

LATE RESULTS OF KROGIUSPLASTY

By

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In recurrent patellar luxations the Krogius method has been employed as a routine operation at the Orthopaedic Clinic in Stockholm since the 30's. In 1947 Fellander carried out an investigation in which it proved to have satisfactory results. When at a later period other methods were recommended in the literature it was considered that there were good grounds for continuing with an investigation of those cases which were operated even during the last 10 year period. In these years 35 patients were operated on, 4 of these bilaterally. In the investigation I was able to reach 31 patients and amongst these were the 4 operated on bilaterally. The observation period varies between 10 and $\frac{1}{2}$ years, on average $5\frac{1}{2}$ years. The age of patients at operation varied between 6 and 41 years. The majority were, however, as usual in their twenties.

In all cases but one the Krogiusplasty was performed with a double-stalked flap—thus this is firmly attached at both ends. In 5 cases the plasty was combined with medial displacement of the tuberosity of the tibia. Postoperatively the patient was treated with knee plaster on average for $2\frac{1}{2}$ weeks. The period in hospital lasted on average 5 weeks.

At the follow-up examination in 1958 31 knee joints were found with good functional status and in 4 cases there was recurrence.

In the 31 cases free from recurrence there was complete mobility and good power in the quadriceps. 8 cases had moderate atrophy of the quadriceps with an area of 1 cm. (calculated 15 cm. above the patella). 8 cases revealed signs of chondromalacia, objectively with abundant crepitation and tenderness around the border of the patella, and with more or less pronounced subjective trouble.

A clear valgus position, i.e., more than 15° , was only established in 3 cases, 1 of which at the follow-up showed recurrence of luxation. In

these 3 cases the Krogiusplasty had been combined with medial displacement of the tibial tuberosity.

In the recurrence cases this first arose in a woman, aged 19 at operation, with habitual congenital patellar luxation and considerable valgus position of the knees. Krogiusplasty was performed combined with displacement of the tuberosity. The patient suffered recurrence very soon postoperatively. Now she has much discomfort, cannot cycle, dance, or take part in sport, etc. The axial X-ray of the femoro-patellar joint showed considerable dysplasia.

The second case was a woman, aged 20 at operation, who had had closely recurrent dislocations in the left knee since the age of 8½. She was operated on in 1939, 1940, 1942 with capsulorrhaphy.—

In 1948 the Krogius operation was performed at the Norrbackainstitutet with displacement of the tibial tuberosity 2 cm. medially. 7 years after the operation the patient had habitual medial dislocations of the patella, which give, however, moderate trouble and have not occasioned any further operative measure. The patient is said to have had polio when aged 1 and has had since then an obviously weaker quadriceps in the leg operated on. A complete smoothing out of the condyle part is to be found on the X-ray without any danger.

In the 3rd recurrence case patellar extirpation was performed owing to chondromalacia and habitual dislocations post-operatively.

During a traffic accident the patient happened to suffer a severe trauma at the age of 40 in 1948 and afterwards had habitual partial dislocations in the right knee. Krogiusplasty was carried out in 1948 without improvement of the condition. She was reoperated on in 1949 at NBI and recovered in 5 years. Afterwards habitual subluxations and increasing chondromalacia reoccurred and this brought about patellar extirpation in February, 1958.

In the 4th case of recurrence the patient, a woman aged 35 at operation, had habitual subluxations bilaterally and also complete dislocations. She had had trouble for 15 years. After operation the habitual subluxations remained on both sides but she is now fully free from the complete dislocations.

On radiological examination by axial pictures 29 dysplastic joints were found and 6 normal femoro-patellar joints. Amongst the 6 patients who had normal joints radiologically, 4 had been exposed to severe trauma which started the dislocations. These were football and gymnastic injuries.

Those who had the most advanced anatomic changes experienced

their dislocations in early childhood. With more moderate dysplastic changes the dislocations often began during the school years, often spontaneously, but sometimes initiated by a moderate trauma.

As far as the mobility of the knee is concerned, $8\frac{1}{2}$ weeks on average intervened before the patient again obtained a flexion of 90° . Those who most rapidly obtained full knee mobility again were the traumatic dislocations with normal femoro-patellar joints. These took 2 to 3 weeks.

