

Tibialis Anterior Partial Rupture Mimicking Muscle Hernia: A Rare Case Report

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ABSTRACT

Rupture of tibialis anterior tendons is infrequently described in literature, and those described were around the ankle, either at the origin or in the tendon substance. To our known knowledge only very few cases of rupture of the tibialis anterior at musculotendinous junction were reported. We highlight the occurrence of rupture at the musculotendinous junction in tibialis anterior muscle after trauma, presenting as a soft tissue mass, the need to differentiate it from traumatic muscle hernia, mechanism of injury and its ultrasound and MRI findings.

Keywords: Anterior tibial muscle, Diagnosis, Differential, Hernia, Muscles, Rupture, Tendon Injuries, Trauma, Young adult

CASE REPORT

A 20-year-old male presented to the outpatient department with complaints of pain and swelling over the anterior aspect of lower leg, for 10 days following an automobile accident, where the foot was forced into hyper plantar flexion along with twisting of leg and ankle. He felt excruciating pain and weakness in the leg after the event. Though he could stand, he could barely walk due to pain. He went to a local doctor and got treated by analgesics and took rest for one week. Though the pain has now decreased to half of the initial event, the patient had difficulty walking and constant discomfort while walking.

On examination, there was no gait abnormality, there was a noticeable swelling in the middle third of the leg of size 6×3 cm adjacent to the shin of tibia [Table/Fig-1], the swelling was moving with movements of the foot, and it became prominent on active dorsiflexion of ankle. On palpation, tenderness was felt at the site, and the bulge had the same consistency as the muscle, and was moving up and down with the movements of the ankle. There was no discontinuity distal to the mass. The patient was complaining of pain on dorsiflexion of his left ankle, and the prominence of the tendon can be seen and felt at the ankle during dorsiflexion of foot. The power of dorsiflexion was grade 4 (medical research council) and the neurological examination was normal. Antalgic limp was noted.

The radiography of the affected limb did not show any abnormality. Sonography revealed a partial tear at musculotendinous junction [Table/Fig-2].

The MRI of the involved limb showed heterogeneous signal intensity that is hyper intense on T2 and hypo intense with peripheral hyper intensity on STIR noted at musculotendinous junction of the tibialis anterior muscle suggestive of tear of at least 50% of the muscle [Table/Fig-3,4].

We diagnosed it as a case of partial rupture of musculotendinous junction of the tibialis anterior and treated the patient conservatively by analgesics and immobilization in 15° or 15 degrees of dorsiflexion with a below the knee cast for two weeks without weight bearing. The patient was allowed toe touch weight bearing for four more weeks. Dorsiflexion exercises were started after the initial two weeks. Then he was gradually allowed to return to his routine activities. Jumping and running were initiated as tolerated. The patient recovered completely at the end of four months. The AOFAS clinical scores improved significantly (71 to 100). Manual muscle testing revealed a strength of 5/5 in dorsiflexion of foot.

DISCUSSION

Tibialis anterior tendon ruptures are among the rarer clinical entities described in orthopedic literature. The tendon ruptures usually fall in either spontaneous category or because of an acute trauma.

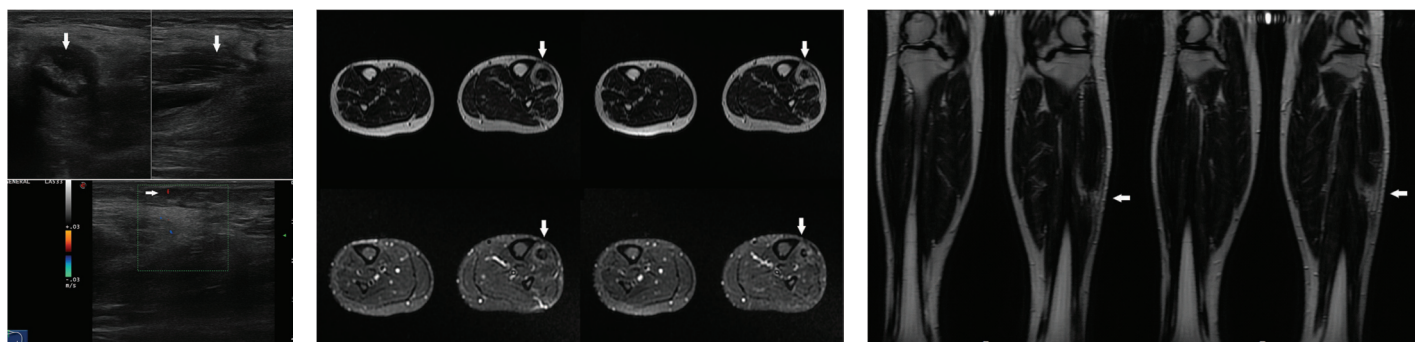
Spontaneous ruptures of the tendon are more commonly seen in the elderly with or without a minor trauma [1] and are usually because of an underlying systemic pathology like diabetes or local pathologies [2-6].

