Closed Complete Rupture of the Flexor Hallucis Longus Tendon at the Groove of the Talus

ABSTRACT

A rare case of closed complete rupture of the flexor hallucis longus tendon at its groove in the posterior process of the talus is reported in a soccer player who developed pseudarthrosis of the posterolateral tubercle of the talus after a Shepherd's fracture. Partial rupture or tenosynovitis of the flexor hallucis longus tendon at this level is well known in classical ballet dancers and soccer players. Three cases of complete rupture of the flexor hallucis longus tendon near the metatarsophalangeal joint and three under the sustentaculum tali have been reported, but there have been no reports at the groove of the talus. Repair was accomplished by tendon graft, and active flexion of the interphalangeal joint is now possible.

INTRODUCTION

It is well known that fractures of the posterolateral tubercle of the talus of soccer players and classical ballet dancers may cause pseudarthrosis, may produce the os trigonum syndrome, and may become the source of chronic pain in the posterolateral portion of the foot. However, cases in which the os trigonum syndrome is associated with a complete rupture of the flexor hallucis longus (FHL) tendon are unknown. We report a rare case of a soccer player who suffered a fracture of the posterolateral tubercle of the talus during practice and developed the os trigonum syndrome as a result of pseudarthrosis of the posterolateral tubercle, which led to a complete rupture of the FHL tendon.

CASE REPORT

A 27-year-old male soccer player presented with absence of flexion of the interphalangeal (IP) joint on

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the right great toe and pain in the posteromedial portion of the ankle joint. In February 1992, he fell during soccer practice, injuring his ankle joint by forcing it into plantarflexion. At the time, he experienced pain and swelling of the posteromedial portion of his ankle joint, but toe movement was noted to be normal. Because the pain was relieved by rest, no treatment was sought. However, the patient stopped playing soccer temporarily. After 5 months, the pain had resolved and the patient returned to soccer practice. He again experienced pain in the posteromedial portion of his ankle whenever he kicked a ball. He nevertheless continued to play soccer; although the pain continued when he played, he did not seek any treatment. In March 1994, the patient experienced an uncomfortable feeling in the posteromedial portion of his ankle joint when he walked down stairs, without any specific injury. He realized that he could not flex his right great toe and was referred to our hospital in April 1994.

Pain and tenderness were present on the medial side of the Achilles tendon, but severe swelling was not present. Range of motion of the ankle joint was not restricted, but the pain was most intense in maximal plantarflexion. The passive range of motion of the IP joint of the right great toe was normal, and active extension was also possible, but the patient was incapable of actively flexing it. An approximately 1.5 cm \times 1 cm os trigonum-like bone fragment was observed posterior to the talus on a plain x-ray film (Fig. 1). We suspected a rupture of the FHL tendon associated with the pseudarthrosis of the posterolateral process of the talus, and surgery was performed.

We approached from the medial side rather than the lateral side, which was recommended when operating on os trigonum pseudarthrosis, because we were intending to address the ruptured FHL tendon. The groove of the FHL was empty, and no tendon was seen. The bone fragment of the posterolateral tubercle of the talus was mobile, and cicatricial tissue had grown around it. The proximal end of the ruptured tendon had contracted to about 5 cm proximal to the

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Fig. 1. Lateral radiograph of a nonweightbearing foot showing an os trigonum-like bone fragment.

posterior portion of the talus (Fig. 2A), and the distal end had contracted to close to the center of the longitudinal arch of the foot (Fig. 2B). We grafted fascia from the tensor fascia lata muscle between the proximal and distal ends, because they could not be reapproximated. Histopathologic examination of the resected bone specimen revealed fibrous cartilage on the talar side, but some areas showed evidence of new bone formation. Therefore, the diagnosis of pseudarthrosis of the posterior process of the talus was supported.

After surgery, immobilization in a plaster cast was continued for 4 weeks, followed by active toe exercises. Two years after the operation, the active range of motion of the IP joint of the right great toe was 10° to 50° (the left toe, 0° to 60°). The pain and tenderness of the posteromedial portion of the ankle joint resolved, and the patient was participating in soccer 2 days a week.

DISCUSSION

We report a case of a closed complete rupture of the FHL tendon at its groove in the posterior process of the talus. As shown in Table 1, only six reports of closed complete rupture of the FHL can be found,

Foot & Ankle International/Vol. 18, No. 1/January 1997





Fig. 2. *A*, The arrow indicates the proximal end of the ruptured tendon. *B*, The arrow indicates the distal end of the ruptured tendon.

based on our review of the literature. However, to our knowledge, complete rupture of the FHL at the groove of the talus has never been reported. In our patient, symptoms developed as a result of this specific injury, and the surgical findings revealed a bone fragment that was consistent with pseudarthrosis. It seems that

 TABLE 1

 Closed Complete Rupture of the Flexor Hallucis Longus Tendon

Year	Author (Ref.)	Age (yr)	Gender	Sport	Cause	Site of rupture
1980	Krackow (5)	34	Male	Diving	Diving from board	0.5 cm proximal to its insertion
1990	Rasmsussen and Thyssen (7)	34	Male		Lifting a small object	0.5 cm proximal to its insertion
1990	Holt and Cross (4)	42	Female	Marathon running	Running	Under the sustentaculum tali
1993	Thompson et al. (10)	54	Female		Walking	Under the sustentaculum tali
1993	Coghlan and Clarke (2)	48	Male	Marathon running	Running	Just distal to fibrous slip to FDL ^a
1994	Romash (8)	40	Male	Marathon running	Running	Metatarsal head
1996	Inokuchi and Usami	27	Male	Soccer	Soccer	Groove of posterior process of talus

^a FDL, flexor digitorum longus.

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the pseudarthrosis led to abrasion of the FHL tendon, resulting in a rupture because the patient continued to play soccer despite his symptoms.

It is well known that os trigonum syndrome causes tenosynovitis³ and partial rupture⁹ of the FHL tendon in soccer players and classical ballet dancers. The os trigonum syndrome is characterized by pain in the posterolateral ankle joint elicited by maximal plantarflexion of the ankle.¹ Miyanaga et al.⁶ claim that its etiology is the abutting impingement of the os trigonum or a pseudarthrosis fragment between the posterior end of the tibia and the talus. A similar mechanism may have caused the FHL tendon rupture in our patient. However, no reports can be found of complete rupture of the FHL tendon caused by os trigonum syndrome in classical ballet dancers or soccer players. The tendon appears to have ruptured because of the abrasion caused by direct mechanical irritation.

Tendon graft repair was effective in our patient, and he was satisfied despite slight limitation in the range of motion of the IP joint. Thompson et al.¹⁰ reported that active flexion of the IP joint recovered significantly after repair of closed rupture under the sustentaculum tali by tenodesis of the FHL tendon to the flexor digitorum longus proximally and distally. Romash⁸ reported that motion cannot be expected to return when closed rupture occurs near the IP joint. The functional results in our patient were good in spite of the stiffening of the IP joint.

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