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THE TOTAL SYNOVECTOMY OF THE KNEE-JOINT

Although total synovectomy has been resorted to for now about 60 years in a very large number of cases with many different pathological conditions in the knee-joint, the indications for the carrying out of the operation seem still to be uncertain. Since, as far as I know, no cases of total synovectomy in the knee-joint have been published from the Scandinavian countries, I may be justified in publishing the 10 cases which were placed at my disposal by my actual chief *W. Möller*, M.D. and by my previous chief *R. Hanson*, M.D. I beg herewith to express my thanks to both of them.

Most cases, in which a total synovectomy can be resorted to, consist of the so-called "non-specific knee-joint arthritis". The cause of these changes is often unclear, and the difficulty in finding out the etiology increases owing to the fact that pathological conditions with quite different genesis can occur under the same clinical aspect. Some of these "non-specific arthritis" are of certain infectious origin, other may arise after occasional or repeated traumata of the joints, other again are caused by unfavourable static conditions. To this may be added other conditions, the genesis of which is unclear, such as, for instance, the arthritis which not seldom occurs in psoriasis. Moreover, it must be pointed out that a process starting as specific can during its subsequent development alter its character entirely. For example, it is not uncommon that a knee-joint tuberculosis can heal with a final stage which clinically and pathologically-anatomically can appear to be a non-specific in-

flammation. While the clinical aspect, in processes with different genesis, thus can appear to be similar, quite different symptom aspects, in which the same etiology will be assumed with certainty, can, on the other hand, in some cases, be obtained. This might in some way depend upon which parts of the knee-joint are mostly engaged in the pathological process. However, the synovial membrane is in the majority of cases engaged, no matter which part of the knee-joint receives the primary injury. Clinically, this reaction manifests itself from the synovial membrane in a more or less important hydrops, moreover, often in a palpable thickening of the capsule, an increase of the temperature of the skin over the knee-joint, etc. To this, may be added possible symptoms from other parts of the knee-joint, which have been primarily injured or secondarily affected (degeneration of the menisci, chondromalacia patellae), the consequence being that symptomatology will greatly vary from case to case, and that it will hardly be possible to judge by the final stage which part has been primarily injured by trauma or infection, excepted in such cases where, for instance, trauma has left visible traces such as intra-articular fractures or luxations of the menisci. It is neither possible in the beginning to ascertain which final result will be obtained in any of the cases concerned.

Attempts to classify these knee-joint affections have not been lacking. One of the best is, according to my opinion, the attempt made by *Mandl*. He divides the alterations of the knee-joint into 3 groups. The first group contains such cases where the alterations are primarily localized at the synovial membrane. In these cases the cartilages of the joint are said to be mostly intact, which however is discussable. The second group comprises the cases in which injury primarily occurred at the interior of the joint, and in which subsequently symptoms from practically the whole joint are obtained. The third group includes finally such cases where primary troubles can be ascribed to the whole joint, but where the pathological changes are chiefly localized in the cartilages and in the bones. There are naturally no sharp delimitations between these groups, and especially

the delimitation between the second and the third group will no doubt be difficult to define practically.

Of course, only the first group will be here dealt with regarding the indications as to total synovectomy. The pathological conditions, in which a primary injury of the synovial membrane can be assumed, may depend partly upon an inflammation, partly upon the seldom occurring benign and malignant tumours of synovialis, and finally upon an osteochondromatosis synovialis ("ossifying synovitis"). In all these cases, there is as chief symptom a hydrops, which can be intermittent, and a clinically ascertainable thickening of the capsule. To these symptoms is often added tenderness on palpation over the joint. Now and then, there is a locking symptom from hyperplastic villi. Out of the purely inflammatory types, two forms will be noted: a hyperplastic and an atrophic form. In both these forms a *villous hypertrophy* can take place. Blowing of air into the knee-joint followed by roentgen-photographing can reveal a villous hypertrophy (lipoma arborescens) (*Junghagen, Bircher and Oberholzer*). It will be remembered that also specific arthritis such as tuberculous arthritis can give rise to lipoma arborescens, thus presenting the same roentgen-picture as such a one on a non-specific basis.

From a differential-diagnostic point of view, it is important to make a distinction between these "non-specific arthritis" of various kinds and synovial tuberculosis. Puncture of the joint, and culture and guinea-pig tests of the punctate must first of all be resorted to in these doubtful cases, when no changes of the skeleton can be found. Test-arthrotomy with test-excisions out of the capsule, when tuberculosis is suspected, must not be made, as in the case of tuberculosis prevailing, fistulas in the operation scar may often occur.

As pointed out at the beginning, the indications of total synovectomy in a pathological condition of the knee-joint are far from being clearly defined. There is nothing peculiar in this, as the etiology of the changes in which a total synovectomy can be resorted to is by no means completely known. The indications are then almost entirely based upon symptomatology, a

circumstance which will be found with most authors having treated this subject before. As a rule, it is emphatically pointed out that no indications of total synovectomy whatever, determined dogmatically, must be advanced, but that each case will have to be taken under careful consideration and formulated as a problem for itself. (*Swett, Speed, Jones, Bernstein*). A general rule is that synovectomy must not be made, unless conservative therapy has been tried without result. Of course, there are cases in which the diagnosis can be ascertained both clinically and roentgenologically, for instance, in villous hyperplasia (lipoma arborescens), or osteochondromatosis, and where it can be said a priori that conservative therapy is of no value. In such cases, unanimous opinion also prevails regarding the value of total synovectomy. (*Läwen, Speed, Sweet, Mandl, Payr, etc.*). The same as regards the uncommon tumours of the synovial membrane.

It is more difficult to form an opinion with regard to the "non-specific knee-joint arthritis". In the year 1920 or about, American surgeons began to perform synovectomies in chronic infectious arthritis (*Jones, Speed, Swett*). However, in these cases, conservative therapy will have to be attempted first. The time for a synovectomy varies naturally from case to case, depending upon the patient's age and profession, the development stage of the process, and the troubles caused to the patient by the illness. The question of synovectomy in arthritis deformans has been taken up by many authors. A few do not quite dismiss the idea (*Speed, Swett, etc.*). Others declare to have obtained good results, particularly in cases with strong hypertrophy of the synovial membrane, while slight cartilage or bone alterations have been found. (*Wehner*). It is maintained that after a synovectomy in arthritis deformans, movement pains, so acute before, disappear even in cases with fully developed osteophytes (*Jones, Läwen*). In other chronic affections of the knee-joint, especially in primary chronic polyarthritis, or in the final stages of an acute polyarthritis, opinion differ regarding the use of synovectomy. Especially in these cases, conservative therapy must be resorted to, possibly with punctures, fenestrating of the capsule (*Läwen*), etc.

