Cerclage Wire Adjunct in Traumatic Femoral Fracture:
A Comparison of Union, Complication, and Reoperation

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Purpose: The purpose of this study was to compare the results of fractures of the femur in which the reduction was assisted with the use of cerclage wire(s) to those femoral fractures treated with closed, indirect reduction. The primary outcome was fracture union. Secondary outcomes included complication or reoperation.

Methods: We performed a retrospective observational study which included 236 lower extremity traumatic fractures (31A-33C) in adults at a Level-I trauma center. Study (cerclage) and control groups were age, sex, and fracture-matched for comparison. Fractures were treated with intramedullary nailing or plate fixation based on surgeon judgement. Chart and radiographic reviews were used to determine union and any return to surgery.
Patients lacking a minimum of 9 months follow-up were excluded in order to capture the most accurate potential union and reoperation numbers. Quality of reduction was measured by an independent observer using3 parameters: (1) <10°of angulation in orthogonal radiographic views, (2) <5 mm of displacement between the major fracture fragments, and (3) <5 mm of gap between the major fracture fragments. A good reduction was one that met all 3 criteria, an acceptable reduction met 2 criteria, and a bad reduction met 1 or none of the criteria.

Results: Patients operated using cerclage had no significant difference in final union rates (P = 0.749), wound complication (P = 1.000,) or hardware removal for pain (P = 0.6218). Overall reoperation rates were 9.3% (cerclage) and 17.8% (non-cerclage). Nonunion/fixation failure requiring additional surgery was significantly higher in the non-cerclage group (P = 0.0263). In this study patients were 3.14 times more likely to have a nonunion or fixation failure if cerclage was not used. Furthermore, there was a significantly higher proportion of good (n = 92) (P <0.0001) or good/acceptable (n = 116) (P <0.0001) quality reductions than bad (n = 2) using cerclage, resulting in a patient being 13.29 times more likely to have a bad quality reduction when cerclage was not used.

Conclusion: Despite long-standing beliefs that cerclage wire may result in prevention of callus formation and inhibition of local blood supply, our study suggests that in the long bone fracture population cerclage may actually assist with union. Finally, cerclage did not result in any additional wound or hardware removal complications and had a lower reoperation rate.