

THE LATE RESULTS OF OPERATIVE
TREATMENT OF RECURRENT
DISLOCATION OF THE PATELLA

BY

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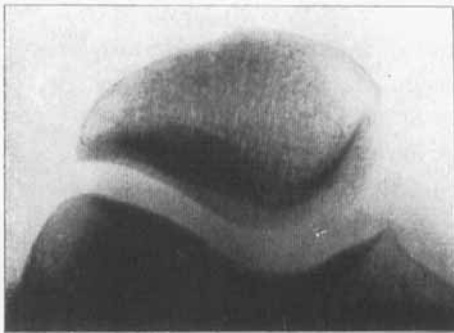
I have called these dislocations of the patella recurrent, but from the point of view of prognosis it seems that one should distinguish a smaller group of permanent dislocations consisting of both habitual cases, where the patella dislocates with each movement of the knee-joint, and cases where the patella is always in an abnormal position. The dislocations nearly always occur laterally, which can be explained on purely mechanical grounds by a normal slight valgus position of the knee and by the poorer development of parapatellar tissue on the medial side.

The condition may be either acquired or congenital. It may be acquired as a result of one or more traumatic dislocations, of valgus deformity of the knee due to either trauma or rickets, and of paresis of the muscles, usually from anterior poliomyelitis.

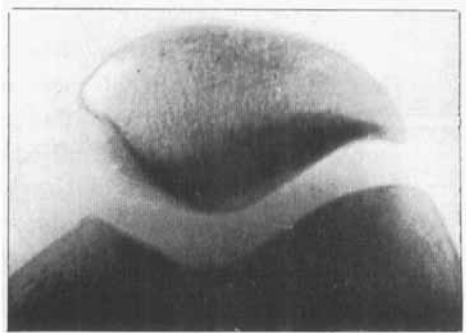
Congenital causes are developmental failure of either the extension apparatus or the femoral condyles. There may also be a tendency to lateral dislocation, even without valgus deformity, if the tibial tuberosity is placed more laterally than usual, thus giving a valgus deformity of the extension mechanism. Another congenital factor is faulty development of the quadriceps muscle, hypertrophy of the vastus lateralis combined with defective development of the vastus medialis. One

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of the most important factors is faulty development of the femoral condyles. It has been observed at operation and can now be studied radiographically, using a special technique by which an axial picture of the femoro-patellar joint is taken with the knee flexed between 30° and 50° . If the picture is taken with greater flexion of the knee one cannot obtain a profile picture of the patellar surface of the femur but only of the part of the condyles which articulates with the tibia. The joint surface of the patella normally consists of 2 facets of which the lateral is the bigger. The patellar surface of the

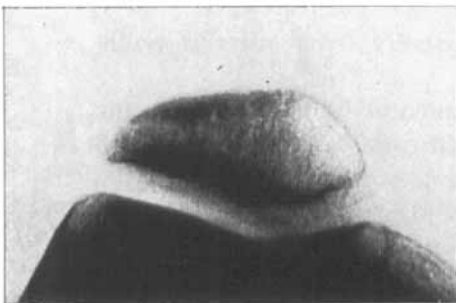


R.

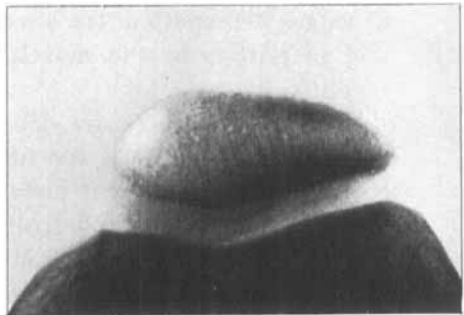
Fig. 1.

L.

Normal femoro-patellar joints.



R.

Fig. 2.

L.

Slight variation of the configuration of the joint: the division of the joint surface of the patella into 2 facets is less clear; the groove between the femoral condyles is shallow.

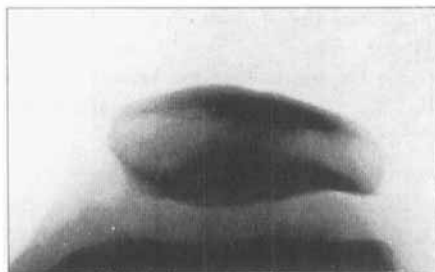
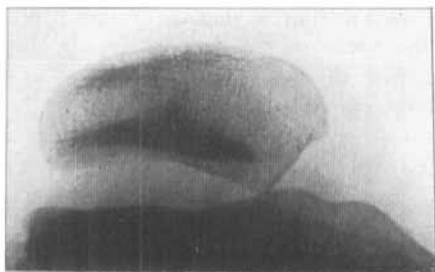


R.

