Proximal femoral fracture after hip resurfacing managed with blade-plate fixation. A case report. Weinrauch P1, Krikler S.

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Published
2008

Journal Title
The Journal of Bone and Joint Surgery

DOI
https://doi.org/10.2106/JBJS.G.00950

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Proximal Femoral Fracture After Hip Resurfacing Managed with Blade-Plate Fixation

A Case Report

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Periprosthetic and proximal femoral fractures that occur after hip resurfacing are a challenging problem which, with the increasing popularity of resurfacing arthroplasty, is likely to increase in frequency. In the presence of a well-fixed acetabular component, periprosthetic femoral neck fractures about a hip resurfacing implant may be successfully managed by isolated revision of the femoral component and retention of the socket. However, successful internal fixation of the fracture would allow retention of the femoral implant and salvage of a previously well-functioning resurfacing prosthesis.

When the resurfacing femoral component is retained, however, the presence of the implant stem, which is centrally located in the femoral neck, causes difficulty in placing the typical implants (e.g., a screw-plate device or a cephalomedullary nail) that are used in the management of intertrochanteric and proximal femoral fractures.

Disclosure: The authors did not receive any outside funding or grants in support of their research for or preparation of this work. Neither they nor a member of their immediate families received payments or other benefits or a commitment or agreement to provide such benefits from a commercial entity. No commercial entity paid or directed, or agreed to pay or direct, any benefits to any research fund, foundation, division, center, clinical practice, or other charitable or nonprofit organization with which the authors, or a member of their immediate families, are affiliated or associated.
We present the case of a patient in whom an intertrochanteric femoral fracture distal to a hip resurfacing implant was successfully managed by internal fixation with use of an angled blade plate. The patient was informed that data concerning the case would be submitted for publication, and he consented.

**Case Report**

A sixty-seven-year-old man with end-stage osteoarthritis underwent left hip resurfacing through a posterior approach and with use of a Cormet (Corin Group, Cirencester, United Kingdom) metal-on-metal resurfacing prosthesis. The femoral component was fixed with Simplex polymethylmethacrylate cement (Stryker, Limerick, Ireland), which was poured into the prosthesis early in the curing cycle prior to application of the implant to bone. The stem of the femoral component was not cemented. Immediate postoperative radiographs revealed satisfactory orientation of the implant (Fig. 1), and the patient made an uneventful recovery. At twelve months postoperatively, the prosthesis was considered to be functioning well on the basis of satisfactory pain relief as reported by the patient, and the Harris hip score was 92. At nineteen months postoperatively, the patient sustained a closed intertrochanteric fracture (Kyle type-II pattern) as a result of a fall in which he landed directly on the hip on a hard surface (Fig. 2). After consideration of the management options and completion of preoperative templating and with the patient under combined spinal and general anesthesia, the fracture was reduced in a closed manner on a traction table and then internally fixed with use of an 80-mm, four-holed, 130-degree angled blade plate (Synthes, Solothurn, Switzerland). The duration of surgery was fifty-five minutes. The patient recovered without complication and was discharged seven days after surgery, with instructions to walk with the use of crutches and toe-touch weight-bearing for eight weeks. Radiographs made at three months after the injury showed the fracture to be solidly united; the satisfactory reduction was unchanged relative to the immediate postoperative radiographs. At seventeen months after fracture, the latest clinical review, radiographs showed no complication related to either the resurfacing implant or

Radiographs at one year showed the prosthesis to be well fixed with no change in position and no new radiolucency relative to the immediate postoperative radiographs. At nineteen months postoperatively, the patient sustained a closed intertrochanteric fracture (Kyle type-II pattern) as a result of a fall in which he landed directly on the hip on a hard surface (Fig. 2). After consideration of the management options and completion of preoperative templating and with the patient under combined spinal and general anesthesia, the fracture was reduced in a closed manner on a traction table and then internally fixed with use of an 80-mm, four-holed, 130-degree angled blade plate (Synthes, Solothurn, Switzerland). The duration of surgery was fifty-five minutes. The patient recovered without complication and was discharged seven days after surgery, with instructions to walk with the use of crutches and toe-touch weight-bearing for eight weeks. Radiographs made at three months after the injury showed the fracture to be solidly united; the satisfactory reduction was unchanged relative to the immediate postoperative radiographs. At seventeen months after fracture, radiographs showed no complication related to either the resurfacing implant or

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**Fig. 3-A**
Anteroposterior (Fig. 3-A) and lateral (Fig. 3-B) postoperative radiographs, made seventeen months after fracture fixation. The fracture has healed in excellent alignment.
the internal fixation, and the Harris hip score was 88 (Figs. 3-A and 3-B). The patient reported only slight and occasional discomfort, which did limit activity. No plans have been made to remove the blade plate.

Discussion

Guidelines from the National Institute for Clinical Excellence and data from the Australian Orthopaedic Association National Joint Replacement Registry recommend that alternatives to resurfacing arthroplasty should be considered in patients who are older than sixty-five years.\(^4\) Our patient was functioning well prior to sustaining a proximal femoral fracture as a result of substantial trauma. Had this patient initially been managed with a conventional total hip replacement and sustained a periprosthetic femoral fracture about the stem, fracture treatment may have been more challenging.

Successful fracture fixation allows the femoral resurfacing component to be retained and is therefore an attractive alternative, particularly in physiologically younger patients. With regard to internal fixation of a proximal femoral fracture distal to a resurfacing femoral component, however, the practical problem is how to obtain adequate proximal purchase and stability. Most screw-plate devices for internal fixation of intertrochanteric hip fractures utilize a lag screw with an outer thread diameter of 12.7 mm. With a resurfacing femoral component stem centrally located within the femoral neck, the placement of an implant of this diameter might be impossible or would require the lag screw to be placed into a substantially eccentric position within the femoral neck and head, potentially compromising the quality of internal fixation. The Synthes angled blade plate has a U-shaped profile and measures 16 mm in width and 6.5 mm in height. With a resurfacing component in situ, the reduced height and the U shape of the blade makes positioning of the proximal fixation easier and enables the blade to be placed into a more central position within the femoral neck, if desired. After consolidation of the fracture in our patient, the femoral component was in a slightly varus position in comparison with its prefracture alignment; however, we believe both the fracture reduction and implant orientation are acceptable. Aning et al. described an alternative method of fixation of a comminuted fracture and concomitant proximal femoral shaft fracture distal to a resurfacing femoral component; this method involved the use of a cephalomedullary reconstruction nail and two proximal interlocking screws on either side of the resurfacing femoral component stem.\(^5\) In less complex fractures, however, as a technically easier alternative, we suggest consideration of internal fixation with a suitable blade plate. We acknowledge potential technical difficulties and limitations in using a blade plate for intertrochanteric hip fractures, with or without a resurfacing femoral component in situ, particularly in situations of unstable fracture patterns and extensive comminution. In addition, if cement is pressurized into the femoral neck around the stem of the implant at the time of the resurfacing arthroplasty, it might obstruct the passage of the blade. This was not a concern in the case of our patient.

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References