

# Variant Insertion of Double - Tailed Teres Major, an Anatomical Case Report

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## ABSTRACT

**Introduction:** teres major muscle of the scapular region, is located inferior to the teres minor. This connects the humerus bone with scapula posteriorly. This has anatomical importance of forming the intermuscular spaces and the clinical importance of repair of rotator cuff muscle tendons. Teres major muscle along with the latissimus dorsi, adducts and medially rotates the arm and assists in the extension of shoulder joint. The anatomical variation of teres major muscle is rarely documented. We have found the variation in teres major muscle insertion in a female cadaver on the left side, in which the said muscle merged with the triceps brachii and latissimus dorsi.

**Keywords:** Teres major; Latissimus dorsi; Triceps brachii .

## Introduction

Teres major (TMaj) is the muscle of the back, which originates from the lower one third of dorsal surface of the lateral border and inferior angle of the scapula. This inserts into the medial lip of bicipital groove of humerus<sup>1</sup>. TMaj along with the latissimus dorsi (LAT) rotates the arm medially, adducts the arm, and assists in extension of the arm. The nerve supply of TMaj is the lower subscapular nerve, which also supplies the subscapularis muscle. While searching the literature, we have found that many variations of TMaj muscle are not documented. To explain unusual movements of the arm, the rare variations of TMaj are necessary to be recognized. Here we report an unusual kind of variation.

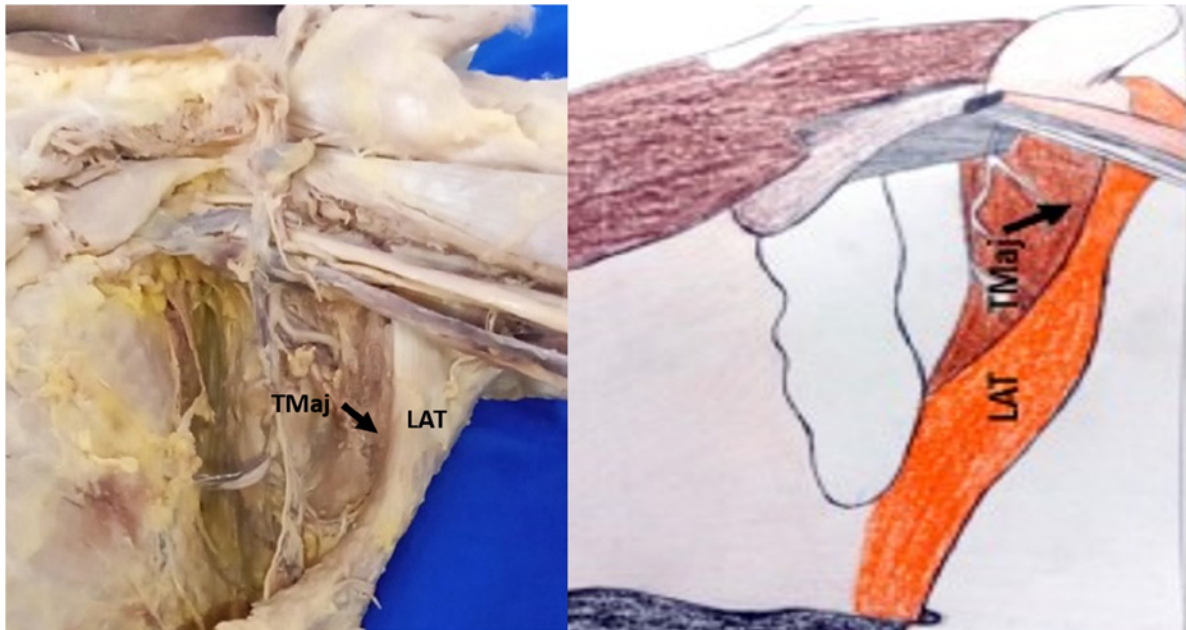
## Case Report

During the routine dissection class for postgraduate students, we have observed the variation in insertion of the left TMaj muscle in an embalmed cadaver. The cadaver belongs to female of 75 years old, who died due to the chronic renal failure. The uncommon division of TMaj muscle tendon in a “V” shaped insertion was observed. The muscle fibers of TMaj divided into 3 parts at its insertion, the one in the anterior, where the fibers of the TMaj merged with LAT muscle fibers (Fig. 1), and with its tendon getting inserted into the floor of bicipital groove. The other fibers of TMaj muscle merged with the triceps brachii (TRI) and inserted into the infraglenoid tubercle of scapula. Both these muscle fibers formed “V” shaped