The question of synovectomy in the synovial tuberculosis has been taken up by several authors, and, as a rule, in well selected cases, an operation is considered as indicated. (*Swett, Löwen, Erb*, etc.). In the present material there is an indubious case of synovial tuberculosis (case 3). The researches made during the last years about the spreading and localization of tuberculosis, chiefly by *Koizumi* and *Randerath*, have shown that in 100 per cent of miliary tuberculosis there are miliary nests in the bone-system, especially in the myeloic bone medulla. In 75—81 per cent of chronic organ-tuberculosis similar changes have been found. Possibilities that a tuberculous manifestation in the adjoining skeleton parts will be found simultaneously with tuberculous changes in the synovial membrane are thus in chronic organ-tuberculosis very great, and in miliary tuberculosis one can safely speak of a 100 % occurrence. Therefore, in synovial tuberculosis, healing probabilities of the process by means of a synovectomy do not appear to be very great. That good results, in spite of that, can be obtained will be shown by case No. 3 mentioned hereafter. An enquiry made recently (7 years after the operation) about the patient's condition shows that the knee status of the patient is about the same as at the previous examination made 2½ years after operation. However, it must be remembered that tuberculosis can remain latent many years, even decennaries, to get exacerbated afterwards and give clinical and roentgenologically ascertainable manifestations. In the cases of synovectomy in the synovial tuberculosis published by other authors, the time of observation has been too short to enable one to form a definite judgment about the value of the operation. Synovectomy in the so-called arthritis caused by tabes or syringomyelia does not seem to be much indicated. Therapy is in these cases exclusively directed to a partial symptom in a disease process.

The method of operation in synovectomy has been extensively treated by several authors (*Jones, Payr, Speed, Swett*, etc.). As a rule, a medial incision is made, either like a Payr's incision or a parapatellar incision (*Speed*). The latter can suitably be prolonged upwards along the medial edge of m. rectus femoris.

By means of this incision a very good survey of the joint will be obtained, and from this incision the whole synovial membrane can be removed in one piece. Some authors, besides the medial incision, also use a lateral parapatellar incision. Moreover, there are incisions with parting of the patella lengthwise (*Bernstein, Jones*), or diagonally, and superior or inferior curved incisions. However, a parapatellar incision or Payr's incision are no doubt most sparing for the joint. At least from a medial incision such good survey and access to the joint will in most cases be obtained that total synovectomy can be performed, even with the extirpation of the back capsular parts.

As regards after-treatment, the most important will be to start an active movement treatment soon after the operation. It is said, as a rule, that the time comprised between the operation and the beginning of the movement treatment is 3 to 10 days.

The results of total synovectomy in the cases concerned are considered to be generally good. Many authors hold forth that pains of motion, in the cases where such occurred, disappeared entirely after the synovectomy. Motility in the knee-joint is maintained or in most cases increased.

Case reports.

The present material comprises ten synovectomies effected on nine patients, thus, in one case a double-sided synovectomy (case 4 and 5). Out of these, 5 patients have been operated by Dr. W. Möller, 3 by Dr. R. Hanson, and one by the author. In order to obtain a better survey, we give hereafter a synopsis of the cases concerned. Cases 1, 2 and 3 have been published before by *Junghagen* specially regarding roentgen-findings.

Case	Sex	Age	Localization	Diagnosis
1	m.	64 yrs	r. knee	Lipoma arborescens
2	m.	46 "	"	"
3	f.	22 "	l. knee	Tuberculosis
4	m.	19 "	"	Papillomatous hyperplastic synovitis (psoriasis)
5	m.	19 "	r. knee	
				" (same patient)

Case	Sex	Age	Localization	Diagnosis
6	m.	38	„ l. knee	Villous hyperplasia
7	m.	48	„ „	Subchronic arthritis
8	m.	37	„ r. knee	Chronic synovitis
9	f.	19	„ „	„
10	m.	60	„ l. knee	Osteochondromatosis

Case 1. Man. 64 years. Sometime in 1890 or about, the patient got a suffusion in the right knee. The knee was punctured, whereupon the patient remained free from symptoms until 1917, when the knee began to swell again, and since then it has always been swollen. After thermal treatment in 1923, temporary improvement. Roentgen-picture was at that time negative. In May—July was attended at the medical department for exudative pleurisy. In the summer 1930, increased swelling and pains. Pains when beginning to move. No locking symptoms. Has got thinner lately. Admitted into the surgical department at Centrallasarettet in Umeå the 13/8 1930. (Journal No. K. 1487/30). General condition good. S.R. 22 mm. *Right knee:* Considerably swollen, mostly over bursa suprapatellaris, with distinct patellar fluctuation. Tenderness on palpation over the anterior part of the medial space of the joint. Almost normal extension and flexion. No atrophy of the musculature. *Roentgen the 14/8 1930 (Junghagen):* "The space of the joint in the right knee-joint appears somewhat constricted. The tibial condyles somewhat flattened with sharp corner outlines, like the back outline of the patella. Laterally, in the space of the joint, there is a plateau-like exostosis situated at the back in the joint.—Arthritis deformans".—Repeated punctures in the knee-joint. A microscopic examination of the punctate showed but few leucocytes, no bacteria. *Roentgen the 3/9 1930* (after insufflation of air into the joint): "No dilatation of the joint-capsule itself. On the other hand, bursa suprapatellaris is very large and trabeculated (Hygroma?). No loose bodies visible in the joint. The lateral meniscus is clearly apparent, also lig. cruciata. The cartilages of the joint seem likewise to be intact". (*Junghagen.*) The patient had his knee treated with roentgen for 10 days, whereupon he was discharged the 15/10 1930 on the whole unimproved. Was re-admitted the 17/11 1930. (Journal No. K. 2089/1930). Unchanged status. *Roentgen the 18/11 1930* showed unchanged picture. 20/11 1930 *Operation.* (W. Möller): *Arthrotomy + exstirpatio totalis membran. synovialis.* Payr's incision on medial side. Moderate quantity of consistent fluid in the joint. The superior recess is considerably distended, and its inside strewn with red pea-sized formations of fairly soft consistence. At the inferior part of the femur there is a membrane of similar appearance. No damage of the cartilages of the joint or of the menisci can be detected. The whole of the altered membrana synovialis is exstirpated, which is

easily performed from the incision made. The swollen membrane at the inferior extremity of the femur is removed. Exact suture of both soft tissue and skin.—*Pathological-anatomical diagnosis*: "Lipoma arborescens. The papilla-shaped excrescences shows outermost a thin endothelial layer covering a loose connective tissue with fat cells and heaps of round cells, nearest of the plasma-cell type although the nucleus is deprived of the characteristic chromatin grouping". (*Lundqvist*). Post-operative progress during the 9 first days after the operation free from complications with afebrile temperature during the last week. Afterwards rise of temperature and condition rapidly getting worse. *Exitus the 17/12 1930* (27 days after operation). *Post-mortem examination*: From the field of operation nothing abnormal. In the soft tissue above the femoral condyles, small quantity of substance soaked with blood. The cotyla is free, without signs of inflammatory irritation. *In both lungs and in the milt ancient and more recent tuberculous changes.*

