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Function after arthrodesis of the knee

A long-term follow-up of 30 patients with knee arthrodesis, mostly for arthrosis, revealed that 24 were satisfied with the operation, while six were not satisfied, two because of persistent pain. Twenty-three patients were at work at the time of operation, 18 were able to go back to work, while three were allowed disability pensions and two old age pensions. Many patients had problems in attending public performances and in using buses and trains.

We conclude that two-thirds of the patients are totally relieved of pain after knee arthrodesis. Most patients accept the stiff joint, some have problems in social life, and a few have to give up working.

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Endoprosthetic arthroplasty has reduced the number of primary knee arthrodeses. Sometimes, however, arthrodesis is unavoidable, notably for salvage of failed arthroplasty. We examined to what extent the activities of daily living are influenced by fusion of the knee joint, and whether or not the patients get accustomed to their stiff leg.

Patients and methods

From 1955 through 1981, 48 patients underwent an arthrodesis of the knee in our department. No bilateral procedure was performed. Thirty-one were females, and 17 were males. The median age at operation was 54 (20–76) years. Compression arthrodesis was performed in 45 patients using the Charnley apparatus, in two with the Hoffman external fixation device, while one patient had a tibia graft transferred to the arthrodesis followed by immobilization in a plaster cast. Solid union of the arthrodesis was obtained in all cases. At the time of follow-up, 15 patients had died and two were unwilling to participate in the study. One patient, who was still under postoperative treatment, was excluded from the study. Three patients who had left the county were examined by their home physician.

Thus 30 patients participated in the follow-up study (Table 1). The median observation time was 14 (3–28) years and the median age at the examination 69 (33–84) years. Prior to the operation, 13 patients (Group 1) had no other joint affection; the operation was usually performed for arthrosis, and this group represents most clearly the effect of a knee joint arthrodesis. Seventeen patients (Group 2) complained of symptoms from at least two joints, notably associated with rheumatoid arthritis.

Results

Group 1 (Cases 1–13, Table 1) Before the operation, all patients were at work. Eight returned to their former job, while two were transferred from heavy manual work to less heavy work. Two patients were allowed an old age pension and one received a disability pension. One patient was an active dancer, and one took part in several sports including badminton and skiing.

Group 2 (Cases 14–30). At the time of the operation, 10 patients were at work, three were receiving old age pensions and four disability pensions. After the operation, six patients were able to resume their former work, while two were transferred to less heavy work and two were granted disability pensions.

At the follow-up examination, all 30 arthrodeses were stable, and radiographs confirmed solid union.

Table 1. Data from 13 patients with no other joint affection (Group 1) and 17 patients with symptoms from at least two joints (Group 2)

	Case	Sex Age	Diagnosis[a]	Follow-up (yr)	Satisfied	Knee pain[b]	Walking aids[c]	Motorist	Uses bus/train	Attends public performances	Flexion angle (degree)	Leg shortening (cm)
Group 1	1	M 49	pO	4	Yes	+++	2	–	+	–	20	4
	2	F 68	iO	25	Yes	+++	1	–	–	–	10	1
	3	F 65	sO	27	Yes	–	–	+	+	+	5	3
	4	F 71	iO	4	Yes	–	1	–	+	–	25	4
	5	F 38	pO	9	Yes	+	–	+	–	+	20	3
	6	M 78	sO	23	Yes	–	–	+	+	–	20	3
	7	F 80	iO	24	Yes	–	–	–	+	+	25	3
	8	F 69	sO	3	Yes	–	1	–	+	+	15	3
	9	M 56	pO	24	Yes	++	1	+	+	+	5	2,5
	10	M 84	iO	25	Yes	–	1	–	+	–	5	3
	11	M 62	iO	28	Yes	–	–	+	+	+	5	1
	12	M 69	sO	27	Yes	–	–	–	+	+	5	3,5
	13	M 36	P	4	Yes	–	–	+	+	+	15	1
Group 2	14	F 51	Pm	4	Yes	–	1	+	+	–	10	4
	15	F 80	iO	4	Yes	–	1	–	–	+	5	2
	16	F 75	iO	3	Yes	–	1	–	–	–	10	0
	17	F 60	R	3	Yes	–	2	–	–	–	5	2
	18	M 43	pO	19	No	–	–	+	+	+	10	4,5
	19	F 70	iO	25	No	–	1	–	+	–	5	1
	20	F 35	R	3	Yes	+	–	–	–	–	20	2
	21	M 69	R	15	Yes	–	W	+	–	–	0	0
	22	M 71	R	3	Yes	+	1	–	–	–	25	3
	23	F 69	R	13	No	+	–	–	–	–	10	3
	24	F 71	iO	15	No	+++	1	–	+	+	20	4
	25	F 80	A	5	Yes	–	1	–	–	–	15	3,5
	26	M 33	pO	5	No	+	–	–	+	+	15	3
	27	F 51	H	9	No	+++	W	–	–	–	25	2
	28	F 44	pO	22	Yes	–	–	–	+	+	5	6
	29	F 78	C	27	Yes	–	1	–	–	–	20	2
	30	F 47	sO	27	Yes	–	–	+	+	+	15	2

[a] A Failed arthroplasty, C Chondromalacia patellae, H Habitual dislocation of the patella, iO Idiopathic osteoarthrosis, pO posttraumatic osteoarthrosis, sO Osteoarthrosis following septic arthritis, P Pigmented villonodular synovitis, Pm Poliomyelitis, R Rheumatoid arthritis.

[b] – never, + rarely, ++ often, +++ constantly.

[c] Crutch or cane, W wheel-chair.

Cases 3, 18 and 24 had back pain at follow-up.

Discussion

Siller & Hadjipavlou (1976) reported a high incidence of complications following arthrodesis of the knee with persistent knee pain in one third of their cases and back pain in nearly half. They concluded that "knee arthrodesis completely alters the patient's life style; in many cases employment is lost and social activities are curtailed". Ten of our 30 patients denied being relieved of pain, and two disapproved of the arthrodesis for this reason. Only 3 of our 30 patients had back problems. Siller & Hadjipavlou (1976) found that most patients had difficulties in returning to work, while 18 of our 23 patients returned to their work.

Many patients give up certain social activities, and in our series this seemed to be true in patients with polyarticular disease. Patients should, therefore, prior to the arthrodesis, be informed that attending public performances, such as concerts or the cinema may be a problem, as is using buses and trains. Brattström & Brattström (1971) have emphasized the importance for rheumatoid patients of adequate leg length compensation after arthrodesis of the knee.

Today, failed arthroplasty is the main indica-

tion for an arthrodesis. However, the operation is more difficult in such cases than when performed as a primary procedure; in the presence of infection and/or severe loss of bone stock, notably after removal of a hinge endoprosthesis, half of attempted arthrodeses have been reported to fail (Hagemann et al. 1978, Brodersen et al. 1979, Knutson et al. 1984).

We conclude that knee arthrodesis gives a functioning leg, and that most patients are relieved of pain. Arthrodesis creates social obstacles which should not be neglected, but most patients get accustomed to their stiff leg and resume work.

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