Figure 2. AP view of the left hip showing a fracture of the cement spacer at the level of the neck of the cement spacer mould (case II).

prostheses, in shape and size. These moulded spacers provide intramedullary support to the weak femur and enable local antibiotic delivery, as well as permit limited mobilization of the patient.[1] It has been shown that if a spacer is used, the patients are almost free of pain and mobile with good leg control, spending two-thirds of the treatment period at home.[2]

However, the mechanical resistance offered by these cement moulds to the weight bearing forces is unknown. Schoellner et al in their study on fabricated moulds showed an average failure load 1550 N on being loaded at 20N/s in a craniocaudal direction.[3]

O'Connor and colleagues,[4] in their invitro study on bone cement, found that there are two specific foci where the magnitude of the strain in the cement mantle approaches values that could lead to early fatigue failure of the cement. These two regions with highest (greater than 1,000 microstrain) strains were the most proximal portions of the cement mantle and near the tip of the femoral component. Although these two regions are recognized areas of high strain and also common sites of cement debonding and cement mantle failure, the strain-gauge studies have shown that the magnitude of cement strains in the proximal portion of the cement mantle were highest especially during stair-climbing. The moulded articulating cement moulds are probably subjected to similar high strains at the level of the spacer neck.

Full weight bearing or excessive movement, as seen in the above two cases, puts the fragile cement insert under tremendous strain and this may lead to fatigue failure.

We, therefore, believe that a construct made of a high strength material should structurally support the spacer and materials that weaken it must be avoided. One study has revealed that the fractures in the cement mantle of a proximal femoral prosthesis are seen by the addition of barium sulphate to render the cement radio-opaque.[5] However, this needs to be investigated by further studies.

Figure 3. The fractured cement spacer mould as removed from the hip.

The moulded cement spacers should, therefore, be treated as just ordinary spacers aimed to maintain the soft tissue planes and length. Full weight bearing mobilisation should be avoided. Commercial designs of the cement spacers may be improved by the addition of a hard shell composed of an inert (non reactive) material with high tensile strength that can withstand weight-bearing forces.

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