



Extensive Loss of Tibialis Anterior Tendon: Surgical Repair With Split Tendon Transfer of Tibialis Posterior Tendon: A Case Report



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ABSTRACT

Extensive damage of the tibialis anterior tendon is rare and mainly caused by trauma. Surgical treatment of these injuries can become challenging owing to the limited availability of autogenous graft resources for reconstruction of the defect. In the present case report, we describe a large defect in the midfoot soft tissue after a traffic injury, which included complete loss of the tibialis anterior tendon. The tendon was reconstructed by split tendon transfer of the tibialis posterior tendon without sacrificing function, which was confirmed by the follow-up examination at 6 years after injury. We believe split tendon transfer of the tibialis posterior tendon can be one of the treatment options for patients with extensive disruption of the tibialis anterior tendon.

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Extensive damage to the tibialis anterior tendon is rare and mainly caused by trauma (1). Such damage is generally related to laceration or blunt trauma to the anterior leg (2) or severe trauma to the dorsum of the foot. Extensive defects of the soft tissue, bone, and tendon associated with severe injury of the dorsum of foot are difficult to manage and often result in amputation (3). Surgical treatment of these injuries can also be difficult owing to the limited availability of autogenous resources for reconstruction of the defect.

In the present case report, we describe a 6-year-old female with a large defect in the midfoot soft tissue and bone, which extended to include complete loss of the tibialis anterior tendon after a traffic accident. The tendon was reconstructed using split tendon transfer of the tibialis posterior tendon. Next, the tibialis anterior and tibialis posterior muscles and tendons were evaluated using magnetic resonance imaging (MRI) during a 6-year follow-up period after surgical repair.

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Case Report

A 6-year-old female, a primary school student, was hit by a car while crossing the street and dragged underneath the car for 25 meters. She sustained serious injuries of the medial and dorsal side of the right foot. A large skin defect over the dorsal side of the foot was evident. The tibialis anterior tendon and extensor hallucis longus tendon had sustained severe damage. A loss of bone tissue was found on the medial side of the distal tibia, talus, navicular, medial cuneiform, and base of the first metatarsal with complete absence of the insertion of the tibialis anterior (Figs. 1 and 2). Surgery was performed as described in the next paragraphs.

Surgery was performed in 2 stages. The first surgical repair was conducted on the day of the traffic accident and consisted of irrigation, debridement, and repair of the extensor hallucis longus tendon, which had been partially damaged at the dorsal side of the foot. The wound was almost covered by the rolled up skin, but a partial skin defect (approximately 2 cm × 2 cm) was present over the cuneiform; therefore, we closed the wound temporarily using artificial skin (Pelnac®; Gunze Limited, Kyoto, Japan) and monitored it for a 2-week period. The wound showed no signs of infection before the second operation. During the first operation, the defect of the tibialis anterior tendon was noted to be almost 8 cm long. The



Fig. 1. Lateral (A) and anteroposterior (B) radiographs of the right ankle at the initial presentation. Note the bone defect (arrows) on the anterior and medial sides of the tibia secondary to the dragging injury.

insertion into the medial cuneiform and first metatarsal had been completely lost owing to the trauma (Fig. 2). The stump of the tibialis anterior muscle was comparatively clean, and the muscle was functional (Fig. 2); however, the tibialis posterior tendon was almost

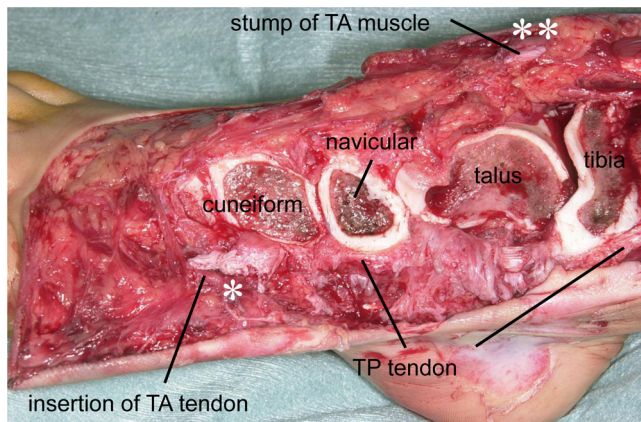


Fig. 2. Soft tissue loss and bone defect at presentation. Soft tissue loss after wound care showed an extensive defect (15 cm × 10 cm) on the medial side of the ankle. An approximately 8-cm defect of the tibialis anterior (TA) tendon was evidenced between the insertion (asterisk) and distal stump of the tibialis anterior muscle (double asterisks). The tibialis posterior (TP) tendon is marked underneath the distal tibia, talus, navicular, medial cuneiform.

intact. The insertion of the tibialis posterior tendon was at almost the same anatomic position as that of an undamaged tibialis anterior tendon. In the present case, massive soft tissue damage and tendon defects on the dorsum of the foot were present; however, no peroneal nerve palsy or injury to the tibialis anterior muscle was seen. Accordingly, we planned a tendon transfer using splitting of the tibialis posterior tendon in half of the width. The extent of the tibialis anterior tendon defect was 8 cm long; therefore, we split the distal 12 cm portion of the tibialis posterior tendon (Fig. 3A). One half of the split tendon to be used was turned over and passed under the inferior extensor retinaculum (Fig. 3B). The distal tibialis anterior tendon stump was trimmed to receive ≥ 2 cm of the graft. Next, an interlacing suture was achieved by 4-0 nylon stitches using a continuous and buried suture (Fig. 3C). The ankle joint was held in maximal dorsiflexion throughout the procedure. The soft tissue of the dorsum of the foot was mobilized without tension to cover the tendon graft. In this way, we tried to avoid possible adhesions to the hypodermis. After mobilization of the skin, the wound was closed without tension using vertical mattress sutures. Fig. 3D shows the intraoperative site after the reconstructive surgery. A postoperative lower leg plaster cast provided immobilization of the foot for 4 weeks. Until the sixth postoperative week, only a rolling motion was allowed, followed by a gradual increase of the permissible load. The patient continued her training program throughout the treatment period.

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