HISTORICAL NOTE

Smith-Petersen Vitallium mould arthroplasty

A 62-YEAR FOLLOW-UP

J. F. Baker,
M. H. Vioreanu,
H. A. Khan

From Cork
University Hospital,
Cork, Ireland

A variety of materials were used for early hip prostheses. The introduction of Vitallium by Smith-Petersen represented a further advance in this surgical field. We present the longest known follow-up of a Smith-Petersen Vitallium mould arthroplasty.

Case report

A 91-year-old woman attended the emergency department complaining of right groin pain following a fall while getting out of her car one week earlier. She was helped to her feet by a passer-by but subsequently walked with a limp.

A plain pelvic radiograph showed an intra-capsular fracture of the right hip. On the left a Smith-Petersen mould arthroplasty was noted to be in situ, with marked femoral shortening and osteopenia (Fig. 1).

In 1949 she had travelled to London and underwent surgery on her painful left hip resulting from a congenital dislocation with the implantation of a mould arthroplasty. Her operation was conducted by Mr W. A. Law. Post-operatively she spent two weeks in traction and a further two months in hospital. She returned home four months after her operation and had a single follow-up appointment six months post-operatively.

Thereafter the left hip remained entirely pain-free. She noticed only the gradual development of leg-length discrepancy over the years and because of this used a heel raise. For the previous five years, following an undisplaced fracture of the lateral condyle of the left femur, she used a stick in her left hand when walking outdoors. This represents the only indication of functional decline during the 15 years since an earlier report of her case.1

On examination of the left hip, flexion was to 90°, adduction 20°, abduction 30°, and internal and external rotation with the hip flexed were > 20°. The left leg was short by 6 cm. She was able to demonstrate a straight leg raise against gravity. Her Harris hip score5 was 87 and Oxford hip score 43.6

Discussion

In 1947, in his Moynihan Lecture at the University of Leeds, Smith-Petersen discussed the evolution of mould arthroplasty.7 He noted that it was beneficial for painful hips following congenital dislocation, owing to the 'mesial transplantation of the femoral head into a new and deep acetabulum'. In 50 hips the outcomes were deemed more than satisfactory. In 1970 Law and Manzoni8 reported on 278 hips treated by Vitallium mould arthroplasty in which they found consistent relief of pain but noted gradual progression of limb shortening in just over 40% of cases.8 Independence was restored in 85% of elderly patients who had previously been dependent on neighbourly help.

The Smith-Petersen mould arthroplasty was shown to be superior to the acrylic-based Judet prosthesis in the relief of hip pain,9 until supplanted by the introduction of the low-friction arthroplasty.

Wright et al4 reported patient with a 56-year follow-up following Smith-Petersen mould arthroplasty. Their patient also had a leg-length discrepancy and was rated 'good' on the Harris hip score.7 Similarly, Radcliffe and Geary3 reported a 46-year follow-up of the mould arthroplasty, again with a very satisfied patient despite a shorter limb.

Denham and Law9 proposed that a patient of a 'stoical, courageous character' might do better following hip arthroplasty. Although their results did not support this hypothesis,
these three patients with ‘ultra-long’ follow-up would undoubtedly have fitted their hypothetical profile of an ideal patient.

A significant feature of this case is the preservation of movement. Although the limb shortening would make the outcome unacceptable to modern patients, the survival and function of the implant is remarkable. Early arthroplasty surgeons were aware of the need to obtain good head coverage, the technical difficulties in larger patients and the benefits of one surgical approach over another. We believe that attention to detail and early analysis of results by these pioneers contributed to the good outcome for this patient.

**References**