



Metatarsosesamoid Arthroscopy for Management of Plantar Pain of the First Metatarsophalangeal Joint After Surgical Correction of Hallux Valgus Deformity

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Abstract: Residual pain in the early postoperative phase after hallux valgus surgery is common, but persistent plantar pain of the first metatarsophalangeal joint after surgery is rare. This can be due to intra- or extra-articular causes. Metatarsosesamoid arthroscopy is effective for the management of intra-articular causes of plantar pain. The purpose of this technical note is to describe the details of metatarsosesamoid arthroscopy for the management of plantar pain of the first metatarsophalangeal joint after surgical correction of hallux valgus deformity.

Residual pain in the early postoperative phase after hallux valgus surgery is common, but persistent plantar pain of the first metatarsophalangeal joint after surgery is rare.¹ This can be due to intra- or extra-articular causes. Intra-articular causes include synovitis, fibrosis, and cartilage damage in the metatarsosesamoid compartment. Extra-articular causes include excessive plantar flexion of the first metatarsal after hallux valgus surgery and flexor hallucis longus pathology (e.g., tendinosis or tenosynovitis).

The purpose of this technical note is to describe the details of metatarsosesamoid arthroscopy for the management of plantar pain of the first metatarsophalangeal joint after surgical correction of hallux valgus deformity. It is indicated in case of persistent plantar pain of the first metatarsophalangeal joint after surgical correction of hallux valgus deformity due to intra-articular causes with failure of conservative

treatment to relieve the symptoms.²⁻⁴ It is contraindicated if the pain is due to extra-articular pathology (e.g., metatarsalgia) owing to excessive plantar flexion of the first metatarsal, as well as flexor hallucis longus tenosynovitis or tendinosis underneath the first metatarsal head (Table 1).

Technique

Preoperative Assessment and Patient Positioning

Tenderness of the sesamoid bones and flexor hallucis longus tendon is checked. If active plantar flexion of the great toe against resistance reproduces the pain, flexor hallucis longus tendon pathology should be investigated. Callosity on the plantar side of the first metatarsal head indicates plantar flexion of the first metatarsal and can be confirmed by footprint evaluation. Preoperative magnetic resonance imaging may be helpful to delineate the pathology.

The patient is in the supine position with the legs spread. A thigh tourniquet is applied to provide a bloodless operative field. A 1.9-mm, 30° arthroscope (Henke Sass Wolf, Tuttlingen, Germany) is used for this procedure. Fluid inflow is driven by gravity, and no arthro-pump is used.

Portal Placement

This procedure is performed with the medial portal and proximal plantar medial portal. The medial portal is established through the medial capsule midway between the dorsal and plantar aspects of the joint. The proximal plantar medial portal is 5 to 10 mm proximal

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Received December 14, 2023; accepted February 17, 2024.

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2212-6287/231798

<https://doi.org/10.1016/j.eats.2024.102990>

Table 1. Indications and Contraindications of Metatarsosesamoid Arthroscopy for Management of Plantar Pain of First Metatarsophalangeal Joint After Surgical Correction of Hallux Valgus Deformity

Indications

Persistent plantar pain of first metatarsophalangeal joint after surgical correction of hallux valgus deformity due to intra-articular causes with failure of conservative treatment to relieve symptom

Contraindications

Metatarsalgia due to excessive plantar flexion of first metatarsal
Flexor hallucis longus tenosynovitis or tendinosis underneath first metatarsal head

to the plantar proximal margin of the first metatarsal head and between the flexor hallucis brevis and abductor hallucis tendons (Fig 1).⁵⁻¹⁰

Identification of Proximal Plantar Medial Portal

The medial portal is the viewing portal. A needle is inserted from the proximal plantar medial portal to the metatarsosesamoid compartment. The proper positioning of the needle is confirmed arthroscopically (Fig 2).

Arthroscopic Adhesiolysis of Metatarsosesamoid Compartment

The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal. The fibrous adhesions of the metatarsosesamoid compartment are released with an arthroscopic shaver (Dyonics; Smith & Nephew, Andover, MA) (Fig 3). This will expose the inflamed synovium of the compartment.

