Acetabular Revision With Bone Graft and Cementless Cup

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Abstract: Cementless acetabular components are routinely used in revision hip surgery. Nevertheless, few investigators have assessed their retention and efficacy over the long term. This occurs mainly in cases which originate from moderate to severe bone losses (cavitary and or segmental) requiring the use of morselized and or bulk bone graft. Our objective in the present study is to report the outcome of 42 patients with 43 cementless acetabular revisions with bone graft who were operated by the same surgeon. The report is based on the clinical and radiographic evaluation of the patients alive at 167 months of follow-up. **Key words:** acetabular revision, bone graft, cementless cup, osteolysys, bone loss.

After the consolidation of the concepts for the use of total hip arthroplasty (THA) by Sir John Charnley, the large number of patients undergoing THA (particularly from at the end of the 1970s to the 1980s) inevitably led to an increase in patients who required revision surgery. In many cases, loosening accompanied by migration of the prosthesis, together with osteolysis, led to considerable bone loss. The latter was provoked by debris from the materials, either because of macrophagic cell action or to mechanical factors (especially hydrostatic action), as well as delays in carrying out the revision, thereby making revision surgery on the prosthesis a real challenge in such cases.

Revisions carried out using cemented prostheses, in cases of small bone losses, have provided satisfactory results even over the long term, as demonstrated in the work done by Raut et al [1]. Nevertheless, when bone losses are greater, the results have not been as satisfactory in direct proportion to the severity of such losses. The study by Jasty and Harris [2], among others [3,4], has also demonstrated this.

Since at that time we were unfamiliar with the technique of Slooff et al [5], who proposed the use of impacted bone grafts with cemented prostheses, and because we were in personal contact with Dr Jorge Galante [6], we decided to partially follow his advice. He proposed the use of a cementless acetabular prosthesis in revision cases, however, only in those cases where the use of bone grafts was considered necessary due to bone failures.

Thus, in January 1987, we started to use this technique only in revision cases in which the use of bone grafts was indicated due to moderate to severe bone losses.

Materials and Methods

Between January 1987 and October 1994, 205 loose acetabular prostheses underwent revision by the same surgeon, in a hospital associated with his private clinic.

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Table 1. Analysis of the 43 Cases Studied