In this case, the histologic research showed no specific alterations, but at the post-mortem examination, extended tuberculous changes were found in the lungs and in the milt. Moreover, the patient had had an exudative pleurisy. Of course, it is not possible to prove for certain the existence of a connection between the patient's tuberculous infection and his knee-joint troubles. On the other hand, it is not preposterous to suppose that such a connection existed. Two possibilities may be assumed. It might have been a "primary" synovial tuberculosis, healed with remaining non-specific changes, or there can also have been miliary changes in the tibia and in the femur-epimetaphysis. The synovial alterations can be assumed to be a "sympathetic" reaction under the influence of toxin from numerous miliary juxta-articular nests.

Case 2. Man, 46 years. Since about 1920, increasing stiffness in the back and pains in the joints of the lower extremities, and also slight pains in the right arm. No swelling in these joints. Since 1925, treated many times in the medical department for *spondylarthritis anchylopoetica* + *polyarthritis deformans*. The whole spinal column acnhylotic. Roentgen shows the typical image of a spondylarthritis anchylopoetica. *Since 1926, the patient has had an intumescence above the right knee.* Repeated punctures. A microscopic examination of the punctate showed an abundant quantity of lymphocytes, isolated leucocytes and plenty of diplococcus. The patient is said to have been treated for lues in 1921 in U.S.A. Later on, repeated W.R. in blood, knee punctate and lumbal fluid have been

negative. Has inter alia undergone a roentgen-treatment in the right knee. *Admitted into the surgical department at Centrallasarettet in Umeå the 5/2 1931.* (Journal No. K. 210/31). General condition normal. S.R. 26 mm. From internal organs nothing noteworthy. *Right knee-joint:* Considerably swollen, especially above patella. The swelling extends about 13 cm. above the knee-joint. Visible patellar fluctuation. From full extension flexion to 120 degrees possible. *6/2 1931 Operation.* (W. Möller): *Exstirpatio totalis membran. synovialis.* Large Payr's incision on medial side. On opening the knee abundant flow of clear, consistent fluid from bursa suprapatellaris. The latter stretches high up on the thigh, especially on the lateral side. In that part of the knee-joint the inside is even, without polypous formations. On the other hand, the knee-joint under bursa suprapatellaris is filled with polypous, stalked, red formations of about the size of a pea occupying the whole inside of the capsule and filling up the joint. Such formations are also found on the inferior extremity of the femur close to the cartilage of the joint and round patella, which is surrounded by a ring of polypous formations. The whole membrana synovialis with bursa suprapatellaris is extirpated, which goes fairly easily from the incision, after folding up the patella laterally. Also the polypous formations on the lower part of the quadriceps-tendon and round patella are removed, and some of them also on plicae alares. On the edge of the medial femoral condyle, two small deforming changes are also removed. On the femoral condyle and on the joint-surface of patella, decay of the cartilage, like in the deforming arthritis. Sutures. Compress-bandage.—*Pathological-anatomical diagnosis:* "Lipoma arborescens. The excrescences protruding in lumen are covered with an endothelial layer, at some places consisting of several layers. The essential substance comprises fat tissue with a large number of dilated, sometimes cystic vessels and isolated marginal leucocytes. Cells, at some places, are richly represented in this tissue. Apart from inflammatory cells, such as round and plasma-cells and isolated leucocytes, there is a great number of round cells with large and light protoplasm, sometimes with two or several nuclei. These cells derive most certainly from the endothelium and have no connection whatever with tuberculosis". (Lundqvist).—Progress free from complications. Healed p.p. Was discharged the 5/3 (one month after operation). Walked fairly well without support. The soft tissue round the right knee somewhat swollen, but no exudation in the joint. From full extension flexion to 90 degrees possible. 19/3 1931: Finds that motility has improved considerably. No pains in the knee, the soft tissue of which is somewhat thickened, especially where bursa suprapatellaris was extirpated. Slight crepitations when moving the knee. Patella free. 29/1 1932: No pains in the right knee. Can go well. The patient is very pleased with the result. Right knee somewhat swollen with patellar fluctuation. Stretches fully, bends to right angle. Upon

written enquiry in November 1934 (3¾ years after operation) the patient states that the operated knee feels perfectly well. No pain when moving, no swelling. As regards motility, he says: "I can almost sit on my hocks".

This is the case of a man 46 years old, who besides his knee-joint affection has an anchylosing spondylitis, troubles in the joints of the lower extremities and in the right arm. He is said to have been treated in U.S.A. for the lues. However, there are no holds tending to support a luetic infection. It is here probably the question of a deforming arthritis, may be, on a chronic infectious basis.

Case 3. Woman. 22 years. (Fig. 1.) No tuberculosis heredity. "Sprained" her left knee in 1925. Since then the knee has been more or less swollen. Now and then pains in the knee. 7 years before her admission into the hospital, the patient had a pleuresy on the right side. Admitted into the surgical department at Centrallasarettet in Umeå the 2/4 1932. Status: A little thin, but general condition normal. S.R. 23 mm. From internal organs nothing pathological. Left knee: considerably tumefied. Volume 6 cm. larger than on right side. Left thigh 4 cm. narrower than right one. Knee-joint and bursa suprapatellaris seat of an extended loosely fluctuating suffusion with patellar fluctuation. Medially over the space of the joint slight tenderness, and here a granulated, soft and somewhat tender filling can be felt together with crepitation over the medial part of the joint when moving. Full stretching and almost full flexion, but slight pain on passive forcing of outer positions. No abnormal lateral motion. On puncturing the knee-joint 140 c.c. of a consistent, yellow-brown at the beginning clear fluid was taken out. Microscopic examination showed leuco- and lymphocytes. No bacteria. Guinea-pig test positive for tuberculosis. Roentgenogram 4/4 1932. Left knee: Very slight deforming arthritic changes with flattening of the epicondyles and sharpening of their corners. No atrophy of the skeleton, but visible increase of the density of the soft tissue shadow. After tapping out the exudate, air is injected into the knee-joint until the capsule is strongly expanded. Bursa suprapatellaris is found here to be considerably extended, and trabeculated lengthwise and diagonally. In the inferior part of bursa there are fairly well defined projecting vegetations located in the capsular wall. No expansion of the capsule on a level with the joint space. Below the patella a few small, dense shadows are also found which may be of the same nature as the ones described above". (Jung-hagen).—9/4 1932. Operation. (W. Möller): Synovectomy totalis. Payr's incision on medial side. In the joint, air and some turbid fluid. The

upper recess is considerably distended and inside a few very powerful folds can be seen. In the inferior part of the joint there are numerous breloque-shaped excrescences inside the capsule of the joint like an ornamental lipoma arborescens; the excrescences are partly located at the insertion of the joint capsule at the cartilage of the joint. Besides, the inside of the capsule is strongly reddened. Membrana synovialis is extirpated entirely which is easily performed from the incision. The cartilage of the joint is of quite normal appearance. Careful suture of



