The Hauser operation for patellar dislocation

3–32-year results in 63 knees

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The Hauser operation for patellar dislocation was performed in 34 women and 20 men, median age 18 (3–55) years; one leg was amputated because of wound infection with chronic septic arthritis. At the time of follow-up, 8 (3–32) years after the operation 57 knees had normal or almost normal patellar stability, but only 26 knees were free from pain. Only 16 knees had both normal patellar stability and were without pain. Patellar arthrosis had developed in 16 knees and femorotibial arthrosis in 23 knees. Eleven patients operated on before the age of 15 years showed varying grades of axial deformity of the proximal tibia.

We report our results of tibial tubercle transfer (Hauser 1938) for recurrent dislocation of the patella.

Patients and methods

During a 30-year period, 1954–1983, 66 consecutive Hauser operations were performed in 54 patients (34 females, 20 males). In all the cases but 1, the indication for operation was recurrent dislocation of the patella. Twelve patients underwent a bilateral procedure. The median age at surgery was 18 (3–55) years.

In 7 knees (5 patients, 2 of them with Down's syndrome, with 2 operated on bilaterally) the dislocation was congenital and permanent. The median duration of symptoms was 5 years in 60 knees, and it was unknown in 6. The main symptoms were pain and recurrent subluxations in 23 cases, feeling of instability or giving way restricting physical activities in another 29. Twelve patients gave a history of effusion in one or both knees.

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In 16 cases the primary cause of recurrent dislocation was traumatic. Six patients presented with extensive ligamentous laxity, and 17 had a family history of recurrent dislocation of the patella, 7 of these having more than 1 relative that was affected. Genu valgum was found in 6 cases. One patient had been treated conservatively for Osgood-Schlatter disease in the operated on knee, and 3 others had been operated on previously—1 with removal of a loose body and the other 2 with a Roux-Goldthwait procedure. One patient had contracture of the knee postoperatively.

Preoperative radiography showed patella alta in 8 cases, hypoplastic lateral femur condyle in 9, varying degrees of osteophytes in 5, and patellar bipartita in 1 case.

The tibial tubercle was transferred medially and slightly distally, combined with lateral retinacular release and medial advancement with imbrication of the vastus medialis in most cases (Hauser 1938). In 10 cases additional corrective procedures were combined with a Hauser operation (Table 1).

Table 1. Additional procedures to tibial tubercle transfer

Supracondylar femoral osteotomy	2
Semitendinosus tenodesis	3
Patellar shaving	5
Campbell's soft-tissue realignment	5
Partial synovectomy	1
Removal of a rudimentary fragment in a patella bipartita	1

Complications

One deep infection caused septic arthritis with secondary arthrosis and severe instability. Fusion was not successful, and amputation at an above-the-knee level had to be performed 6 years after the primary surgery.

Dislocation of a femoral osteotomy, performed as an additional procedure, occurred in 1 case necessitating reoperation with uneventful healing. Peroneal palsy after the Hauser procedure developed in 3 patients with full recovery in only 1 case. One patient had to be operated on because of medial overcorrection of the patella, and another underwent a new Hauser procedure for insufficient primary correction leading to early recurrent dislocation. Manipulation of the operated on knee under general anesthesia was required in 2 cases owing to stiffness. One bone block dislocated and rotated, and excision of a bony, sharp edge had to be carried out 1 year later.

Follow-up

At the time of the follow-up examination, 2 patients had died. One patient living abroad and another who had the limb amputated were excluded. All the remaining 50 patients with 62 operated on knees were examined clinically and radiographically after a median follow-up time of 8 (3–32) years.

Standing radiographs and a tangential view of the patella of both knees were taken in all the patients. The degree of arthrosis in the femorotibial joint was classified according to Ahlbäck's (1968) grading system, and the degree of patellar arthrosis was rated as mild, moderate, or severe (Crosby and Insall 1976).

The results were rated by the patients according to the following system:

Excellent: When there was no feeling of instability, no restriction of activities, no pain, or only occasional pain following strenuous effort.

Improved: Occasional discomfort, feeling of stiffness, but the knee considered as stable or improved by the operation.

Unchanged: Discomfort and pain as before operation.

Worse: Dissatisfied with the operation regardless of reason.

Results

The operation was considered to be successful in 52 of 62 cases. However, 36 knees caused pain or discomfort; in 2 cases the pain was severe. Patellar stability was achieved better in adults than in children (Table 2). Only one fourth of the knees had both complete freedom from pain and stability (Table 3).