Fig. 3.

L.

The patella's joint surface is flat. The lateral femoral condyle is less prominent and the groove between the condyles is poorly defined.

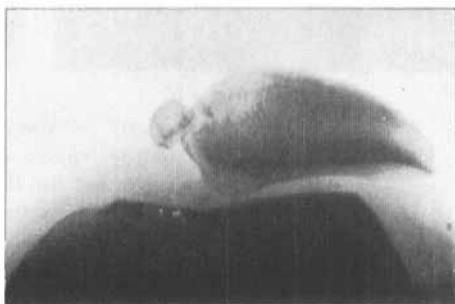


R.

Fig. 4.

L.

Flat joint surfaces.



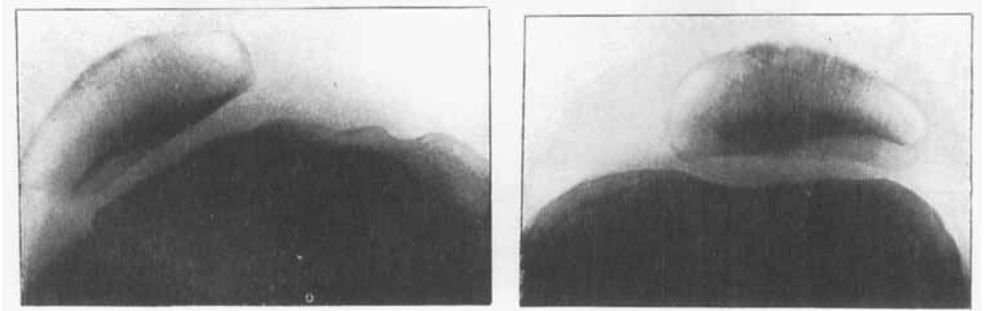
R.

Fig. 5.

L.

On the R. side the patellar surface of the femur is slightly convex.
On the L. side the variation is not so marked.

femur is saddle-shaped, the lateral half being more prominent than the medial.



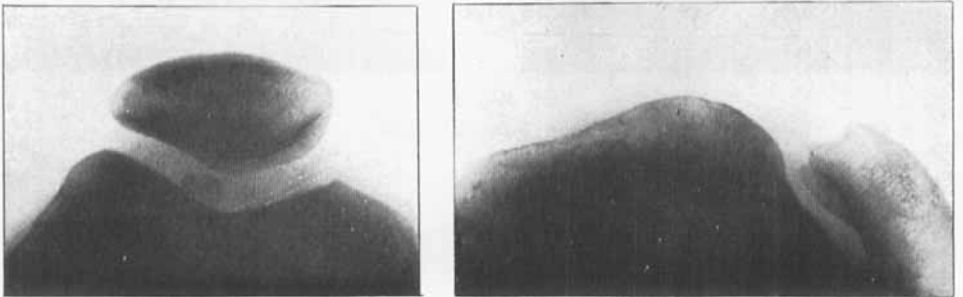
R.

Fig. 6.

L.

On the R. side the patella is dislocated on the convex surface of the patellar surface of the femur.

On the L. side the lateral condyle is level with the medial and they are separated by a shallow groove.



R.

Fig. 7.

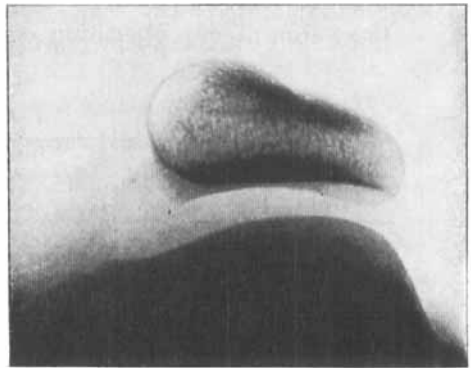
L.

On the L. side the patella is completely dislocated to the lateral side of the cylindrical end of the femur: a new joint has been formed between the patella and the lateral end of the femur.

On the R. side is a normal femoro-patellar joint.

In cases of dislocation of the patella one often finds that the shape of the joint differs from the normal. The joint surface of the patella is plane or concave, and therefore not divided into two facets with a sagittal crest. The

lateral condyle is poorly developed, so that it is either level with, or lower than, the medial condyle. The groove between the two condyles is poorly defined. In other words, the joint surface is nearly cylindrical. In addition, the lower end of the femur may be broader from side to side than normally. The femoral condyles have just this appearance during foetal life, and the joint surfaces of an adult gorilla have similar pro-



R.

Fig. 8.

L.