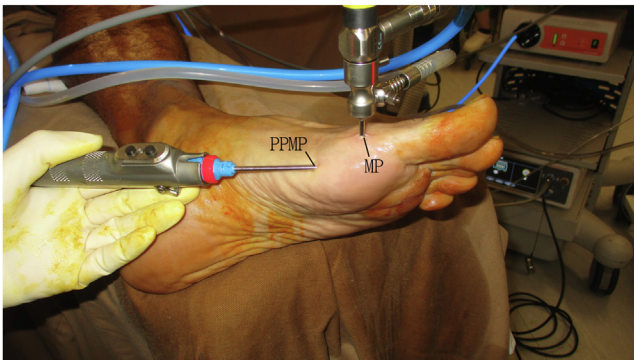


Fig 1. Metatarsosesamoid arthroscopy for management of plantar pain of first metatarsophalangeal joint after surgical correction of left hallux valgus deformity. The patient is in the supine position with the legs spread. Metatarsosesamoid arthroscopy is performed with the medial portal (MP) and proximal plantar medial portal (PPMP). The MP is established through the medial capsule midway between the dorsal and plantar aspects of the joint. The PPMP is 5 to 10 mm proximal to the plantar proximal margin of the first metatarsal head and between the flexor hallucis brevis and abductor hallucis tendons.

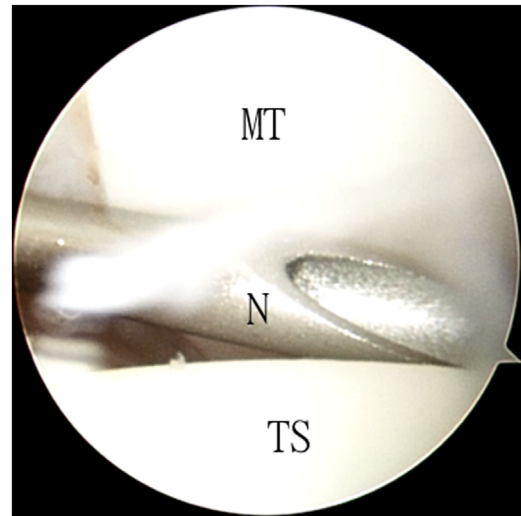


Fig 2. Metatarsosesamoid arthroscopy for management of plantar pain of first metatarsophalangeal joint after surgical correction of left hallux valgus deformity. The patient is in the supine position with the legs spread. The medial portal is the viewing portal. A needle (N) is inserted from the proximal plantar medial portal to the metatarsosesamoid compartment. The proper positioning of the needle (N) is confirmed arthroscopically. (MT, first metatarsal head; TS, tibial sesamoid.)

Arthroscopic Synovectomy of Metatarsosesamoid Compartment

The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal.

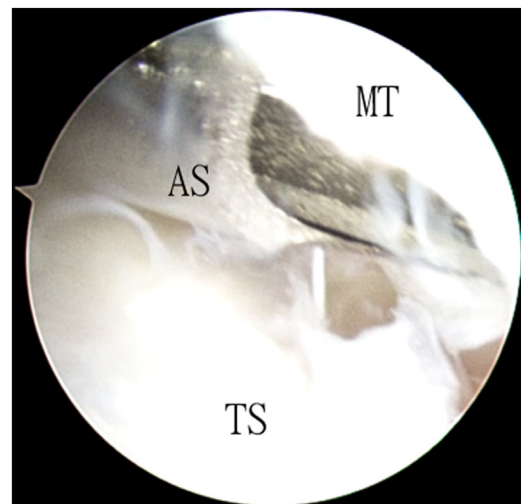


Fig 3. Metatarsosesamoid arthroscopy for management of plantar pain of first metatarsophalangeal joint after surgical correction of left hallux valgus deformity. The patient is in the supine position with the legs spread. The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal. The fibrous adhesions of the metatarsosesamoid compartment are released with an arthroscopic shaver (AS). (MT, first metatarsal head; TS, tibial sesamoid.)

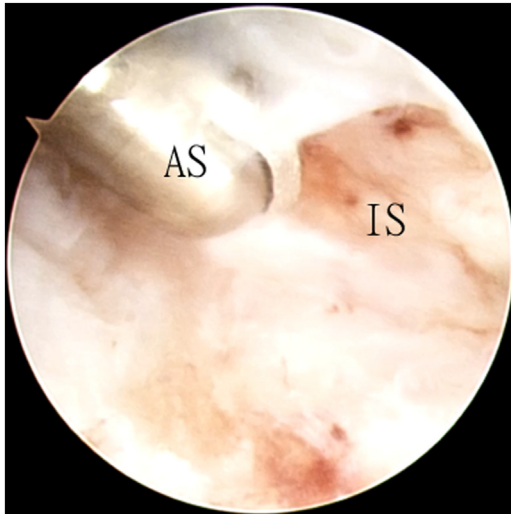


Fig 4. Metatarsosesamoid arthroscopy for management of plantar pain of first metatarsophalangeal joint after surgical correction of left hallux valgus deformity. The patient is in the supine position with the legs spread. The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal. Arthroscopic synovectomy and debridement of the damaged cartilage of the compartment are performed with the arthroscopic shaver (AS). (IS, inflamed synovium.)

