

Case Report

A Rare Cause of Irreducible Dislocation of a Total Hip Prosthesis

V. S. Pai, D'Orth, MS(Orth), MCh(Orth)

Abstract: This report describes a patient with an anterior dislocation of the total hip arthroplasty, which was irreducible using described techniques of closed reduction. It required an open reduction using a direct lateral approach with the release of the rectus femoris. **Key words:** cemented total hip arthroplasty, irreducible prosthetic dislocation.

Copyright 2003, Elsevier Science (USA). All rights reserved.

Despite many recent advances in total hip arthroplasty (THA), dislocation remains a frequent complication, and many series still report a dislocation rate of 1% to 5%. Common factors such as malposition of components [1,2], soft tissue laxity [3], surgical approach [2,4,5], and prosthetic design [2] have been well cited in the literature. In most cases, reduction is can be achieved under sedation or general anesthesia.

Irreducible dislocation is very rare and is usually due to dissociation of a modular femoral or acetabular component, preventing relocation [6]. Rarer causes of irreducible dislocation include dislocation secondary to false aneurysm [7] and entrapment of the iliopsoas tendon [8]. Interposition of gentamicin beads [9], capsule [10], and cement [11,12] have also been reported. The author reports a case of anterior dislocation of THA performed through a posterior approach that could not be reduced because the neck was entrapped between the rectus

femoris and psoas muscles. To the author's knowledge no such case as been reported previously in the English literature.

Case Report

An 83-year-old woman was admitted in June 1995 with a displaced fractured neck of left femur. Because she was quite an independent woman, a cemented Exeter hip arthroplasty (Howmedica International, Clare, Ireland) was performed using a posterior approach. She was doing well until November 2000, when she presented to the emergency department with a prosthetic dislocation. This occurred during with a trivial pivot on her left hip, as she was trying to take clothing from a closet.

Clinically, her leg was shortened and externally rotated. Radiologic examination confirmed an anterior dislocation (Figs. 1, 2). Closed reduction was attempted within 6 hours of the injury under general anesthesia with complete muscle relaxation. The technique included using manual longitudinal traction with the hip in flexion as well as in extension: the Allis and Bigelow methods. Because the head of the prosthesis was palpable superficially just below and medial to the anterior superior iliac spine, direct pressure was applied with axial trac-

From the Health Care Hawkes Bay, Hastings, New Zealand.

Submitted December 27, 2001; accepted September 13, 2002.

No benefits or funds were received in support of this study.

Reprint requests: V. S. Pai, 207 Musselburgh Rise, Dunedin, New Zealand.

Copyright 2003, Elsevier Science (USA). All rights reserved.

0883-5403/03/1802-0015\$30.00/0

doi:10.1054/arth.2003.50042



Fig. 1. A anteroposterior radiograph of pelvis showing dislocation of a cemented hip prosthesis on the left side.

tion. Even with this maneuver, the head remained well anterior as seen on the image intensifier. At this stage, a soft tissue interposition was suspected, and it was decided to explore the hip.

The hip was then exposed through a lateral approach because it was believed that the open reduction would be easier because the dislocation was very anterior. Gluteus minimus and medius were reflected as described by Hardinge [13]. The straight head of the

rectus femoris appeared to run anterior to the neck of the prosthesis, impeding the reduction because the neck was pincer cocked between the iliopsoas posteriorly and rectus anteriorly. A flat band of rectus in front was divided of the neck. The reduction was easily achieved with the hip flexed to 30° to relax the iliopsoas muscle. Once divided, reduction was achieved quite easily. After relocation, the hip was found to be stable at 90° of flexion, 30° of external rotation, and 50° of internal rotation. However, it was noted both intraoperatively and on radiographs that there was excessive anteversion of both components of the THA (Fig. 2), which probably predisposed to anterior dislocation. The wound was closed in layers. The patient was kept on bed rest with her leg in balanced suspension for 48 hours. She was then mobilized and instructed on proper positioning of the leg and especially to avoid extension combined with external rotation and adduction. The patient had an uneventful recovery and remained dislocation free 12 months after surgery.

