CASE STUDY

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TENOSYNOVITIS AND LONGITUDINAL TEAR OF THE LONG FIBULAR TENDON CAUSED BY HYPERTROPHY OF THE PERONEAL TUBERCLE

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Background. Tenosynovitis and longitudinal rupture of the tendon of the long fibular muscle linked to hypertrophy of the fibular tubercle of the calcaneus are relatively uncommon conditions. The literature has documented isolated clinical cases, but there is a lack of comprehensive research on diagnosing and treating these ailments.

Aim. This article seeks to present an effective surgical treatment option along with mandatory diagnostic blockade for a patient with hypertrophic fibular tubercle complicated by tenosynovitis and longitudinal rupture of the tendon of the long fibular muscle.

Case description. This article describes a rare clinical case involving tenosynovitis and longitudinal rupture of the tendon of the long fibular muscle, which is associated with hypertrophy of the fibular tubercle of the calcaneus. After examination, diagnostic blockade and unsuccessful conservative therapy, the decision was made to pursue surgical intervention.. The surgical procedure involved resection of the fibular tubercle and tubularisation of the tendon of the long fibular muscle. Eight months after treatment, there was no recurrence of symptoms.

Conclusion. This clinical case illustrates the successful outcome of surgical intervention for a patient with hypertrophic fibular tubercle tenosynovitis, and longitudinal rupture of the tendon of the long fibular muscle. Diagnostic blockades can be beneficial for identifying the primary cause of foot pain and devising appropriate treatment strategies.

Keywords: tenosynovitis of fibular tendons, fibular tubercle, longitudinal rupture of fibular tendons, diagnostic blockade

Conflict of interest: The authors declare no conflict of interest.

Introduction

Pain in the lateral structures of the ankle joint is one of the most common reasons for patients to seek medical treatment, especially in outpatient traumatology and orthopaedics. An underestimated, and often unknown, cause of pain in the lateral structures of the ankle joint is a hypertrophic peroneal tubercle.

The peroneal tubercle is an anatomical formation on the lateral wall of the calcaneus bone, normally separating the fibular tendons [1; 2]. It acts as a point of support, directing the peroneus longus tendon towards the cuboid bone. Additionally, the inferior peroneal retinaculum attaches to the peroneal tubercle [3]. The size of the tubercle is determined by its width, height and length. As conventional X-rays often lack precision in assessing the size of the peroneal tubercle, measurements are more reliably performed using CT or MRI scans. The width of the peroneal tubercle is a parameter that is easiest to measure on axial or coronal CT or MRI images. Hyer et al. studied samples of 114 calcaneus bones, paying particular attention to the characteristics of the peroneal tubercle. Their measurements showed that the average width of the tubercle is 3.13 mm [4].

While there are publications addressing this topic, a consensus definition of hypertrophic peroneal tubercle remains a subject of ongoing discussion. Based on the few existing reports, we conclude that a width exceeding 5 mm is considered hypertrophic, predisposing to chronic trauma of the fibular tendons, development of tenosynovitis and even their rupture [2; 5–10].

Although the literature mentions isolated clinical observations, there is a shortage of research on the diagnosis and treatment of such pathologies. In this article, we will describe our experience in managing a patient with tenosynovitis and longitudinal tear of the peroneus longus tendon associated with hypertrophic peroneal tubercle of the calcaneus.

This article aims to present an effective variant of surgical treatment and its outcomes in a patient with a hypertrophic peroneal tubercle complicated by tenosynovitis and a longitudinal tear of the peroneus longus tendon. The surgery was performed alongside mandatory diagnostic blockage.

Clinical observation

A 58-year-old patient sought medical help, reporting widespread pain along the left foot's lateral surface, which scored 5 points on the Visual Analog Scale (VAS) and 42 points on the American Orthopedic Foot and Ankle Society scale (AOFAS). His medical history revealed recurrent ankle sprains over several years. Conservative

treatments, including oral NSAIDs, wearing a soft orthopaedic brace and physiotherapy, were intermittently administered without significant improvement. Although the patient maintained an active lifestyle that included sports, the pain in his ankle area notably decreased his level of activity. Physical examination revealed swelling distal to the apex of the lateral malleolus, palpable tenderness along fibular tendons, anterior talofibular ligament (ATFL) and calcaneofibular ligament (CFL). There were no signs of mechanical instability of the ankle joint, including the anterior drawer sign, upon palpation and range of motion assessment. However, pain intensified during subtalar joint movement, especially during foot inversion.

An X-ray of the left ankle joint was performed in standard projections, revealing no bone pathology. MRI was conducted to verify the diagnosis. It was found that the lateral side of the left calcaneus has a hypertrophic peroneal tubercle measuring 13.7 mm (Fig. 1), alongside signs of tenosynovitis in the peroneus longus tendon and a longitudinal tear therein (Grade 2) (Fig. 2).

