ACETABULAR EROSION AND THE MONK "HARD TOP" HIP PROSTHESIS

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Nine cases of acetabular erosion following insertion of the Monk "hard top" hip prosthesis for subcapital fractures are presented. All of these patients had significant symptoms and represented 5% of the total group. In our experience acetabular erosion has proved to be a significant complication of the Monk "hard top" prosthesis.

The original version of the Monk hip prosthesis allowed movement between a polyethylene acetabular cup and the enclosed metallic head of the femoral component. Although initial results were promising with this "soft top" prosthesis, it later became apparent that the polyethylene cup underwent excessive wear, stimulating a prolific fibrous reaction associated with progressive clinical deterioration (Webb, Wright and Winter 1980).

In 1976 the "soft top" Monk prosthesis was superseded by the "hard top" modification; to overcome the problem of wear the polyethylene cup was covered with a cap of stainless steel or titanium alloy. The femoral stem is available with either a Thompson or an Austin Moore stem and can be used with or without acrylic cement.

Schwartz Lausten and Vedel (1981) have reviewed the results in 116 patients with subcapital fractures treated by the Monk "hard top" hip prosthesis and found no cases of acetabular erosion or migration of the prosthesis after a maximum follow-up of 47 months (mean 23.9 months).

We have used this prosthesis since July 1978 in elderly patients with fresh displaced intracapsular fractures of the femoral neck. In our experience the newer prosthesis does not eliminate all the complications associated with its predecessor and this paper describes nine cases where there has been evidence of acetabular erosion.

PATIENTS AND METHODS

Between July 1978 and January 1982 182 Monk "hard top" hip prostheses were inserted in 182 patients (140 women and 42 men) at Singleton Hospital, Swansea. In

130 patients an Austin Moore stem without acrylic cement was used and in the remaining 52 acrylic cement was used with a Thompson-type stem. All patients after operation were mobilised and allowed to take full weight. Many of these elderly patients were lost to follow-up, but nine presented with evidence of acetabular erosion.

The cases are summarised in Table I. In each case the Monk prosthesis was initially satisfactory but symptoms in the form of groin pain began between 18 months and 3½ years after operation. In seven patients the Monk prosthesis was revised to a total hip replacement. In three of these there was radiological evidence of acetabular erosion (Figs 1 to 3) and during revision the

Table I. Acetabular erosion with the Monk "hard top" hip prosthesis

Case	Age (years)	Femoral stem	Time to symptoms (years)	Radiology	Findings at revision
1	65	Thompson	3.5	Acetabular erosion	Very eroded and thin acetabular floor. Wire mesh used
2	86	Thompson	2.5	Acetabular erosion	Eroded acetabular floor. Wire mesh reinforcement
3	87	Austin Moore	2	Acetabular erosion	Central erosion of acetabular floor. Wire mesh used
4	79	Austin Moore	1.5	No significant acetabular erosion	Soft and eroded acetabular floor
5	70	Austin Moore	1.5	No significant acetabular erosion	Softening of articular cartilage and subchondral bone
6	67	Austin Moore	2	Early acetabular erosion	Central erosion of acetabulum
7	66	Thompson	2	Early acetabular erosion	Central erosion of acetabulum
8	71	Austin Moore	2	Acetabular erosion	No revision
9	80	Austin Moore	2	Gross acetabular erosion	No revision

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Fig. 1

Fig. 2

Fig. 3

Case 3. Figure 1 - Postoperative film after insertion of Monk "hard top" prosthesis. Figure 2—Eighteen months postoperatively showing early radiological evidence of acetabular erosion. Figure 3 -- Two years postoperatively; acetabular erosion increasing. Reinforcement of the acetabular floor was required at revision.

Fig. 4

Fig. 5

Case 9. Figure 4 - Postoperative film after insertion of Monk "hard top" prosthesis. Figure 5—Two years postoperatively: gross acetabular erosion.

acetabular floor required reinforcement with a wire mesh to facilitate insertion of the acetabular cup. In the other four the radiological erosion was not marked but at exploration there was erosion of the articular cartilage and subchondral bone of the central portion of the acetabulum.

In the two remaining patients there was significant radiological evidence of acetabular erosion (Figs 4 and 5) but both were too infirm for revision surgery.

DISCUSSION

Acetabular erosion and migration of the prosthesis are important and often serious late complications of the Moore and Thompson prostheses; they occur in 11% of patients (Andersson and Nielsen 1972; D'Arcy and Devas 1976). The concept underlying the Monk "hard top" prosthesis is that by transmitting most of the movement in the hip joint from the metal/acetabulum interface to the low-friction metal/polyethylene interface

of the inner bearing, the acetabular wear should be lessened. It has also been suggested that the high-density polyethylene cup between the two metallic components might afford some shock-absorbing effect (Chen, Sarkar and Pell 1980). To date there has been no published report of complications from the use of this prosthesis.

In the present series there were seven patients in whom revision operations showed definite evidence of acetabular erosion; and in two further patients who were not operated upon there was radiological evidence of the prosthesis sinking into the acetabulum. All nine of these patients had significant symptoms. They represented 5%

of the total group, but because of the difficulties in follow-up, the true incidence may well be higher. It would appear that movement at the dual universal articulation of the prosthesis may in the long term be lost and the greater part of movement then takes place at the metal/acetabulum interface with consequent acetabular erosion (Scales 1983), although in the cases we present there was no evidence of such loss of movement.

This group of cases indicates that the Monk "hard top" prosthesis has not eliminated the problem of acetabular erosion and awareness of this complication is important in units where the prosthesis is in regular use.

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REFERENCES

- Andersson G, Nielsen JM. Results after arthroplasty of the hip with Moore's prosthesis. *Acta Orthop Scand* 1972; **43**:397-410.
- Chen SC, Sarkar S, Pell LH. A radiological study of the movements of the two components of the Monk prosthesis (hard top 'duo-pleet') in patients. *Injury* 1980; **12**:243-9.
- D'Arcy J, Devas M. Treatment of fractures of the femoral neck by replacement with the Thompson prosthesis. *J Bone Joint Surg [Br]* 1976; **58-B**:279-86.
- Scales JT. Editorial. Prosthetic replacement of the femoral head for femoral neck fractures: which design? *J Bone Joint Surg [Br]* 1983; **65-B**:530-1.
- Schwarz Lausten G, Vedel P. The Monk hard-top endoprosthesis for intracapsular fractures of the femoral neck. *Injury* 1981; **13**:233-8.
- Webb PJ, Wright KWJ, Winter GD. The Monk "soft top" endoprosthesis: clinical, biomechanical and histopathological observations. *J Bone Joint Surg [Br]* 1980; **62-B**:174-9.