Design Rationale and Clinical Experience with the LSF Total Hip System

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ABSTRACT

Fifty (50) "Implant Technology" LSF primary non-cemented porous-coated total hip replacements were reviewed clinically and radiographically. The devices were placed in 47 patients with an average patient age at time of surgery of 58.0 years (range, 28 to 81 years). The devices had been in situ an average of 24 months (range, 18 to 36 months). The average preoperative Harris Hip Score was 41.0 (range, 12 to 67), and the average postoperative Harris Hip Score was 91.5 (range, 74 to 100). Mild thigh pain was present in only 8% of the cases. Radiographically no component demonstrated a complete radiolucency, and all components showed radiographic evidence of bone ingrowth. Radiographic changes (percentage of cases) noted with time were: neck round-off (30%), neck osteolysis (10%), neck corticocancellisation (4%), endosteal bone bridging (4%), distal hypertrophy (18%), and subsidence of 3 millimeters or more (6%). On radiographic zonal analysis, radiolucency greater than one millimeter was observed most frequently in the most proximal lateral zone of the femoral components (46%) and at the distal tip (20%).

Clinical and radiographic results demonstrated a superior performance with the LSF System. We believe that this is directly related to the prosthesis design and instrumentation.

INTRODUCTION

The LSF (Long-Term Stable Fixation) Total Hip System (Implant Technology, Inc., Secaucus, NJ) was designed to address many of the obstacles in non-cemented total hip replacement. Although total hip arthroplasty utilizing contemporary cementing techniques has proven to be an extremely successful clinical procedure,[21,22,30] the problem of long-term fixation remains unsolved. This has been a particular problem in younger more active patients. It was these long-term problems which lead to the general enthusiasm for alternate methods of implant attachment, including bone growth into a porous-surfaced implant.[19] Among the obstacles which must be overcome when utilizing biologically attached implant systems are micromotion at the implant-tissue interface (which results in fibrous rather than bone tissue ingrowth), subsidence of the femoral component, and stress shielding due to failure of the implant design to reproduce adequately anatomical stress distribution.[3,9,11,15,27] Torsional loosening of components, the potential for fatigue failure due to the reduced material properties of a porous-coated device, and a limited

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