CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 22 (2016) 66–69

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Dislodgement of a cemented exeter femoral stem during closed manipulative reduction of a dislocated total hip replacement

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ARTICLE INFO

Article history:
Received 5 January 2016
Received in revised form 1 March 2016
Accepted 12 March 2016
Available online 18 March 2016

Keywords:
Dislodgement
Cemented
Polished
Femoral
Stem

ABSTRACT

INTRODUCTION: The incidence of cemented femoral stem migration and dislodgement even though has been described is extremely unusual. There is a high chance of polished femoral stem displacement happening while trying to reduce a dislocated total hip replacement by closed measures.
PRESENTATION OF THE CASE: A 73 year old lady who had an Exeter cemented total hip replacement about two weeks back was admitted from Accident and Emergency with a dislocation. During the closed manipulative reduction under general anaesthesia it was noted that the femoral stem has dislodged from the canal. She underwent revision of the total hip replacement with good outcome.
DISCUSSION: Femoral stem dislodgement occurs in total hip replacement if polished stem or inadequate cementing of the collar is carried out.
CONCLUSION: Gentle manipulative reduction under general anaesthesia of dislocated total hip replacement should be carried out if the polished femoral stem is used.

1. Introduction

Hip dislocation is one of the most frequent complications after total hip arthroplasty (THA). The incidence varies from 0.5% to 5% [1,2]. The common patient risk factors include neuromuscular and cognitive disorders, patient non-compliance, and previous hip surgery. The surgical factors causing dislocation include approach, soft-tissue tension, component positioning, impingement, head size, acetabular liner profile, and surgeon experience [3,4]. Closed reduction is the preferred nonsurgical and definitive management [5].

Dislodgement of a cemented femoral stem while attempting a closed manipulative reduction is extremely rare. There are few case reports in the literature where the femoral stem displaced during closed reduction of a dislocated total hip replacement [6–9].

We report a case of dislodgement of the femoral stem in a dislocated Exeter total hip replacement while attempting a closed manipulative reduction.

2. Case report

A 73 year old lady underwent a cemented Exeter total hip replacement for severe osteoarthritis of the right hip (Fig. 1). The surgical procedure was performed through a modified Hardinge approach by an experienced orthopaedic surgeon and there were no untoward incidents during the operation. The postoperative period was uneventful and had a very successful rehabilitation with the physiotherapist. The post-operative check X-rays showed satisfactory position of the prosthesis (Fig. 2). The patient then presented to Accident and Emergency department after two weeks of surgery complaining of pain and inability to weight bear. She was sitting in a chair and tried to move slightly and heard a “pop” in the right hip with instant pain.

On examination of the right hip revealed severe tenderness in the groin. The right lower limb was shortened and externally rotated. All the movements of the right hip were painfully restricted. The X-ray of the right hip showed dislocation of the total hip replacement (Fig. 3). The patient was taken to theatre and under general anaesthesia a closed manipulative reduction of the dislocated total hip replacement was attempted under image intensifier. During reduction of the hip it was noted in the image intensifier pictures that the polished Exeter stem was dislodged by about three fourths from the femoral canal (Fig. 4a and b).

The hip was exposed through the same incision and approach. The distal abductor muscles and the capsule were found to be peeled off the anterior and medial surface of the femur. The femoral stem was out of the femoral canal by more than 75% and was easily removed. There was no shoulder cement mantle around the femoral stem. The acetabulum was excessively anteverted and revised to a larger shell, 54 mm Rimfit cup correcting the version. The cement mantle in the femoral canal was burred to accommodate a 44 m × 125 Exeter stem and a cement to cement revision

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http://dx.doi.org/10.1016/j.ijscr.2016.03.019

