

# Bilateral fracture of prostheses post-hip replacement

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## SUMMARY

Fracture of hip prostheses is a rare occurrence. A case of bilateral hip prostheses fracture is described here. The need to follow-up and remain vigilant post hip replacement is highlighted.

## KEY WORDS:

*Bilateral hip replacement, prostheses fracture*

## CASE SUMMARY

A 54-year-old Punjabi male had bilateral total hip replacement done due to avascular necrosis. His right hip was operated in 2001 and the left in 2002. The implant was a cemented cobalt chrome material with a modular femoral component of stem and head. The patient is physically fit at about 90kgs weight and standing at 180cm. Prior to surgery he was a recreational deep-sea diver which could have contributed to his initial condition of avascular necrosis.

He presented in October 2015 with a history of right knee pain of one week duration. There was no history of trauma or fall. He was examined and the x-rays showed a fracture of the stem in the middle third of his right total hip replacement (Figure 1). He underwent surgery where a revision of the femoral stem was done through the previous surgical scar. The acetabular component was not affected during surgery and on X-ray and thus was not replaced. Post-operatively he developed a superficial wound infection which settled with wound debridement and antibiotics. He was discharged home well after a week. The whole episode however made him weary and anxious and he started to question the stability of the other prostheses.



Fig. 1: Right Prostheses fracture on X-ray.

A month after his discharge he was unable to get out of bed and had to be taken to the hospital on a wheelchair due to pain and weakness of his left hip. Again, there was no history of trauma or fall. X-rays done showed fracture of the left femoral implant (Figure 2). This was again revised in the same way as the first with no post-operative complications. Both instances of fracture occurred spontaneously.

X-rays done preoperatively for both prosthesis fractures showed radiolucent shadows between the femoral stem and the cement indicating loosening at the level of the calcar. Both implants were fractured in the middle third of the stem and had burnishing marks on them.

## DISCUSSION

Breakage of a femoral component of prostheses for hip replacement is a rare occurrence. According to MA Khanna et al., the incidence of stem failure or fracture was 0.27%.<sup>1</sup> A literature search for bilateral failure of femoral stem implants using all medical search engines showed no results for such cases in Malaysia. This prompted us to believe that this may be the first reported case in Malaysia.

Failure of the implants took place at 13 and 14 years respectively. After his initial hip replacements, the patient did not have a very active life style. Both the arthroplasties were cemented and both stems showed signs of burnishing which may be due to loosening.

A possible reason why the implants failed includes loosening of the implant itself. Prosthesis fracture at the point where the distal stem is well fixed and the proximal stem unsupported,



Fig. 2: Left Prostheses fracture on X-ray.

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due to wear of the cement at the cement-implant interface was common with the early Charnley prostheses.<sup>2</sup> Prosthesis modification and the introduction of Orthron 90 (DePuy, Warsaw, Ind.) have tried to eliminate this mode of failure.<sup>2</sup>

This highlights the importance to ensure adequate cement mantle in Gruen zones 1 and 7 as failure to do so, may result in micro motion and subsequent stem fracture irrespective of the metal used. Gruen zones are descriptive of seven zones of cement mantle around the stem. When there is loosening proximally and a firm fixation distally it can lead to failure of the implant or chronic instability.<sup>3</sup> In this case the implant, which is a cobalt chrome implant, had failed.

Another postulate for implant failure is metal fatigue as both the femoral stems failed within one month of each other. To verify this would have required the services of a metallurgist which we did not have. Other possibilities of failure are defect in design and weight gain. Gait also may pose an influence, as most people who have bilateral hip replacement done via posterior approach tend to have some weakness of the gluteal muscles which may cause abductor weakness leading to chronic instability.<sup>4</sup> The replacement had also been done before the age of 50 and this may contribute to a higher risk of failure of prosthesis survival due to axial loading of the femoral component.<sup>5</sup>

The trauma of having to go through repeated major surgery four times and the fear of being left with a disability to walk were significant for the patient. He still feels anxiety and worries about the integrity of the new implants and this impacts on his daily life.

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