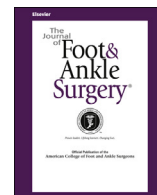


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Case Reports and Series

Ankle Arthritis Combined With Chronic Instability of the Syndesmosis After Ankle Fracture With Syndesmotic Injury: A Case Report

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ABSTRACT

Syndesmotic injuries associated with ankle fractures are commonly treated with reduction and fixation using a transfixing screw. On rare occasions, however, progression to chronic instability of the syndesmosis is observed. Several surgical techniques have been applied in such cases but usually without a report on the results. We report a case of chronic syndesmotic instability and ankle joint osteoarthritis after ankle fracture-dislocation in a 21-year-old male patient who underwent distal tibiofibular arthrodesis. During the relatively long 4-year, 1-month follow-up period, the pain and activity improved from the patient's preoperative condition. Radiographs demonstrated cessation of arthritic changes in the ankle that had initially displayed joint space narrowing. Our findings suggest distal tibiofibular arthrodesis as an option to consider for the treatment of young and active patients with arthritic changes in the ankle joint with concomitant chronic instability of the syndesmosis.

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Disruption of the distal tibiofibular joint or the ankle syndesmosis occurs through an external rotation mechanism of injury (1). This is commonly associated with Weber C, Lauge-Hansen pronation-external rotation fracture patterns or Weber B, Lauge-Hansen supination-external rotation ankle fractures (2–6). Many investigators have reported that appropriate treatment of syndesmotic injuries after rotational ankle fractures has a critical effect on the clinical and radiographic outcomes (4,7). Failure to treat the syndesmotic injuries after ankle fractures can lead to poor functional outcomes and posttraumatic arthritis (8).

Syndesmotic injuries associated with ankle fractures are treated with reduction and fixation. The fixation choices include metal screw fixation, suture button devices, biodegradable implants, bolt fixation, syndesmotic hooks, staples, and direct repair (9). On rare occasions, however, progression to chronic instability of the syndesmosis is observed. Several surgical techniques have been applied for such cases but usually without a report on results. We report a case of chronic syndesmotic instability and ankle joint osteoarthritis after ankle

fracture-dislocation in a 21-year-old male patient who underwent distal tibiofibular arthrodesis.

Case Report

A 21-year-old male patient visited our emergency department after a motorcycle accident. The patient presented with severe pain and swelling in his right ankle. His right lower extremity seemed shorter than the opposite side. Pulsation of the dorsalis pedis artery was palpable on the dorsum of the patient's foot, and circulation of the right ankle and foot was maintained. In the medial malleolar area, 10 × 3-cm size open wound was present, with exposure of the distal tibia (Fig. 1A). Simple radiographs revealed dislocation of the ankle joint and complete disruption of the distal tibiofibular joint. An open fibular fracture was present 12 cm above the fibular tip, and a medial malleolar fracture was also present (Fig. 1B). Closed reduction was attempted in the emergency room, and a short leg splint was applied. Immediate operative treatment was planned, and antibiotic therapy with cefazolin and gentamicin administered intravenously was initiated.

Sufficient irrigation was performed through the open wound in the operating room. A lateral incision was made on the ankle joint, and the fibular fracture was fixated with a one-third tubular plate after open reduction. A medial incision was made for open reduction of the medial malleolar fracture, and two 4.0-mm cannulated screws were used for internal fixation. Instability of the syndesmosis persisted even

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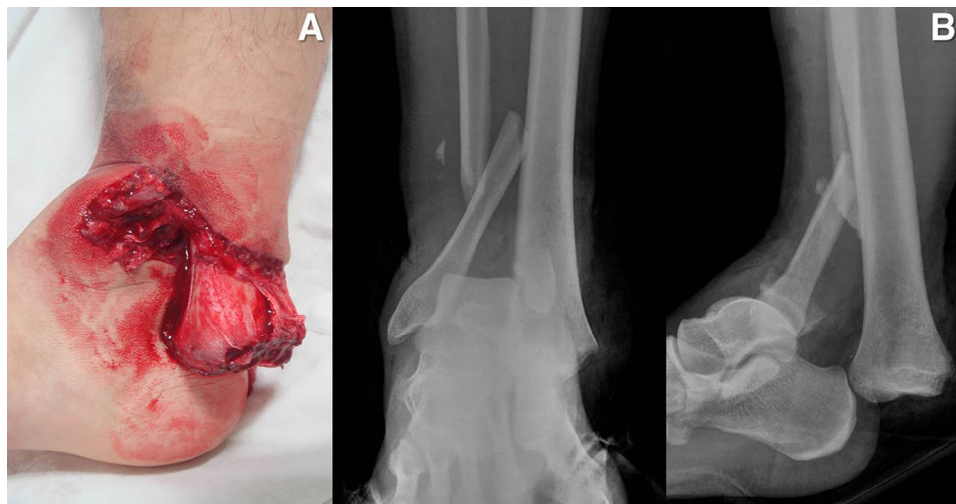


Fig. 1. (A) Photograph of an open ankle fracture dislocation after a motorcycle accident. (B) Preoperative anteroposterior and lateral radiographs at the emergency room.

after reduction of both malleolar fractures. Thus, after visually confirming the reduction of the distal tibiofibular joint through the lateral incision, syndesmotom fixation was performed using 2 screws: one 3.5-mm cortical screw through a distal hole of the one-third tubular plate and one 4.5-mm cortical screw through a more distal hole (Fig. 2A). After surgery, a short leg cast was applied for 2 months, and weightbearing on the injured leg was not allowed. When bony union was observed on simple radiographs, the cast was removed, and weightbearing, as tolerated, was started. The 2 syndesmosis screws were removed at 3 months after surgery (Fig. 2B). However, the patient complained of aggravating ankle pain after screw removal. Simple radiographs also showed a widened tibiofibular space on the mortise views (Fig. 3). At 6 months after the initial operation, the ankle joint pain had gradually increased to a level that impaired the patient's daily activities. The ankle joint range of motion was measured at 5° of dorsiflexion and 25° of plantarflexion. The American Orthopaedic Foot and Ankle Society ankle-hindfoot scale score was 45. Simple radiographs demonstrated an increasingly widened ankle mortise and

aggravated disruption of the distal tibiofibular joint. The talar tilt angle, which had been normal, had increased to 4.3°, showing progression of osteoarthritic changes in the ankle joint (Fig. 3C).

We believed the chronic syndesmotom instability resulting from the unhealed distal tibiofibular joint was mainly attributable to osteoarthritic changes in the ankle joint. Because a moderate degree of arthritic changes was already in progress, we planned a distal tibiofibular arthrodesis, as a salvage procedure, instead of screw fixation or ligament reconstruction despite the young age of the patient. First, the distal tibiofibular joint was exposed with an anterior approach. Next, the intraarticular fibrotic scar tissue interposed in the distal tibiofibular articulation was completely removed. Approximately 3 cm of the medial surface of the fibula and lateral surface of the tibia, which is the distal tibiofibular joint portion, was decorticated to a depth of 2 mm using a high-speed burr with irrigation. Using approximately 3 cm³ of cancellous bone harvested from the proximal tibia, autogenous bone grafting was performed. The distal tibiofibular joint was fixated after congruency of the ankle mortise and reduction of the syndesmosis



Fig. 2. (A) Postoperative anteroposterior and lateral radiographs showing syndesmosis fixation performed using 2 screws. (B) Anteroposterior and lateral radiographs showing the 2 syndesmosis screws were removed at 3 months after surgery.

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