Discussion

Dislocation after hip arthroplasty is a disturbing complication for both patient and surgeon. The literature contains a number of articles on causes and treatment for recurrent dislocation. Closed reduction is usually successful [2]; however, in some situations, open reduction is warranted, such as in dissociation of the modular prosthesis [6], inter-

Fig. 2. A cross table lateral hip radiograph confirming the diagnosis of anterior dislocation. The acetabular component is over anteverted (>30°).



posed cement [12], gentamicin beads [9], or soft tissues[8]. A pincer-cock mechanism of obstruction of reduction by a posterior displacement of the iliopsoas posteriorly and the rectus femoris anteriorly has not been reported.

As a cause of irreducible dislocation, soft tissue interposition is a rare occurrence [8,10,11,14]. In the case of capsular interposition [10,14], reduction is usually nonconcentric, whereas in muscle or tendon interposition, as in this case, no reduction is possible. Ritter and Harty et al [5] reported that 5 of 8 dislocations were anterior after THA through a posterolateral approach. They attributed it to either excessive anteversion of the acetabular component or excessive removal of anterior osteophytes and anterior capsule. The capsule of the hip joint is related anteriorly from medial to lateral by the pectineus, iliopsoas (with iliacus on its lateral side), and the straight head of the rectus femoris [15].

Posterior displacement of iliopsoas following anterior dislocation has been reported [8]. The iliopsoas tendon passes anterior to the hip capsule before it inserts into the lesser trochanter. Grigoris, Grecula, and Amstutz et al [8] suggested that with extensive soft tissue dissection and total anterior capsulotomy, iliopsoas can easily displace posterior to the prosthesis during anterior dislocation of the hip, making successful closed reduction impossible. If the anterior dislocation is lateral to the rectus femoris, dislocation can be easily reduced using a closed method because the head does not become entrapped; however, when the head buttonholes between the rectus femoris and iliopsoas as in this case, closed reduction is often impossible. The neck gets caught between the rectus femoris anteriorly and the iliopsoas tendon posteriorly, resulting in a pincer-cock effect. One of these structures should be divided to reduce the dislocation. Like a noose, the pincer-cock tightens with increasing tractional force.

Acknowledgment

The authors are grateful to Dr. Peter Lloyd for his help in preparing this manuscript and Mr. Wayne

Blair, medical photographer, Health Care Hawkes Bay.

References

1. Eftekhari NS: Dislocation and instability complicating low friction arthroplasty of the hip joint. *Clin Orthop*, 121:120, 1976
2. Morrey BF: Instability after total hip arthroplasty. *Orthop Clin North Am* 23:237, 1992
3. Turner RS: Postoperative total hip prosthetic femoral head dislocations: incidence, etiologic factors and management. *Clin Orthop* 301:196, 1994
4. Khan MAA, Brakenbury PH, Reynolds ISR: Dislocation following total hip replacement. *J Bone Joint Surg Br* 63:214, 1981
5. Ritter MA, Harty LD, Keating ME, et al: A clinical comparison of the anterolateral and posterolateral approaches to the hip. *Clin Orth* 385:95, 2001
6. Heck DA, Partridge CM, Reuben JD, et al: Prosthetic component failure in hip arthroplasty surgery. *J Arthroplasty* 10:575, 1995
7. Lacroix H, duBois NA, van Biezen FC: Dislocation of a total hip prosthesis by a false aneurysm. *J Bone Joint Surg Br* 74:159, 1992
8. Grigoris P, Grecula MJ, Amstutz HC: Dislocation of a total hip arthroplasty caused by iliopsoas tendon displacement. *Clin Orthop* 306:132, 1994
9. Cresswell T, Shahane SA, Stockley I: Irreducible dislocation of a total hip prosthesis: the risk of gentamicin beads. *Orthopaedics* 23:1095, 2000
10. Krackow KA, Cohn BT: Soft tissue interposition following dislocation of a total hip replacement: A case report and introduction of a new technique. *Orthopaedics* 10:1161, 1987
11. Soudry M, Juhn A, Mendes DG: Interposed soft tissue obstructing the reduction of a dislocated Charnley hip arthroplasty. *Orthopaedics* 8:389, 1985
12. Theis JC, Dunbar JD: Successive dislocations of total hip arthroplasty complicated by acrylic cement interposition. *Aust N Z J Surg* 60:922, 1990
13. Hardinge K: The direct lateral approach to the hip. *J Bone Joint Surg Br* 64:17, 1982
14. Shifrin LZ, Reis ND: Arthroscopy of a dislocated hip replacement. *Clin Orthop* 146:213, 1980
15. Williams PL, Warwick R: *Gray's Anatomy*. Churchill Livingstone, Philadelphia, 1980