Fig. 1.
Case 3.

the soft tissue. *Pathological-anatomical diagnosis*: "The preparation consists, to a small extent, of fat tissue and chiefly of synovial tissue with marked chronic inflammatory changes in the shape of rich plasma-cell infiltration. Moreover, synovialis shows abundant typical epithelioid cell-tubercles and Langhans's giant cells. There is here evidently a tuberculous gonitis". (*Lundqvist*).—Uncomplicated progress. Healed p.p. 2 weeks after the operation, movement and diathermic treatment begins. *Patient discharged from the hospital the 14/5 1932.* (42 days after operation). She was at that time free from pains in the knee-joint. From full extension active and passive flexion to right angle. No abnormal lateral motion. Knee diffusely swollen, feels fairly compact comprising about equally all periarticular tissues with the exception of the skin, which is normal and displaceable. The patient can walk well without noticeable limping.—1934 (2½ years after operation) a written enquiry was made regarding the patient's condition. She answered that her knee was not very well. Sometimes pains. She states that she is able to bend the operated knee as much as the healthy one. When moving quickly pains

in the knee. Attends to housework all way without difficulty. The knee is always a little swollen. In April 1939, the patient stated that she has been able to do housework for 2 years. Motility of the operated knee equal to that of the healthy one. Can walk "almost any distance". Sometimes swelling over the operated knee, which feels weaker than the healthy one. The patient says that motility increased after the operation.

In this case of a 22 year old woman, who has had troubles in her left knee for seven years, the tuberculous etiology of the patient's knee-joint affection is quite clear.

Case 4 (Fig. 2, 3 and 4) and *case 5* (Fig. 5.) *Man 19 years.* Since the age of 10—11, psoriasis (a sister of the patient also suffers of psoriasis). About $\frac{1}{2}$ year before the patient's psoriasis started both knee-joints began to swell. Swelling increased on the whole and during the years immediately before the operation it had kept constant. However, he has been working the whole time. *Admitted into the surgical department at Centralassarettet in Umeå the 3/1 1934* (Journal No. K. 16/34). *Status:* General condition good. S.R. 17 mm. W.R. negative. From internal organs nothing noteworthy. Psoriasis efflorescences abundant all over the trunk

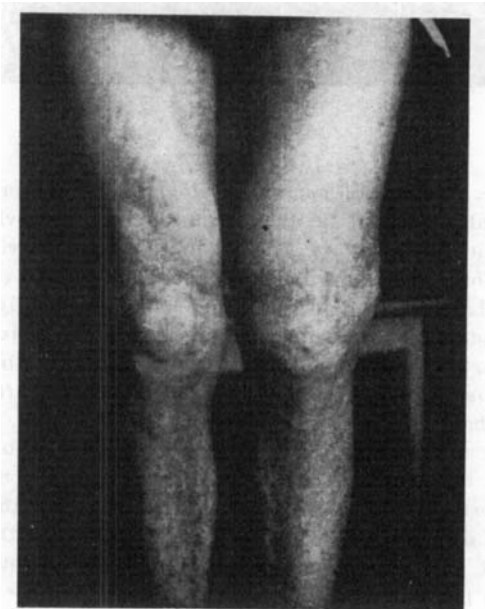


Fig. 2.
Case 4. (Before operation).

and on the extremities. The *right knee-joint* shows a considerably expanded capsule, especially of bursa suprapatellaris. *Moderate dislocation*. No restriction of the motility. No crepitations.—*Left knee-joint* shows also considerable swelling and suffusion, especially over bursa suprapatellaris, which is distended to double the size of a fist, considerably more than on right side. Also here, moderate dislocation. No restriction of the motility nor crepitations. *Right elbow-joint* shows moderately expanded joint-capsule. 15 degrees stretching defect. *Röntgenogram*: The



Fig. 3.
Fig. 3. (After Operation).

knee-joints show no roentgenological changes. After insufflating air into the left knee-joint a considerable dilation of bursa suprapatellaris is noticed; also filling up of bursa in fossa poplitea. No vegetations visible on the walls of bursa". (*Junghagen*).—*Left knee-joint* was punctated, giving out 325 c.c. fluid. In the punctate isolated leucocytes, mostly polynuclear. No bacteria. *Operation* (W. Möller) 17/1 1934: *Synovectomy totalis sinister*. Large Payr's incision on medial side up the thigh. The joint is opened, an abundant, consistent and somewhat turbid fluid and fairly large fibrin corpuscles coming out. Bursa suprapatellaris is considerably expanded, and reaches up under the muscles to $\frac{1}{3}$ of the height of the thigh. Its inside is intensely reddened in the inferior part of the joint close to the insertion of the capsule, at the femoral condyles and at the patella, the capsule shows a large number of considerably reddened, very widely fastened polypous formations up to the size of a pea. The whole synovialis is extirpated without great difficulties. Afterwards, careful blood-staying and sutures. *Pathological-anatomical diagnosis*:

Papillomatous hyperplastic synovitis with important chronic inflammatory changes in the form of round cell and plasma-cell infiltration. No sign of tuberculosis nor other specific process". (*Lundqvist*). Movement and diathermic treatment after 3 weeks. Healed p.p. After the operation an exudation arose in the joint which had to be punctated many times. *Discharged the 24/2 1934* (7 weeks after operation). From full extension the knee could then be inflected to 90 degrees. No abnormal lateral motion. *The suffusion in the right knee-joint had disappeared. Readmitted*



Fig. 4.
Case 4.

