

Fig. E1-A

A fifty-four-year-old male patient with degenerative joint disease of the left hip who underwent total hip arthroplasty without cement when he was forty-two years old. At a follow-up evaluation at a minimum ten years, the StepWatch Activity Monitor demonstrated an average of 1.68 million steps per year, the six-minute walk was 432 m, the UCLA score was 8, and the Tegner score was 4. The patient required a revision for wear at the time of the twelve-year follow-up. The left image is a preoperative radiograph; the center image, an early postoperative radiograph; and the right image, a twelve-year follow-up radiograph made before revision, demonstrating an eccentrically located femoral head due to polyethylene wear. The patient underwent femoral head and acetabular liner revision.



Fig. E1-B

Radiographs of a male patient with posttraumatic degenerative joint disease of the left hip secondary to an acetabular fracture who underwent total hip arthroplasty with moderately cross-linked polyethylene when he was twenty-two years old. At the time of the ten-year follow-up, the StepWatch Activity Monitor demonstrated an average of 3.26 million steps per year, the six-minute walk was 343m, the UCLA score was 6, and the Tegner score was 4. His linear acetabular liner wear rate was 0.089 mm/y. The left image is the preoperative radiograph; the center image, an early postoperative radiograph; and the right image, a ten-year follow-up radiograph demonstrating bone-ingrown fixation of both the acetabular and femoral components with minimal liner wear.

