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Polymer Cable/Grip-Plate System with Locking Screws for Stable Fixation to Promote Healing of Trochanteric Osteotomies or Fractures in Revision Total Hip Arthroplasty.

Keith R. Berend, MD; Jacob L. Willen, BS; Michael J. Morris, MD; Joanne B. Adams, BFA;
Adolph V. Lombardi, Jr., MD, FACS

Joint Implant Surgeons, Inc., New Albany, Ohio, USA

Abstract: Multiple methods have been proposed to establish stable fixation to promote healing of trochanteric osteotomies or fractures in revision total hip arthroplasty (revTHA), from wiring techniques through cable-plate systems with or without supplemental locking screws. The purpose of this study is to report the clinical results of a single cable-plate system with locked screw fixation in revTHA. Between 2009 and 2012, 27 grip-plates (SuperCable® System, Kinamed Inc., Camarillo, CA) were used in 26 patients in 27 revTHA procedures. Utilization was twelve 1-hole (50mm) grip-plates, ten 2-hole (135mm) grip-plates, four 4-hole (190mm) grip-plates, and one 6-hole (245mm) grip-plate. There were 14 women and 12 men. Age averaged 63.2 years and BMI averaged 29.4 kg/m^2. At average 2.5 year follow-up, grip-plate fixation was considered successful in 22 hips (81%) with five failures. Three failures consisted of 50mm/short grip-plates used in one trochanteric slide, and two-intraoperative trochanteric fractures during revTHA. The two additional failures were related to pre-revision trochanteric avulsion from bony necrosis of the proximal femur. An additional three grip-plates were removed electively for soft-tissue irritation and pain but with successful fixation and bony healing. Thus 70% of hips were free of reoperation related to the grip-plate. All other hips had successful fixation and the grip-plate was not symptomatic. In this study, the cable-grip system and isoelastic Supercables provided reliable fixation for adequate healing of difficult ETO and trochanteric fractures with an 81% rate of mechanical success with radiographic and clinical healing observed.

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"The current cohort is made up of only the most complex cases."

Figure 1. Complex reconstruction using SuperCable and grip-plate system. The patient had undergone a two-stage treatment of infection with a 10-inch, bowed, cylindrical stem which failed from aseptic loosening and failure of ingrowth. Subsequent revision was complicated by infection requiring a second two-stage exchange with ETO and massive proximal bone loss. During the reimplantation, multiple fractures of ectatic trochanteric fragment occurred. A 2-hole (135 mm) grip-plate with SuperCables and locked screws was used during the final reconstruction. At four years, the trochanteric fixation is healed and solid and the patient has no complaints related to the construct.

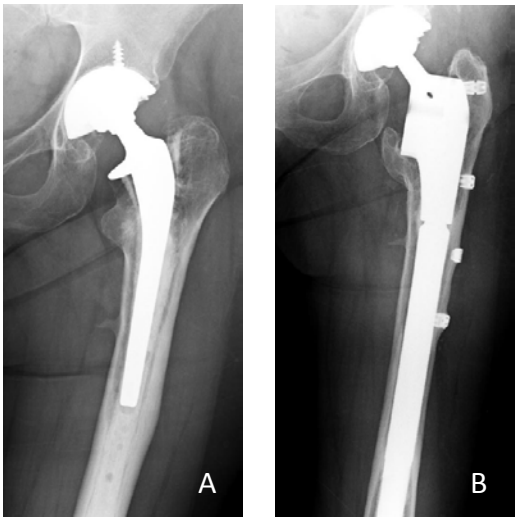

Figure 2. a. Preoperative radiograph of a patient with failed cemented femoral fixation with long cement mantle. **b.** The patient underwent femoral revision requiring ETO for cement removal. The procedure was without fracture of the trochanteric fragment and thus three cables were used without grip-plate for ETO fixation. A fourth Supercable is seen distal to the osteotomy as prophylaxis against fracture. At five years, complete radiographic and clinical healing of the ETO is seen.

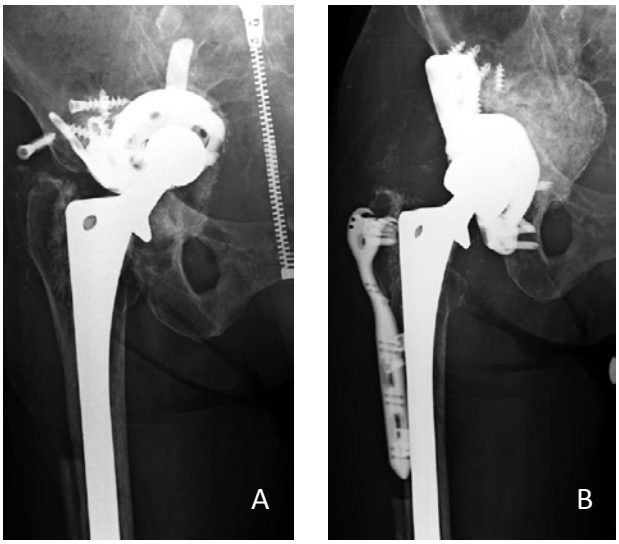

Figure 3. Trochanteric Slide Osteotomy for acetabular exposure. **a.** Preoperative radiograph of the right hip of an elderly female patient demonstrates complete migration of the acetabular component and femoral head through the acetabular wall, and loosening of acetabular screws and plate. **b.** A custom acetabular triflange component was designed and required trochanteric slide osteotomy for exposure and insertion. Given the patient's advanced age, osteoporosis, and multiple surgical history, a 2-hole (135 mm) grip-plate with locked screws and Supercables was used. At four years postoperative, stable trochanteric fixation and healing is present.

"The cable-grip system and isoelastic Supercables provide reliable fixation for adequate healing of difficult ETO and trochanteric fractures with an 81% rate of mechanical success with radiographic and clinical healing observed."