

Variations of pronator teres muscle. A morphological study

Sharma M¹, Prashar R²

¹**Dr Mamta Sharma**
MBBS, MS, Anatomy
Associate Professor
Punjab Institute of Medical Sciences
Jalandhar, Punjab, India

²**Dr Rajeesh Prashar**
MBBS, MS Surgery
Civil Hospital Kapurthala Punjab,
India
rprashardr1195@rediffmail.com

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Correspondence to:

Dr Mamta Sharma
9463369191
rprashardr1195@rediffmail.com

ABSTRACT

The muscles of shoulder girdle and elbow act together to position the hand accurately for manipulative functions. The superior extremity of man has undergone various modifications during evolution one of which is the lateral rotation of forelimbs at joints with pectoral girdle. The aim of the present study was to study the variations of pronator teres muscle. The present study was done on 60 upper limbs (56 Males and 4 Females) of embalmed adult human cadavers obtained from Deptt of Anatomy, Govt. Medical College Patiala. The humeral head of PT was found in all the cases, while Ulnar head was present in 52(86.7%) cases. The Humeral head was muscular in all the cases. The Ulnar origin was muscular in 15 cases (28.84%), tendinous in 7 cases (13.46%) & mixed in 30 cases (57.7%). In 2 (3%) cases there was double humeral head and the median nerve was passing between them. In 3cases (5%) there was high origin of humeral head of Pronator teres from medial intermuscular septum. Anatomy instructors and health professionals should be aware of the common variations in muscles and tendons of the forearm, not only for their academic interest but also for their clinical and functional implications.

Key Words: Pronator teres, humeral head, ulnar head, medial intermuscular septum, coronoid process, entrapment neuropathy

Introduction

In anatomy, normality embraces a range of morphologies and includes those that are most common and others called variations which are less frequent but not considered abnormal. [1] The superior extremity of man has undergone various modifications during evolution one of which is the lateral rotation of forelimbs at joints with pectoral girdle. [2] Pronator teres is the muscle of superficial layer of anterior group of forearm muscles. It has humeral and ulnar attachments. This muscle pronates the forearm and is a

weak flexor of the elbow. [3] Origin of Pronator teres:

Humeral Head: Proximal to medial epicondyle, Common flexor tendon, Adjacent intermuscular septum, Antebrachial fascia

Ulnar Head: Medial side of the coronoid process of ulna, Distal to the attachment of flexor digitorum superficialis, joins the medial head at an acute angle

Insertion: Midway along the lateral surface of the radial shaft

Nerve supply: Usually receives two or more nerves, but may receive a single one. They typically arise from the

Median nerve just before this nerve passes between the two parts of this muscle and contain fibres from C6 and C7 nerves.^[4]

Material and Methods

The present study was done on 60 upper limbs (56 Males and 4 Females) of embalmed adult human cadavers obtained from Deptt of Anatomy, Govt. Medical College Patiala. The upper limb specimens were dissected in the following manner- The skin was reflected from the front of arm. The superficial fascia was removed, and then the deep fascia was reflected. This exposed the muscles and tendons of the anterior group of forearm.

Observations

Pronator teres muscle was identified as the lateral most muscle of the superficial group of flexor muscles. Medial to pronator teres was lying flexor carpi radialis and medial to it was Palmaris Longus Muscle. When Pronator teres was traced upto its origin it was found that origin of the muscle was by two heads: Humeral and Ulnar. The Humeral head of PT was arising from common flexor origin from medial epicondyle of humerus and lower part of the medial supracondylar ridge and the ulnar head was arising from the coronoid process of the ulna and joined the deep surface of the humeral head. This was in accordance with text book description.

The humeral head of PT was found in all the cases, while Ulnar head was present in 52(86.7%) cases. The Humeral head was muscular in all the cases. The Ulnar

origin was muscular in 15 cases (28.84%), tendinous in 7 cases (13.46%) & mixed in 30 cases (57.7%). In 2 (3%) cases there was double humeral head and the median nerve was passing between them. In 3 cases (5%) there was high origin of humeral head of Pronator teres from medial intermuscular septum. The muscle was getting insertion along the lateral surface of the shaft of the radius and the nerve supply of the muscle was from median nerve in all the cases.



