

TABLE E-1 Patient Demographics for Retrieved Specimens

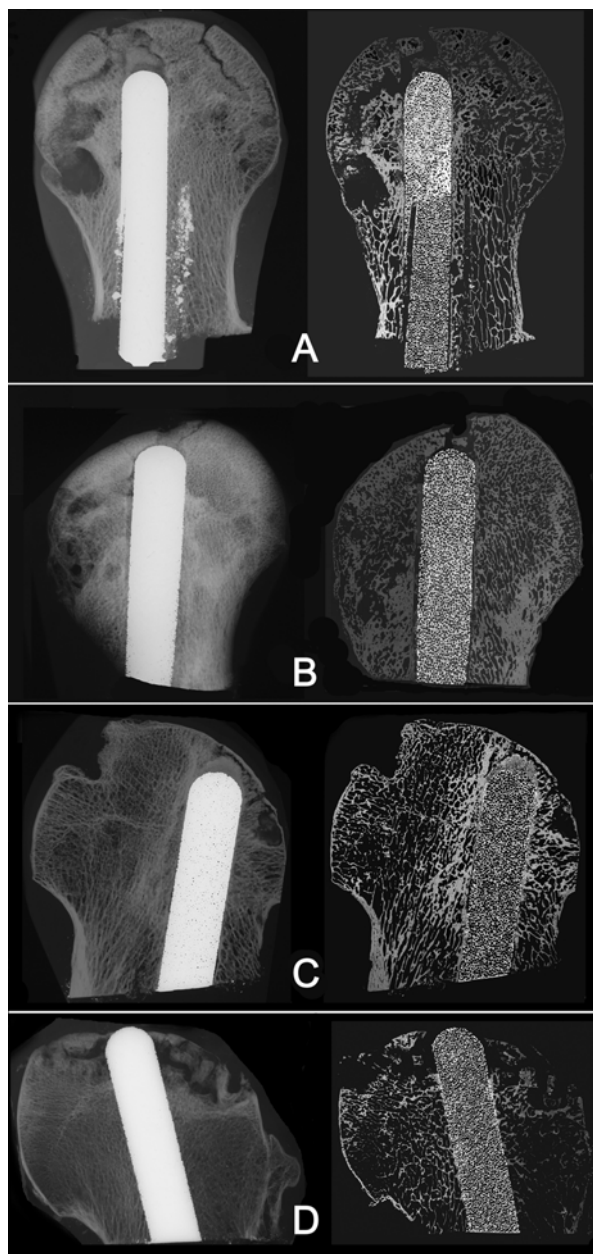
Specimen Number	Time in Situ ( <i>mo</i> )	Patient Age ( <i>yr</i> )	Gender	Body Mass Index	Etiology/Risk Factors	Initial Steinberg Stage*
1	3	53	Female	29	Steroids	II
2	7	37	Female	30	Idiopathic	II
3	7	34	Female	28	Idiopathic	II
4	7	45	Male	29	Idiopathic	II
5	8.5	60	Male	27	Idiopathic	II
6	9	36	Male	31	Steroids	II
7	11	64	Female	21	Steroids	II
8	12	57	Male	25	Idiopathic	II
9	12	34	Male	30	Alcohol	II
10	13	57	Male	37	Alcohol	II
11	13	30	Male	23	Alcohol	II
12	14	34	Male	34	Idiopathic	II
13	19	57	Male	35	Alcohol	II
14	28	28	Male	25	Steroids	II
15	36	40	Male	19	Idiopathic	II

\*As classified by the operating surgeon.

TABLE E-2 Osteonecrotic Characteristics from the Thin Section Made Through the Center of the Long Axis of Each Retrieved Specimen

Specimen Number	Total Femoral Head Area ( $cm^2$ )	Osteonecrotic Lesion Area ( $cm^2$ )	Area of Implant in Osteonecrotic Lesion ( $cm^2$ )	Osteonecrotic Lesion Area/Total Femoral Head Area (%)	Area of Implant in Osteonecrotic Lesion/Osteonecrotic Lesion Area (%)	Distance from Tip of Implant to Precollapsed Subchondral Bone (mm)	Subchondral Fracture	Collapse of Femoral Head	Adjacent Subchondral Bone Collapse
1	14.06	0.00	0.00	0	0	11	Yes	Yes	No
2	8.58	2.43	0.24	28	10	6	Yes	Yes	Yes
3	10.71	2.28	0.14	21	6	10	Yes	No	No
4	15.82	9.58	1.10	61	11	12	Yes	Yes	Yes
5	16.06	5.16	1.13	32	22	5	Yes	No	No
6	10.97	3.03	0.26	28	9	5	Yes	Yes	Yes
7	10.35	4.49	0.97	43	22	7	Yes	Yes	Yes
8	12.23	7.43	2.10	61	28	Through	Yes	No	No
9	15.47	0.75	0.12	5	16	9	Yes	Yes	Yes
10	15.01	4.07	0.96	27	24	4	Yes	Yes	Yes
11	11.28	1.98	1.15	18	58	Through	Yes	No	No
12	17.05	2.20	0.68	13	31	4	Yes	No	No
13	12.92	2.49	0.58	19	23	7	Yes	Yes	No
14	15.63	3.51	0.74	22	21	Through	Yes	Yes	Yes
15	9.82	2.52	0.21	26	8	11	Yes	No	No

Fig. E-1



A, Contact radiograph and corresponding backscattered scanning electron micrograph of Specimen 4, retrieved after seven months in situ. There is diffuse residual osteonecrosis with subchondral fracture and collapse. Note the track and tantalum debris created by the trephine during attempted removal at the time of surgery. This was one of two specimens without any bone ingrowth. B, Contact radiograph and corresponding backscattered scanning electron micrograph of Specimen 9, retrieved after twelve months in situ. Note extensive osteonecrosis with subchondral fracture and collapse of both overlying and adjacent subchondral bone. The extent of bone ingrowth was 0.4%. C, Contact radiograph and corresponding backscattered scanning electron micrograph of Specimen 12, retrieved after fourteen months in situ. There is residual osteonecrosis with subchondral fracture, but no collapse. The extent of bone ingrowth was 2.5%. D, Contact radiograph and corresponding backscattered scanning electron micrograph of Specimen 14, retrieved after twenty-eight months in situ. Note collapse of the overlying and adjacent subchondral bone with resultant penetration of the implant tip through the femoral head. The extent of bone ingrowth was 4.2%.