

## Thoracodorsal Nerve Variation: A Case is seen in Iranian Men Cadaver

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### Abstract

Knowing the exact anatomy of the human body and the available variations can help the doctor in accurately diagnosing the disease. One of the complex anatomical areas of the human body is the axillary region (Figure 1), which is very important due to the multiplicity of structures in this area and has several variations. While dissecting the axillary region of a male corpse, we noticed a change in the brachial plexus and saw that in the brachial plexus, the thoracodorsal nerve separates from the lower sub scapular nerve.

### Introduction

The brachial plexus is composed of the anterior branches of the four cervical spinal nerves (C5, C6, C7, C8) and most of the first thoracic spinal nerve (T1), and in some cases also the anterior branches of C4 or T2 (Figure 2 and 3). They are involved in the formation of this network. The upper trunk is formed from the assembly of the anterior branches C5 and C6, and the lower trunk is formed from the assembly of the anterior branches C8 and T1. The anterior branch of C7 forms the middle trunk alone, then each of the trunks is divided into two anterior and posterior branches. From the connection of the posterior branches of the three upper, middle and lower trunks, the posterior rope is formed. From the assembly of the anterior branches of the upper and middle trunks, the outer rope is formed and the anterior branch of the lower trunk alone forms the inner rope. Numerous branches branching from the roots, trunks and ropes, sense and movement of the limbs. They supply the upper branches. The branches branching from the ropes of the brachial plexus are as follows. Internal pectoral 2. Internal head of median nerve 3. Ulnar nerve 4. Internal cutaneous nerve of arm 5. Internal cutaneous nerve of forearm and posterior cord branches are nerves 1: axillary 2. Radial 3. Upper scapular sub-4. Lower inferior scapular and 5. Thoracodorsal are formed [1-3].

Variations related to the brachial neural network are common. Studies on corpses reveal the existence of numerous variations in the formation of roots, trunks, ropes and lateral branches of the brachial plexus as well as the distribution of these nerves [4,5]. Information on the anatomy and variations of the brachial plexus. In neck, shoulder and axillary surgeries, it can significantly reduce the amount of neurological damage [6].

### Case Report

The dorsal thoracic nerve, which innervates the latissimus dorsi muscle, usually branches from the space between the upper and lower sub scapular nerves to the posterior cord of the brachial plexus, but during dissection of the axilla in the upper limb, Tehran University of Medical Sciences Dissection Hall It was observed that this nerve separates from the inferior sub-capular nerve from the posterior cord of the brachial plexus. In fact, the nerve that reaches the latissimus dorsi muscle is distal to the inferior subcapular nerve (Figure 4).

### Discussion

The formation of the brachial plexus begins in the fourth week of the embryo [7]. The spinal nerve axons grow distally to reach the mesenchyme of the limb bud. They are then divided into abdominal and dorsal parts. The direction of axonal growth and development is regulated by a series of complex signal exchanges between the host muscle and the organizer. Any disturbance in these signal exchanges can lead to different and distinct variations in the brachial plexus [8,9]. So far, various variations have been reported in connection with the formation of trunks, ropes, and end divisions of the brachial plexus. In a study by Ballesteros and Ramirez, it was stated that the thoracodorsal nerve in 78.6% of the bodies was of normal origin from the posterior rope. And has

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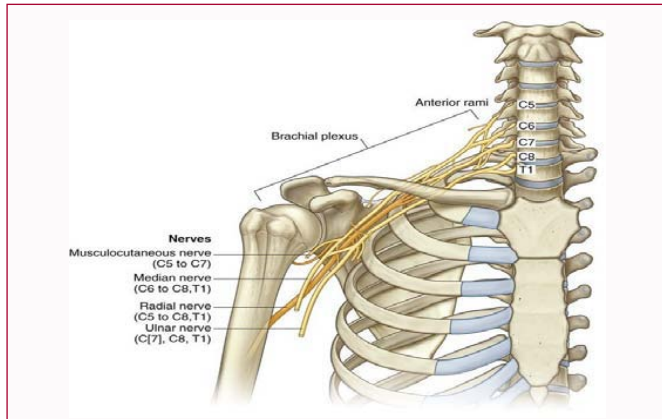


Figure 1: Axillary region and position of brachial plexus.

