

Isoelastic total hip endoprosthesis—a clinical, radiographic and densitometric study

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The isoelastic total hip endoprosthesis is an attempt to solve the problem of the longevity of hip replacement by physiological loading of the bone and thus to avoid stress shielding disuse bone atrophy. The aim of the study was to investigate this property in a clinical setting.

After a mean follow-up of 8.2 years of 108 patients with primary arthroplasties using isoelastic stems, the revision rate was 10%, and a radiographic evaluation showed 25% of 85 stems to be loose, and osteolytic foci appeared in 12% of the hips. The failure rates here were higher than has been reported for stiff stems.

After a mean follow-up of 5.7 years of 102 patients with hip revised using an isoelastic stem, the re-revision rate was 21%, 39% displayed subsidence at the time of survey and 13% were definitely loose. The total failure rate was 33%.

Of the 105 primary hip replacements made using a non-cemented uncoated polyethylene socket, 8% had been revised during 8 years. Osteolytic foci were dis-

played by 22% of the acetabula and 13% of the femora, mostly in cases where the socket had migrated.

The bone mineral density (BMD) around the isoelastic femoral stem proved 8.5 years postoperatively to be lower by a mean of 14% than on the healthy control side. The difference was greatest in the calcar area and smallest in the cortex medially of the prosthesis stem. The decreases in BMD were smaller than those reported for stiff stems.

Magnetic resonance imaging revealed a small contact area between the bone and the stem even in cases with good fit in native x-ray.

The weak point of isoelastic stems was the primary fixation. The primary idea of the isoelastic stem proved to work out: the bone mineral density seems to be maintained definitely better than has been reported for stiff stems.

The study raises the question of appropriate quality assurance of implant surgery. The generation of isoelastic prostheses studied here had only short periods of follow-up reported before the year 1988.