

Case Report

Intra-Operative Femoral Neck Fracture during Attempted Dislocation of a Reduced Hemi-Arthroplasty

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Fragility hip fractures are increasingly common and hemiarthroplasty is one of the standard treatments. Although a common surgery, it should be performed with great caution because of the poor pre-morbid and bone quality in this demographic. Intra-operative fractures can occur while attempting press fit of the femoral implant. However, vigilance often steps down once the implant is secured and the hip reduced.

This case report reminds surgeons that a large amount of torque can be transmitted during intra-operative positioning, such as during an attempt of hip dislocation. This torque, in addition to the risk factor of osteoporotic bone, can result in iatrogenic fractures. Published literature regarding management of an intra-operative fracture while the prosthetic hip is still reduced is lacking. The authors propose that temporary prophylactic cerclage wiring is a prudent and safe procedure prior to hip dislocation.

Keywords: Hip fracture, Arthroplasty, Complication

J Med Assoc Thai 2015; 98 (5): 520-2

Full text. e-Journal: <http://www.jmatonline.com>

Case Report

An 89 year old male walking with a cane sustained a fall on level ground fracturing his right femoral neck. The fracture was fully displaced (Garden type 4) and the patient was advised for surgery, which, according to the local protocol, was a hip hemiarthroplasty.

For the first two weeks, the patient refused surgery and opted for topical alternative therapies. After the expected failure of the alternative therapies and repeated discussions with the patient and his relatives, they finally decided for operative management.

After implantation of the Austin Moore prosthesis, the femoral neck was confirmed to be intact without any fracture and closed reduction was performed.

Unfortunately, soft tissue was found to be interposed in the hip joint after reduction of the prosthesis. Attempt at retrieval failed, and the surgeons decided to dislocate the hip to free the soft tissue. During attempted dislocation with flexion, adduction and internal rotation, a crack was heard and the implant was visibly loosened. An undisplaced fracture crack was noticed at the anteromedial part of the femoral



Fig. 1 Standard posterior approach to the hip was performed by two surgeons whom have operated on more than 500 successful hip arthroplasties. The initial part of surgery was generally uneventful aside from the fact that there was more callus than usual because of the delayed timing of surgery.

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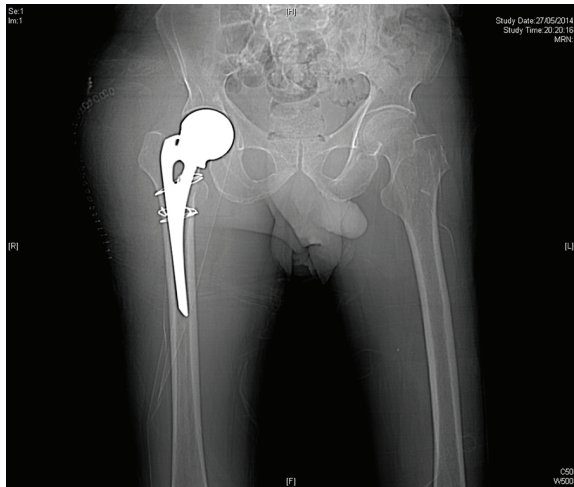


Fig. 2 Post-operative X-ray pelvis showed good alignment and the patient started protected weight bearing walking on post-operative day 3.

neck, but the head of the prosthesis was still located. The fracture propagated with further internal rotation of the hip, halting further attempt at dislocating the prosthesis.

The surgeons decided for prophylactic cerclage wiring to decrease the fracture propagation risk during surgical dislocation of the hip. After wiring, the prosthesis could be dislocated without propagation of the fracture. The interposed soft tissue was retrieved, formal cerclage wiring of the femoral neck was performed and the prosthesis was reimplanted.

Subsequent closed reduction and closure of the wound was uneventful. The patient was placed on a short period of protected weight bearing walking before proceeding to full weight bearing walking.

Discussion

Fragility hip fractures, especially in the elderly population are an increasingly prevalent global problem. The femoral neck fractures are classified into displaced or undisplaced types, with undisplaced fractures mostly managed via fixation with hip screws. There have previously been debate about whether reduction and fixation is preferable to arthroplasty for management of displaced fractures. However, recent consensus is that arthroplasty (both hemi and total) is generally preferred for the elderly population because it leads to decreased revision rates and better functional outcomes⁽¹⁾.

The choice between hemiarthroplasty and total hip arthroplasty is still controversial; some

evidence shows that total hip arthroplasty brings better functional outcomes, but it is also associated with higher dislocation rates. However, the verdict is still out and further high-level trials are required, before a definitive conclusion can be made⁽²⁾.

As a default, the author's unit uses hemiarthroplasty for individuals over 65 years old; in accordance to local guidelines based on its cost effectiveness and good long-term outcomes⁽³⁾. For patients over 85 years old with limited mobility, the primitive Austin Moore prosthesis is sometimes chosen for its cost effectiveness. However, newer hemiarthroplasty designs are gradually replacing the Moore prosthesis because of various complications such as symptomatic loosening⁽⁴⁾ leading to an overall re-operative rate of ~10%⁽⁵⁾.

Known late complications with un-cemented femoral stems include loosening, subsidence, and protrusion, while early complications are infection, dislocation, and intraoperative fractures⁽⁶⁾. The rate of intraoperative fracture is reported to be around 5%⁽⁷⁾; however, the majority of these refer to fractures during prosthesis implantation, when the joint is dislocated. Management of peri-prosthetic fractures with cerclage wiring/cables has been shown to be effective with good long-term results⁽⁸⁾.

However, published literature about subsequent management of a fracture while reducing the arthroplasty prosthesis is lacking. As in the present case, if re-dislocation is difficult, the authors advocate using temporary cerclage wiring prior to attempted dislocation to decrease the risk of fracture propagation.

Take-home messages

1. Although primary prevention is the key for tackling fragility fractures, surgery is still often required.
2. Femoral neck fractures in the elderly are often fragility fractures, which in itself is a risk factor for intra-operative fracture.
3. Iatrogenic fractures can happen during attempted dislocation of the prosthesis because intra-operative positioning can produce large amounts of torque, thus the assistant must be careful at all times.
4. Prophylactic cerclage wiring prior to maneuvers is a prudent choice if there was any suspicion of a crack.

Potential conflicts of interest

None.

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