

Broken wings—common with the Hardinger plug

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ABSTRACT – We used the Hardinger occluder plug in 51 consecutive total hip arthroplasties. In 34 hips, 1 or more of the 12 polyethylene wings fractured and could be washed out from the canal. As many as 7 wings were loose in 2 arthroplasties. Although numerous wings were broken, no failure occurred in occlusion.

The placement of loose wings in the femoral canal was studied by cementing a Charnley prosthesis in a saw-bone prepared with loose wings. The model was cut into slices. We found that the plastic wings could come into contact with both the bone and prosthesis.

at the proximal opening to collect the wing pieces from the plug. The occluding function was evaluated on the postoperative radiographs.

To see how the polyethylene pieces from the plug could be embedded in the cement and their relations to the cement and implant, we cemented a Charnley prosthesis, using the third generation cementing technique, into a saw-bone femur. The femoral canal was prepared with 5 wing pieces from the Hardinger plug. A radiograph was taken of the model before it was cut into 5 mm slices.

We studied the Hardinger femoral canal distal occluder plug (Corin, Gloucestershire, England) in combination with the third generation cementing technique (Harris and Davis 1988). This polyethylene plug consists of 12 wings and fits all femoral canals between 15 and 30 mm. We have observed that the wings can easily break off during insertion. In a consecutive series of arthroplasties, we determined how often this happens and whether it affects the occluding function.

Patients and methods

We studied 51 consecutive hip arthroplasties performed because of osteoarthritis, in which the Charnley (Charnley, Leeds, England) and the MS 30 (Sultzer, Interthure, Switzerland) prosthesis had been used.

To count the polyethylene pieces from the plug, a 2-minute intramedullary high-pressure lavage was done after inserting of the plug. During the lavage, the knee was raised several times and a filter kept

Results

In 34 of the 51 operations we found loosening of mean 3 (1–7) wings (Table, Figure 1). No case showed a poor occluding effect of the plug.

Our cross-sections of the model femur clearly showed that some pieces from the plug may interfere with the cement mantle in a way that it is less than 2 mm thick and sometimes totally absent (Figure 2). On the plane radiographs the loose pieces could not be seen.

Discussion

We have been using the Hardinger polyethylene plug for distal femoral canal occlusion for several years and it has worked well as a distal block (Hungerford and Krackow 1981). However, it sometimes breaks into several pieces which may cause problems if they are not removed. Kawate (1999) has shown that if the cement mantle is thinner than 2 mm, microfractures of the cement are likely to occur, which in the long run may lead to

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Total no of hip arthroplasties	No. of loose wing-pieces
16	0
10	1
10	2
6	3
3	4
4	5
0	6
2	7

stem loosening. One can also speculate whether polyethylene pieces at the cement-bone interface generate wear.

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Hungerford D S, Krackow K A. A convenient distal plug for the femoral cavity in total hip arthroplasty. *Clin Orthop* 1981; 154: 329-30.

Kawate K. Thin cement mantle and osteolysis with pre-coated stem. *Clin Orthop* 1999; 365: 124-9.

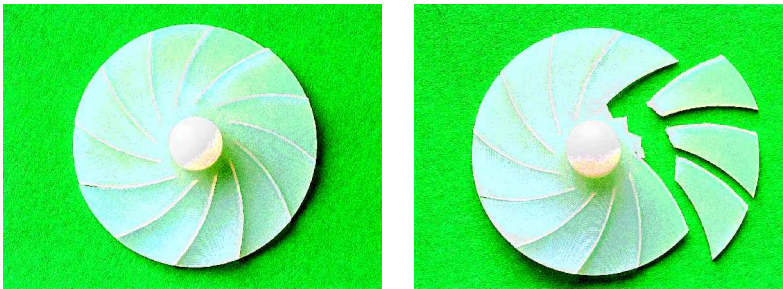


Figure 1. The Hardinger plug often breaks at the base of the wings.



Figure 2. Cross-sections of the femur. The pictures show how the wing pieces from the Hardinger plug interfere with the cement-stem interface.