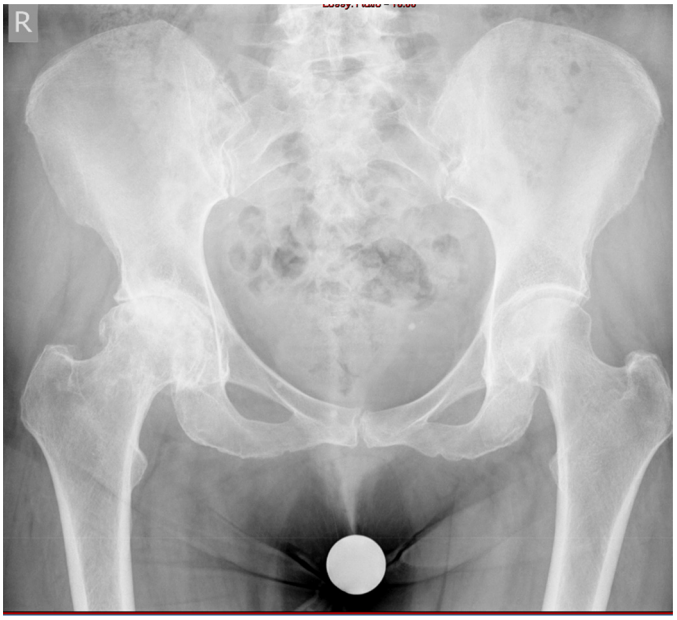

Fig. 1. Pre-operative radiograph showing right hip osteoarthritic changes.

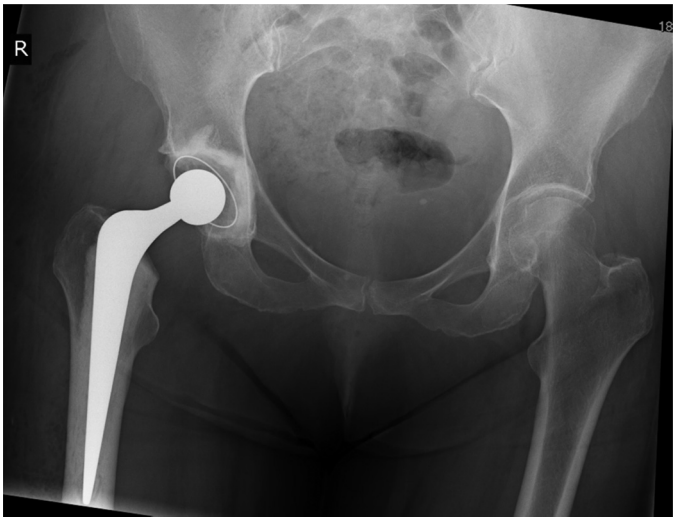

Fig. 2. Post-operative radiograph with satisfactory position of the prosthesis.

was done. A 32 mm × 0 head was inserted on to the trinion of the femoral stem. The hip was reduced and found to stable and no limb length discrepancy. The wound was closed in layers. The check X-rays after the revision surgery was satisfactory (Fig. 5). The patient was followed up at six weeks, six months and one year after the revision surgery. There were no further episodes for hip dislocation or stem displacement during this period. The Harris hip score at the end of one year was 86.

3. Discussion

Cemented Exeter total hip replacement using polished femoral stem has got excellent outcomes [10]. The Exeter stem are double tapered, collarless and polished. The stability depends on the subsidence in the cement mantle when load is applied [11,12]. The bonding strength at the cement–metal interface is determined by the mechanical interlock between the cement and the implant. The increase in roughness of the surface of the implant has been advocated because they would enhance the bonding strength of

Fig. 3. Radiograph showing dislocation of total hip replacement after two weeks with no femoral stem displacement.

the stem–cement interfacial bond [13]. Surface roughness reduced prosthetic subsidence, the micro-motions occurring at the interface, and global cement stresses [14]. However the roughness co-efficient of a polished Exeter stem is very low which predispose to de-bonding and eventually becoming loose [15].

The new generation of Exeter femoral stems has got a prominent shoulder which makes placing cement above the shoulder difficult. It has been recommended that there should be a continuous cement mantle covering the shoulder of the stem in continuity with the cement mantle in the lateral femur. Incorporating the cement in to the cancellous bone of the greater trochanter may increase its mechanical strength and prevent displacement of the stem [9,16]. In our case there was no cementation over the shoulder of the prosthesis which may be one of the reasons for stem dislodgement.

Friedman in 1989 described a case of dislodgement of uncemented femoral stem [17]. The firm fixation of an uncemented stem in the femur depends on the press fit and ingrowth of bone on to the prosthesis. But in the early post-operative period the uncemented stems can be dislodged especially if the size of the stems is undersized. The improvement in the manufacture of uncemented stems with anatomic designs and hydroxyapatite coating prevents loosening of the componenets [18].

Yun et al. observed the displacement of a cemented femoral stem in a bipolar hemiarthroplasty [19]. Even though the polished stems are wedge shaped and depend on the hoop stress generated in the femur for stability [20]; it is unprotected against traction forces [16].

4. Conclusion

The femoral stem dislodgement is a rare and distinct possibility in polished femoral components. The collar of the stem should be adequately cemented. Gentle and careful manipulation