Ruptures due to trauma are seen in younger individuals, which may be closed or open. Open injuries occur in cases with direct injury to the muscle or tendon by an external object [7] or fracture of the tibia [8]. Closed ruptures have known to occur in sports and trauma [9].

Tears at tibialis anterior insertion or in tendon may be due to pre-existing pathologies or ageing [10] or because of relatively poor blood supply of that part of tendon [6,11], while in the young individuals with no apparent weakness in tendon, musculotendinous junction ruptures may be more common than previously thought, and are often missed because of partial nature of rupture and slight disability caused by them, so patients tend to neglect them. Constantinou reported a case of a tear at musculotendinous junction of tibialis anterior in a Gaelic football player. Ours is one of very few such cases [9]. Garrett described that tears predominantly occurred at the muscle tendon junctions in commonly injured muscle groups



[Table/Fig-1]: Soft tissue bulge (white block arrow) seen in the middle half of left leg on dorsiflexion of ankle



[Table/Fig-2]: Ultrasound showing partial tear at musculotendinous junction **[Table/Fig-3]:** Axial T2 and STIR depicts bulky musculotendinous junction with altered signal intensity, which is heterogeneous and peritendinous hyper intensity (oedema) **[Table/Fig-4]:** Coronal T2 showing linear altered signal intensity, which is hyper intense noted at musculotendinous junction of the tibialis anterior seen extending into the adjacent fat planes

because of excessive stretch or stretch during muscle contraction [12]. Safran et al., in his experiments also showed muscles failed consistently at musculotendinous junction [13].

The clinical presentation of this patient with a tender soft mass in the middle of leg and moving and increasing in size with movement of foot and standing has striking resemblance with traumatic muscle hernia [14]. Muscle hernias have been shown to occur in young and active males either because of direct or indirect trauma [15,16]. In our case, there was a history of forced hyper plantar flexion of the foot in the accident. The tibialis anterior is the most common muscle involved in the muscle hernias of the leg [17]. So muscle hernia of the tibialis anterior is a close differential diagnosis. Dynamic ultrasound [17] and MRI confirmed the diagnosis.

Similar presentation of tears at musculotendinous junction as soft tissue mass also has been reported in rectus femoris muscles [18]. Bencardino et al., stated that among quadriceps, rectus femoris muscle is most susceptible to injuries at the muscle tendon junction because of factors like superficial location, eccentric muscle action, predominance of type 2 fibers and extension across two joints [19]. These factors may well apply to tears of the tibialis anterior in young individuals due to plantar hyper flexion injuries of the foot as in our case, which occurred because of indirect trauma and in sports injuries with similar mechanism, similar to one described by Constantinou [9].

The presentation of tibialis anterior tear in our patient like a soft tissue mass has to be differentiated from traumatic muscle hernia as the potential complications of treatment are serious [20]. Proper history and clinical examination can differentiate the two entities, while investigations like ultrasound and MRI help us in confirming the diagnosis and direct the treatment. One should have a high index of suspicion and awareness of the condition to differentiate and appropriately treat these conditions.

CONCLUSION

Tibialis anterior ruptures at the musculotendinous junction were reported only a few times in the literature. The partial tear of tibialis anterior presenting like a mass can mimic muscle hernia and must be differentiated with proper history, clinical examination and appropriate investigations as the treatment can vary considerably.

The factors predisposing to tears at musculotendinous junction were discussed.

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