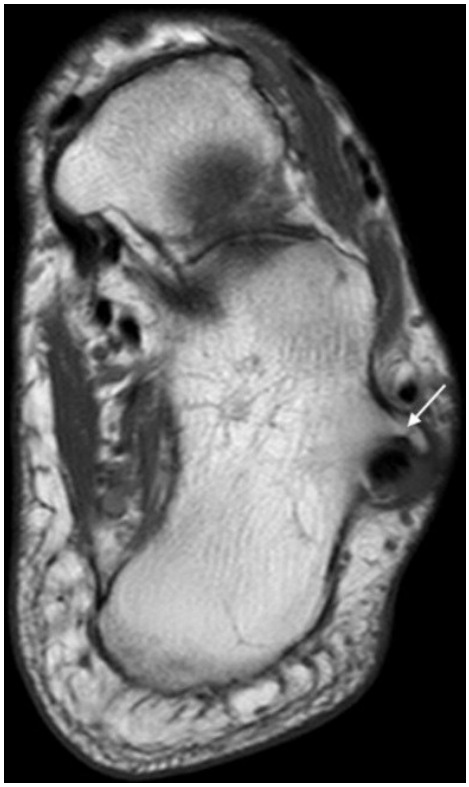

Fig. 1. Coronal MRI of the left foot. A hypertrophied peroneal tubercle (indicated by arrow)

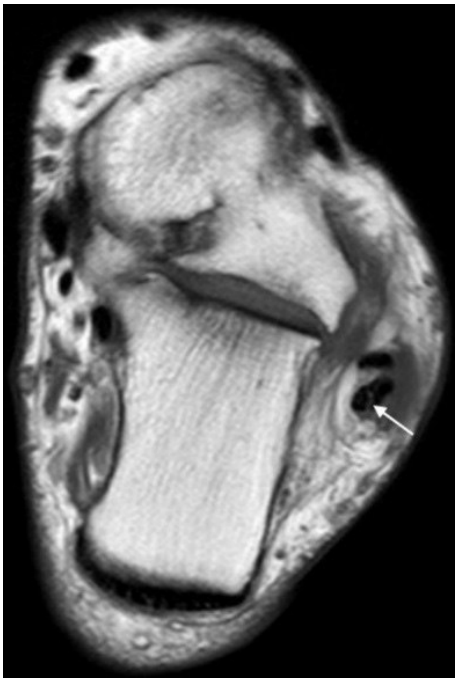

Fig. 2. Coronal MRI of the left foot. The longitudinal tear in the peroneus longus tendon (indicated by arrow)

Signs of ATFL (Grade 3) and CFL (Grade 2) injuries were also identified. To determine the leading cause of foot pain and plan further treatment, a diagnostic blockage was performed in the sheath of the fibular tendons with 2 ml of 2% Lidocaine solution, resulting in a positive effect of pain relief (Fig. 3).

Fig. 3. Diagnostic blockage of the sheath of the fibular tendons

Surgical treatment was proposed, which was performed after preoperative reevaluation and obtaining informed consent. During the procedure, an incision was made in the inferior peroneal retinaculum to expose the peroneal tubercle and fibular tendons, facilitating their surgical exploration. The tendon of the long peroneal muscle was located in the bone canal formed by the hypertrophic peroneal tubercle. This resulted in the limited mobility of the peroneal tubercle. thickened synovial membrane and inflammation (Fig. 4).

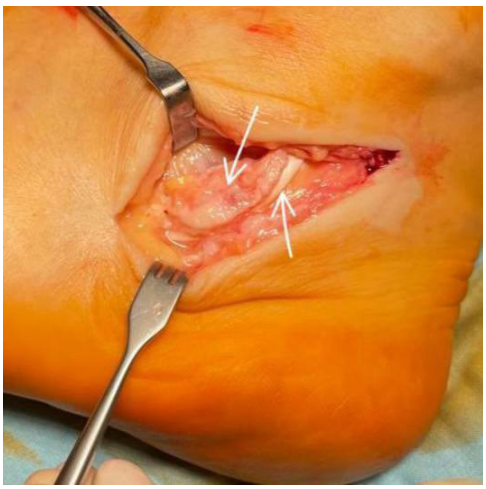

Fig. 4. Peroneus longus tendon in the stenosis-affected canal formed by the peroneal tubercle (indicated by arrows)

Surgical exploration of the tendon revealed its longitudinal tear (Grade 2) (Fig. 5).

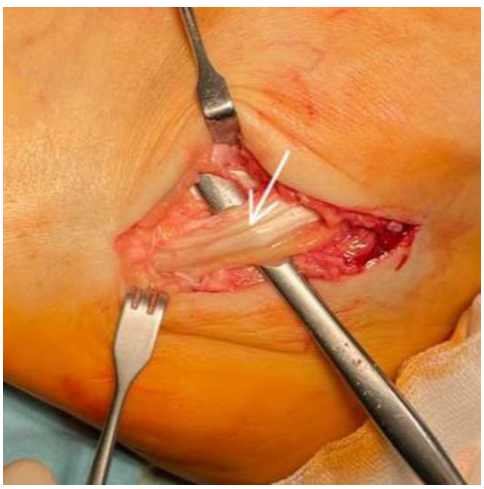

Fig. 5. Longitudinal tear of the peroneus longus tendon (indicated by arrow)

The peroneus brevis tendon was intact. Release of the peroneus longus tendon was performed alongside synovectomy and tubularisation at the site of the longitudinal tear (Fig. 6).

