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Case Report

A UNIQUE UNREPORTED ANOMALOUS MUSCLE OF SCAPULAR REGION AND ITS CLINICAL IMPLICATIONS-A CASE REPORT

Dr. Takkallapalli Anitha[1], Dr. Dattatray Dombe[2], Dr. P.Shanmugaraju[3], Mr. Naresh Thaduri [4].

Associate Professor, Department of Anatomy[1], Assistant Professor, Department of Anatomy, Assistant Professor, Department of Physiotherapy & Rehabilitation[3], Tutor, Department of Anatomy[4], Chalmeda Anandrao Institute of Medical Sciences, Bommakal, Karimnagar, Andhra Pradesh, India.

ABSTRACT

Back ground: It is a well documented fact that the lower border of spine of scapula gives origin to deltoid muscle only. We report a case of anomalous muscle arising from the medial aspect of lower border of spine of scapula in the left upper extremity of a 59 year old male cadaver. The anomalous muscle is innervated by axillary nerve which also gave a motor twig to the long head of triceps brachii. This variation was unilateral. The morphological, embryological and clinical significance of the anomalous muscle is discussed.

KEY WORDS: ANOMALOUS MUSCLE; TRICEPS BRACHII; LATISSIMUS DORSI; AXILLARY NERVE.

Address for Correspondence: Dr. T. Anitha, MD (Anatomy), Associate Professor, Department of Anatomy, Chalmeda Anandrao Institute of Medical Sciences, Bommakal, Karimnagar, Andhra Pradesh, India. Ph. No : +91 98 490 36363. **E-Mail:** tanita.205@gmail.com.

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INTRODUCTION

Anatomical variations of the muscles and nerves of upper limb have been commonly reported and well documented. We describe a rare neuromuscular variation of the scapular region of left superior extremity hitherto not reported to the best of our knowledge. Awareness of these variations is necessaryduring the radio diagnostic and surgical procedures of upper limb.

CASE REPORT

During routine cadaveric dissections in the Department of Anatomy, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, India, we came across an anomalous muscle arising from the lower border of spine of left scapula close to the origin of deltoid muscle.

The length of the anomalous muscle was 8.1 cm and breadth was 4.5cm. The muscle arose by a fleshy belly and coursed downwards superficial to infraspinatus and teres minor muscles. At the lower border of teres minor, the muscle split into two fleshy slips. The superior slip is bulky, passed superficial to teres major and joined the lower border of latissimus dorsi. The inferior slip is slender and is continuous with the long head of triceps brachii muscle. The anomalous muscle is supplied by posterior division of axillary nerve which also gave a small motor twig to the long head of triceps brachii [Fig.1].

DISCUSSION

The neuromuscular variations of the upper limb are clinically important for surgeons, orthopaedicians and anesthetists performing pain management therapies on the upper limb.

Anomalous muscle slips from long head of triceps brachii, latissimus dorsi and deltoid muscle have been reported earlier.

A fourth head of the triceps brachii may be found arising from various points in the humerus, scapula, shoulder joint capsule or the coracoid process[1].

Macalister [2] has frequently seen the long head of triceps split, one attached to the capsule and the other to the tricipital spine, or the first slip was found splitting the capsular ligament like the curved head of rectus femoris.

The existence of a slip from the tendon of latissimus dorsi has been seen several times. It was described by Bergman(1855); and it was also mentioned by Halberstsma under the name of anconeus quintus; this may occasionally come from the teres major[3].

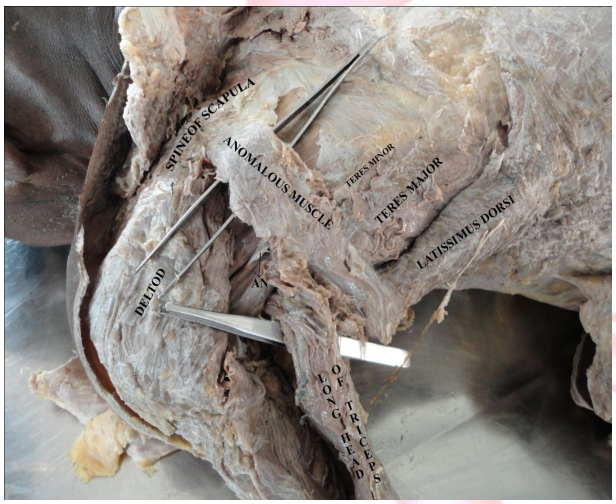

Fig: 1 Showing Anomalous Scapular Muscle with its nerve supply.