Another type of variation of the femoro-patellar joint. The lateral femoral condyle is very prominent, but the joint is not divided into 2 facets, but is nearly ball-shaped.

portions, so that it can be considered as an atavistic phenomenon. By analogy with the changes seen in congenital dysplasia of the hip-joint one can speak of dysplasia in the femoro-patellar joint.

If it is necessary to operate for dislocation of the patella the operation should be done early, before dislocation has occurred too often. If the condition is left untreated changes soon appear in the cartilage of the femoro-patellar joint, and the knee-joint is also soon damaged. More than 70 different operations have been described, which speaks for the failure to find an ideal treatment. Operations have been done on the bone, on the capsule and ligaments, on muscles and tendons, and the various operations have been combined.

Dislocation of the patella is a rather rare condition, so that it has not been possible to gain extensive experience of its treatment in any one clinic. The series published have consisted of at most 30-40 cases, more usually of about 10. The frequency of postoperative recurrence varies considerably, and the figures are hardly comparable. In one hospital the cases are predominantly traumatic ones, which have a good prognosis, and in another they are mostly congenital. It is therefore difficult to draw from the literature any conclusions on the value of one operation compared with another.

TABLE 1

Operation Method	No. of Knees Oper.	No. of Patients
Krogius	17	14
Krogius + transpos. of tibial tuberosity	19	16
Krogius + transpos. of tibial tuberosity, + plastic opn. on patella	1	—
Krogius + transpos. of tibial tuberosity, + excision of patella	2	2
Krogius + Goldthwait	2	2
Krogius + excision of patella,	1	1
Transpos. of tibial tuberosity, and plastic opn. on capsule	1	
Transpos. of tibial tuberosity	1	1
Krogius + transpos. of tibial tuberosity + supracondylar osteotomy of the femur	1	1
Krogius + supracondylar osteotomy of the femur	1	
Krogius + transp. of tibial tuberosity + reconstructive opn. on the skeleton	1	1

At the Orthopaedic Clinic in Stockholm Krogius' operation has been the most commonly used in the last 12 years, either alone or in combination with other methods. Krogius described his operation in 1904; as is known, it is a plastic operation on the muscle and capsule, which can be done without opening the joint. It is an excellent method, which both slackens the

tight tissue laterally and tightens the slack medial tissue. At the same time it secures an active muscle pull medially. 38 cases have been operated; 9 of them were bilateral; altogether 47 knees. The frequency of the different methods is shown in Table 1. There were 29 women and 9 men; this is the usual sex proportion. The ages ranged from 10 to 53 years, with an average of 24 years. In 7 cases areas of degenerated cartilage were excised at the same time. 3 cases had been previously operated by Gocht's method, in which the semitendinosus tendon is transposed to the patella, and one bilateral and one unilateral case had been treated previously according to Krogius.

There were no serious postoperative complications, and no infection.

The postoperative treatment was usually immobilisation on a splint or in plaster for three weeks, during which time active quadriceps contractions were begun. After this, physical treatment was given. The patient's stay in hospital was, on the average, 2 months.

32 patients presented themselves for follow-up examination. Of these, 9 had had bilateral operations, giving 41 operated knees. 13 had signs of dysplasia of the femoro-patellar joint; in most it was very marked, and in 2 it was combined with genu valgum. One case showed a simple genu valgum and another a persistent quadriceps paresis after poliomyelitis. 11 cases were posttraumatic. In 6 the cause was uncertain, but a valgus position of the extension apparatus could have been a contributory cause in some. The observation period was between 1 and 11 years with an average of 6 years.

Of the cases which could not be re-examined, 4 said that they were cured, 2 could not be traced: none of these has been included in the following account.

Recurrence occurred in 2 bilateral and 4 unilateral cases. If these are analysed one finds that one bilateral case had a marked genu valgum. This patient had been operated by Krogius' method alone. If at the same time the tibial tuber-

osity had been transposed there might have been a better chance of a good result. In one case, only a transposition of the tibial tuberosity was performed, which was quite inadequate, as the patient hardly had any valgus deformity; the Krogus technique should have been used at the same time. 3 cases had marked dysplasia. 2 cases illustrate the importance of a personal follow-up examination. One reported full recovery without recurrence. On examination it was found that his original habitual dislocation had changed into a permanent one and as such gave him no trouble. The other had now a slow habitual dislocation which was not noticed by the patient, in contrast with the original painful and sudden condition.

