Technical Brief

Fifth Metatarsal Fracture Fixation with BioPro® Comprehensive Foot Plating System

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Case Overview:
The patient is a 35 year old female with a past medical history of bipolar disorder, traumatic brain injury, seizure disorders, and intellectual disability.

Case Presentation:
The patient fell down some stairs at home and described an inversion injury to the right foot. She was evaluated at the hospital emergency trauma center on the date of injury. Radiographs of the right foot demonstrated a mildly displaced fifth metatarsal shaft fracture. A splint was applied to the right lower extremity and the patient was not using crutches satisfactorily, therefore she was instructed to ambulate with a knee scooter, non-weight bearing on the right lower extremity and follow up with orthopedics on an outpatient basis. When she reported to my office, she presented with her brother-in-law as her guardian. He stated that the patient was not compliant with the non-weight-bearing instructions due to her mental disability. Repeat radiographs showed further displacement and instability (Fig. 1A and 1B).

Preoperative Planning:
Conservative treatment with immobilization and non-weight-bearing was discussed, but with the patient's mental disability and noncompliance, open reduction and internal fixation (ORIF) was recommended. Given the nature of the shaft fracture which included displacement, instability, and comminution, a combination of a plate and screws was favored. The goal of the fixation was stable, anatomic reduction with early return to function.

Operative Technique:
A single incision was made over the dorsum of the fifth metatarsal. The fractures were exposed, anatomic reduction was achieved, and temporary fixation was attained with Kirschner wires. A single 2.0 cortical screw was placed across the oblique portion of the fracture. A BioPro® eight hole T-plate was fashioned to fit over the fifth metatarsal head, neck and shaft. Six 2.0 locking screws were then inserted. Anatomic reduction and stable fixation was achieved.

Postoperative Management:
The patient was instructed to be non-weight-bearing using a controlled ankle movement (CAM) boot. The CAM boot would give the added protection needed due to her history of noncompliance.

Postoperative Follow-Up and Outcomes:
The patient had an uneventful post-op course. The CAM boot was continued at 4 weeks post-op with guarded weight-bearing. At 7 weeks post-op, the patient was pain free and radiographs showed satisfactory alignment with evidence of osseous healing (Fig. 2A, 2B, and 2C).

Discussion:
The BioPro® eight hole T-plate, in combination with 2.0 cortical lag screw and 2.0 locking screws, was sufficient to maintain excellent anatomic alignment of the fifth metatarsal shaft fracture. Moreover, the construct exhibited ample strength to maintain stable reduction even though the patient was not entirely compliant with her post-operative weight bearing instructions.

Fig 1A
Oblique radiograph demonstrating an unstable, displaced and mildly comminuted 5th metatarsal shaft fracture.

Fig 1B
Lateral radiograph demonstrating angulated 5th metatarsal shaft fracture.

Fig 2A, 2B, 2C
Anterioposterior, oblique, and lateral radiographs demonstrating satisfactory alignment and osseous healing at 7 weeks post-op.

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