Table 2. Recurrent dislocation or subluxation at follow-up

Patella instability	Age at operation		Overall results
	< 15 (n 14)	> 15 (n 48)	(n 62)
None	5	38	34
Seldom [a]	3	10	13
Often	3	0	3
Permanent	3	0	3

[a] 1–2 episodes per year.

Retropatellar crepitus was present in 25 of the operated on knees. Among these patients, 6 rated their result as excellent, and 1 belonged to the improved group. Severe restriction of flexion was recorded in 1 case of severe patellar arthrosis. Kneeling was uncomfortable in six knees. Five patients complained of loss of sensibility around the scar, and sensory deficits in the three lateral toes on the operated on side were recorded in 1 case.

All 11 children (14 knees) presented with varying degrees of axial deformities; and among these, 4 were symptomatic. One patient with Down's syndrome, who had been operated on at 3 years of age, still had a permanently dislocated patella on both sides; in another patient the patella dislocates regularly in the the semiflexed position.

Radiographic assessment

Grade 3–4 femorotibial arthrosis was seen in 22 knees, and Grade 5 in one. Patellar arthrosis was found in 16 patients, among whom only 2 had severe changes. Four patients operated on before the age of 15 had a patella baja due to overdistalization.

Discussion

Since it was first introduced in 1938, the Hauser procedure has continued to be widely used for recurrent dislocation of the patella. There seems to be no question that patellar stability is achieved in the majority of cases, both in short- and long-term studies (Heywood 1961, Hampson and Hill 1975, Crosby and Insall 1976, DeCesare 1979, Chrisman et al. 1979).

Table 3. Observations in 54 patients operated on for patellar dislocation by the Hauser technique

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	l	24	M	9	2	-	-	1	-	32	1	1	1
2	r	34	F	2	3	-	1	-	1	a			
3	r	27	M	15	2	-	-	2	-	26	1	1	1
4	r	3	M	c	4	-	7	-	-	26	3	1?	4
4	l	3	M	c	4	-	7	-	-	26	3	1(?)	4
5	r	34	M	17	2	-	3.1	2	-	d	-	-	-
6	r	31	F	14	2	+	1	2	-	d	-	-	-
7	r	27	F	c	3	-	2.3	3	2	23	2	2	1
7	l	27	F	c	2	-		3	-	23	2	2	1
8	l	18	F	2	3	-	3	-	-	23	2	2	1
9	l	15	F		3	-	3	-	-	22	2	2	1
10	l	18	F	6	2	+	3	4	-	22	2	2	1
11	r	17	F	4	2	-	-	-	-	19	2	2	1
12	r	22	M	2		+	-	4	-	19	2	2	1
13	l	34	F	20	2	+	1	4.1	-	18	2	2	1
14	l	25	M	8	2	+	1	4	-	17	1	1	1
15	l	55	F	1	2	+	-	-	-	17	2	2	1
16	r	17	M	6	2	+	4	-	-	15	2	1	3
16	l	18	M	7	2	+	-	-	-	14	1	1	1
17	l	13	F		2	-	5	-	5	13	2	1	1
18	l	32	F	15	1	-	-	-	-	m	-	-	-
19	r	13	F	6	2	-	-	-	-	12	2	3	2
19	l	13	F	6	2	-	-	-	-	12	2	3	2
20	r	30	F	17		+	1	1	-	11	3	1	1
21	r	15	M	c	4	-	7	6	6	10	2	2	1
22	l	11	M		3	-	4	-	-	9	2	2	1
23	r	25	F	13		-	4	-	-	10	2	2	1
24	r	20	M	4	2	-	5	7	-	8	1	1	1
25	r	11	F	c	1	-	4	-	-	9	3	2	4
25	l	11	F	c	1	-	4	-	-	8	2	2	2
26	r	15	M	4	2	-	-	-	-	8	1	1	1
26	l	15	M	4	3	-	-	-	3	7	1	1	1
27	r	18	M	13		-	-	-	-	8	3	2	2
27	l	19	M	13		-	-	-	-	7	3	2	1
28	r	16	F	5		-	2	-	-	8	2	2	1
28	l	17	F	5		-	2	-	-	7	2	2	1
29	r	17	M	1	1	-	-	-	-	7	2	2	2
30	l	10	F	2	2	-	2	-	-	7	3	2	2
31	l	14	M			-	-	-	-	6	3	2	3
32	r	16	M	4	2	-	5.3	-	-	7	1	1	1
32	l	20	M	1	2	-	5.3	-	5	4	1	1	1
33	l	13	F	1	2	-	-	-	-	6	1	1	1
34	r	16	M	3	3	-	2	4	4	4	4	2	3
35	l	15	F	4			5	-	-	6	1	1	2
35	r	14	F	4	2		5	-	-	6	1	1	1
36	l	15	F	4		-	-	-	-	6	2	2	1
37	r	25	F	10	1	-	-	1	-	6	2	2	1
38	r	15	F	6		+	3	5	6	6	1	1	1
39	l	24	M	10	2	+	-	-	-	6	2	2	1
40	r	21	M	4		-	5.2	-	-	6	1	1	1
40	l	20	M	5	3	-	5.2	-	7	6	1	1	1
41	l	45	F	4	2	-	5	1	-	7	2	1	1
42	r	17	F	6	2	-	2,5,3	-	-	5	1	1	1
43	l	33	F	20		+	-	-	-	5	4	2	2
44	r	14	F	8	2	+	3	-	5	6	1	1	1
45	l	22	F	3	2	-	-	-	-	4	2	2	2
46	r	23	F	4	1	+	4	-	-	4	2	2	2
47	r	19	M	8	2	-	-	-	-	4	1	1	1
48	r	24	M	1	2	+	-	-	-	4	2	2	1
49	r	14	F	5	2	-	4	-	-	4	2	1	1
50	r	32	F	10		-	-	-	-	3	1	1	1
51	l	37	F	20	2	+	5	-	-	3	2	2	1
52	l	17	M		2	-	-	-	-	10	2	2	2
53	r	21	F	2		-	-	-	-	8	2	2	1
53	l	19	F	1	2	-	-	-	-	10	2	2	1
54	l	36	F		2	-	-	-	-	10	2	2	1