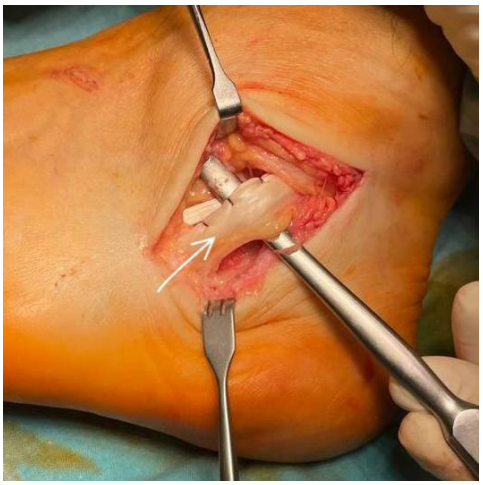

Fig. 6. Tubularisation of the peroneus longus tendon (indicated by arrow)

Resection of the hypertrophic peroneal tubercle was performed using an oscillating saw (Fig. 7).

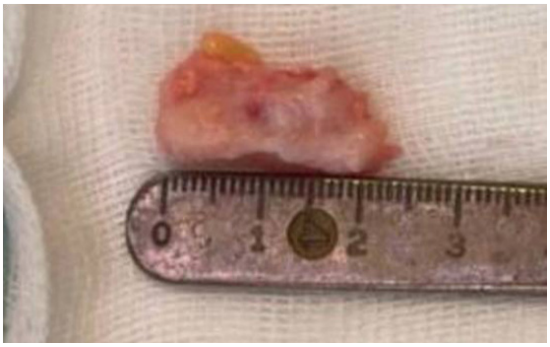

Fig. 7. Resected peroneal tubercle

In the postoperative period, the ankle joint was immobilised with a rigid ankle brace for four weeks. After the immobilisation period, the patient started doing therapeutic exercises to regain motion range in the ankle joint and to improve muscle tone in the calf and foot. The early postoperative period progressed without complications.

An evaluation of the midterm outcome eight months after the surgical treatment showed persistent absence of symptom recurrence. The patient no longer experi-

enced pain in the lateral aspect of the foot (VAS = 0 points, AOFAS = 85 points) and returned to previous levels of physical activity, including sports. Palpation along the course of the fibular tendons and inversion of the left foot did not reveal any tenderness.

On the follow-up MRI of the left foot, the peroneal tubercle was not identified, and there were no signs of recurrence (Fig. 8).

Fig. 8. MRI of the left foot eight months after the surgical treatment.
The area of the resected peroneal tubercle (indicated by arrow)

Discussion

Several works have discussed the comparative anatomy of the peroneal tubercle and its variations in size and form. The peroneal tubercle's occurrence frequency varies between 24 and 90.4 %, according to different authors [4; 11–13]. According to Zanetti et al., a peroneal tubercle measuring 5 mm or more can be considered hypertrophic [9; 10]. The frequency of peroneal tubercle hypertrophy is reported to be between 20.5 % and 28 % [1; 4; 12; 13]. This condition can either be congenital [8; 14] or develop throughout life. Shibata et al. established that both the frequency and size of the peroneal tubercle increase with age [1]. This finding suggests that external factors significantly influence peroneal tubercle hypertrophy. Hypertrophy of the peroneal tubercle causes chronic trauma to the fibular tendons and most commonly leads to

tenosynovitis and rupture of the peroneus longus tendon. Cases of isolated injury to the peroneus brevis tendon have also been described [6; 15]. Peroneal tubercle hypertrophy and/or peroneal tendon tears often occur in conjunction with various foot deformities or sequelae of foot fractures [8; 16–18]. When two or more potential sources of pain are present, diagnostic blocks are advisable [19]. The treatment of peroneal tendon tenosynovitis should begin with conservative approaches, with the underlying condition taken into account. If conservative methods fail to produce results, surgical intervention is a viable alternative. The surgery involves resecting the affected peroneal tubercle, debriding, and repairing the torn tendon. Presently, in Russia, this treatment falls under specialised inpatient medical care rather than high-tech medical care and is not included into national healthcare planning [20–22]. Surgical treatment has shown good results with a rapid return to previous activity levels [3; 5–8; 16–18; 23]. Further research is needed to comprehend the pathophysiology of hypertrophied tubercles and the dynamics of fibular tendons following tubercle resection in the light of accounts of recurrent cases. [15].

Conclusion

The presented clinical case demonstrates a positive outcome of surgical treatment for a patient with a hypertrophic peroneal tubercle complicated by tenosynovitis and a longitudinal tear of the peroneus longus tendon. The use of diagnostic blockages is advisable for determining the leading cause of foot pain and planning further treatment tactics.

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