

Use Of A Long Femoral Stem In The Treatment Of Proximal Femoral Fractures: A Report Of Four Cases

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Abstract

Proximal femoral fractures require early operative stabilization to enable early mobilized especially in the elderly. This is to prevent the development of the complications, which result from prolonged immobilization, such as Orthostatic pneumonia, urinary tract infection, pressure sores and venous thromboembolism. Various methods can be used for stabilization of these fractures, like the dynamic hip screw, the angled blade plate or the intramedullary nail with proximal lag screw (trochanteric Gamma nail, proximal femoral nail or reconstruction nail). However, in certain proximal femoral fractures such as subtrochanteric fractures with associated femoral neck fractures, periprosthetic fractures and pathological fractures, the use of standard methods of fixation may not be feasible. In such cases, the use of long femoral stem component provides adequate and immediate stabilization of the fracture. We report four cases where we employed the use of long femoral stems to treat such fractures. The first is a fracture at the neck of femur with an ipsilateral intertrochanteric fracture, the second case was a periprosthetic fracture around a Austin-Moore hemiarthroplasty prosthesis and the other two cases were pathological fractures of the proximal femur due to metastatic secondaries.

INTRODUCTION

Long stem cemented hip arthroplasty, whether total or hemi, is fast becoming an established form of treatment in cases of proximal femoral fractures in the elderly. Internal fixation in these cases can lead to a higher incidence of fracture non-union and implant failure, especially when dealing with pathological bone, in cases of osteoporosis and metastasis.

We report four cases of the use of the long femoral stem cemented prosthesis for replacement of the proximal femur.

CASE SUMMARY

CASE 1

This is an 87 year old lady who was pre-morbidly ambulant, had a fall at home. She has an Austin-Moore hemiarthroplasty hip prosthesis done for her left side many years ago for a femoral neck fracture. Due to the fall, she sustained a periprosthetic fracture around the Austin-Moore stem which was spiral in configuration and extending up to the proximal femur. We treated her fracture surgically by removal of the Austin-Moore stem and insertion of a long femoral stem total hip replacement (totally cemented). She is currently walking full-weightbearing with the aid of a walking frame.

Figure 1

Figure 1a: Preoperative xray



Figure 2

Figure 1b: Postoperative xray



CASE 2

An 85 year old lady had a fall in the bathroom and sustained a comminuted fracture of the right proximal femur at the intertrochanteric region with extension to the subtrochanteric area and also an associated intracapsular neck fracture

ipsilaterally.

We treated her surgically by a right hip hemi-arthroplasty using a bipolar prosthesis with a long femoral stem. Postoperatively, she was able to ambulate on walking frame.

Figure 3

Figure 2a: Preoperative radiograph



Figure 4

Figure 2b: Postoperative radiograph



CASE 3

A 51 year old lady with advanced breast carcinoma and multiple bone metastases presents with a sudden pain and weakness of the left thigh. Radiograph revealed osteolytic lesion to the left proximal femur at the subtrochanteric region. There was a pathological fracture at the subtrochanteric region secondary to metastatic breast carcinoma. We proceeded to do a bipolar hemiarthroplasty of the left hip using a long femoral stem. Postoperatively, the patient was initially put on wheelchair ambulation and later started on ambulation by walking frame.

Figure 5

Figure 3a: Preoperative radiograph



Figure 6

Figure 3b: Postoperative radiograph



CASE 4

A 66 year old male presented with a history of limping and right hip pain 1 month prior to admission to the ward and a 3 day history of sudden inability to weight bear on the right side. He also has loss of weight and loss of appetite. Plain radiograph showed a pathological subtrochanteric fracture of his right proximal femur with osteosclerotic lesion over the entire proximal femur. There was also osteolytic erosion of the ipsilateral acetabulum. We proceeded to do a right totally cemented total hip arthroplasty with a long femoral stem. Postoperatively, the patient ambulated on a wheelchair.

Figure 7

Figure 4a: Preoperative radiograph



Figure 8

Figure 4b: Postoperative radiograph



DISCUSSION

In the treatment of any proximal femoral fractures, whether pathological due to tumor deposits or osteoporosis, there are two issues which need to be addressed:

1. Adequate stability for immediate weight bearing and
2. The prosthesis should bypass the abnormal bone to obtain a stable and strong construct.

Case 1 is a periprosthetic fracture around an Austin-Moore femoral stem. The fracture extended spirally up to the proximal femur. Revision with a conventional length stem would not have been adequate because of the extent of the fracture as well as inadequate bone stock, which is a common problem in revision arthroplasty [1]. Cemented long-stem femoral components, compared to cemented conventional-length stems decreases the extent and progression of femoral lucencies, thereby lowering the incidence of mechanical failures and improving long-term survival of the prosthesis.[1]

In case 2, the patient had a comminuted fracture of the proximal femur around the peritrochanteric area. There was also an associated intracapsular femoral neck fracture. The risk of avascular necrosis of the femoral head and non-union

of the neck fracture is likely to be high. Therefore, fixation with an intramedullary device such as a gamma nail or proximal femur nail is contra-indicated. As such, replacement of the proximal femur with a femoral stem prosthesis was chosen.

In cases 3 and 4, there was a pathological fracture of the proximal femur due to metastatic disease. Healing of pathological fractures cannot be relied on because healing generally proceeds more slowly than normal, is impeded both by the metastatic tumor and by the effects of postoperative radiation treatment [2]. For lesions about the hip, where as much as six times body weight may be borne by the bone, the need for immediate stability and prolonged durability strongly favors prosthetic replacement rather than internal fixation. [2] Internal fixation of pathological fractures or impending pathological fractures that are due to metastatic involvement of the femoral head and neck region is associated with an unacceptably high risk of subsequent pathological fracture. Thus, in cases 3 and 4 prosthetic replacement is the treatment of choice [2]. As for the length of the femoral stem, in all the 4 cases described, we chose long stem femoral implants, measuring at least 20 cm. From a biomechanical standpoint, the tip of the intramedullary femoral stem should bypass the most distal area of weakness by two bone diameters. This minimizes stresses and motion that could be associated with clinical loosening of the cemented stem. [2,3]. A shorter stem that just bridges the fracture may not provide adequate distal fixation due to high cement-bone shear stresses [2,3].

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References

1. Damron TA, Sim FH. Operative treatment for metastatic disease of the pelvis and the proximal end of the femur. JBJS (Am) Jan 2000. Vol. 82, Iss. 1; pg. 114 (13 pages)
2. Mann KA, Ayers DC, Damron TA. Effects of stem length on mechanics of the femoral hip component after cemented revision. J. Orthop. Research. NY: Jan 1997. Vol. 15, Iss. 1; pg. 62 (7 pages)
3. Turner RH, Mattingly DA, Scheller A. Femoral revision total hip arthroplasty using a long-stem femoral component Clinical and radiographic analysis. J.Arthroplasty. 1987. Vol.2, Iss. 3,pg. 247-258.

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