Fig.1 High origin of humeral head of Pronator teres from medial intermuscular septum
MIMS – Medial Intermuscular Septum, PT- Pronator Teres

Discussion

In 60 upper limbs, humeral head of PT was found in all the cases, ulnar head was present in only 52 (86.7%) cases. The humeral head was muscular in all the cases. The ulnar origin was muscular in 15 cases (28.84%), tendinous in 7 cases (13.46%) and mixed in 30 cases (57.7%). In 2 (3%) cases there was double humeral head and the median nerve was passing between them.

Earlier Nebot-Cegarra et al^[5] found that humeral head was present in all the

cases while ulnar head was present in 47(78.3%) out of 60 cases. The double humeral head of Pronator teres in 3 cases (5%) out of 60 limbs and they further observed that median nerve was passing between two humeral heads in 2 cases (3%) and between ulnar and humeral head in 58 cases (96.6%). In a study conducted by Jamieson and Anson.^[6] Ulnar head of Pronator teres was found absent in 26(8.7%) out of 300 limbs. Anson^[7] observed that the median nerve was passing between ulnar and humeral heads in 198 cases (82.5%) out of 240 arms, passing beneath the humeral head in 21 cases (8.75%) where ulnar head was lacking, behind the ulnar head in 15 cases (6.25%) and the nerve pierced the humeral head in 6 cases (2.5%) only. The high origin of Pronator teres from medial inter muscular septum was found in 3 cases (5%) in the present study. Dellon^[8] reported high origin of pronator teres in 18 cases (17%) out of 104 upper extremities. Similarly, Standring S^[9] mentioned high origin of Pronator teres, without giving actual statistics. Double humeral head of pronator teres with median nerve passing between them - 2 cases (3%) may lead to entrapment neuropathy. High origin of pronator teres from medial intermuscular septum - 3 cases (5%) may provide a proximal site for double crush syndrome of the median Nerve.

So, it can be stated that the muscles are notoriously variable morphologically and no standard pattern can be given regarding the

arrangement of the tendons of anterior group of forearm muscles. An anomalous muscle usually does not cause any symptom and is of academic interest only. It becomes a surgical problem when anomalous muscle produce symptoms or are difficult to differentiate from soft tissue tumours and important in entrapment neuropathy. Hence any surgical procedure in this particular region should be planned carefully in advance keeping in mind the variations which can be encountered.

References

1. Tupper JW. Pollex abductus due to congenital malposition of the flexor pollicis longus. The journal of Bone and Joint Surgery 1969 Oct; 51A (7):1285-9.
2. Gray H, Williams PL, Bannister LH. Skeletal system. In: Williams PL, editor. Gray's Anatomy. 38thed. New York: Churchill Livingstone; 2000.p.844-8.
3. Hollinshead WH. Flexor Forearm. In Hollinshead WH editor. Functional Anatomy of the Limbs and Back. 2nd ed. Philadelphia: WB Saunders Company; 1960.p.141-51.
4. Hollinshead WH. Arm, Elbow and Forearm. In: Hollinshead WH editor. Anatomy for surgeons Vol 3, 2nd ed. Philadelphia; Harper and Row; 1969.p.400-23.
5. Nebot-Cegarra J, Perez Berruezo J, Reina de la Torre F. Variations of the pronator teres muscle: predispositional role to median nerve entrapment. Arch Anat Histol Embryol 1991-92;74:35-45.
6. Jamieson RW, Anson BJ. The relation of the median nerve to the heads of origin

of the pronator teres muscle: A study of 300 specimen. Quart Bull North western Univ M School 1952;26- 34.

7. Anson BJ. Muscles of the forearm. In Anson BJ editor. An Atlas of Human Anatomy. WB Saunders company: Philadelphia; 1950.p.124-30.
8. Dellon AL. Musculotendinous variations about the medial humeral epicondyle. J Hand Surg Br;1986 Jun;11(2):175-81.
9. Gray H, Williams PL, Bannister LH . Muscles. In: Williams PL, editor. Gray's Anatomy. 38thed. New York: Churchill Livingstone; 2000.p.862-4.

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