

Horizontal rotation of the patella

A case report with review of the literature

In a 14-year-old boy a direct blow caused the patella to rotate around its horizontal axis; the articular surface faced distally. Thirty-two cases have been described previously.

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Case report

A boy aged 14 years hit a parked car with his right knee while playing soccer on the street. He fell and was unable to move the leg. The knee was found to be locked in flexion of about 45°. Palpation suggested a fractured patella, but the radiographs showed a dislocation (Figure 1). Closed reduction after sedation and muscle relaxation was accomplished after flexion of the knee and manual elevation of the patella. The patient was immediately able to raise his leg. Control radiographs showed the patella in a good position.

Forty ml blood was aspirated from the joint. The leg was kept in a cast in extension, with weight-bearing permitted after 10 days. Radiographs made 3

months after the accident showed calcification at the upper pole of the patella (Figure 1). At 6 months the knee was functioning normally. There were no signs of laxity in any joint.

Discussion

Until now, as far as we know, only 32 other cases of horizontal rotation of the patella have been reported (Table 1). Brady & Russell (1965) mentioned 25 cases, but they included dislocation with the articular surface facing upwards, with a former knee ligament injury (Böhler 1957), or with severe trauma (Szuman

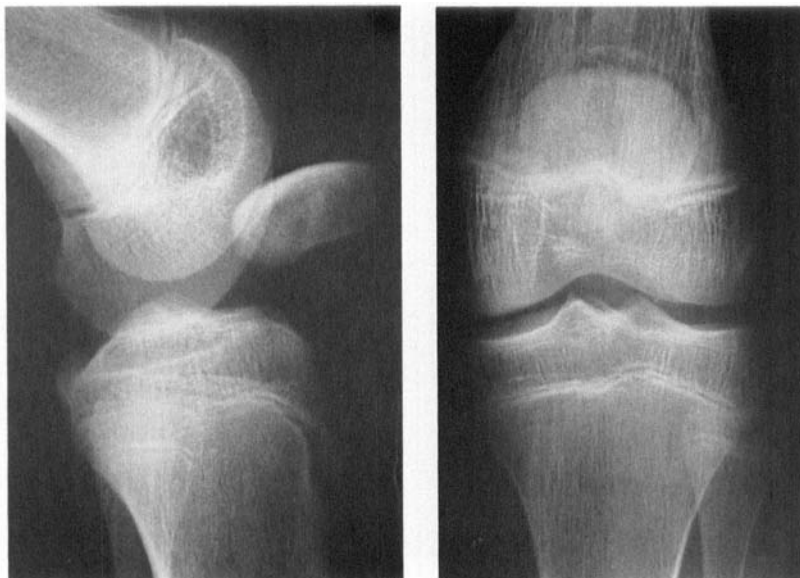


Figure 1. Horizontal rotation dislocation of patella. 3 months after the accident. Calcification at the upper pole of the patella.

Table 1. Previously published data on horizontal rotation dislocation of the patella, with the articular surface facing downward.

Reference	Age	Intact extensor apparatus	Reduction ^a	Knee function at follow up ^b
1.	17	+	c	G
3.	12	+	o	F
4.	17	—	o	F
5.	13	—	o	G
6.	19	+	p	?
7.	12	+	o	G
8.	11	+	o	G
9.	10	+	c	G
10.	11	+	c	G
11.	11	+	c	G
12.	13	+	o	F
13.	20	+	o	B
14.	11	+	o	G
15.	21	+	c	F
18.	38	+	c	F
19.	12	+	o	?
20.	57	+	o	F
21.	10	+	c	G
22.	18	+	o	G
23.	16	+	o	F
24.	18	?	o	B
25.	42	+	o	F
25.	7	+	p	G
26.	12	+	o	G
27.	16	+	o	G
28.	9	+	o	F
29.	15	?	o	F
29.	15	?	o	F
30.	14	+	o	G
31.	12	+	o	G
33.	56	+	o	B
34.	12	+	o ← p	F
Present case	14	+	c	G

^a. o = open reduction; c = successful closed reduction; p = closed reduction with use of percutaneous instrument additionally (in Case 23 the joint was explored after successful percutaneous reduction).

^b. G = unlimited knee and muscle function. F = minor limitations of function; muscle atrophy; swollen joint. B = knee function < 90 degrees of flexion; severe atrophy; disturbed walking.

1889, Küttner 1904). The mean age was 18 (7–57) years, and the majority were male.

Most authors have described one trauma, or a sequence of traumata striking the upper pole of the patella obliquely from the front. The dis-

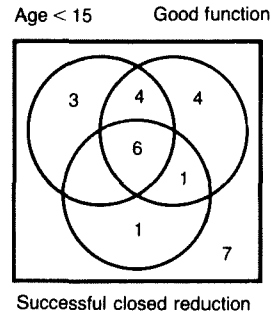


Figure 2. Results in 26 knees with horizontal dislocation of patella. In seven patients no results were available, a fracture was present, or the extensor apparatus was not intact.

location is more likely to occur in hyperlaxity of the joint (Jones 1928), or when the quadriceps muscle is relaxed. In three cases a fracture was seen in the same extremity (Rochedieu 1921, Henrichson 1923, Kager 1957).

The trauma results in a rotation of the patella, with maintained fixation on the lower pole. Apparently no disturbance of the circulation supplying the patella occurs. The dislocation is maintained by the quadriceps muscle, which fixes the patella like an arrow on a tensed bow. For closed reduction, a relaxed muscle is mandatory.

Several recommendations have been made with respect to closed reduction. Flexion should be used, combined with digital pressure on the inferior pole of the patella, or its tendon. Direct traction may be applied at the sides of the patella.