**Figure 1.** showing double tailed insertion of teres major. Black arrow showing the tendons of Teres major merging with Latissimus dorsi and triceps brachii. White arrow showing tendon of Latissimus dorsi.  
LAT= Latissimus dorsi, TMaj= Teres major, TR= Triceps brachii.

insertion, in which one part of “V” merged with long head of TRI muscle and other part of “V” merged with the LAT muscle (Fig. 2). Third part of the muscle tendon is observed to have normal insertion into the medial lip of bicipital groove.



**Figure 2.** showing teres major fibres merging with Latissimus dorsi. LAT= Latissimus dorsi, TMaj= Teres major.

It was observed that, TMaj muscle fibers divided and inserted along with tendon of long head of TRI superiolaterally (Fig. 1) and inferiolaterally merged with the tendon of LAT (Fig. 2). The belly of TMaj was 8.5cm in length and the width at origin was 2.8cm, whereas the width at belly was 4.4cm and the thickness of the belly was 1cm. The fibers of TMaj merging with the tendon of long head of TRI was 6.4cm in length, width of 1.4cm and the thickness was 1.1cm. The fibers of TMaj with the normal insertion, i.e., medial lip of bicipital groove of the humerus was 5.4cm in length, width about 2cm and the thickness was 0.9cm. The tendon of TMaj merging with the tendon of LAT, measured 4.1cm by length, 1.5 cm by width, and 0.8 cm by thickness.

On the right side upper limb, the TMaj was found to be a normal insertion in the medial lip of bicipital groove of the humerus and there was no anatomical variation.

## Discussion

The muscles of the upper limb with anatomical variations have been well documented in the literature. But the variations of TMaj muscle are rarely reported. It has been observed that muscle fibers of TMaj and LAT could be attached<sup>2</sup>, the fusion of TMaj with TRI is very rare. Herein, we found that the muscle fibers of TMaj attached with the tendon of LAT in the superolateral direction. In the present study, the total length of TMaj muscle from its origin to the humeral insertion

was 13.9cm, from origin to TRI insertion was 14.9 cm, and from origin to LAT insertion was 12.6 cm, which was lesser than the dimensions observed by Sahin *et al.*, 14.5-18.8 cm<sup>2</sup>. The muscle tendons of LAT, TMaj play an important role in tendon transfer surgeries and the

salvage procedure in case of rotator cuff deficiency<sup>3-7</sup>. It has been noted that after the transfer surgery the TMaj muscle has the very good functional activation<sup>2</sup>. Moreover, the LAT can be used for reconstruction of the breast, cardiomyoplasty, and other reconstructive surgeries. Due to high significance of the TMaj for surgeons, the knowledge of variations of this muscle-tendon insertion is very important. It is useful if TMaj muscle has three different tendons, as observed in this case. The additional insertion tendons can be helpful for tendon reconstruction surgeries and tendon transfers. Any of tendon can be harvested if there is enough knowledge about such variations. The surgeon can find out by doing the preoperative ultrasonography about this kind of variations.

In the muscle development of limb buds, the muscle mass divides into dorsal and ventral parts<sup>8</sup>. The TMaj and TRI develop from the dorsal muscle mass and because of this, both muscles can persist as the same musculo-tendinous structures as observed in this case. Kazum *et al.*<sup>9</sup> observed tendon transfer with LAT along with TMaj or in isolation, which was proven to have similar effect in restoring the external rotation in the repair of a massive postero-superior cuff tears. This was treated with reverse shoulder arthroplasty in their clinical study<sup>9</sup>. The tear of both muscle LAT and TMaj at a time have been reported very less. Takase 2018<sup>10</sup> reported a rare case of a tear of the TMaj muscle alone. The first description of tendon transfer with the TMaj and latissimus dorsi (LD) was described

in 1934 by L 'Episcopo<sup>11</sup> in the treatment of obstetric brachial plexus palsy in 6 children. It is very important to know about exact anatomical location of site of insertion of TMaj and LAT in tendon transfer surgeries for LAT muscle alone<sup>12</sup>.

## Conclusion

The knowledge of this rare case variation will be useful to the orthopedic and plastic surgeons during the tendon transfer procedures. It will also enlighten to anatomists during the dissection class.

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