the 8/2 1935 into the surgical department at Centrallasarettet in Umeå (Journal No. K. 287/35). After the discharge, the left knee remained swollen and stiff for about 3 months, but improved afterwards so that the patient has been able to attend to light work outside. However, a few months ago the knee got worse again. The left knee has been more swollen, especially after great efforts. *The right knee* has been all the time as swollen as before. *Status:* Extensive psoriasis changes like before. S.R. 28 mm. Nothing remarkable from internal organs. *Right knee-joint:* Considerable swelling, especially of bursa suprapatellaris which is expanded to over the size of a fist. Visible patellar fluctuation. Capsule thickened. Normal motility with *slight abnormal lateral motion*. Unimportant crepitations, no tenderness on palpation. *Left knee-joint:* Operation scar soft. Here also, evident exudation, chiefly in bursa suprapatellaris, but less than in the right knee. Visible patellar fluctuation. Unimportant crepitations. From full extension flexion to a little over than 90 degrees. No tenderness on palpation. Slight abnormal lateral motion. Puncture of both knee-joints on many occasions, right knee giving

out between 700—175 c.c. and left one between 100 and 150 c.c. 26/3 1935 operation (W. Möller): *Synovectomy totalis dx.* Large medial Payr's incision. In the joint consistent fluid and a few large fibrin corpuscles. Inside of synovial membrane considerably reddened, in the superior recess fairly even. In the inferior part around the lower extremity of the femur, the patella and the extremity of the upper tibia, the synovial membrane is, on the other hand, abundantly supplied with red, polypous formations of various sizes. The synovial membrane entirely thickened



Fig. 5.
Case 5.

in the wall. The upper recess is first taken away, which is easily done from the incision made, and loosening of the synovial membrane from the border of the femoral cartilage continues from the patella all round and from the tibia at the attachment of the menisci. This is also successfully performed without great difficulty, the whole synovial membrane being extirpated all at once. Plica synovialis patellae is also thickened and intensely reddened. It is extirpated. The covering of the synovial membrane on lig. cruciata also reddened. On the other hand, the menisci and the cartilage on the femoral condyles and patella are unchanged. Careful blood-staying executed at the margins of the cartilage with diathermy. Suture of the soft tissue.—*Pathological-anatomical diagnosis*: "Arthritis chron.; hyperplastic papillomatous synovitis with strong chronic inflammatory changes in the form of round cell and abundant plasma-cell infiltration. It has not been possible to discover any signs of tuberculosis or any other specific process. The aspect does not allow any conclusion as to pathogenetic connection between synovitis and psoriasis". (Lundqvist). Post-operative progress without observation. Healed p.p. 3

days after the operation, the patient is allowed to begin with active motion. One week after the operation, slight exudation. 11/4 1935 (15 days after the operation) the patient can inflect the right knee from full extension to 40 degrees. Physical treatment in the ordinary way. About a fortnight after operation, the patient got a psoriasis eruption almost all over the body. *Discharged the 20/7 1935* (53 days after operation). The patient was then able to bend the right knee from full extension to 110 degrees. Knee no longer swollen.

The above case is about a man 19 years old who since the age of 10—11 has been affected with psoriasis, and $\frac{1}{2}$ year earlier had troubles in both knee-joints in the form of increasing suffusion. Such joint symptoms are not uncommon in psoriasis (1—5 %), and can affect any joints, however, mostly the knee-joints. In the case mentioned here, there were also symptoms from the right elbow-joint. Although a connection between psoriasis and changes in the joints is generally admitted, it has not been possible to find any objective proofs that such may be the case. In all cases published up till now, the changes observed in the joints have been of non-specific, chronic nature. Several authors have, however, in these cases considered a specific infection as probable. (*Nobl.* and others, cit. after *Nordin*). The thought that psoriasis with subsequent arthritis should depend upon an inside secretory dysfunction has also been expressed, no proofs of its correctness having, however, been given.

Asked by writing about his condition, the patient states in April 1939 as follows: Has been fully engaged with work since 1936. Had no pains in the knee-joints. Can bend both knee-joints to right angle and possesses full stretching faculty. He considers that his condition has much improved after the operations.

Case 6. Man. 38 years. (Fig. 6.) The patient was "delicate" as a child. Does not know whether he has had joint-rheumatism before. At the age of 16, pains and swelling in both knee-joints. Owing to this, has not been quite able to work since then. He finds that the knee-joints feel unsafe and lack bearing, which makes that he has to go carefully. Often very great pains in the knee-joints when walking. At about 33 years of age, pains and swelling in the right hand and shoulder joints. *Admitted into the surgical department at Centrallasarettet in Umeå the 1/8 1935. (Journal No. K. 1733/35).* (The patient had been treated before

in the rheumatic department at Centrallasarettet in Umeå 12/7—1/8 1935). *Status*: General condition undisturbed. From inside organs nothing remarkable. S.R. 3 mm. *Both knee-joints* considerably tumefied and a little painful, especially the left one, where the large, filled-in suprapatellar bursa clearly stands out. In the right knee also abundant hydrops. *Abnormal motility in the left knee-joint both laterally and from the front backwards*. From full extension normal flexion possible bilaterally. Crepitations bilaterally. *Roentgen the 16/7 1935 (Junghagen)*:

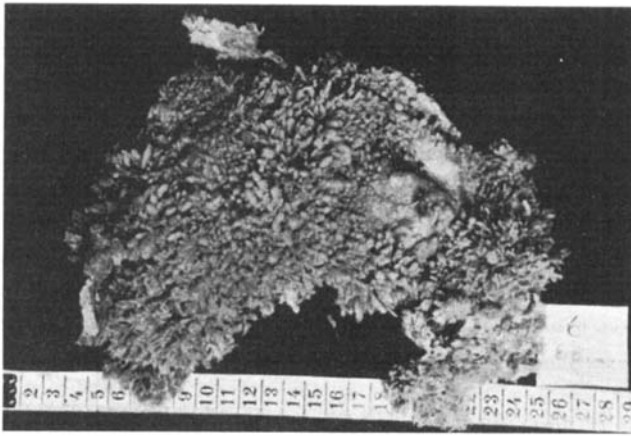


Fig. 6.
Case 6.

"Both knee-joints are the seats of fairly marked arthritis-deformans changes and dissecting osteochondrous processes. On right side, several free bodies visible." Left knee-joint punctated and giving out 60 c.c. clear yellow fluid. A microscopic examination showed a moderate number of cells, chiefly lymphocytes. No bacteria. W.R. in the blood and knee-punctate negative. Guinea-pig test negative. *Operation 6/8 1935 (W. Möller)*: *Synovectomy totalis sin.* Large medial Payr's incision. The joint contains an abundant, consistent yellowish fluid. The synovial membrane is considerably thickened, and its inside strewn all over with compact, soft, polypous and villous formations. The superior recess stretches up to $\frac{1}{3}$ of the thigh. The synovial membrane can be easily extirpated entirely with very slight bleeding stayed by menas of ligatures and diathermy at the insertion of the synovial membrane at the joint surfaces. These show extended decay and marginal osteophytes on both femur and patella. Sutures. Progress free from complications. Healed p.p. A few days afterwards, active motion. Post-operative exudation punctured several times. The patient was transferred the 26/8 1935 to the rheumatic depart-

ment, wherefrom he was discharged the 9/9 1935. The left knee was at that time thickened on account of a periarticular swelling. No exudation in the left knee-joint. Flexion to 90 degrees.