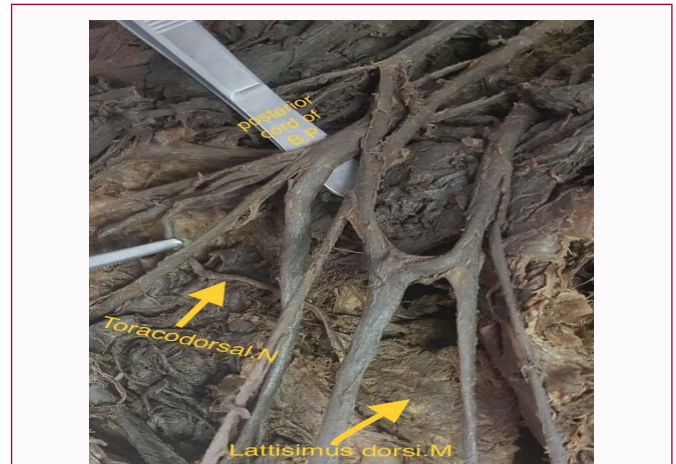


Figure 4: Case variation: thoracodorsal nerve separate below to subscapular nerve.

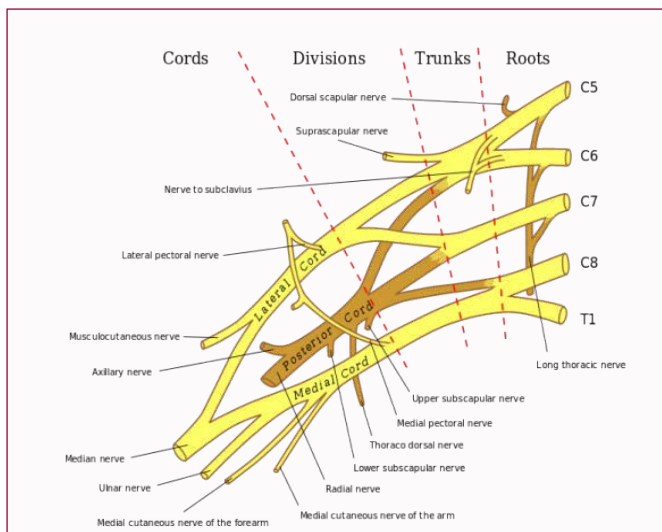


Figure 2: Brachial plexus and its branches.

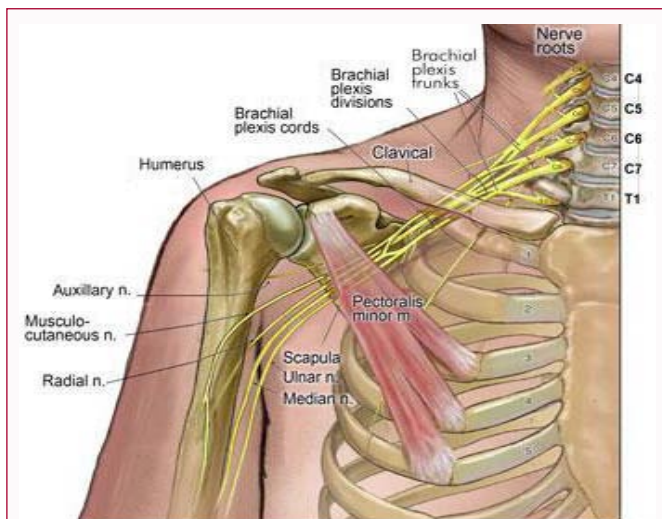


Figure 3: Position of brachial plexus relative to pectoralis minor muscle.

variation in 21.4% of corpses. It was also stated that the thoracodorsal nerve is separated from the radial nerve in 8.9%, the axillary nerve in 8.9% and the medial trunk of the brachial plexus in 3.6% [10]. In another study, the rate of thoracodorsal nerve separation from axillary

and radial nerves was 13 and 5.5%, respectively [11]. In another study, it was found that 5% of the brachial plexus in human embryo had a similar variation to that observed, and the order of separation of the sub scapular and thoracodorsal nerves from the proximal to the distal, respectively, was as follows: Sub-scapular nerve The superior, inferior sub scapular nerve and thoracodorsal nerve of the brachial plexus are important because of their complex structure and relationship to other structures [12]. Awareness of brachial plexus variations is essential for surgeons in head and neck surgeries, especially in the axilla [13,14]. Knowledge of these variations can help the physician to more accurately diagnose the damaged area (or nerve). It also helps prevent nerve damage during surgery [15]. If the thoracodorsal nerve is damaged during axillary surgery or scapular lymph node surgery, the latissimus dorsi muscle is paralyzed and the person is unable to lift the trunk, variations in the brachial plexus can also cause local anesthesia. Failure in the brachial region. Therefore, in the treatment of arm injuries, the surgeon should be well aware of the anatomy as well as the variations of this neural network [16].

**Suggestion**

Further studies in the field of anatomy and finding a different and better way to dissect the body are recommended.

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