THE LOCKED PATELLA

AN UNUSUAL COMPLICATION OF HAEMOPHILIA

C. E. ACKROYD and R. J. DINLEY, OXFORD, ENGLAND

From the Nuffield Orthopaedic Centre, Oxford

Mechanical derangements of the knee are an uncommon complication of chronic haemophilic arthropathy. Two patients with locking of the patella were treated by manipulation. The mechanism of the injury was forced flexion of the knee joint beyond the limit of its restricted range. The injury is a serious one and may take six months to recover.

The knee is the joint most commonly involved in haemophilia, particularly the patello-femoral compartment. Out of 692 admissions for acute haemarthrosis to the Nuffield Orthopaedic Centre between 1966 and 1974, 302 involved the knee joint. Radiological abnormalities are common: they include narrowing of the joint space, loss of congruity of the joint surfaces and, more particularly, squaring off of the inferior pole of the patella (Gilbert and Cockin 1972). A study of these radiological changes in haemophilic patients over the age of twenty-five revealed that 50 per cent showed moderate or severe changes; a further 25 per cent were noted to have only mild changes (Duthie, Matthews, Rizza and Steel 1972). The severity of bleeding manifestations depends upon the blood level of active factor VIII. With levels of factor VIII greater than 5 per cent bleeding occurs only after injury or operation. When the level is between 1 and 5 per cent spontaneous bleeding occurs only occasionally. With levels of less than 1 per cent severe haemophilia occurs, with consequent chronic arthropathy (Rizza and Biggs 1971).

The main complications resulting from damage caused by repeated bleeding into the knee joint are, first, fixed flexion deformity, and secondly, postero-lateral subluxation of the tibia on the femur, leading to increasing pain, disability and restriction of joint movement. Though the formation of osteophytes is an inevitable accompaniment of the degenerative process, they seldom give rise to symptomatic loose body formation or other mechanical problems (Duthie *et al* 1972). In this paper we report two cases in which a knee with a limited range of flexion was subjected to a flexion injury, with the result that the upper pole of the patella became locked on the femoral condyles.

CASE REPORTS

Case 1—A man aged twenty-one with deficiency of factor VIII (0 per cent) with no antibodies, was admitted after a fall in December 1972. He had had numerous haemarthroses of the right knee before the injury and the range of movement was only from 10 to 90 degrees. In the fall the knee was forcibly

flexed well beyond the right angle. There was severe pain in the knee, which was locked at 90 degrees. A radiograph (Fig. 1) showed the patella to be lying low over the femoral condyles.

Examination under a general anaesthetic during infusion of antihæmophilic globulin revealed that there was a prominence on the lateral femoral condyle and that the patella was jammed below it. As the knee was gradually straightened, the patella was felt and seen to snap over the prominence and was restored to its normal position. The knee then easily extended to within 15 degrees of full extension and was immobilised in this position in a plaster-of-Paris splint. The splint was retained for a total of two months, but after two weeks he was allowed to mobilise the knee for gradually increasing periods. When the splint was discarded the range of movement was from 10 to 80 degrees, with a 10-degree extension lag. Despite intensive exercises, six months elapsed before the range of movement present before the accident was regained.

When this patient was reviewed two and a half years later, he continued to have some pain from the right knee and flexed it cautiously. There was marked crepitus under the patella on flexion. The range of movement was from 10 to 100 degrees, with a 5-degree extension lag. The radiograph (Fig. 2) showed an unusual appearance of the patello-femoral joint with a large osteophyte on the lateral femoral condyle which was tilting the patella to the medial side.

Case 2—A man aged forty-three with deficiency of factor VIII (5 per cent) with no antibodies, was admitted after a fall in May 1975. He had had four previous haemarthroses of the left knee, but none in the previous four years, and the range of movement before the injury was from 0 to 80 degrees. In the fall he fell forward on to the knee, taking the full weight of his body, and the knee was forcibly flexed beyond its usual limit.

When admitted he was in severe pain with the knee locked at 80 degrees of flexion. There was slight swelling, the knee circumference being 0.5 centimetre greater than the other. The patella was immobile and tender but the quadriceps mechanism was intact. A radiograph (Fig. 3) showed that the upper pole of the patella was locked in a depression in the femoral condyle. Reduction was done under general anaesthesia while an infusion of antihæmophilic globulin was given. The knee was flexed to release the patella which was then tilted by pressing the lower pole, thereby unlocking it.

Full extension and flexion to 85 degrees was then possible and the quadriceps mechanism was found to be intact. The knee was immobilised in a Robert Jones bandage which was

C. E. Ackroyd, F.R.C.S. }
R. J. Dinley, F.R.C.S. } Accident Service, The Radcliffe Infirmary, Oxford OX2 6HE, England.

FIG. 1

FIG. 2

FIG. 3

Figure 1—Case 1. Lateral radiograph of the right knee showing the patella low down on the femoral condyles. Figure 2—Case 1. Tangential radiograph to show the patello-femoral joint with a large osteophyte on the lateral femoral condyle.

Case 3. Lateral radiograph of the left knee showing the patella locked in a subchondral cyst.

changed three days later to a plaster cylinder. The patient was allowed to bear weight at two weeks. Flexion was allowed at four weeks but a posterior plaster splint was kept for six weeks. At three months there was no extension lag and flexion to 30 degrees.

DISCUSSION

Haemophilic arthropathy of the knee is associated with irregularity of the articular surfaces of both condyles and also of the patella itself. Squaring off of the poles of the patella, first described by Jordan in 1958, was seen in both patients. It is present in 20 to 30 per cent of patients but no satisfactory explanation has been offered for this. The patella may vary in size, being large and wide or long and thin; or it may be absent. Widening of the

intercondylar notch also occurs. When such a joint is forcibly flexed beyond its restricted limit, the patella is pulled deeply into the intercondylar notch, and can lock.

Both the patients had flexion limited to 90 degrees before injury. In Case 1 the patella was forced beyond the bony osteophyte and the upper pole impinged upon this and locked; in Case 2 the upper pole of the tilted patella locked into a subchondral cyst.

Despite the bony changes in the knee with haemophilic arthropathy, mechanical problems of this nature are extremely rare, and no such cases have been described previously. The injury causes a serious morbidity because of the already damaged joint, and it may take many months to recover; even then further loss of flexion may have occurred.

We would like to thank Professor R. B. Duthie for permission to study these patients and for his advice and criticism. We are also grateful to Mrs Olive Kingsworth for the secretarial help and Mr R. Emanuel of the Photographic Department for the preparation of the illustrations.

REFERENCES

- Duthie, R. B., Matthews, J. M., Rizza, C. R., and Steel, W. M. (1972) *The Management of Musculo-skeletal Problems in the Haemophilias*. Oxford, London, Edinburgh: Blackwell Scientific Publications.
- Gilbert, M., and Cockin, J. (1972) An evaluation of the radiological changes in haemophilic arthropathy of the knee. In *Proceedings of 7th Congress of the World Federation Haemophilia*, May 17-20, 1971, Teheran. ed. F. Alg and K. W. E. Denson, I.C.S. No. 252, pp. 191-196. Amsterdam: Excerpta Medica.
- Jordan, H. H. (1958) *Haemophilic Arthropathies*. Springfield, Illinois: Charles C Thomas.
- Rizza, C. R., and Biggs, R. (1971) Haemophilia today. *British Journal of Hospital Medicine*, 6, 343-356.