Revision for Aseptic Acetabular Loosening

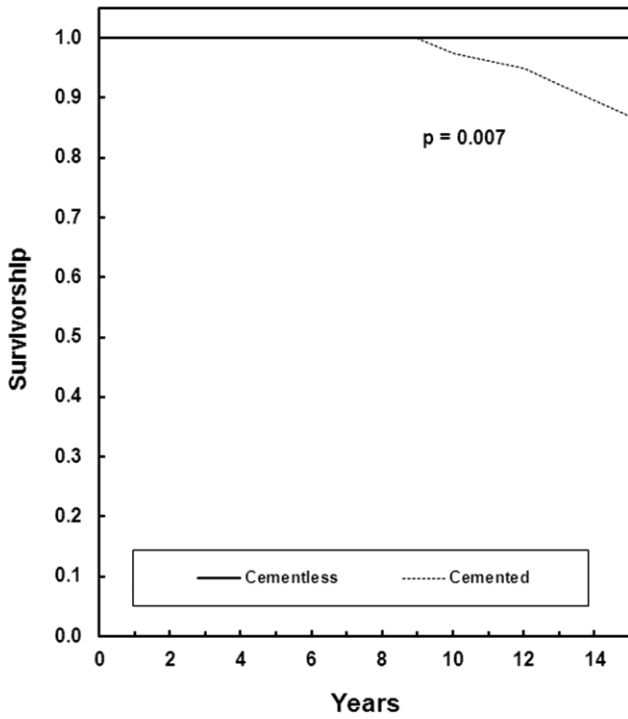


Fig. E2-A

Revision for Aseptic Femoral Loosening

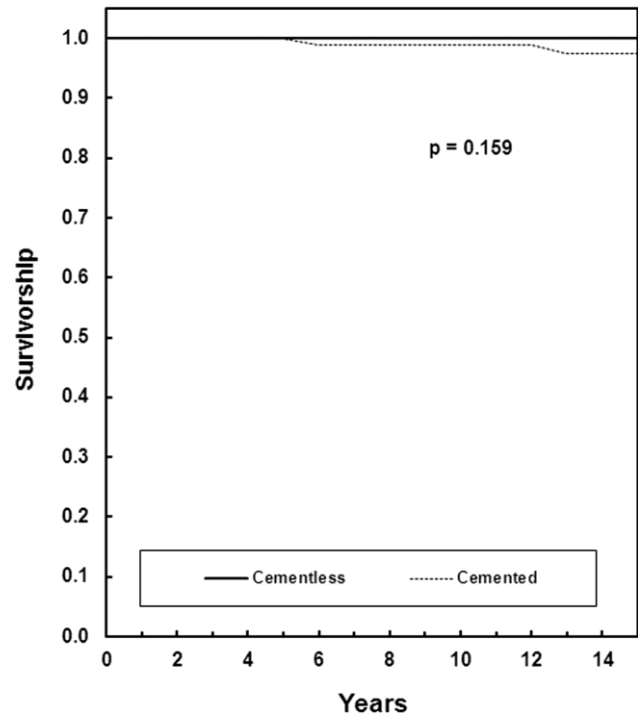


Fig. E2-B

Acetabular Radiographic Loosening

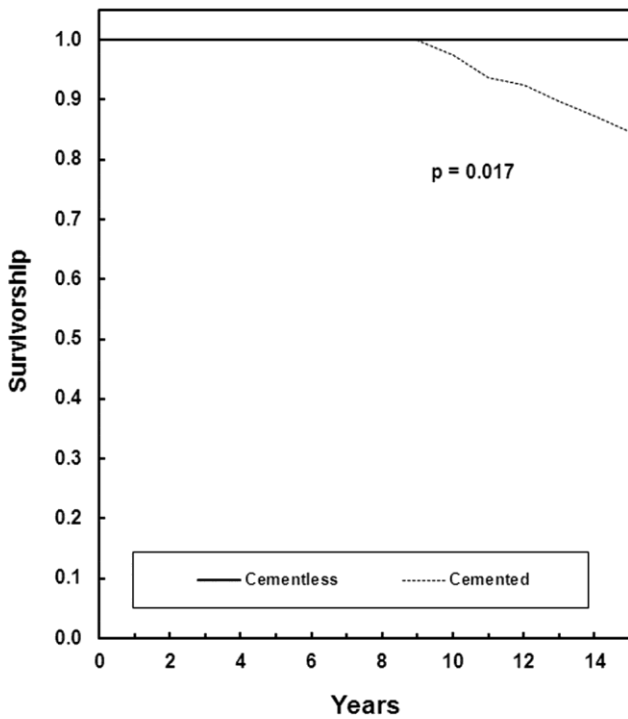


Fig. E2-C

Femoral Radiographic Loosening

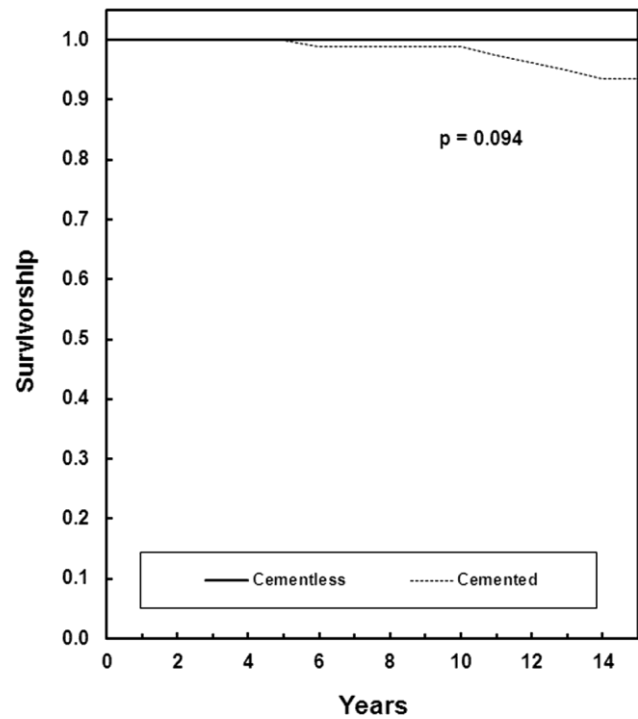


Fig. E2-D

**Fig. E2-A through Fig. E2-D** Survivorship curves, as determined by the Kaplan-Meier method. The two lines represent the two comparative groups of patients who had cementless total hip arthroplasty (the present study) and patients who had total hip arthroplasty with cement (the cemented cohort). **Fig. E2-A** Survivorship curve, with revision for aseptic loosening of acetabular component as the end point. **Fig. E2-B** Survivorship curve, with revision for aseptic loosening of femoral component as the end point. **Fig. E2-C** Survivorship curve, with radiographic loosening of acetabular component as the end point. **Fig. E2-D** Survivorship curve, with radiographic loosening of femoral component as the end point.

TABLE E-1 Reoperations

Time from Index Primary Total Hip Arthroplasty to Reoperation (y)	Indication for Reoperation	Components Revised
0.1	Dislocation	Head and liner exchange
0.1	Periprosthetic fracture (patient fell down steps)	Stem revision and head exchange
0.5	Dislocation	Head and liner exchange (cemented constrained liner)
8.0	Liner wear	Head and liner exchange (cemented liner)
8.9	Liner wear	Head and liner exchange (cemented liner)
9.6	Liner dissociation and liner wear	Head and liner exchange (cemented liner)
9.9	Liner dissociation and liner wear	Head, liner, and cup exchange (constrained liner and shell used)
10.1	Periprosthetic fracture	Original components retained
10.1	Liner dissociation and liner wear	Head and liner exchange (cemented liner)
10.4	Liner dissociation and liner wear	Head and liner exchange (cemented liner)
10.4	Periprosthetic fracture with femoral nonunion	Head and liner exchange and conversion to longer stem
11.2	Liner wear and pelvic osteolysis	Head and liner exchange and bone-grafting
11.8	Liner wear and pelvic and femoral osteolysis	Head and liner exchange and bone-grafting
12.0	Liner wear and pelvic osteolysis	Head and liner exchange and bone-grafting
12.0	Liner wear	Head and liner exchange
12.2	Liner wear	Head and liner exchange
12.3	Liner dissociation and liner wear	Head and liner exchange (cemented liner)