No.	Name	Age	Sex	D'Aubigne Postel Before Surgery	GPA	GPF	Date of Revision	Type of THA/ Reimplant	Bone Graft, Acetabula	Bone Graft, Femur	Follow-Up (mo)	D'Aubigne Postel Last Examination	HHS	Alive
1	JTR	38	Male	A222	III	II	01/87	HG	Autologous	Autologous	217	A666	95	No
2	APP	30	Female	C113	III	II	02/87	HG	Autologous	Autologous	132	C655	72	Yes
3	APP	30	Female	C114	III	II	02/87	HG	Autologous	Autologous	132	C655	72	Yes
4	LMDF	44	Female	A123	II	II	09/87	HG	Autologous	Autologous	213	A655	91	No
5	CM	32	Female	A323	III	II	12/87	HG	Autologous	Autologous	196	A666	81	No
6	WSB	56	Female	A224	III	II	04/88	HG	Autologous	Autologous	203	A646	59	No
7	LCDFDC	57	Female	A235	IV	I	04/88	HG	Autologous	Autologous	202	A666	94	No
8	RCR	68	Female	B124	IV	IV	06/88	HG + bias	Autologous	Autologous	200	B644	82	No
9	AP	65	Male	B214	III	III	10/88	HG	Autologous	Autologous	196	B456	61	No
10	EVDFC	37	Male	A134	II	III	03/89	HG	Both	Both	198	A636	79	No
11	EDN	47	Male	B224	III	II	04/89	HG	Both	Both	190	B666	100	No
12	MBBB	55	Female	B224	IV	I	04/89	HG	Both	Both	149	B544	78	No
13	OF	64	Male	B224	II	III	06/89	HG	Autologous	Autologous	187	B666	91	No
14	AT	63	Male	A323	IV	II	07/89	HG	Autologous	Autologous	90	A666	94	Yes
15	AM	76	Male	A334	III	III	09/89	HG	Autologous	None	184	C626	79	No
16	MDLSL	38	Female	C113	IV	–	09/89	HG	Both	None	189	C655	91	No
17	AGDM	58	Male	A223	II	III	10/89	HG + bias	Autologous	Autologous	139	A556	93	No
18	CAC	71	Male	B112	IV	II	10/89	HG	Autologous	None	163	B566	80	No
19	DDSN	74	Female	A224	III	I	12/89	HG	Autologous	None	145	A666	89	Yes
20	RC	69	Female	B354	III	III	01/90	HG	Both	Both	182	B646	84	No
21	LCDO	56	Female	A252	IV	II	03/90	HG + bias	Both	Both	180	A666	96	No
22	RP	50	Male	B123	II	IV	05/90	HG + bias	Autologous	Autologous	177	B455	57	No
23	MSP	70	Female	C222	IV	III	11/90	HG	Autologous	None	171	C646	87	No
24	SG	60	Female	A224	III	IV	01/91	HG + bias	Autologous	Autologous	84	A655	89	Yes
25	NFB	73	Male	A123	II	IV	01/91	HG + bias	Both	Both	135	C544	78	Yes
26	HW	75	Male	B234	III	I	03/91	HG	Autologous	None	167	B666	87	No
27	SM	59	Female	A225	III	II	04/91	HG + bias	Autologous	Autologous	166	A645	84	No
28	ACDM	61	Male	B114	IV	IV	05/91	HG + bias	Both	Both	166	B656	96	No
29	CP	47	Male	A222	IV	III	08/91	HG	Both	Both	183	A666	95	No
30	AAM	64	Male	A224	III	II	11/91	HG	Autologous	None	63	A666	91	Yes
31	IDS	64	Female	A222	III	I	11/91	HG + cement	Autologous	None	159	A666	85	No
32	PEFCD	71	Female	B124	IV	I	01/92	HG + bias	Both	Both	157	B656	81	No
33	AP	39	Male	B112	IV	II	02/92	HG + bias	Autologous	Autologous	134	B655	89	No
34	MBJGM	55	Female	B224	III	–	03/92	AML	Autologous	None	44	B215	52	No
35	JLFR	37	Male	A124	IV	II	04/92	HG + cement	Autologous	None	154	A666	95	No
36	SK	68	Female	A334	IV	II	09/92	AML+HG	Autologous	Autologous	117	A666	90	Yes
37	ADM	71	Male	B225	III	III	11/92	AML	Autologous	None	138	B456	66	No
38	NMDC	63	Female	A113	III	IV	12/92	AML	Both	Both	147	A666	82	No
39	CMMS	40	Female	A234	III	II	01/93	AML	Homologous	Homologous	148	A335	64	No
40	FS	66	Female	A233	III	–	03/93	AML	Autologous	None	143	A555	87	No
41	MCASS	39	Female	B334	III	–	04/93	AML	Autologous	None	133	B656	81	No
42	NTT	55	Female	A114	II	–	09/93	AML + cement	Autologous	None	88	A666	85	Yes
43	MGT	54	Female	A323	II	II	10/94	AML	Both	Both	124	A666	92	No

GPA, classification of Gustilo Pasternak for acetabular lesions; GPF, classification of Gustilo Pasternak for femoral lesions; THA, total hip arthroplasty; HHS, Harris hip score.

Forty-nine of these patients, with 51 loose acetabular components and moderate to severe bone losses (Gustilo-Pasternak [7] types II, III and IV), underwent full revision in a single surgical stage using a cementless acetabular component and bone graft. This group forms the focus of the present study.

Within this group of 49 patients, 12 of them with 14 THA died from a variety of reasons, apparently unrelated to the surgery. Eight of them, with 9 revisions, died after a minimum follow-up period of 7 years and were considered suitable for inclusion in this study. The 7-year follow-up period was established arbitrarily. On the other hand, the other 4 patients with 5 revisions who died before reaching this minimum length of follow-up were excluded from this study, along with 3 other patients with 3 revisions who did not respond to our calls.

The other 34 patients, with 34 revisions, who were alive and responded to our calls between January and September 2006, were included in the study with a mean follow-up of 167 months. Among these, 31 came to our service and were evaluated both clinically and radiographically by at least 1 of the present authors. The clinical examination used