Trochanteric Osteotomy

Analysis of Pattern of Wire Fixation Failure and Complications

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Since the middle of 1969, total hip replacement using trochanteric osteotomy has been a frequently performed procedure at New England Baptist Hospital. We find that greater exposure and the ability to improve the biomechanics of the hip outweigh the recognized disadvantages of increased operating time and increased blood loss.[5,9,10,11]

We wish to discuss the problems and complications that are directly related to trochanteric osteotomy. These include: loss of trochanteric position, osteotomy nonunion and delayed union, trochanteric bursitis, reoperation for trochanteric reattachment or for "bursitis" secondary to wires and fractured wires (with or without migration).[7] The incidence of problems and complications related to trochanteric osteotomy, as reported by various authors, is found in Table 1. Loss of trochanteric position may not be associated with a poor result. Osteotomy healing requiring more than 3 months is considered delayed union. Many of these osteotomies which demonstrate delayed healing will later heal. Fractured wires, themselves, are not complications but, rather, problems. They lead to loss of the trochanteric position, which is not considered a problem unless pain and disability ensue. Fractured wires may also migrate, but this is merely a problem, unless the wire moves into the hip joint.[4] The overall incidence of complications, as reported by Thompson[11] is 17.5% and is 9.9% as Johnson[8] reported although other authors would dispute these high figures.

We realize that most of these complications and problems arise due to local irritation within a wound caused by wire and the fatigue properties of wire. Wire knots and twists can produce intractable pain, for which wire removal becomes necessary. Wire breakage is ordinarily due to fatigue failure. Charnley states, "Wire breakage is never due to tension except at the moment of tightening by the surgeon."[5] We could, however, envision situations where early, ill-advised ambulation could produce tensile forces in 18 gauge stainless steel wire above the recognized strength. Also, improper wire handling can markedly reduce its tensile and fatigue strength. We do not agree with Bechtol that fracture is due to varying chemical concentrations between wire entrapped in cement and wire in tissue.[2]

This study was planned in the hope that by better understanding the spatial and time patterns of wire breakage following trochanteric osteotomy, certain conclusions could be drawn regarding the significance of early and late wire breakage, the most desirable wire configuration, refinements in technique, and properties that a material would need in order to be more suitable for fixation than stainless steel wire. Also, we hoped that we could identify certain patient characteristics that lead to a greater incidence of avulsion and other complications. This analysis would hopefully allow us to take measures to reduce our incidence of complications and problems related to trochanteric osteotomy.

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