

Endoscopic Approach to Posterior Ankle via Lateral Portals



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Abstract: Posterior ankle pain is a common foot and ankle problem faced by orthopaedic surgeons. It can have many causes, including posterior ankle joint pathologies (synovitis or osteochondral lesion), ankle impingement (posterior, posterolateral, or posteromedial), flexor hallucis longus pathologies, peroneal tendon problems, posterior tibial tendinopathy, Achilles tendon pathology, posterior subtalar tarsal coalition, or tarsal tunnel syndrome. Most of these pathologies can be managed effectively by an endoscopic approach. The classic endoscopic approach is the 2-portal posterior ankle endoscopy with the portals at the medial and lateral side of the Achilles tendon. This is performed with the patient in prone position. In this technical note, we describe the details of endoscopic approach to the posterior ankle via lateral portals. This allow flexibility of patient positioning (supine, prone, or lateral). It is particularly effective for the management of posteromedial ankle impingement without the risk of injury to the posterior tibial neurovascular bundle. Moreover, any concomitant peroneal tendon pathology can be managed via the same lateral portals.

Posterior ankle pain is a common foot and ankle problem faced by orthopaedic surgeons. It can have many causes, including posterior ankle joint pathologies (synovitis or osteochondral lesion), ankle impingement (posterior, posterolateral or posteromedial), flexor hallucis longus (FHL) pathologies, peroneal tendon problems, posterior tibial tendinopathy, Achilles tendon pathology, posterior subtalar tarsal coalition, or tarsal tunnel syndrome.¹⁻⁷ Pathologies that can cause posterior ankle pain may occur on their own or in coexistence.⁷ Most of these pathologies can be managed effectively by an endoscopic approach.^{3,4,8,9} The classic endoscopic approach

is the 2-portal posterior ankle endoscopy with the portals at the medial and lateral side of the Achilles tendon.^{4,8,9} This is performed with the patient in the prone position, which is usually not favorable to the anaesthetist. Moreover, intraoperative change of the patient's position may be needed if other concomitant procedures are performed. The purpose of this technical note is to describe the details of an endoscopic approach to posterior ankle via lateral portals. This can be performed with the patient in the supine, prone, or lateral position. It is indicated for posterior ankle pain due to posterior, posteromedial or posterolateral ankle impingement, FHL pathology at the posterior ankle, posterior ankle synovitis, or chondral lesion. It is particularly useful in the presence of peroneal tendon problem, which can be dealt with by the same lateral portals. It is contraindicated if the posterior ankle pain is due to tibial tendinopathy, Achilles tendon pathology, tarsal tunnel syndrome, or post-traumatic arthritis (Table 1).⁹

Technique

Preoperative Planning and Patient Positioning

A detailed history and clinical examination are the most important tools to identify and locate the pathologies causing posterior ankle pain. Radiographs and magnetic imaging are important investigations to confirm the diagnosis.

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Table 1. Indications and Contraindications of Endoscopic Approach to Posterior Ankle via Lateral Portals

Indications	Contraindications
Posterior ankle pain due to posterior, posteromedial or posterolateral ankle impingement, flexor hallucis longus pathology at the posterior ankle, posterior ankle synovitis, or chondral lesion. In the presence of peroneal tendon problem, which can be dealt with by the same lateral portals.	Posterior ankle pain due to tibial tendinopathy, Achilles tendon pathology, tarsal tunnel syndrome, or post-traumatic arthritis.

The procedure can be performed with the patient in the lateral, prone, or supine position, according to the needs of any planned concomitant procedures. In this illustrated case, endoscopic superior peroneal reconstruction was performed and the patient was in the lateral position.^{10,11} A thigh tourniquet is applied to provide a bloodless operative field. A 2.7-mm 30° arthroscope (Henke Sass Wolf GmbH, Tuttlingen, Germany) is used for this procedure. Fluid inflow is by gravity and no arthropump is used.

Portal Placement

The procedure is performed via the proximal and distal portals, which are along the peroneal tendons and at the proximal and distal ends of the superior peroneal retinaculum, respectively. The distal portal is close to the tip of the lateral malleolus and the proximal portal is about 2 to 3 cm proximal to the distal portal (Fig 1).



Fig 1. Endoscopic approach to left posterior ankle via lateral portals. The patient is in the lateral position. The procedure is performed via the proximal and distal portals which are along the peroneal tendons and at the proximal and distal ends of the superior peroneal retinaculum respectively. The distal portal is close to the tip of the lateral malleolus and the proximal portal is about 2 to 3 cm proximal to the distal portal. (C, upper border of posterior calcaneal tubercle; DP, distal portal; LM, lateral malleolus; PP, proximal portal; SPR, superior peroneal retinaculum.)

