Revision of the PCA unicompartmental knee

52 arthrosis knees followed for 2–5 years

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We evaluated 52 unicompartmental PCA arthroplasties for primary (46) or secondary (6) arthrosis after 3 (2–5) years. Cementless fixation was used in 35 femoral and in 28 tibial components. There were indications for revision in 11 cases. Conversion to a total knee had been performed in 4 cases, and 1 tibial as well as 1 femoral component had been exchanged, mainly because of polyethylene wear with increasing deformity. 2 femoral components were loose and 1 had fractured.

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We investigated our 2–5 year results with the PCA unicompartmental prosthesis for arthrosis.

Patients and methods

58 patients (61 knees) were operated on at our hospital during 1985–1989. 49 patients (52 knees) were available for follow-up examination after 3 (2–5) years. Mean age at the time of the operation was 66 (31–84) years. There were 42 medial arthroplasties and 10 lateral. 46 knees had primary arthrosis and 6 arthrosis secondary to a trauma. The mean duration of symptoms was 7 (2–20) years. According to Ahlbäck (1968), the stages of arthrosis were on the medial side: I–II (n 22), III (n 8), IV–V (n 9), and laterally: I–II (n 4) and IV–V (n 4); in 5 cases preoperative radiographs could not be retrieved. On weight-bearing radiography the mean tibiofemoral (TF) angles were 2.3° (± 4.7°) varus and 17° (± 5.2°) valgus in medial and lateral arthroplasties, respectively. The mean preoperative range of motion was 5°–110°.

If the quality of the bone stock seemed acceptable, the porous-coated implants were fixed without cement (35 femoral and 28 tibial components). Large enough components were chosen to achieve sufficient cortical support. Special instruments and guides were used to achieve the recommended positions of the implants (Lindstrand et al. 1988).

The function was estimated using the scoring system of Hungerford and Kenna (1983). At the follow-up, the score of the Knee Society (Insall et al. 1989) was also calculated.

Radiographic definition of the mechanical axis was not routinely performed postoperatively. The tibiofemoral angle was measured on the pre- and postoperative radiographs and at the follow-up examination. The position of the components was measured in the AP and lateral views. In evaluating loosening of the components, the criteria presented by Ewald (1989) were used.

For statistical analysis, the *t*-test, analysis of variance, correlation coefficients, and chi-square were used.

Results

6 knees were revised (1 tibial, 1 femoral component and 4 conversions to a total knee), and in another 5 knees a revision was judged to be indicated (Figures 1–3 and Table 1).

There was no difference in position, alignment and occurrence of radiolucent zones between failed and intact knees.

Failure tended to be commoner in knees with secondary than with primary arthrosis (1/2 vs 1/5).

Discussion

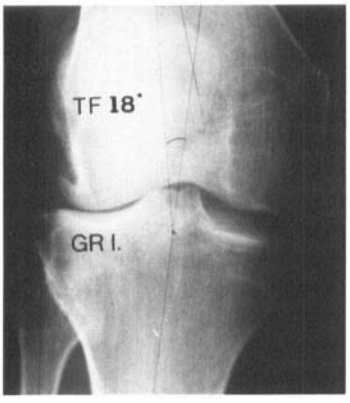
Our series of PCA knees confirm the unsatisfactory results reported by Lindstrand and Stenström (1992). According to the Swedish Knee Arthroplasty Project, 65 (8 percent) of the implanted 772 PCA unicompartmental knees in the years 1983–90 had to be revised (Lindstrand et al. 1992), the most common reason being a loose femoral component. Polyethylene wear was the indication for revision in 9 cases. In the PCA

Table 1. PCA unicompartmental knee arthroplasties which have been revised or suggested for revision