It is here evidently the question of a primary-chronic poly-arthritis chiefly localized in both knee-joints. Besides changes in the synovial membrane, there were also bone-cartilage alterations; therefore, it is not possible to expect so good results from the operation. To this must be added that considerable bone-cartilage changes and loose bodies were also found in the non-operated right knee.

Our suspicion that the functional result in this case would not turn out so well was confirmed by the patient in a letter of May 1939 stating that bearing in both knees is bad. He cannot fully stretch the operated knee. He can bend it to 90 degrees. Can walk at the utmost 500 m. without support. Sometimes swelling. Has not been able to do proper work. However, after the operation he is completely free from pains in the operated left knee. The right one has each year become worse.

Case 7. Man. 48 years. (Fig. 7.) The present illness began in the spring 1932 with pains increasing little by little, reduction of the motility and swelling of the *left knee*. Was treated in the hospital, punctated and sent home with plaster. Since then has been treated several times for the same affection. During his stay at the hospital has had now and then sub-febrile temperature (37.1—37.5 lying in bed). S.R. has increased to 33 mm. In October 1933, similar troubles arose in the *right knee*. The symptoms since then remained unchanged. The patient has lately had similar but slight symptoms in some other joints. Guinea-pig tests from the punctate of the knee-joint in June 1933 and in January 1934 negative. *Was admitted into the Coast Sanatorium at Älviken the 19/4 1934* (Journal No. 112/34. *Status:* General condition good. From internal organs nothing worth noticing. *Local status:* Both knee-joints considerably tumefied, especially the left one. The capsule in both knee-joints considerably thickened, in the left knee, moreover, abundant crepitations. No tenderness direct or indirect, on the other hand, pains when moving quickly. Flexion goes cautiously in both knee-joints to 90 degrees, no stretching defect. Patellar fluctuation in both knee-joints. No increased skin temperature of the knees. No reduction of the motility nor tenderness in the other joints. *23/4 1934 Roentgen knee-joints:* Right knee: "Diffuse spotted atrophy, mostly pronounced in the femur subchondrally. The

height of the joint space is maintained. No nestshaped changes. Left knee: diffuse, very pronounced atrophy. The height of the joint space is maintained. No destructions visible. *Chronic gonitis*". (R. Hanson). 26/4 1934 Operation (R. Hanson): *Synovectomy totalis sin.* Owing to the spool-shaped tumefaction of the left knee-joint and the patient having had symptoms from several joints, and guinea-pig tests being negative, chronic polyarthritis with hyperplasy of the synovial membrane was prior to the operation considered as probable. Medial parapatellar incision.

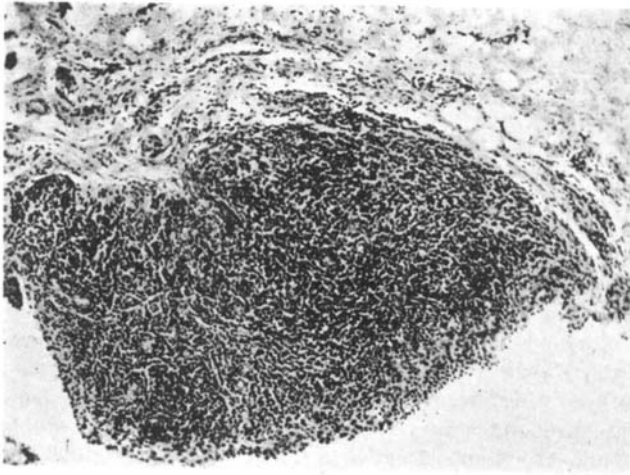


Fig. 7.
Case 7.

The synovial membrane 3—4 mm. thick, edematous, considerably hyperemic and flabby, and provided with numerous villi. No excrescences. The cartilage on the femoral condyles had turned yellowish. On the medial half of the medial femoral condyle the cartilage was destroyed and replaced by connective tissue, the surface was covered with small excrescences. The backside of the patella had lost its cartilage. As the whole capsule had undergone extensive changes total synovectomy was made. *Pathological-anatomical diagnosis*: "Powerful infiltrations of lymphocytes and plasma-cells. At other places, polymorphonuclear leucocytes. No histologic tubercles; the round cell infiltrations are perivascular, and there are no holds permitting to suppose that they should constitute so-called round cell tubercles. *Pathological-anatomical diagnosis*: Sub-chronic arthritidis without specific histologic character". (Reuterwall). Progress free from complications. Healed p.p. Discharged the 21/6 1934. When the patient begins to go after having been sitting quietly for a while, he feels slight pains in the knees, but has no other pains. On the

other hand, has a feeling of unsteadiness in the knees. In the left knee, fairly considerable thickening of the capsule still prevailing, no suffusion, bends to 110 degrees, stretching defect 10 degrees. In the right knee, capsule somewhat thickened, no suffusion, bends to 120 degrees, no stretching defect.

In this case with symptoms from both knee-joints it is evidently the question of a chronic polyarthritis. This is also confirmed by the progress of the illness. The patient stated by writing that, later on, he has had symptoms from practically all joints. He has been treated for that different times in various hospitals. Regarding the operated knee he gave the following information: The knee can be stretched almost fully and bent to 90 degrees. He feels pains when moving the knee, which is always a little swollen.