Macalister [2] has also reported a tendon of union from the lower border of latissimus dorsi to the long head of triceps brachii. He also observed a fleshy slip of connection from the costal fibres of latissimus dorsi into the same part of triceps brachii.

The latissimocondyloideus / dorsoepitrochlearis muscle is found in about 5% of individuals and is described as a part of the triceps brachii that attaches proximally to the latissimus dorsi tendon of insertion[4,5]. Any of the above description does not mention additional attachment to spine of scapula which is seen in the present case.

The continuation of the fibres of the deltoid muscle into the trapezius; fusion with pectoralis major; and the presence of additional slips from the vertebral border of scapula, infraspinous fascia, and the axillary border of scapula are the commonly reported variations of the deltoid muscle[6]. We have not observed any slips from the above mentioned sources in our present study.

Although anatomical variants of triceps, deltoid, latissimus dorsi have been reported earlier none of the exisisting literature gives details regarding any anomalous muscle arising from medial aspect of lower border of the crest of spine of scapula and becoming continuous with long head of triceps brachii and latissimus dorsi.

The long head of triceps and the anomalous muscle are innervated by posterior division of axillary nerve from quadrilateral space [Fig 1] in the present case. A retrospective clinical study of traumatic injuries of the axillary nerve with associated paralysis of the long head of triceps suggests that the motor branch of the long head of triceps may arise from the axillary nerve [7].

DEVELOPMENTAL BASIS

The origin of anomalous muscles may be explained on the basis of embryogenesis of muscles of the arm. The intrinsic muscles of the upper limb differentiate in situ from the limb bud mesenchyme of the lateral plate mesoderm. At a certain age of development, the muscle primordia within the different layers of the arm fuse to form a single muscle mass; thereafter, some muscle primordia disappear through cell death. Failure of muscle primordia to disappear during embryonic development may account for the presence anomalous muscle slips [8].

The variations of the nerves of the upper limb can be explained embryologically. The upper limb buds lie opposite to the lower five cervical and upper two thoracic segments. As soon as the buds form, the ventral rami of spinal nerves penetrate into the mesenchyme of limb bud and establish intimate contact with differentiating mesodermal condensations. The early contact between nerve and muscle is a prerequisite for their complete functional differentiation [9].

As the guidance of the developing axons is regulated by expression of chemo-attractants and chemo-repellents in a highly coordinated site specific fashion, any alteration in signaling between mesenchymal cells of limb buds and neuronal growth cones can lead to significant variations [10].

CLINICAL SIGNIFICANCE

Knowledge of anomalous muscles and their innervations is of interest to anatomist and clinician alike.

The close relationship of this anomalous muscle to the neurovascular structures found in the quadrilateral space may cause compressive neuropathy. As the neurovascular bundle enters this space it may be compressed, eliciting clinical symptoms characterized by i) Pain localized to the shoulder ii) Paresthesia in a non-dermatomal distribution iii) Discrete point/localized tenderness in the spatium axillare laterale (Quadrilateral space) and iv) An arteriogram showing compression of the posterior,circumflex humeral artery with abduction of shoulder. Cahill and palmer[11] have recognized this constellation of symptoms as the "Quadrilateral space" syndrome.

The long head of triceps is used as a free functioning muscle graft[12]. The triceps musculo cutaneous flap is used for chest wall defects and to release axillary contractures[13,14]. In case of massive tear of the rotator cuff muscles, the long head of triceps is used as interposition muscle flap for the surgical correction of the rotaror cuff muscles[15]. Anomalous muscle slip which continued with long head of triceps in the present case is an added advantage in the above conditions.

The knowledge of variations in the nerve supply of long head of triceps and the anomalous muscle in the present case is important.While examining patients with traumatic injury involving axillary nerve, it is important to look for the paralysis of the long head of triceps brachii[16].

Transfer of latissimus dorsi to replace a paralysed anterior deltoid by a new technique using an inverted pedicled graft has been reported [17]. An additional attachment from the anomalous muscle may be of more help in replacing some of the functions of a paralyzed deltoid.

CONCLUSION

Awareness of the Anatomical variations of anomalous muscles around shoulder joint and their innervations is important while performing arthroscopic surgery of shoulder joint, during infraclavicular brachial plexus block, nerve transplantation procedures. A thorough review of the literature failed to reveal any previous reports of this variant and hence this case report constitutes the first description of this anomaly.

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