Key to data

A Case
B Side
C Age at operation
D Sex
E Duration of symptoms before operation (years)
  c congenital
F Number of patellar dislocations per year before operation
  1 1–2
  2 3–10
  3 > 10
  4 permanent.
G History of trauma
H Other findings
  1 patellofemoral arthrosis
  2 genu valgum
  3 hyperplastic lateral femoral condyle
  4 general ligamentous laxity
  5 patella alta
  6 effusion
  7 Down's syndrome.
I Additional corrective procedures
  1 patellar shaving
  2 semitendinosus tenodesis
  3 supracondylar femoral osteotomy
  4 Campbell's soft-tissue realignment
  5 partial synovectomy
  6 debridement
  7 removal of a rudimentary fragment in a patella bipartita
J Postoperative complication
  1 deep infection
  2 reoperation
  3 reoperation for recurrence
  4 reoperation for overcorrection
  5 peroneal palsy
  6 manipulation under anesthesia
  7 bone block dislocation
K Follow-up (years)
  a amputated
  d dead of unrelated cause
  m moved abroad
L Patients' own assessment at follow-up
  1 excellent
  2 improved
  3 unchanged
  4 worse
M Knee pain at follow-up
  1 none
  2 moderate
  3 severe
N Recurrent dislocation or subluxation at follow-up
  1 none
  2 seldom
  3 often
  4 permanent

Residual complaints, mainly pain, were found in half of our knees, irrespective of the age group at the time of operation. This was not generally a source of great discomfort. Significant pain and retropatellar degeneration occurred in most of Hampson and Hill's (1975) patients. We could not find such a correlation.

Further, our study demonstrates that the Hauser procedure is still associated with a relatively high complication rate. In prospective comparisons of the Hauser and Roux-Goldthwait operations, Crosby and Insall (1976) and Chrisman et al. (1979) found a lower incidence of complications in the latter group.

Some authors have pointed out the detrimental effect of medial transposition of the extensor functions (Goutallier and Debeyer 1974, Thygesen et al. 1982). Medialization of the patellar ligament generates posterior displacement, and in this way constraints the patellar articulation. In order to prevent this detrimental effect, simultaneous advancement of the tibial attachment of the patellar ligament using a bone graft has been recommended (Lord et al. 1977, Fondren et al. 1985).

Hauser's operation must be avoided in the skeletally immature patient with open epiphyseal plates (Fielding et al. 1960). The risk of growth arrest with secondary recurvatum, with or without other axial deformities, has been clearly shown once more in our follow-up.

The 2 patients with Down's syndrome in our series were not improved by the procedure. It has been shown in a recent study that patellar instability, although frequent in this group, is rarely disabling and does not require surgical correction in most cases (Dugdal and Renshaw 1986).

We conclude that the use of Hauser's operation should be limited to severe cases of patellar instability. Whenever this method is found appropriate, careful attention to details is essential.

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