We present a series of four intra-articular calcaneal fractures in three patients that were treated with arthroscopic assisted reduction and percutaneous fixation. All four presented with Sanders class III or IV intra-articular fractures confirmed with computerized tomography (CT) scan and were treated with immediate Sir Robert Jones compression dressing. Once the acute edema was resolved, operative intervention was indicated. An arthroscopic assisted reduction with percutaneous fixation technique that allows for less dissection while maintaining direct visualization of the entire articular surface for precise realignment.1 While the lateral extensile approach for open reduction and internal fixation of calcaneal fractures is well documented in the literature, the arthroscopic assisted reduction with percutaneous fixation technique has not been reported frequently. What information there is points to a reduction in post-operative complications and an increase in patient satisfaction.

Intra-articular calcaneal fractures present a tough challenge to the foot and ankle surgeon. The amount of articular disruption as well as the number of fracture fragments makes anatomical alignment difficult to achieve. A large lateral extensile approach has traditionally been the gold standard to allow for adequate visualization and manipulation of the fracture fragments; however this dissection technique is not without the risk for iatrogenic complications. An arthroscopic assisted reduction with percutaneous fixation maintains direct visualization of the articular surface while avoiding such complications as wound dehiscence, infection and nerve damage. As shown by the case series, correct anatomical realignment can still be achieved with this limited incisional approach.

References
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Figure 2: A-B: Intra-operative image intensification evaluation. (A) Intra-articular, displaced calcaneal fracture, (B) Kirschner wire in sinus tarsi for correct placement of arthroscopic portal and Schantz pin in posterior tuber for manual manipulation, (C) Intra-operative photograph of above [B] depicting minimal trauma to the soft tissue envelope, (D-F) Arthroscopic examination of the subtalar articular surface revealing the intrinsic damage created by the traumatic injury and the extent of depression to the fracture fragments, (G) Inspection of the articular surface with the arthroscopic camera showing the realignment achieved, (H) Intra-operative image intensification revealing the varus malalignment remaining to the calcaneus, (I) Post-manipulation image intensification with return of the anatomic alignment of the calcaneus, (J) Percutaneous delivery of Kirschner wire for image intensification of guide wires for permanent internal fixation, (K) Intra-operative photograph of the arthroscopic portal and percutaneous wire delivery, (L) Manual depression of the anterior fracture fragment under direct image intensification to realign the remaining aspect of the subtalar joint, (M) Advancement of the axial guide wire under intra-operative image intensification, lateral, and coronal views under intra-operative image intensification of the final internal fixation construct with return of normal Boehler’s angle [N] and reduction of varus malalignment to the calcaneus.

Figure 1: A-B: Intra-operative image intensification evaluation. (A) Intra-articular, displaced calcaneal fracture, (B) Kirschner wire in sinus tarsi for correct placement of arthroscopic portal and Schantz pin in posterior tuber for manual manipulation, (C) Intra-operative photograph of above [B] depicting minimal trauma to the soft tissue envelope. We present a series of four intra-articular calcaneal fractures in three patients that were treated with arthroscopic assisted reduction and percutaneous fixation. All four presented with Sanders class III or IV intra-articular fractures confirmed with computerized tomography (CT) scan and were treated with immediate Sir Robert Jones compression dressing. Once the acute edema was resolved, operative intervention was indicated. An arthroscopic assisted reduction with percutaneous fixation technique that allows for less dissection while maintaining direct visualization of the entire articular surface for precise realignment.