

## Case Report

# Rare Case of Sciatic Nerve Palsy in a Modular Total Hip Arthroplasty

V. S. Pai MS (Orth), Dip National board (Orth), MCh(Orth), and Neil Patel, FRCS

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**Abstract:** A rare case of sciatic nerve palsy in an uncemented modular hip arthroplasty is described. We believe that a delay in recognizing liner dissociation causing granuloma was responsible for the nerve palsy. Delay in diagnosis can be avoided by a careful inspection of prereduction and postreduction radiographs. **Key words:** uncemented total hip arthroplasty, metallosis, sciatic nerve palsy, wear.

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The modular acetabular component was described for the first time in 1971, which allowed the polyethylene liner to be changed without disturbing its metal shell [1]. This widely used system increased the surgeon's options during total hip joint arthroplasty (THA) but also introduced the risks of failure at the interfaces. Dissociation of polyethylene liners from modular uncemented metal-backed components has been described [2–4]. A granuloma in a patient with a dissociated liner producing sciatic nerve symptoms is reported here.

### Case Report

A 60-year-old woman with degenerative arthritis of the left hip underwent a hybrid THA in July 1994. A noncemented, Mallory/Head hexlock acetabular component with a polyethylene modular liner and a cemented Biomet Bi Metric Femoral

component (collarless interlock) (Warsaw, IN) with a 28-mm diameter modular head component were used. The patient was readmitted in March 1995 with dislocation of the prosthesis, which was reduced under image intensifier. The reduction appeared congruent, and she was discharged home the next day.

The patient did well for the next 6 months, but then began to experience pain in the left hip, radiating to the ankle. This pain was investigated by an orthopaedic surgeon, who diagnosed the problem as nerve root irritation because there was extensive multiple disk degeneration of lumbar spine. The patient was treated with analgesics and physiotherapy. The patient's symptoms worsened, however. She was referred to our institution for further assessment in October 1998. At this time, she complained of a dull pain in the groin that was exacerbated by weight bearing. She also had discomfort in the gluteal region that was referred to the posterolateral aspect of the leg as far as the ankle joint. The only neurologic signs elicited were slight numbness in the distribution of the L5 dermatome and a grade IV weakness in the extensor hallucis longus. On deep palpation, between the ischial tuberosity and the greater trochanter, the sciatic nerve was found to be tender. The left hip could be flexed 90° with 20° to 30° of abduction and rotation. On straight leg

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

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Reprint requests: V. S. Pai, MS (Orth), Healthcare Hawkes Bay, Omaha Road, Hastings, New Zealand. E-mail: vasu\_chitra@clear.net.nz

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**Fig. 1.** Postreduction radiograph shows apparent concentric reduction but a decrease in the visualized femoral head measurement of Ferez. A small area of osteolysis is visible in the calcar.

raising, the patient felt pain in the buttock at 70° of flexion.

Routine blood tests showed an elevated erythrocyte sedimentation rate (125 mm/h) and a high C-reactive protein (134 units). A peripheral smear revealed hypochromic microcytic cells with elliptocytes, although the ferritin level was normal. A radiograph showed an eccentric positioning of the femoral head in relation to the cup with a significant reduction in the *visualized femoral head* measurement secondary to loss of space between the cup and the shell (Fig. 1). Retrospectively, this radiologic sign was present in the previous radiographs. There was evidence of osteolysis in the medial aspect of the femoral neck. Aspiration of the hip joint showed 30 mL of thick black fluid. This aspirate, together with a core biopsy, failed to show any microbiologic growth.

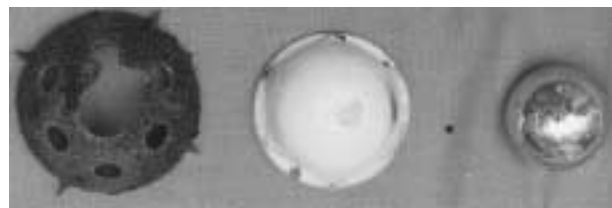
In October 1998, the patient underwent revision surgery through a standard posterior approach. The polyethylene liner was found to be completely dissociated from and displaced inferior to the metal shell (Fig 2). The femoral head articulated with the metal shell, which showed severe wear (Fig. 3). Because the screw head was deformed and the cup was well fixed, there was considerable difficulty in retrieving the metal shell. The acetabulum was reamed sequentially such that bleeding bone was visible. A cemented acetabular cup was used. The femoral stem was found to be well fixed, and only the head was replaced.



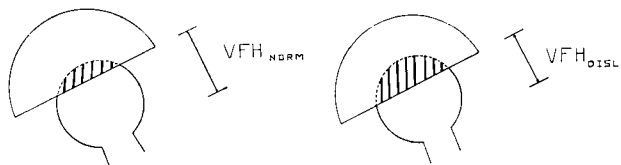
**Fig. 2.** Intraoperative photograph shows complete dissociation of the polyethylene liner from the metal shell. Evidence of metallosis in the soft tissues is seen.

An extensive metallosis granuloma was noted not only within the pseudocapsule, but also over the greater trochanter and around the sciatic nerve. This granuloma was dissected and excised. Histologic examination revealed a foreign body giant cell reaction and histiocytic response to metal debris. Aerobic, anaerobic, and fungal cultures obtained at the time of revision surgery were negative.

Postoperatively, there was worsening of sciatic irritation with a footdrop with grade 0 power in the Perone and dorsiflexors. There was decreased sensation over the dorsum of the foot. The tibial component of the sciatic nerve was intact. The patient was treated with physiotherapy, mobilization, and an ankle-foot orthosis, with complete recovery in the footdrop noted within 6 months.



**Fig. 3.** Removed acetabular components show the wear of the metal shell.



**Fig. 4.** Visualized femoral head (VFH) measurement of Ferez. (A) Normal case. (B) Measurement after extrusion of the acetabular insert. Projections must be taken from similar angles and with similar rotation.

## Discussion

The incidence of complications relating to modularity is low, reported to be 0.1% to 0.2%. A total of 28 failures of fixation of the polyethylene liner to its metal shell have been described since the introduction of the modular uncemented THA [5]. Various causes for the liner failure have been reported, including dislocation, wear of the polyethylene or material failure, and loss of integrity of the locking system. We are unsure of the effect of the first dislocation and reduction on the acetabular components in the present case, although intraoperative films showed concentric reduction. Subsequent radiographs showed evidence of dissociation of the liner, but this was missed by clinician as well as radiologist. A delay in recognition of the problem has been reported previously [2,5,6]. We agree with the previous reports [5,7] that manufacturers should provide radiodense markers for acetabular inserts because this would facilitate diagnosis of liner dislodgment.

Early recognition of dissociation is important to avoid the need to remove and replace a well-fixed acetabular shell as well as to prevent pseudotumor caused by metallosis. The clinical and radiologic findings may be subtle but have been well described [7]. In the present case, a postreduction radiograph showed a concentric reduction with the head of the prosthesis apparently sitting deep within the cup, and the visualized femoral head measurement of Ferez [7] was much reduced (Fig 4).

Foreign body reaction to methyl methacrylate or polyethylene or metallosis has been implicated in the pathogenesis of osteolysis and pseudotumor

[8,9]. The association of pseudotumor secondary to metallosis and sciatic nerve palsy after a liner dissociation has not been described previously, however. The literature is not clear about the local effect of pseudotumor on the soft tissues. We believe that in the present case sciatic nerve palsy was due to pressure rather than a toxic effect of metallosis. In the presence of extensive degeneration of the spine, pressure on the sciatic nerve distally may produce more symptoms owing to the *second crush effect*.

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