

Avoiding Superficial Peroneal Nerve Injury in Arthroscopically Assisted Ankle Fractures: A Technical Tip

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Due to advancements in ankle fracture management, arthroscopy has been suggested as an adjuvant in surgical treatment. However, iatrogenic of the superficial peroneal nerve injury is a possible complication due to the close relation between this structure and the anterolateral portal. This technical note describes a simple and reproducible technical tip to avoid this complication using a “translateral portal”.

Keywords: Ankle, Arthroscopy, Fracture, Superficial peroneal nerve, Technical tip

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Introduction

Although ankle fractures are common, several studies suggest that intra-articular pathology goes undetected at the time of injury. Ankle arthroscopy can aid in its diagnosis and treatment with the potential to improve patient outcomes [1][2][3].

Literature is controversial to conclude its clinical significance although studies tend to favor it [3][4][5][6][7][8][9][10].

In order to eliminate the risk of the most common complication of ankle arthroscopy [11] – neurologic injury affecting the superficial peroneal nerve (SPN) - we describe a simple method to assess the joint without the anterolateral portal (**Table 1**).

The SPN has a high variable course over the intermalleolar line. After its emergence from the crural fascia, it descends superficially over the anterolateral surface of the leg and generally bifurcates in two branches [12].

Surgical Technique

The patient is positioned in the supine position and the standard approach for open reduction and internal fixation of the fibula is performed.

Standard anteromedial portal is performed. In the dorsiflexed position, an incision is made through the skin and then, using

a mosquito clamp, blunt dissection is performed and the 4.0 mm 30° arthroscope is introduced (**Table 2**).

Visualization may be difficult at the beginning due to hematoma. This should be evacuated while keeping a low-pressure inflow.

Instead of performing the standard anterolateral portal, with the concurring risk of lesion of the superficial peroneal nerve injury, a mosquito clamp is introduced through the lateral incision anterior to the peroneus – “translateral portal” (**Figure 1**).

Removal of loose bodies, osteochondral lesions, ligamentous injuries – such as syndesmotomic or deltoid injuries – and others intra-articular lesions may be assessed and treated using this portal and technique (**Figure 2**). This includes anterior ankle impingement and repair of anterior talofibular ligament.

It is our experience that the portal allows for a good range of motion and opportunity to use the arthroscopic tools to do the associated procedures despite working under the soft tissue (when compared to standard antero-lateral portals). Despite that, if needed, standard antero-lateral portal might still be created as needed.

Creating a direct connection between the joint and the fracture site could possibly increase the risk for septic arthritis but, when performing a osteosyntheses of the ankle, an articular fracture, arthrotomy is a common gesture to the

evaluate the joint and search for chondral lesions. Therefore, using a translateral portal should not increase the risk for septic arthritis.

Possible risks of this technique include: fluid extravasation and increased costs and operative time, but similar to standard ankle arthroscopy (**Table 3**) [10].

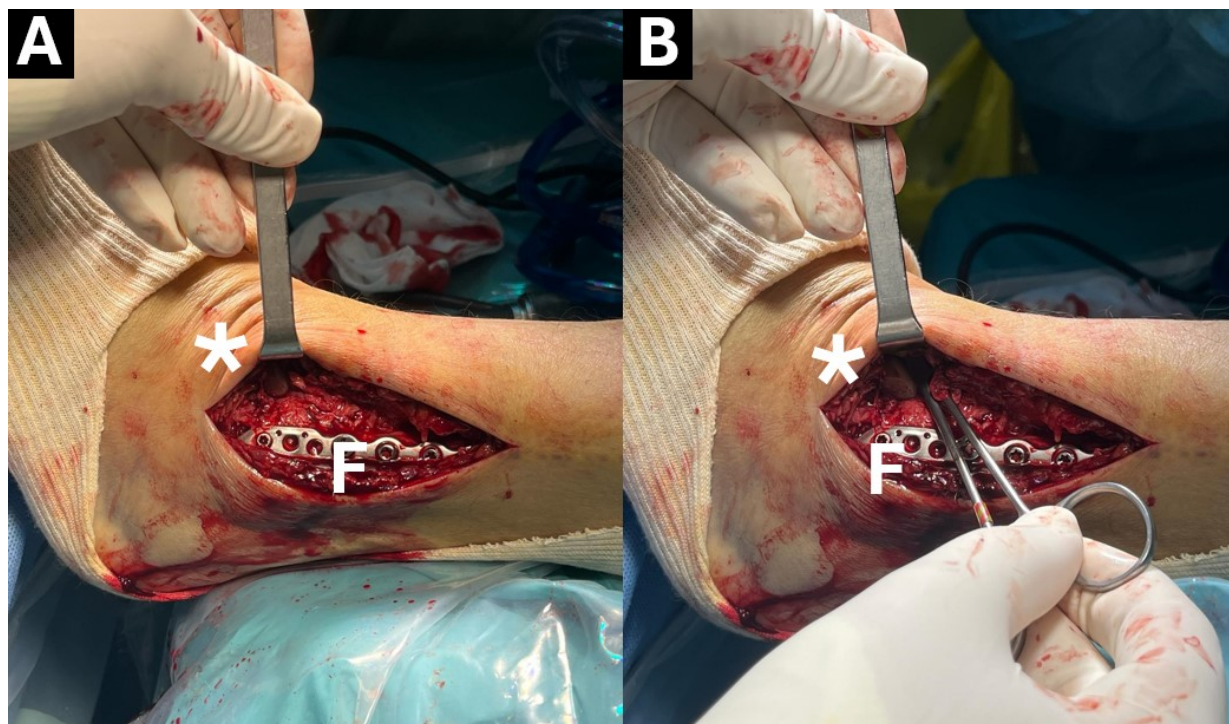


Figure 1. Left ankle (lateral view): A - The patient is positioned in the supine position and standard lateral approach and peroneal ORIF (F) is performed. An anterolateral arthrotomy is performed through the lateral incision (*). B - A mosquito clamp is introduced through the arthrotomy.