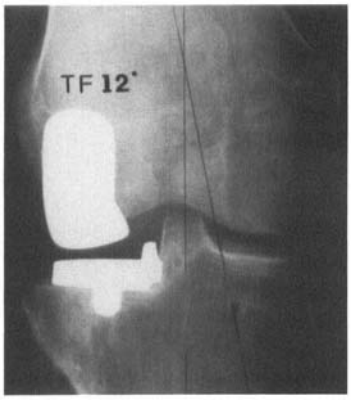
Case	Sex	Age	Type[a]	Stage[b]	Cement	Polyethylene mm	Weight-bearing tibiofemoral angle[c]			Years fu	Revision	Indication
							Pre	Post	fu			
1	F	66	mp	V	–	9	18	–2	2	3.8	total	varus deformity
2	F	53	ms	II	+	13	6	–5	–3	3	total	loose femur
3	M	65	mp	II	–	7	2	–7	–6	2.9	no	bad congruence
4	M	59	mp	I	+	9	–5	–10	–6	2	femoral	loose femur
5	F	63	mp	IV	–	7	8	–3	0	4.5	no	polyeth. wear
6	F	59	mp	V	–	11	9	0	6	4.2	no	varus deformity
7	F	67	mp	II	+	7	1	–9	–4	2.8	total	varus deformity
8	F	72	lp	V	–	11	–21	–15	–18	5	no	valgus deformity
9	F	54	lp	I	–	7	–18	–12	–15	3.5	tibial	valgus deformity
10	F	68	ls	IV	–	11	–20	–9	–16	2.9	total	fract. fem. comp.
11	M	49	ls	IV	–	11	–20	–4	–7	4.6	no	tibial subsidence

[a] medial/lateral primary, secondary
[b] Ahlbäck
[c] + varus, – valgus
fu follow-up

Figure 1. Case 9.

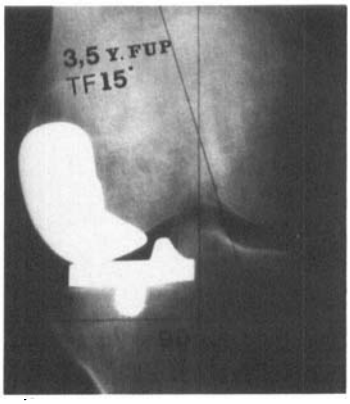


Lateral Ahlbäck stage I arthrosis in a 54-year-old woman with a tibiofemoral angle of 18° valgus.

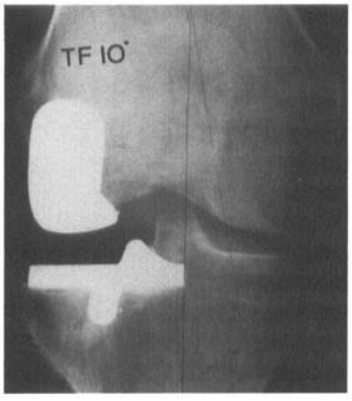


Postoperative, 12° valgus. The thinnest (7 mm) polyethylene component was used.

Figure 2. Case 1. A typical delamination type of polyethylene wear.



After 3.5 years, the valgus deformity has increased to 15°. At arthrotomy, the polyethylene was abraded to the metal and there was moderate metallosis.



After revision of the tibial component to the thickest (13 mm) component, 10° valgus.

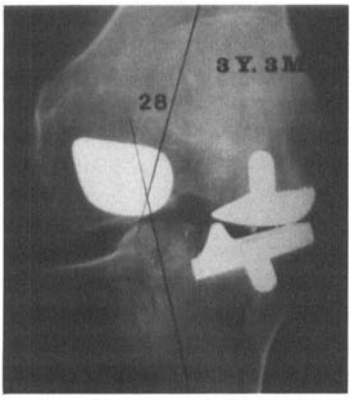


Figure 3. Case 10. After 3 years a fracture of the femoral component caused a suddenly increased valgus deformity.

prostheses, a severe delamination type of wear has been observed a short time after implantation (Blunn et al. 1992). In our series, polyethylene wear was the reason for increasing deformity in 6 cases, frequently extending to the metal base (Figures 1 and 2). Excessive postoperative varus or valgus alignment (as in Cases 6, 8, and 9) can predispose to polyethylene wear, but the material properties of the polyethylene also seem to be inadequate. Cementless fixation might allow tibial subsidence with resulting deformity, and the uniknee is usually not suitable in Ahlbäck III and worse medial arthrosis. A unique complication in our material was the fractured femoral component (Figure 3); cementless fixation and weakness of the material might have been the reasons.

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