Case 8. Man. 37 years. (Fig. 8.) No heredity known nor exposition for tuberculosis. In the summer 1921, the patient suffered from articular rheumatism and was treated in the hospital for one month. Had at that time both ankle-joints swollen, but not the other joints. No fever. Afterwards, no symptoms in the joints before October 1932. The patient knocked his right knee which began to swell at once. Was taken into the hospital. The right knee-joint was very much tumefied. Roentgen did not show any fracture. Afterwards, treated in the hospital a few times for relapsing hydrops in the right knee. *He never had blood in the joint.* No fever. *Admitted into the Coast Sanatorium at Apelviken the 1/5 1935 (Journal No. 212/35).* *Status:* General condition good. From internal organs nothing worth mentioning. S.R. 16 mm. *Right knee:* Considerable swelling all over the knee-joint. No reddening nor tenderness. Large exudate. Free motility in the knee-joint. No crepitations. No tenderness over the joint space. No abnormal lateral motion for certain. *4/6 1935 Roentgen right knee:* "Slight atrophy. The height of the joint space maintained. No nest-shaped destructions. The outlines of the joint are even and sharp. Back-side of patella even". (*P. Hanson*). *4/6 1935: Puncture of the knee-joint and draining of a clear, yellow exudate. Cells: exclusively mononuclear. Guinea-pig test negative.* *6/6 1935 Operation (R. Hanson).* *Right knee:* Under the diagnosis gonit. chron. hyperplastica, it was decided to perform the operation. *Arthrotomi + synovectomy totalis dx.* Medial parapatellar incision. In the joint there were a few c.c. thin, clear fluid, synovial membrane $\frac{1}{2}$ cm. thick and flabby. No villous hyperplasia. No excrescences nor other typical signs of tuberculosis. On the medial part of the patella, the cartilage was destroyed and replaced by a connective tissue-cartilage. The destroyed cartilage was excised. The medial me-

niscus was entire, with a normal colour. It was possible to excise the whole synovial membrane and the whole bursa suprapatellaris. *Pathological-anatomical diagnosis*: Capsular part from the knee-joint + excised patellar cartilage: "In the synovial villi considerable infiltration of plasma-cells and lymphocytes. Some of them rounded, however, no ground for the existence of round cell tuberculosis. In the tissue, close to the patellar cartilage pieces, cell infiltration of the same kind. Pathological-anatomical diagnosis: Chronic inflammatory changes without specific



Fig. 8.
Case 8.

histologic character." (*Reuterwall*). *Knee-joint punctate*: "Wassermann's reaction negative. Sachs-Georgis' reaction negative. Kahn's reaction negative. No tuberculosis found in direct preparation. Culture of Holm & Löwenstein's substrate: No growth. Inoculation on guinea-pig: No tuberculous changes in the glands or organs." (*Wassén*). Post-operative progress free from complication. Healed p.p. After the operation very important quantities of exudate, which were aspirated. *Discharged the 1/7 1935*. Flexion over 90 degrees, full stretching of the right knee.

The above case is about a 37 year old man who in 1921 has had a chronic polyarthritis localized in both ankle-joints. In 1932, in connection with a trauma he got an exudate in the right knee-joint, which on the whole remained constant. The patient stated by writing that he has been relatively well, and was able to work a little from August 1935 to May 1938, when

he began to get troubles in the operated knee such as swelling and acute pains. Later on, he had similar symptoms in the other knee and in the ankle-joints, the wrists and the elbow-joints. He is actually treated (April 1939) in a rheumatic ward.

Case 9. Woman. 17 years. No tuberculosis heredity known nor exposition. In 1930, the patient noticed that her *left knee-joint* was swollen. (At that time the patient's sister got tuberculous neck lymphoma). Since then she has felt stiff in her left knee. Since $\frac{1}{2}$ year noticed enlarged glands on both sides of the neck, and from that time has also suffered from eye troubles (phlyctena). *Was admitted into the Coast Sanatorium at Apelviken the 29/4 1932. Status the 10/5 1932.* General condition good. From internal organs nothing worth mentioning. Fairly large lymphoma on both sides of the neck. Both knee swollen without characteristic contours. *Left knee:* No signs of exudation. The capsule in the middle is considerably thickened, less laterally. Motility: very slight reduction of the flexion. Phlyctena in the left eye. *13/5 1932. Roentgen left knee:* "No atrophy worth mentioning. Visible thickening of the capsule. No diminution of the joint space. The contours of the femur are maintained. In the medial femoral condyle, immediately under the ligament insertion, irregular thinning in the epiphysis of a red bean size. At the insertion of the capsule, on the medial border of the tibia, a small 2—3 mm high decay. There is in this case, most probably, a knee-joint tuberculosis". (*R. Hanson*). *Guinea-pig tests on the knee-joint punctates*, right and left, *negative* for tuberculosis. *The 27/10 1932, arthrotomy was performed on the left knee.* The capsule of the joint much thickened. The whole synovial membrane blue-red, swollen and edematous with numerous stalked villi between the joint surfaces. The cartilage of the patella and of the medial condyle without remarks. Exstirpation of some of the largest villi, excision from the capsule. *Pathological-anatomical diagnosis:* "Chronic inflammation with villous hyperplasia. No signs of tuberculosis". (*Forselius*). *Guinea-pig test on the exudate negative for tuberculosis.*

At the beginning of the year 1933, the patient got a skin-tuberculosis. The right knee had with slight alterations kept unchanged since her arrival at the hospital. *14/9 1933 Roentgen right knee.* "The joint-space is somewhat diminished. A projection a few mm. deep and a few mm. high at the capsular insertion on the medial border of the medial tibial condyle. Besides, no changes." (*R. Hanson*). At the end of 1933, it was found that both knees presented a fairly important capsule thickening, mostly pronounced on the right knee. No suffusion. Owing to the lasting tumefaction and swelling of the right knee showing no tendency to diminish and in order to ascertain the diagnosis, which as regards etiology was doubtful, it was decided to resort to operation. *20/4 1934. Operation* (*R. Hanson*). Diagnosis prior to the operation: villous hyperplasia of the

synovial membrane. *Arthrotomi + synovectomia totalis*. Medial parapatellar incision. The synovial capsule was a good $\frac{1}{2}$ cm. thick and flabby, its inside was hyperemic. At several places, flat villi up to 2 cm. diam. with narrow stalks. No tuberculous excrescences. In the joint about 10 c.c. almost clear, somewhat consistent, yellowish fluid, kept for guinea-pig test and W.R. The loosened cartilage on backside of the patella, which had turned yellowish, was excised. The cartilage on the femoral condyles had turned yellowish, and was at some places loosened. However it was not undermined at the borders as in tuberculosis. Along the borders pannus was growing down, and stretched in on to the surface of the joint, no marginal decay as in tuberculosis. Owing to the important changes of the capsule, it was decided to perform synovectomy, which was easily made after a lateral parapatellar incision, *Guinea-pig test negative. W.R. negative. Pathological-anatomical diagnosis*: Piece of the knee-joint capsule: "Fairly strong inflammatory processes in the capsular surface. No pictures revealing the existence of tuberculosis. (*Forselius*). The patient's skin-tuberculosis got worse, abscess formations and large ulcerations arising. Pathological-anatomical diagnosis from an excised skin section became *tuberculosis cutis*. Discharged the 21/4 1936. General condition good. From internal organ nothing worth mentioning. S.R. 28—60 mm. The ulcerations of erythma induratum are completely healed. Knee-joints: Tumefaction of both knee-joints with somewhat blurred normal configuration. Swelling of the capsule. No increase of temperature. Bilateral flexion from full stretching to 90 degrees. No pains when moving, but slight crepitations.