Amongst those who had had no recurrence, most had full functional result. All had full extension of the knee. It is worth noting that even the completion of the extension movement was perfect. This completion is effected by the vastus medialis and one could imagine that the muscle might well be weakened since it is used for the plastic operation. Flexion was remarkably good, even in those cases whose after-treatment had been prolonged and troublesome. In 2 cases it was slightly reduced. The least satisfactory function was seen in 2 cases with a valgus deformity of the extension apparatus, in whom transposition of the tibial tuberosity was not done, in 3 cases with marked dysplasia, and in one case in which the patella was excised at the same time as the plastic operation.

If the results are studied in relation to the duration of the condition it appears that dislocations beginning in early childhood had the most recurrences and the worst functional results. Most of them had marked dysplasia. On the whole, the result seemed to be better the sooner the operation was done. In this respect this material is unsatisfactory. Only 10 cases had a duration of less than 5 years. The permanent dislocations gave the worst results. Of 8 cases, 4 relapsed.

Osteoarthritis was found both clinically and radiographically in most cases, independent of the aetiology, often localised only to the femoropatellar joint.

For comparison I have also followed-up 14 cases of dislocation which had not had an operation, but who had come to the Clinic during the same period. One post-traumatic case which had dislocated 10 times has now fully recovered; the same is true of another case who had had two dislocations. The remainder had more or less marked signs of osteoarthritis, reduced range of movement, and muscular atrophy. 3 had permanent dislocations and these showed surprisingly good function of the knee.

The conclusions which can be drawn from these studies are the following. Recurrent dislocation of the patella, which is a severely disabling and painful condition ought to be operated as soon as possible. Permanent dislocations give surprisingly few symptoms, and since the result is not so good in these cases it is doubtful whether one should advise operation, especially in adults. Krogius' operation, combined in suitable cases with transposition of the tibial tuberosity, gives good results. Operation has no serious risks. The prognosis is favourable when the outline of the femoro-patellar joint is normal and operation is performed before there are too great changes in the cartilage. The risk of recurrence and impairment of function is greater the more marked is the dysplasia.

SUMMARY

A follow-up investigation of 32 cases of recurrent dislocation of the patella treated by operation and of 14 unoperated cases is reported. Most cases were treated by a plastic operation on the muscle and capsule by Krogius' method, either alone or combined with transposition of the tibial tuberosity. Operation gave good results, especially in cases where the surfaces of the femoro-patellar joint were normal. Dysplasia of the joint was demonstrated by axial radiography in 13 cases. In patients with genu valgum or a valgus arrangement of the extension mechanism it seemed to be important to do a combined operation, that is to say, transposition of

the extension mechanism to prevent a lateral pull on the patella. Permanent dislocations give fewer symptoms, so that it is doubtful whether they require operation, especially as these cases have the worst results.

RESUME

Nouveaux examens de 32 cas de dislocation récurrente dans la rotule, traités opératoirement et de 14 cas non opérés. Dans la plupart des cas il s'agissait d'une opération plastique du muscle et du tendon par la seule méthode de Krogius ou combinée à la transposition de la tubérosité tibiale. L'opération a donné de bons résultats spécialement dans les cas où les surfaces de l'articulation fémoro-patellaire étaient normales. Dans 13 cas, une radiographie axiale a révélé une dysplasie de l'articulation. Dans les cas de genu valgus ou de valgus du mécanisme d'extension, il semble qu'il soit important de pratiquer une opération combinée, à savoir une transposition du mécanisme d'extension, afin de prévenir une pression latérale sur la rotule. Les dislocations permanentes donnent peu de symptômes et il est douteux qu'il faille les opérer, d'autant plus que ce sont ces cas qui ont donné les plus mauvais résultats.

ZUSAMMENFASSUNG

Eine Nachuntersuchung von 32 operativ behandelten Fällen von rezidivierender Dislokation der Patella und von 14 nicht operierten Fällen. In den meisten Fällen handelte es sich um eine plastische Operation des Muskels und der Faszie mit der Krogius'schen Methode allein oder in Kombination mit einer Transposition der Tuberositas tibiae. Die Operation ergab gute Resultate, insbesondere in Fällen, wo die Oberflächen des Femoro-Patellargelenks normal waren. In 13 Fällen zeigte das Röntgenbild bei axialer Aufnahme eine Dysplasie des Gelenks. In Fällen von Genu valgum oder einer Valgus-Anordnung des Extensionsmechanismus scheint es von Be-

deutung zu sein, eine kombinierte Operation vorzunehmen, d. h. eine Transposition des Extensionsmechanismus, um einem lateralen Zug an der Patella vorzubeugen. Permanente Dislokationen machen weniger Symptome, so dass es zweifelhaft sein kann, ob sie einer Operation bedürfen, insbesondere da diese Fälle die schlechtesten Ergebnisse haben.

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