialis muscle by the musculocutaneous nerve close to its formation. (Woodburn, 1983).



Fig.1: Showing the bundles of fibres carried by musculocutaneous nerve (C) which later join the median nerve (N) at low level in the brachium.

The present study shows a prefixed (high type) of brachial plexus in 6 cases (10%), where the three cords gave their derivatives at the level of the upper border of pectoralis minor muscle. A nearly similar findings had been reported before. (Bergman et al., 1984).

The origin of the median nerve is subject to frequent variations, and very often the contribution of the lateral cord to the median nerve is made up of several separated bundles. (Woodburn, 1983). In 3 cases (5%) in the present work shows that the median nerve was formed mainly by its lateral root from the lateral cord with a small contribution from the medial cord; in these cases the lateral cord, after giving off the musculocutaneous nerve about 7cm distal to its formation. In 3 cases (5%) the median nerve was formed by the union of two roots from lateral cord with a single root from the medial cord, and in one case the median nerve was formed by the union of its two roots about the level of the junction between the middle and lower thirds of the arm.

The ulnar nerve is normally derived from the medial cord (Woodburn, 1983), but occasionally the ulnar nerve obtains fibres from the seventh cervical root by means of a communication established between it and the lateral root of the median nerve. (Linel, 1921). In 2 cases (3.7%) of this study the ulnar nerve was formed by the union of two roots, one root from the lateral cord with a second root from the medial cord (Fig. 2). To the best of our knowledge this variation has not been reported by any previous investigators.

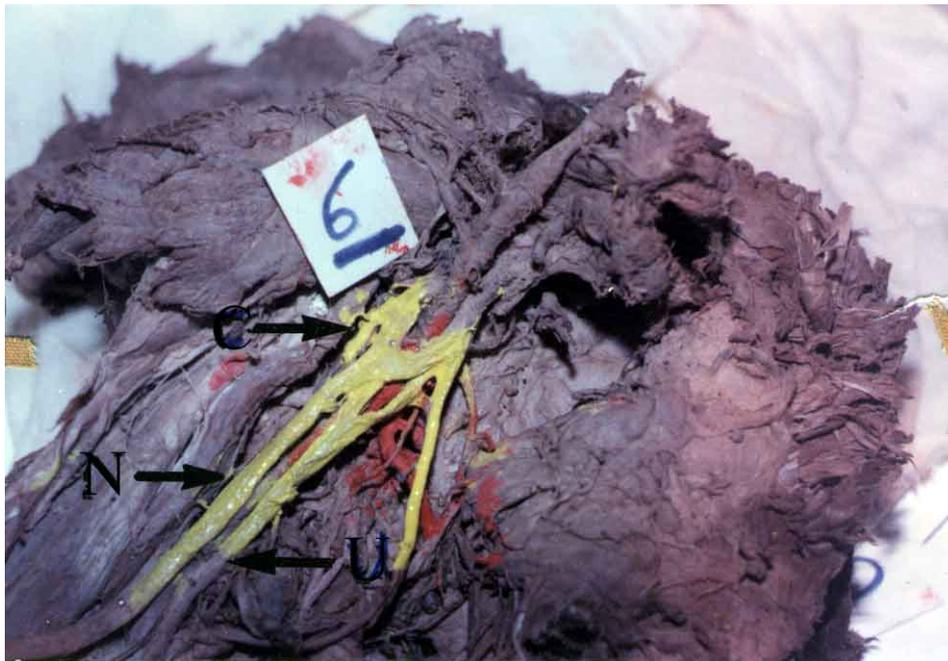


Fig.2: Showing ulnar nerve (U) formed by two roots, first root from medial cord and second root from lateral cord, median nerve (N) and musculocutaneous nerve (C).

Regarding the posterior cord of the brachial plexus, the following observations have been noticed:

- 1- The origin of the radial nerve has been found to correspond accurately to the description given in the textbooks of anatomy.

2- The origin of the axillary nerve was relatively constant, where in 37 cases (61.7%), the axillary nerve was found to be the last branch given off by the posterior cord before it continued as the radial nerve, while in 10 cases (16.7%) a common stem for it and the thoracodorsal nerve was given off by the posterior cord.

3- The thoracodorsal nerve.

All textbooks of anatomy mentioned that it arises from the posterior cord midway between the upper and lower subscapular nerves (Woodburn, 1983) and some authors consider it as the middle subscapular nerve, whereas the present study shows that only in 25 cases (41.7%) it corresponds with the description given by these authors. In 10 cases (16.7%), there was a common stem for it and the axillary nerve.

The present work shows that in 13 cases (21.7%) the thoracodorsal nerve was the last branch given off by the posterior cord before it continued as the radial nerve (Fig. 3), and in 12 cases (20%) it arose at the same level as the axillary nerve. The last two variations for the level of origin of the thoracodorsal nerve have not been reported before except by one worker. (Bergman et al., 1984) who stated that there are 3 subscapular nerves (upper, middle & lower) in addition to the thoracodorsal nerve, but they did not give its level of origin.

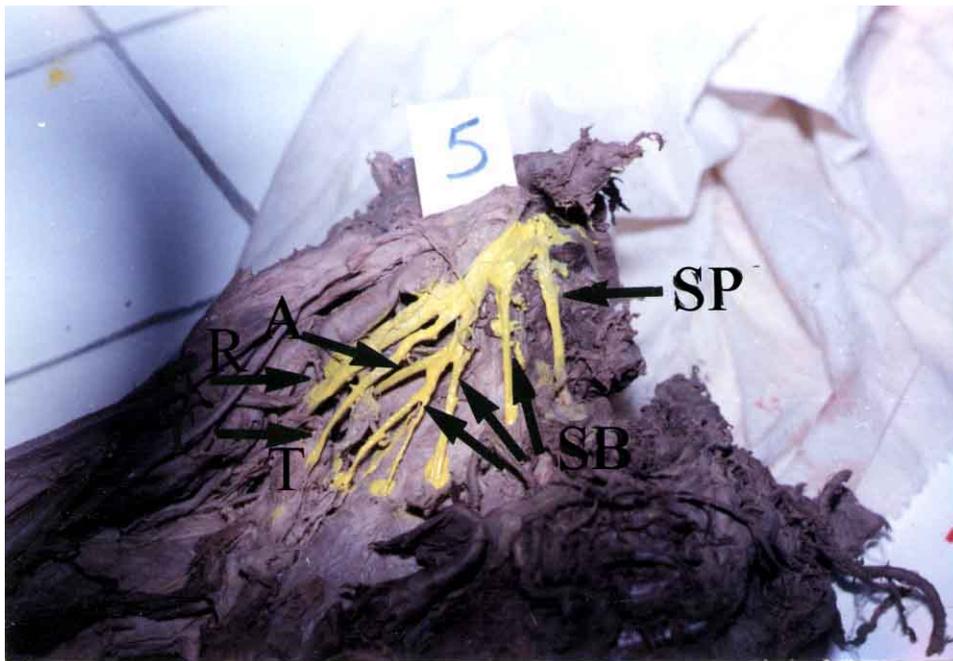


Fig. 3: Posterior cord showing:

- a. Suprascapular nerve as a first branch. (SP).
- b. Three subscapular nerve. (SB).
- c. Thoracodorsal nerve (T) as last branch before the posterior cord continued as the radial nerve. (R).
- d. Axillary nerve (A).

4- In 2 cases (3.7%) of the present work shows that the suprascapular nerve arose as the first branch from the posterior cord (Fig. 3), while normally it arises from the superior trunk

of the brachial plexus (C₅₋₆). This anomaly has not been reported by any previous investigator.

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