Access to Posterior Ankle Recess

The distal portal is the viewing portal and the proximal portal is the working portal. The arthroscope and arthroscopic shaver (Smith & Nephew, Andover, MA) pass through the peroneal tendon sheath and enter the posterior recess of the ankle joint (Fig 2). The portals can be interchanged as the viewing and working portals if needed. Arthroscopic synovectomy can be performed. The arthroscope and instrument can reach the posteromedial corner of the ankle joint (Fig 3). Debridement of the posteromedial corner can be performed in case of posteromedial ankle impingement. The FHL tendon does not need to be pushed medially and impingement to the tibial neurovascular bundle can be avoided.^{12,13}

Access to Zone 1 FHL Tendon

The distal portal is the viewing portal and the proximal portal is the working portal. The lateral half of the posterior ankle capsule is resected with the shaver and the FHL tendon posterior to the ankle (zone 1) is exposed (Fig 4).¹⁴ The tendon can be examined for any pathology, which can be treated accordingly.

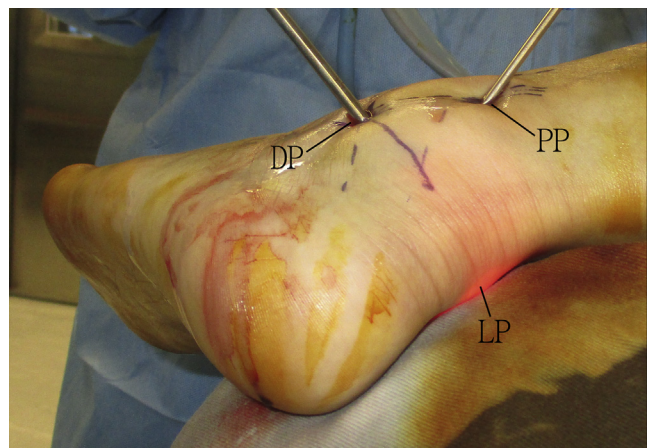


Fig 2. Endoscopic approach to left posterior ankle via lateral portals. The patient is in the lateral position. The arthroscope and arthroscopic shaver pass through the peroneal tendon sheath and enter the posterior ankle recess. (DP, distal portal; LP, arthroscopic light spot; PP, proximal portal.)

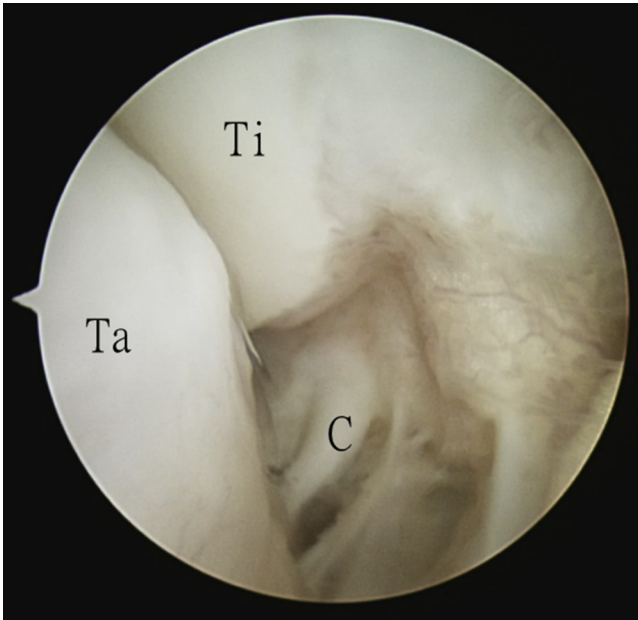


Fig 3. Endoscopic approach to left posterior ankle via lateral portals. The patient is in the lateral position. The distal portal is the viewing portal. This is the arthroscopic view of the posteromedial corner of the ankle joint. (C, posteromedial ankle capsule; Ta, talus; Ti, tibia.)

