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SYNOVECTOMY OF THE KNEE

A Follow-up Examination

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Synovectomy of the knee joint was first reported by Volkmann in 1877. In the last few years the number of operations of this type has increased rapidly.

The indications for synovectomy of the knee joint are persistent pain and swelling, and it is done to prevent further destruction of ligaments and articular cartilage (Marmor 1966).

In rheumatoid joints all the known facts indicate a destructive factor from the synovial membrane, presumably an enzyme, is actively trying to break down the cartilage. This may explain the preventive effect of synovectomy (Moberg 1969, McEwen 1971).

In a number of reports it is claimed that the clinical effect of synovectomy is good both in children and adults (London 1955, Marmor 1966, Eyring et al. 1971, Walter & Vesterdal 1971). Together with the clinical improvement a thermographic and arthrographic investigation has shown reduced inflammatory activity (Goldie 1969, Taylor & Ansell 1972).

Other investigators claim that the effect of synovectomy ceases with the years. This has been proved by experiments with animals and evaluation of the radioactive isotope uptake in clinical trials (Dick et al. 1970, Taylor & Ansell 1972).

The task of our investigation has been to evaluate the effect of a synovectomy of the knee on the mobility of the joint, the swelling of the joint, and the patients' assessment of the result.

MATERIAL AND METHODS

Clinical Material

At the Orthopaedic Hospital in Arhus 57 synovectomies of the knee were performed on 51 patients between 1963 and 1968. Six had bilateral synovectomy. Two

patients died before the follow-up examination. 55 knee joints of 49 patients were evaluated at the follow-up examination. The youngest patient in the material was 11 years old and the oldest 68. In the five decades between the ages 11 and 60 the numbers of patients operated on were distributed so that there were between 9 and 12 in each decade; in the decade between 61 and 70 only three patients were operated upon.

The indications for operation were: prolonged swelling, pain and tenderness, and resistance to treatment by conservative and medicinal measures. Operation on the knee was avoided where there was severely limited range of movement, especially in cases with pronounced extension defects and with instability, and in patients with severe bone changes.

The diagnoses have been based on clinical examination as well as histological examination made in connection with the operation. Six patients showed synovitis villonodularis pigmentosa, 23 rheumatoid arthritis and 15 had a histological diagnosis synovitis chronica non specifica.

Technique of Operation

The operation was done with the aid of a tourniquet and usually a lateral and medial parapatellar incision as suggested by Marmor (1969) was used. In some cases and with increasing frequency an anterior transversal incision was used. All accessible synovial tissue was removed, which included removal of the suprapatellar pouch. From the posterior part of the joint as much of the synovial tissue as possible was removed. The postoperative treatment has been: guided knee flexion from the first day and weightbearing from about 2 weeks after the operation.

Assessment of Clinical Results

The following objective criteria were used:

Range of passive movement: classification:
grade 1: no lack of extension, and flexion $> 90°$
grade 2: no lack of extension, and flexion $< 90°$
grade 3: extension defect, and flexion $> 90°$
grade 4: extension defect, and flexion $< 90°$

X-ray changes were classified as follows:

grade 1: no abnormalities
grade 2: narrow joint space and/or slight bone changes near to the joint surfaces.
grade 3: pronounced bone changes with destruction and/or severe arthrosis.
All the knee X-rays were taken with the patient in the prone position.

At the follow-up examination the patients' evaluation was graded as follows:

excellent: no subjective symptoms at all
good: knees with marked improvement compared with condition before operation
fair: knee joints, which have shown slight or no improvement but the condition was not worse than before operation.
poor: knee joints, which are worse than before operation.

RESULTS

The patients were all followed-up as a routine in the out-patients' clinic at intervals of months to years after the operation. A special examination was made for the follow-up of this work. This special follow-up examination took place on the average 4.2 years after the synovectomy (minimum 3 years—maximum 8 years).

One of the most interesting features to record when trying to prove the value of knee synovectomy is the development of bone changes estimated by X-ray examination. We used the classification given under clinical assessment. The result is shown in Table 1.

Unfortunately, 7 knee-joints were not examined radiologically due to technical misunderstanding.

The passive range of movement is shown in Table 2.

As stated earlier all the knee-joints were swollen before the operation. At the follow-up examination 34 patients presented with the same measurement on the operated knee as on the non-affected knee.

At the follow-up examination the patients' own opinion of the operated knee has been recorded (Table 3).

Table 1. X-ray changes evaluated before and after synovectomy.

Classification	1	2	3	–X-ray
Before operation	26	26	3	0
At follow-up	19	18	11	7

Table 2. The changes in passive knee movement in relation to synovectomy.

Classification	1	2	3	4
Before operation	33	7	14	1
At follow-up	45	1	9	0

Table 3. The patients' own opinion of the result of the synovectomy at the follow-up examination.

Excellent	15
Good	27
Fair	11
Poor	2

DISCUSSION

As regards the radiological changes we found that the greater proportion of the knees evaluated as normal before operation, remained in that group after the synovectomy.

In evaluation of the effect of the procedure on the joint movement, we found improvement in only one quarter of the material. On the other hand no cases showed deterioration.

All patients operated on had swelling of the joint; at the re-examination there was swelling only in one third of the patients.

Finally we tried to evaluate the patients' own assessment of the value of the operation. Three quarters of the patients claimed marked improvement compared with their remembrance of the condition before the knee operation.

SUMMARY

Synovectomy in a chronically swollen knee joint is a useful procedure with regard to subjective results. The procedure may preserve and sometimes restore the movement, diminish swelling and arrest development of bone changes.

REFERENCES

Dick, W., Shenkin, A., Freeman, G., Nuki, K., Whaley, P. & Buchanan, W. W. (1970) Effect of synovectomy on the clearance of radioactive xenon. *J. Bone Jt Surg.* **52**-B, 70–76.

Eyring, E. J., Longert, A. & Bass, J. C. (1971) Synovectomy in juvenile rheumatoid arthritis. *J. Bone Jt Surg.* **53**-A, 638–651.

Goldie, I. (1969) Thermographic evaluation of results of synovectomy in rheumatoid knee-joints. *Acta orthop. scand.* **40**, 382–391.

London, P. S. (1955) Synovectomy of the knee in rheumatoid arthritis. *J. Bone Jt Surg.* **37**-B, 392–398.

Marmor, L. (1966) Synovectomy of the rheumatoid knee. *Clin. Orthop.* **44**, 151–162.

McEwen, C. (1971) Synovectomy and the rehabilitation of the patient with rheumatoid arthritis. *J. Bone Jt Surg.* Editorial, **53**-A, 621–623.

Moberg, E. (1969) Why synovectomy in rheumatoid arthritis. *Acta orthop. scand.* **40**, 683–684.

Taylor, A. R. & Ansell, B. M. (1972) Arthrography of the knee before and after synovectomy. *J. Bone Jt Surg.* **54**-B, 110–115.

Walter, S. & Vesterdal, J. (1971) Synovectomy in the knee joint of children. *Nord. Med.* **85**, 800–803.

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