Arthroscopic synovectomy and debridement of the damaged cartilage of the compartment are performed with the arthroscopic shaver (Fig 4). The plantar capsule can be pressed toward the shaver to facilitate synovectomy (Fig 5). The proximal edge of the sesamoid bones should be carefully examined for the presence of inflamed synovium because this can be missed via visualization through the medial portal. If present, inflamed synovium at the proximal edge of the sesamoid bones should be resected (Fig 6).

Arthroscopic Probing of Sesamoid Bones

The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal. The sesamoid bones are probed with an arthroscopic probe (Acufex; Smith & Nephew). If the sesamoid bone is fragmented, arthroscopic sesamoidectomy is indicated (Fig 7, Table 2, Video 1).

Postoperatively, the patient is allowed weight-bearing walking as tolerated by pain. Active and passive mobilization of the first metatarsophalangeal joint can be started on day 1.

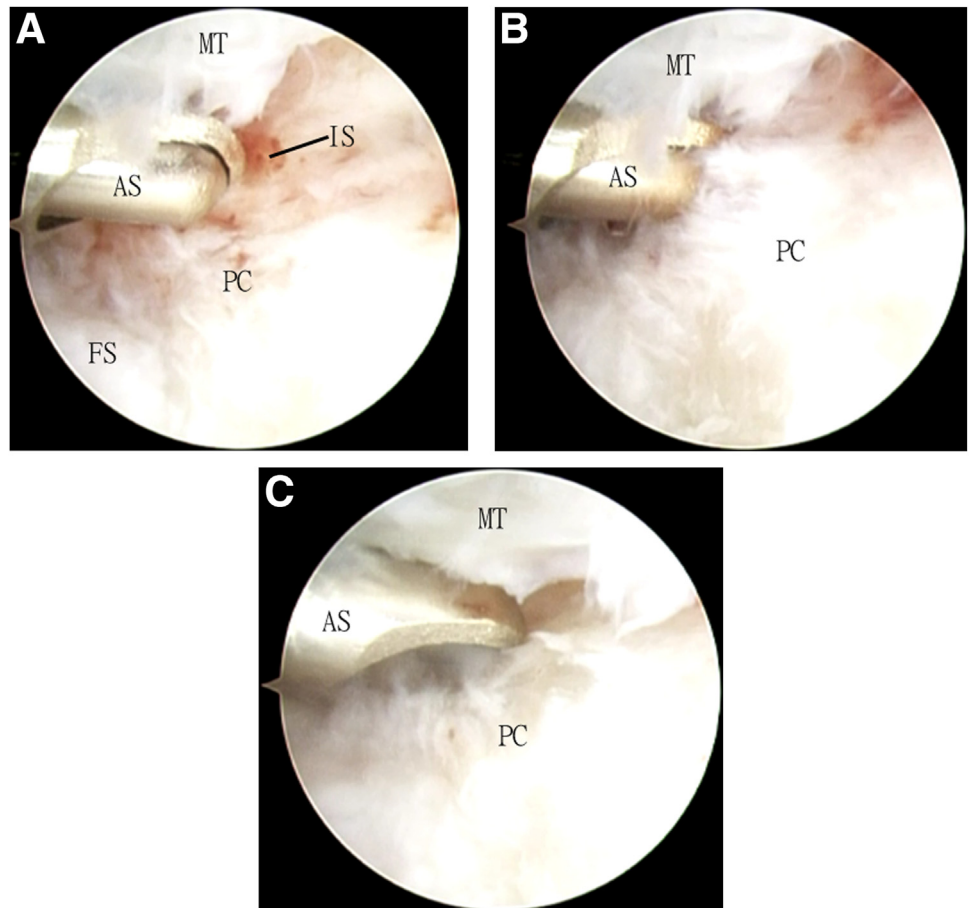


Fig 5. Metatarsosesamoid arthroscopy for management of plantar pain of first metatarsophalangeal joint after surgical correction of left hallux valgus deformity. The patient is in the supine position with the legs spread. The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal. (A) The shaver blade is placed at the area of inflamed synovium (IS) of the plantar capsule (PC). (B) The PC is pushed manually toward the shaver blade. (C) Arthroscopic synovectomy of the PC is performed. (AS, arthroscopic shaver; FS, fibular sesamoid; MT, first metatarsal head.)