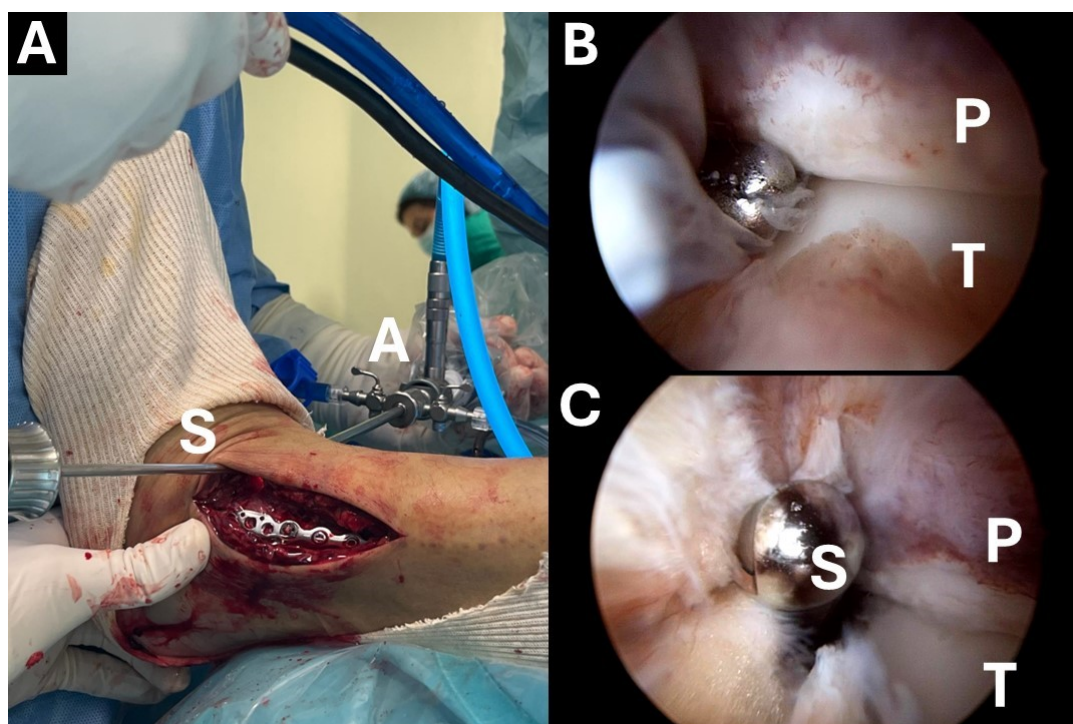


Figure 2. Left ankle (lateral view): A - Standard ankle arthroscopy is performed using the anteromedial portal (A) and the "translateral portal" (S). B/C - Anteromedial (A) portal is used to provide clear visualization of the joint (P – tibial plafond and T – talus) and the "translateral portal" (S) is used as the main working or instrumentation portal.

Table 1. Indications and contraindications of Arthroscopically assisted ankle fractures - “translateral portal”.

Indications	Contraindications
Ankle fractures with direct lateral approach	Neurovascular damage
	Open fracture
	Significant swelling

Table 2. Surgical pearls and pitfalls of Arthroscopically assisted ankle fractures - “translateral portal”

Surgical Step	Pearls and Pitfalls
Positioning	A bump under the ipsilateral buttock in order to the foot is perpendicular to the operating table
Surface anatomy	Identifying the level of the ankle joint, the tibialis anterior tendon and the superficial peroneal nerve
Lateral approach of the fibula	Standard approach for open reduction and internal fixation of the fibula.
Anteromedial portal	In the dorsiflexed position, an incision is made and, using a mosquito clamp, blunt dissection is performed and the 4.0 mm 30° arthroscope is introduced.
Hematoma evacuation	The hematoma impairs visualization; therefore, it should be evacuated while keeping a low-pressure inflow to avoid excessive fluid extravasation.
“Translateral portal”	A mosquito clamp is introduced through the lateral incision anterior to the peroneus – “translateral portal” – through the ankle joint.
Intra-articular assessment and treatment	The ankle joint is screened and osteochondral lesions, ligamentous injuries or others intra-articular lesions are treated.

Table 3. Advantages and disadvantages of arthroscopically assisted ankle fractures - “translateral portal”.

Advantages	Disadvantages
Avoidance of iatrogenic superficial peroneal nerve injury using the “translateral portal”.	Standard ankle arthroscopy increases costs and operative time but our technique matches standard arthroscopy in both cost and time.
Direct minimally invasive visualization of the joint	Need for Skilled Surgeons
Assessment of fracture reduction	Fluid extravasation
Identification and management of associated intra-articular injuries like cartilage damage, loose bodies	Iatrogenic neurovascular damage
Comprehensive Evaluation of the syndesmosis	

Conclusion

Ankle arthroscopy has become progressively more frequent as an adjunct of acute treatment of ankle fractures.

Our technique has not previously been reported in the literature. It acts as a simple reproducible way of avoiding neurologic complications due to anterolateral portal.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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