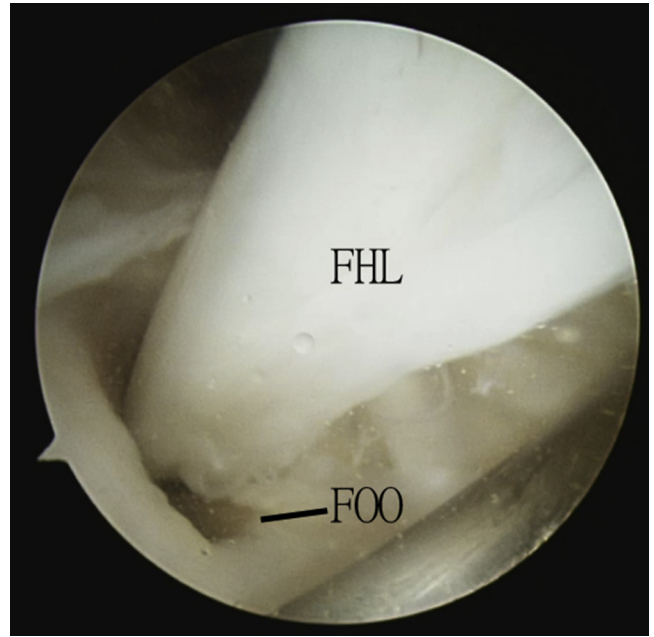


Fig 5. Endoscopic approach to left posterior ankle via lateral portals. The patient is in lateral position. The proximal portal is the viewing portal. The FHL tendon can be traced distally to the fibro-osseous tunnel between posterior talar tubercles. (FHL, flexor hallucis longus tendon; FOO, fibro-osseous orifice between the posterior talar tubercles.)

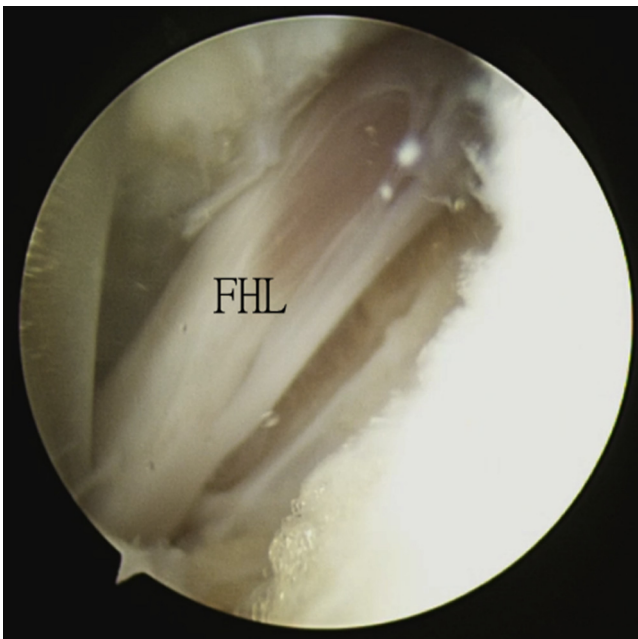


Fig 4. Endoscopic approach to left posterior ankle via lateral portals. The patient is in the lateral position. The distal portal is the viewing portal. The lateral half of the posterior ankle capsule is resected to expose the zone 1 FHL tendon posterior to the ankle joint. (FHL, flexor hallucis longus tendon.)

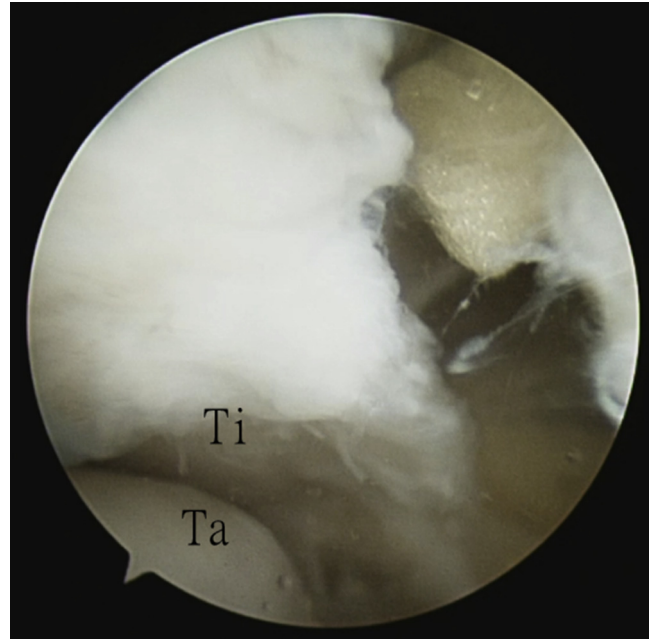


Fig 6. Endoscopic approach to left posterior ankle via lateral portals. The patient is in lateral position. The distal portal is the viewing portal. The ankle is plantarflexed and the presence of posterior or posterolateral ankle impingement is examined. (Ta, talus; Ti, tibia.)