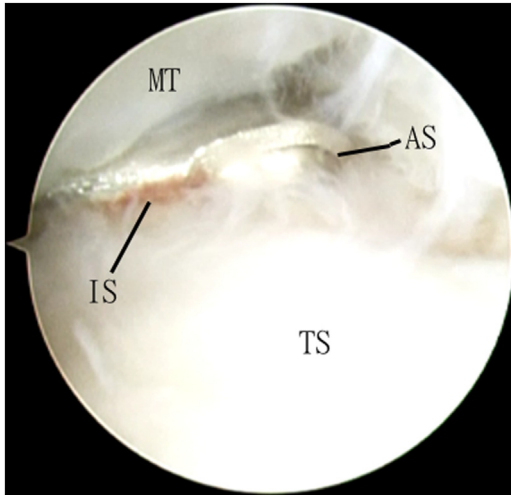


Fig 6. Metatarsosesamoid arthroscopy for management of plantar pain of first metatarsophalangeal joint after surgical correction of left hallux valgus deformity. The patient is in the supine position with the legs spread. The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal. Arthroscopic synovectomy of the medial edge of the sesamoid bones is performed with the arthroscopic shaver (AS). (IS, inflamed synovium; MT, first metatarsal head; TS, tibial sesamoid.)

Discussion

The key to success of the management of plantar pain after hallux valgus surgery is to differentiate the intra- and extra-articular causes of the pain.

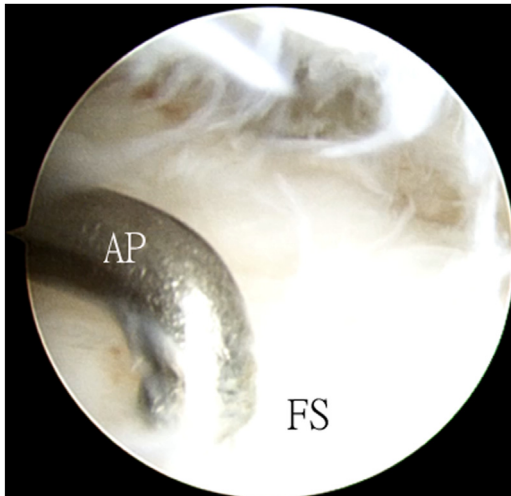


Fig 7. Metatarsosesamoid arthroscopy for management of plantar pain of first metatarsophalangeal joint after surgical correction of left hallux valgus deformity. The patient is in the supine position with the legs spread. The medial portal is the viewing portal, and the proximal plantar medial portal is the working portal. The sesamoid bones are probed with an arthroscopic probe (AP). If the sesamoid bone is fragmented, arthroscopic sesamoidectomy is indicated. (AP, arthroscopic probe; FS, fibular sesamoid.)

Table 2. Pearls and Pitfalls of Metatarsosesamoid Arthroscopy for Management of Plantar Pain of First Metatarsophalangeal Joint After Surgical Correction of Hallux Valgus Deformity

Pearls

- Placing the proximal plantar medial portal between the flexor hallucis brevis and abductor hallucis tendons can ensure that the portal tract is in line with the metatarsosesamoid articulation.
- The plantar capsule can be pressed toward the shaver to facilitate synovectomy.

Pitfalls

- If the pain is due to extra-articular pathology (e.g., excessive plantar flexion of the first metatarsal or flexor hallucis longus tenosynovitis), metatarsosesamoid arthroscopy cannot relieve it.
- Incomplete debridement of the proximal recess of the metatarsosesamoid compartment may lead to residual pain.

Table 3. Advantages and Risks of Metatarsosesamoid Arthroscopy for Management of Plantar Pain of First Metatarsophalangeal Joint After Surgical Correction of Hallux Valgus Deformity

Advantages

- Small incisions and better cosmetic outcome
- Minimal soft-tissue trauma
- Early mobilization exercise is allowed

Risks

- Digital nerve injury
- Articular cartilage injury
- Persistent pain

Metatarsosesamoid arthroscopy is only effective for treatment of intra-articular causes of pain. Extra-articular causes should be managed by other appropriate procedures such as metatarsal osteotomy¹¹ or flexor hallucis longus tendoscopy.¹²⁻¹⁴ To provide effective treatment of the intra-articular causes, complete arthroscopic adhesiolysis with synovectomy and debridement of the damaged cartilage of the metatarsosesamoid compartment should be performed. If there is fragmentation of the sesamoid bone signifying severe sesamoiditis, arthroscopic sesamoidectomy should also be performed.^{9,10,14}

The advantages of the described technique include small incisions and a better cosmetic outcome, as well as minimal soft-tissue trauma; moreover, early mobilization exercise is allowed. The potential risks of this technique include injury to the digital nerve or articular cartilage and persistent pain (Table 3). This procedure is technically difficult and should be performed by experienced foot and ankle arthroscopists.

Disclosures

Both authors (T.H.L., C.Y.T.) declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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