Posterior Tibial Tendoscopy

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KEYWORDS

• Tendoscopy • Posterior tibial tendon • Endoscopy • Adult flatfoot

KEY POINTS

- Disorders of posterior tibial tendon (PTT) include tenosynovitis, acute rupture, degenerative tears, dislocation, instability, enthesopathies, and chronic tendinopathy with dysfunction and flat foot deformity.
- Open surgery was the conventional approach to deal with these disorders.
- Tendoscopy offers advantages over open procedures. There are fewer wound infections, and smaller wounds; in addition, there is less morbidity, quicker recovery, early mobilization and function, mild postoperative pain, and the possibility of being performed under local anesthesia on an outpatient basis.
- PTT tendoscopy allows for the visualization and palpation of the tendon, the tendon sheath, the vinculum, and partial tears.
- Tendoscopy may be the gold standard technique to perform adhesiolysis, synovectomy, debridement of partial tears, and restore physiologic gliding properties of the PTT, with low complication rates.

Videos of posterior tibial tendon tendoscopy accompany this article at http://www.foot.theclinics.com/

INTRODUCTION

Proper function of posterior tibial tendon (PTT) may be impaired by direct or indirect trauma, systemic inflammatory diseases, flatfoot deformity, or iatrogenic causes.

Imaging studies may suggest the type and location of injury, but there are several false-positive and false-negative studies. An inherent drawback of MRI is the difficulty to categorize PTT abnormalities. Inhomogeneity of the tendon on MRI could be due to tendinopathy, partial tear, degeneration, or reactive synovitis.

The authors have nothing to disclose.

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Open surgery is frequently needed to establish a diagnosis and to treat PTT disorders that have not responded to conservative treatments. However, open surgery has not been free of complications such as adhesions and painful scars. Over the last decade, tendoscopy has become a useful tool to diagnose and treat tendon disorders by providing a dynamic anatomic assessment of certain tendons and pathologic entities. Most indications for open surgery of the PTT are now covered by PTT tendoscopy with less morbidity and faster return to daily activities including sport.

ANATOMY

The PTT is the largest and most anterior tendon in the posterior ankle retinaculum. The muscle is contained within the deep posterior compartment of the leg, originating on the tibia, the interosseous membrane, and the fibula, and it descends within the posterior compartment of the leg.[1] The synovial sheath of the PTT is 7 to 9 cm in length and starts around 6 cm proximal to the tip of the medial malleolus. It descends along the tendon in the retromalleolar groove, with a shift in direction of almost 90° around the medial malleolus, and it terminates close to the tuberosity of the navicular.[2] When the tendon enters the foot, it flattens, and the tissue structure changes. It exhibits an increased amount of fibrocartilage.[3,4] Histochemical studies have shown hypovascularization of the PTT in the retromalleolar region,[5,6] but another study did not confirm that extent.[7] PTT has no mesotendon, but it has a vinculum (specialized form of mesotendon), which is consistently found on the posterior side of the tendon, between the posterior side of the PTT and most posterior side of the sheath.[1] It runs in all directions proximally to end with a free edge at around 4.3 cm (range 3.5–6.5 cm) above the posteromedial tip of the medial malleolus. The vinculum is irrigated by vessels from the posterior tibial artery collaterals, running from the flexor digitorum longus synovium.[8] It is important to respect this vinculum when establishing the proximal portal for tendoscopy.

PATHOMECHANICS

The posterior tibial muscle/tendon is physiologically stretched during the first rocker of gait to allow subtalar pronation.[9] During the second rocker of gait, the PTT helps to center the talus over the navicular. Transition from the second to the third rocker starts at heel lift. The PTT actively externally rotates the tibia/leg and induces foot supination. During the third rocker, the foot behaves like a wheelbarrow, which is balanced by the peroneal tendons and the PTT. The PTT allows for the locking of the medial column of the foot during the third rocker, by the lock of the calcaneus to the cuboid and the talus to the navicular.

The PTT is a gliding tendon as it changes direction by curving around the medial malleolus. Fibrocartilage found within connective tissue is due to repetitive stimulus of intermittent compressive and shear forces.[10] The fibrocartilaginous region of PTT is located around the medial malleolus and is more vulnerable to repetitive microtrauma. It is in this region where most ruptures occur. Degeneration may arise because of the poor repair response of the hypovascular fibrocartilaginous tissue. This portion of the tendon rubs back and forth between the underlying malleolus and the overlying flexor digitorum longus. Longitudinal friction and changes in the gliding resistance of the tendon make PTT more susceptible to suffering longitudinal tears.[10]

The sliding properties of PTT may be altered due to synovitis, an irregular medial malleolus, longitudinal or transverse splits, elongation because of continuous overpronation, or a combination of several disorders. All these entities may lead to fibrous