After reduction the joint may be aspirated. In approximately half of the patients, immobilization was used. However, no difference in the results was found between patients with or without immobilization. In six cases, at follow-up calcification was noticed along the upper pole of the patella (Humphries 1943, Schüttemeier 1947, Kager 1957, Wortmann 1959, Sarkar 1981, present case). A favourable outcome seems to be associated with young age at debut, and successful closed reduction (Figure 2).

References

- Aud, G. (1922) Downward dislocation of the patella. *J. Am. Med. Assoc.* **78**, 1457–1458.
- Böhler, L. (1957) Traumatische Verrenkungen der Kniescheibe. In: *Die Technik der Knochenbruchbehandlung* 12 und 13. II/2, pp. 1617–1619. Verlag für medizinische Wissenschaften Wilhelm Maudrich, Wien, Bonn, Bern.
- Brady, T. A. & Russell, D. (1965) Interarticular horizontal dislocation of the patella. *J. Bone Joint Surg.* **47**, 1393–1396.
- Brown, K. P. (1924) Interarticular dislocation of the patella. *Edinburgh Med. J.* **31**, 403–406.
- Cheesman, W. S. (1905) Dislocations of the patella, with rotation on its horizontal axis. *Ann. Surg.* **41**, 107–114.
- Deaderick, C. (1980) Case of rupture of quadriceps femoris tendon with dislocation of patella beneath the intercondyloid groove of the femur. *Ann. Surg.* **11**, 102–103.
- Donelson, R. G. & Tomaoui, M. (1979) Intra-articular dislocation of the patella. *J. Bone Joint Surg.* **61-A**, 615–616.
- Farmer, A. W. (1931) A case of intra-articular dislocation of the patella. *Can. Med. Assoc.* **25**, 706–707.
- Feneley, R. C. L. (1968) Intra-articular dislocation of the patella. *J. Bone Joint Surg.* **50-B**, 653–655.
- Frangakis, E. K. (1974) Intra-articular dislocation of the patella. *J. Bone Joint Surg.* **56-A**, 423–424.
- Gore, D. R. (1970) Horizontal dislocation of the patella. *J. Am. Med. Assoc.* **214**, 1119.
- Henrichson, A. (1923) Ein Fall von Luxatio patellar horizontalis inferior. *Zentralbl. Chir.* **30**, 62–67.
- Humphries, S. V. (1943) Intercondylar dislocation of the patella. *S Afr. Med. J.* **17**, 347–348.
- Jones, J. P. (1928) Interarticular dislocation of the patella. *Br. J. Surg.* **16**, 338–339.
- Kager, A. (1957) Bericht über einen seltenen Fall von horizontaler Verrenkung der Kniescheibe. *Zentralbl. chir.* **82**, 111–113.
- Küttner, H. (1904) Demonstration eines Präparates von horizontaler Luxation der Patella. *Zentralbl. Chir.* **31**, 168–170.
- Küttner, H. (1904) Die Einklemmungsluxation der Patella (Luxatio patellae cuneata). *Brunns' Beitr. Klin. Chir.* **42**, 553–577.
- Lamprecht, W. (1948) Die Horizontalluxation der Patella. *Chirurg* **19**, 378–379.
- Midelfart, V. (1887) En sjelden luxation af patella. *Nor. Mag. Lagevidensk.* **47**, 588.
- Mowbray, M. A. S. & Allum, R. (1980) Horizontal intra-articular dislocations of the patella. *J. Trauma* **20** 99–100.
- Murakami, Y. (1982) Intra-articular dislocation of the patella. *Clin. Orthop. Rel. Res.* **171**, 137–139.
- Newman, D. & Rutherford, H. (1901) Two cases of dislocation of the patella, one upwards and one downwards. *Lancet* **i**, 1761–1762.
- Perkins, J. W. (1920) Hitherto undescribed dislocation of the patella endwise. *J. Am. Med. Assoc.* **74**, 388.
- Rochedieu, (1921) A propos d'un cas de luxation horizontale inférieure de la rotule. Quoted from *Zentralbl. Chir.* **48**, 1701–1702.
- Rutherford, H. (1921) Downward dislocation of the patella. *Br. J. Surg.* **8**, 524–526.
- Sarkar, S. D. (1981) Central dislocations of the patella. *J. Trauma* **21**, 409–410.
- Schmidt, E. (1900) Ein Fall von Luxation der Patella mit Abriss der Quadricepssehne. *Zentralbl. Chir.* **27**, 1023.
- Schüttemeier, W. (1947) Die Horizontal- oder Einklemmungsluxation der Patella. *Chirurg* **17/18**, 364–365.
- Scott, C. M. (1924) Two rare cases of dislocated patella. *J. Am. Med. Assoc.* **82** 1198–1199.
- Steinmann, F. (1919) Horizontale Luxation der Patella. In: *Lehrbuch der Funktionellen Behandlung der Knochenbrüche und Gelenkverletzungen*. XVI-9^c, pp. 212–213. Verlag von Ferd Enke, Stuttgart.
- Stover, C. N. (1967) Interarticular dislocation of the patella. *J. Am. Med. Assoc.* **200**, 188.
- Szuman, L. (1889) Ueber eine seltene Form von Patellaluxation. *Arch. Klin. Chir.*, **259**, 642–650.
- Wildt, A. (1908) Ein Fall von Einklemmungsluxation der Patella. *Münch. Med. Wochenschr.* **II**, 2705–2706.
- Wortmann, V. (1959) Horizontale Patellaluxation. *Monatsch. Unfallheilk.* **62**, 196–198.