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The Nerve to the Long Head of the Triceps Brachii Muscle and Its Motor Point: A Cadaveric Study.

Mee-Gang Kim[1*], Eun Ah Hong[2], Yong Seok Nam[2], Jong-In Lee[1†]

Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Department of Rehabilitation Medicine[1], Institute for Applied Anatomy, College of Medicine, The Catholic University of Korea, Department of Anatomy[2]

Introduction

The motor branch of the long head of the triceps brachii (LHT) is known to arise from the radial nerve in the major anatomy textbooks. However, some cadaveric studies and case reports have shown that the LHT is innervated by the axillary nerve. In perspective of electrodiagnostic medicine, the axillary innervated variation of the LHT may have some clinical importance for diagnosis and treatment. The purpose of this study is to investigate the innervation pattern of nerve to the LHT, and to investigate the motor point of the LHT in reference to palpable surface landmarks.

Materials and methods

27 shoulders of 14 fresh cadavers were dissected. The origin, number, and penetrating points of the nerve branches to the LHT were identified. In 27 shoulders, the distances between the inferolateral corner of the acromion and the penetrating points to the LHT, the bifurcation of the long and the lateral head of the triceps brachii were measured in relation to the reference line between the acromion and the medial epicondyle of the humerus (AA-ME). The proximal and distal points where the AA-ME crossed the LHT were distinguished and the distances from the acromion were measured.

Results

In all 27 shoulders, the LHTs were observed to have exclusive innervation by the radial nerve, and no variation of the axillary innervation was found. The nerve branches were separated into smaller branches penetrating the LHT. The number of the nerve branches ranged from 2 to 4, and that of the terminal branches penetrating the LHT ranged from 4 to 9. The mean length of AA-ME was 252.52±19.79mm. The distance to first penetrating point was 64.72±11.48mm (25.57% of total length), and to the last penetrating point was 107.06±15.69mm (42.38% of total length) (Figure 1). The mean distance from the acromion to the deltoid and the bifurcation was 64.46±12.44mm (25.39% of total length) and 99.57±17.98mm (39.51% of total length), respectively (Table 1).

Discussion

The LHT of 27 specimens were all innervated by the multiple motor branch of the radial nerve. We found only radial innervation to the LHT in 27 cadaveric shoulders. Although we did not find any variation from the classic pattern of radial-innervated LHT, this result may contribute to enrich the published data because previous literatures did not include East-Asian population. The motor points of the LHT were from 25.57% to 42.38% of the AA-ME on average. Anatomical knowledge of the branching pattern and the motor point of the nerve to LHT would have clinical significance, in motor point block of the LHT to control spasticity, or motor nerve transfer surgery in upper brachial plexus injury or isolated axillary nerve injury.

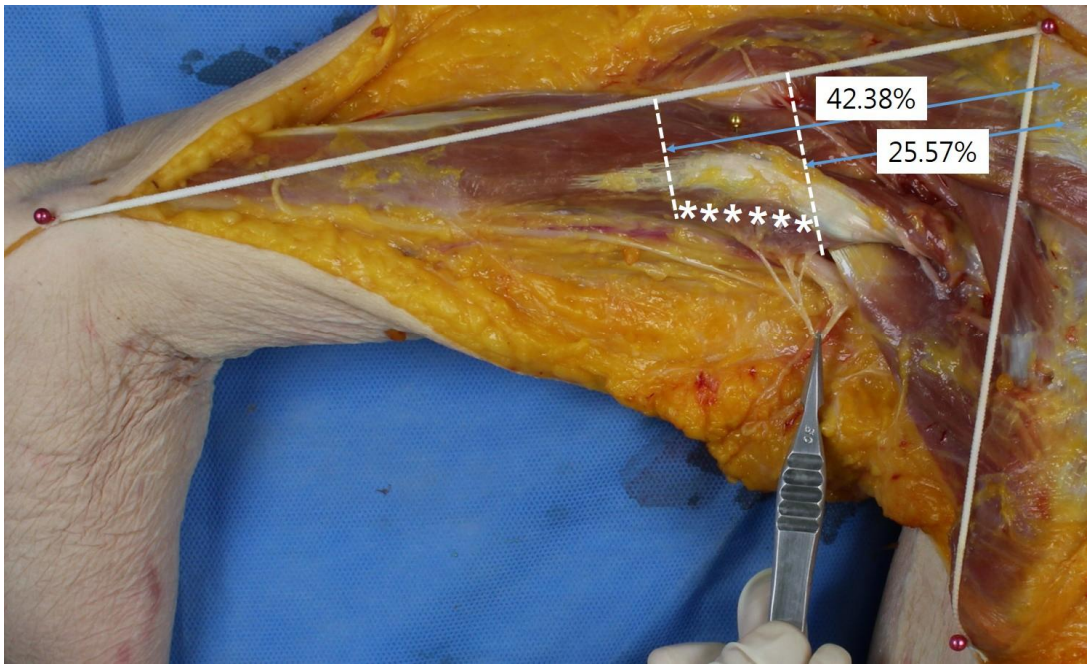

Figure 1. The motor points (asterisk) of the long head of the triceps brachii muscle, in reference to the acromion and the medial epicondyle of the humerus.

Table 1. The long head of the triceps brachii (LHT) and the radial nerve in relation to the reference line between the acromion and the medial epicondyle (AA-ME) of the humerus. Abbreviation: AA, the acromion of the scapula; ME, the medial epicondyle of the humerus; LHT, the long head of the triceps brachii

	The nerve to the LHT
Origin	Posterior trunk of brachial plexus
	Radial nerve (n=27)
Number of branches	2 (n=10)
	3 (n=11)
	4 (n=2)
Length of the reference line (AA-ME)	252.52±19.79mm
Starting point of radial branches	41.64±19.18mm (16.54%)
Penetrating point of radial branches	First entry 64.71±11.48mm (25.57%)
	Last entry 107.06±15.69mm (42.38%)
Crossing point with the deltoid	64.46±12.44mm (25.39%)
Superficial bifurcation of the long and the lateral heads of the triceps brachii	99.57±17.98mm (39.51%)