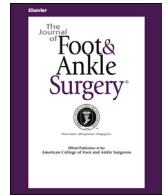




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Tips, Quips, and Pearls

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Low-Cost Intra-Articular Distraction Technique Using Kirschner Wires and a Toothed Lamina Spreader

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ABSTRACT

We describe a low-cost (instrument cost) technique for joint distraction using 2 Kirschner wires and a toothed lamina spreader in lieu of a Hintermann distractor. The described technique allows for temporary intra-articular distraction and visualization and preservation of the articular surface with extra-articular instrumentation. The technique can also allow for closed reduction and percutaneous treatment in cases of soft tissue compromise. Additionally, the technique uses common orthopedic surgical instruments, leading to a minimal learning curve for novice surgeons. We have found this distraction technique to be most effective for intra-articular preparation of hindfoot and midfoot arthrodeses and for navicular fracture reduction.

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Distraction of the various midfoot and hindfoot joints allows surgeons to visualize the intra-articular surface for fracture reduction or malalignment correction through arthrodesis. Several investigators have described the technique of placing a lamina spreader into either the talonavicular or subtalar joint to allow for access to the joint for arthrodesis preparation (1,2). However, that technique involves the need for intra-articular distractor placement through open dissection, limits visualization of the joint, and involves extensive soft tissue releases to gain access to the joint. The use of a Hintermann distractor (Integra LifeSciences Corp., Plainsboro, NJ) or a mini-distractor allows for distraction across 2 Kirschner wires (K-wires) or pins placed on either side of the joint. The technique has also been described for use in both navicular fractures and talar neck osteotomies for talus malunions (3,4). However, the use of a Hintermann distractor or equivalent surgical tool has been limited because it is not available throughout the worldwide orthopedic community owing to its cost. In the present report, we describe a low-cost technique for joint distraction using 2 K-wires and a toothed lamina spreader.

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Conflict of Interest: None reported.

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Surgical Technique

After proper preparation and exposure of the fracture or joint, the toothed lamina spreader is placed superficially on the joint before inserting the K-wires to ensure enough length is left between the proposed K-wire sites to allow access for the lamina spreader but not so much room as to prevent adequate distraction. Next, 2 parallel K-wires are placed across the joint or area that requires distraction. Using the largest diameter K-wire size will help to improve the pull out strength. Normally, the size of the K-wire will be between 1.6 and 2.0 mm. One should ensure that the K-wires are placed into as much of the bone as possible, engaging the far cortex, for maximum strength. Fully threaded K-wires can also be used to enhance purchase in the bone.

The toothed lamina spreader is then placed between the 2 K-wires, and the area between the teeth is engaged, creating distraction between the K-wires (Fig. 1). A smooth lamina spreader could also be used but is more prone to slipping off the K-wires. The K-wires can also now be bent over the edges of the lamina spreader using pliers to decrease the risk of the lamina spreader slipping or backing out. Once the lamina spreader has been engaged and the joint or area distracted, the joint can be treated as needed (e.g., prepared for arthrodesis, mobilization or reduction of fracture).

With the assistance of intraoperative fluoroscopy, our technique can be performed percutaneously without the need for open

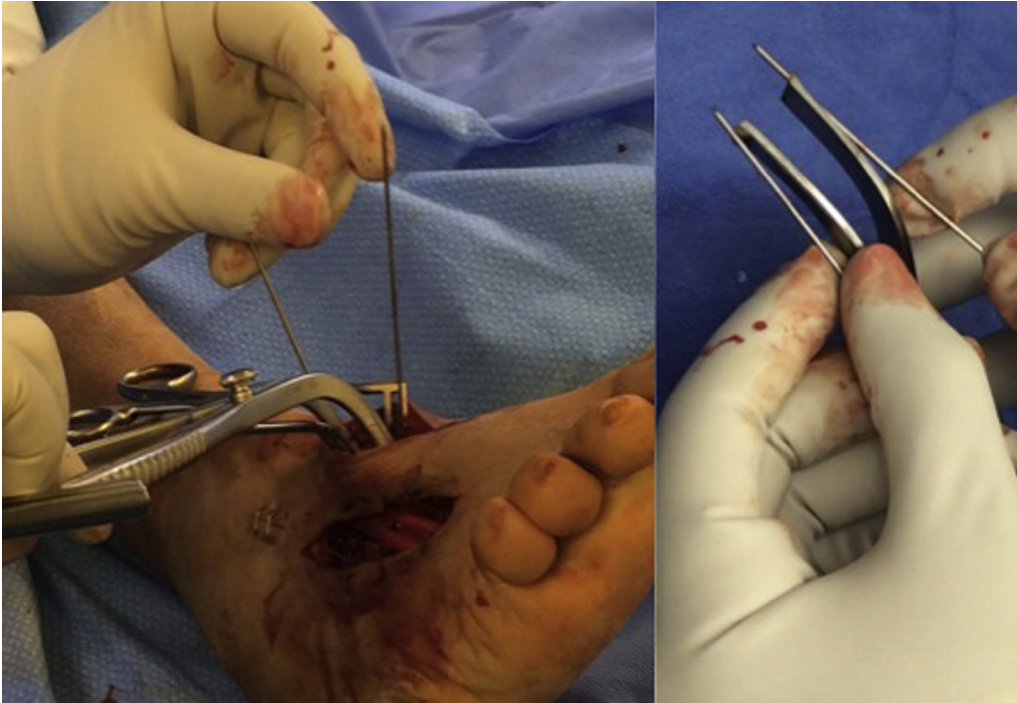


Fig. 1. Intraoperative photographs demonstrating placement of a toothed lamina spreader between 2 Kirschner wires placed across the navicular-cuneiform joint and the subsequent distraction across the Kirschner wires using the lamina spreader.



Fig. 2. Radiographs (anteroposterior and lateral) of the right foot demonstrating a comminuted navicular fracture secondary to a gunshot wound.

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