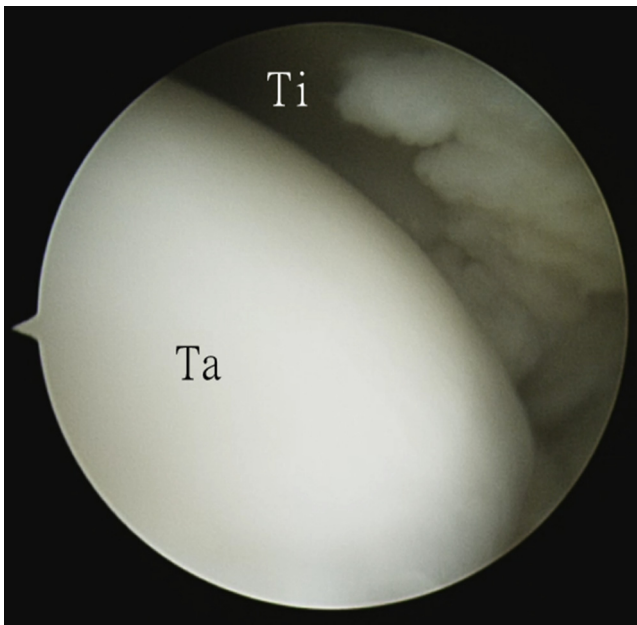


Fig 7. Endoscopic approach to left posterior ankle via lateral portals. The patient is in lateral position. The distal portal is the viewing portal. The posterior half of the ankle joint is examined for any chondral lesion. (Ta, talus; Ti: tibia.)

Access to Zone 2 FHL Tendon

The proximal portal is the viewing portal. The FHL tendon can be traced distally to the fibro-osseous tunnel between posterior talar tubercles (Fig 5). If there is evidence of zone 2 FHL tendon under the

sustentaculum tali, a proper zone 2 FHL tendoscopy via posteromedial and plantar portals should be performed.¹⁴

Assessment of Posterior Ankle Impingement

The distal portal is the viewing portal and the proximal portal is the working portal. The arthroscope and shaver go posteriorly and outside the ankle joint (Fig 6). The ankle is plantarflexed and the presence of posterior (bony) or posterolateral (soft tissue) impingement can be examined and the impinging structures can be resected endoscopically.

Access to Posterior Ankle Joint Proper

The distal portal is the viewing portal and the proximal portal is the working portal. The posterior half of the ankle joint is examined for any chondral lesion that can be debrided arthroscopically (Fig 7, Table 2, Video 1). For the more anterior lesions, it is easier to be debrided with the distal portal as the working portal. The postoperative rehabilitation plan should be individualized according to what procedures that have been done.

Discussion

Posterior ankle endoscopy remains the standard endoscopic approach for management of most of the pathologies that cause posterior ankle pain. However, the patient must be in the prone position. Our endoscopic approach via lateral portals allows flexibility in patient positioning but Achilles tendon and zone 2 FHL tendon pathology cannot be addressed. Detailed

Table 2. Pearls and Pitfalls of Correction of Endoscopic Approach to Posterior Ankle via Lateral Portals

Pearls	Pitfalls
Preoperative clinical examination and imaging study are important to identify and locate the pathologies responsible for the posterior ankle pain.	Preoperative assessment should exclude Achilles tendon pathology, posterior tibial tendon problem and tarsal tunnel syndrome as the source of pain.
The chondral lesion at the centrolateral corner of the talar dome can be approached by dorsiflexion of the ankle.	Zone 2 FHL tendon pathology cannot be dealt with by this approach and zone 2 FHL tendoscopy via the posteromedial and plantar portals is needed.
The posteromedial ankle impingement is due to intra-articular fibrosis or synovitis at the posteromedial corner of the ankle joint. The impinged structure can be resected arthroscopically without the need of breaching the posteromedial capsule of the ankle joint.	

FHL, flexor hallucis longus.

Table 3. Advantages and Risks of the Endoscopic Approach to Posterior Ankle via Lateral Portals

Advantages	Risks
Flexibility of patient positioning	Injury to the sural nerve
Fewer soft-tissue complications such as wound dehiscence and infection	Injury to the posterior tibial neurovascular bundle
Reduced risk of injury to the posterior tibial neurovascular bundle, especially for treatment of posteromedial ankle impingement	Injury to the flexor hallucis longus tendon or the peroneal tendons.
Can deal with associated peroneal tendon pathology via the same lateral portals	Injury to the cartilage of the posterior ankle

preoperative planning is important for selection of the appropriate endoscopic approach.

This endoscopic technique has the advantage of flexibility of patient positioning and fewer soft-tissue complications such as wound dehiscence and infection. It reduces the risk of injury to the posterior tibial neurovascular bundle, especially for treatment of posteromedial ankle impingement. Moreover, any associated peroneal tendon pathology can be managed via the same lateral portals. The potential risks of this technique include injury to the sural nerve, posterior tibial neurovascular bundle, cartilage of the posterior ankle, FHL tendon, or peroneal tendons (Table 3). This is not technically demanding and attempted by averaged foot and ankle arthroscopists.

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