It proved that those patients who at the follow-up showed signs of chondromalacia found it difficult in nearly all cases to regain knee mobility. In 8 cases of clinically established chondromalacia at the follow-up, 14 weeks were required on average to obtain 90° of mobility in the knee. This group does not consist of old patients, the average age at operation was 25 years. It appears possible that too great tightness of the capsule flap contributed to the development of chondromalacia. Moreover, the surgical report provides instances of this in a number of cases where the surgeon talks about considerable tightness. Among other technical operative details it may be pointed out that all but one were operated with a double-stalked flap. In order to avoid too great tightness it is necessary to proceed into the vastus medialis, which is freed and the muscle mass of which will lie across the quadriceps tendon when the plasty is complete. Here it ought also to be attached to the extension apparatus so that it should remain in place. When the plasty is finished one should be able to bend the knee to 80° - 90° without too much tightness.

In 1957 Gylling & Hellström made a post-investigation into 21 operated cases. The operation was performed according to Roux, with displacement of the tuberosity medially-distally, this being with a screw. The observation period averaged 5 years. Increasing crepitation was found after the operation arguing that the method often provoked degenerative changes in the cartilage. No recurrence of total dislocation arose but in $\frac{1}{3}$ of the cases the patella remained subluxated. In 14 cases the patients experienced discomfort from tenderness above the tuberosity post-operatively and in 4 cases so much trouble that it was doubtful whether any improvement had been achieved.

The Krogiusplasty has thus proved to be a good operative procedure and there are no grounds for abandoning it. The Krogius method involves probably less risk of chondromalacia post-operatively than, for example, the operation according to Roux.

Follow-up Examination Into Krogiusplasty 1958.

31 patients including 4 Bilat. Total 35 Kneejoints.

Observation period on average 5½ years.

3 recurrent.

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| X-ray | } | Dysplastic joints | 29 |
| Axial | | Normal joints | 6 |

90° knee mobility was achieved after 8½ weeks on average.

In 8 cases of chondromalacia 90° mobility after 14 weeks.

SUMMARY

A follow-up examination was made into 35 knee joints with recurrent patellar dislocation operated according to a method which Krogius described in 1904.

At the examination 31 knee joints were found with good functional status and in 4 cases recurrence had set in.

In those cases in which chondromalacia was established post-operatively it had taken a particularly long time to regain knee mobility.

To lessen the risk of post-operative chondromalacia the importance of not stretching the flap too much is emphasized. With the plasty completed one should be able to bend the knee almost 90°.

RESUME

Un examen complémentaire a été effectué dans 35 cas d'articulation du genou avec luxation de la rotule récidivante opérées d'après une méthode décrite par Krogius en 1904.

A l'examen, on a trouvé 31 genoux dont l'état fonctionnel était bon et 4 dans lesquels il y avait eu récidive.

Dans les cas où une chondromalacie post-opératoire avait été constatée, il s'est écoulé une très longue période avant que le genou ait repris sa mobilité.

Pour diminuer le risque de la chondromalacie post-opératoire, il est souligné qu'il ne faut pas tendre trop fort le lambeau. L'opération terminée, le genou doit pratiquement pouvoir être plié à un angle de 90°.

ZUSAMMENFASSUNG

Es wurde eine Nachuntersuchung von 35 Kniegelenken durchgeführt, die wegen recidivierender Patellarluxation gemäss einer von Krogius im Jahre 1904 beschriebenen Methode operiert worden waren.

Bei der Untersuchung fandt man 31 Kniegelenke in gutem funktionellen Zustand, während 4 einen Rückfall erlitten hatten.

Bei den Fällen, in denen man postoperativ eine Chondromalazie feststellte, nahm es besonders lange Zeit die Kniebeweglichkeit wiederzu erhalten.

Um die Gefahr der postoperativen Chondromalazia zu vermindern, betont man die Wichtigkeit die Kapselplastik niemals allzustark anzu spannen. Nach Abschluss der Plastik sollte man das Knie beinahe 90° beugen können.

REFERENCES

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