The above case is about a 19 years old woman with symptoms from both knee-joints in the form of exudation and restricted motility. She has positive tuberculous lymphomata on the neck, a positive skin tuberculosis and, moreover, a conjunctivitis phlyctenulosa. The roentgenfindings from both knee-joints presented pictures suspected to reveal tuberculosis. The pathological-anatomical diagnosis of the synovial membrane from both knee-joints became a "non-specific inflammation". That these knee-joint symptoms must be connected with her tuberculous infection is hardly to be doubted. Naturally, it is not possible to prove this, however, much favours the belief that the knee-joint changes have been of tuberculous etiology.

Case 10. Man. 60 years. (Fig. 9.) 30—29 years ago respectively, the patient had suffusion in the right and afterwards in the left knee. No certain connection with trauma. Recidive 24 years ago. Afterwards free

from troubles. A little more than 3 months ago, the left knee began to swell; no connection with trauma. The size of the swelling has been varying. The patient has had no reduction of the motility, but felt pains in his knee. The last fortnight, the size of the swelling increased. The left leg, these last years, has been a little thicker than the right one. *Was admitted into the surgical department at Centrallasarettet in Borås the 5/8 1938. (Journal No. K. 2007/38). The left leg considerably thicker than the right one. The left knee as big as a child's head. Pronounced*

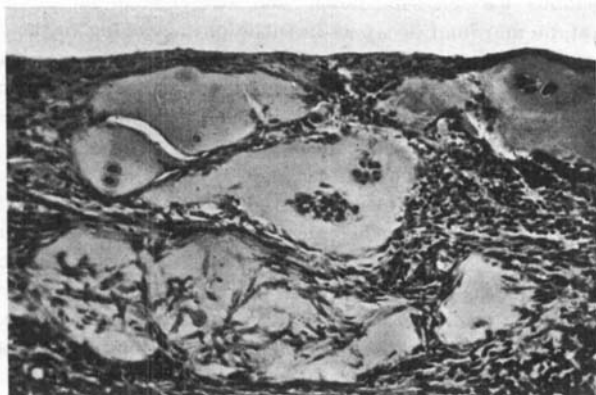


Fig. 9.
Case 10.

patellar fluctuation. No tenderness. Stretches unhindered. Bends over 90 degrees. 7/8 *Knee puncture*: 225 c.c. of a viscerous, amber-yellow fluid being tapped. 7/8 *Roentgen left knee*: "Thickening of the capsule. Considerable reduction of the distance of the cartilages, especially medially. Osteoarthritis". (*Hagberg*). The patient was administered a series of roentgen treatments and improved. A renewed puncture of the knee gave 250 c.c. After aspiration, the knee-joint was filled with air which after roentgen was sucked out again. 30/8. *Roentgen left knee*: "Insufflation of air into the left knee-joint reveals a considerable distension of the joint-capsule widely connected with the expanded bursa suprapatellaris. No foreign soft tissue shadow outlined within the air-filled joint". (*Hagberg*.) 13/9 1938. *Operation (the author)*: *Total synovectomy and extirpation of the medial meniscus*. Medial parapatellar incision, which had to be prolonged both upwards and downwards. Bursa suprapatellaris a good fist-size, provided with thick walls. It was firmly fixed at the front to m. rectus femoris. On the sides and at the back, it could be loosened by means of a blunt instrument with very slight bleeding which was stopped by a ligature. Besides, the synovial mem-

brane was easily loosened, excepted at the back, where access was rendered difficult on account of the small space available in the joint. However, the whole synovial membrane could be taken out all at once. The synovial membrane was intensely reddened and its surface almost smooth. The medial meniscus, thin and narrow and yellowish discoloured, was therefore extirpated. Pannus was growing down a bit on both femoral condyles. The whole patella was overgrown with pannus. There, the cartilage presented a few crack formations. The surface was made even. In the medial femoral condyle, there was a nearly 1 cm. deep score sagittally located. Corresponding to this, there was in the tibial condyle a marginal ridge running into the score in the femoral condyle. Sutures.

Preparation: The synovial membrane considerably thickened, about 3—4 mm. thick, firm and fibrous. Surface almost smooth and even. *Pathological-anatomical diagnosis:* Piece of knee-capsule: "A nearly tumefied capsule with atrophy of the villosity and remainders of an inflammatory, non-specific process. In the capsule, layers of cartilage, chondroid tissue and bone are found. The bone is there necrotic, the cartilage partly dead. In some parts, however, the cartilage presents the picture of a growth. The genesis of these layers is in fact somewhat contested, in the present case they must undoubtedly be considered as a part of the general regressive change prevailing. It is interesting to note that such a plate seems to be on the way to detach itself from the capsule to become a loose body. (*Forselius.*) Discharged 26/10 1938. Healed p.p. After the operation new exudations took place which were punctated several times. Otherwise, progress free from complications. February 1939. The patient, now and then, has still exudations in the left knee. Considerable swelling. In spite of this, the patient is pleased with the operation, because the knee is entirely painless. From full extension can bend to a little more than right angle. Pronounced abnormal lateral motion.

The present case is about an osteochondromatosis synovialis. Moreover, there were cartilage changes on the patella and degeneration of the medial meniscus.

In four cases (1, 3, 4 and 5), besides the pathological changes of the synovial membrane, there were no other changes in the knee-joint. In all the other cases, together with synovial changes of various kinds, there were also cartilage or bone alterations. Thus, in the 6 other cases, there were more or less pronounced changes of the patellar cartilage, and in two cases (2 and 6) signs of an arthritis deformans. In three cases (2, 6 and 7) there were changes in the femoral cartilages. If one tries to get a correlation between the synovial changes and the chan-

ges found in the cartilages, it will be noticed that the latters are not bound to a certain type of changes in the synovial membrane, besides the patient's age does not seem to play any rôle, and the length of the time of illness does not either seem to have any influence in that respect. In a few cases (4, 5 and 6) abnormal lateral motion in the knee-joint, before the operation, has been observed. In these cases, the suffusion in the joint was considerable, therefore, the abnormal lateral motion must have presumably depended upon a distinction of the fibrous capsule. In one of these cases (4) abnormal lateral motion was also prevailing after the operation. In case 10 laxity of the joint occurred after the operation. In this case a resection had perhaps been more indicated.

The result given here, from an indicating point of view is very yielding. Absolute indication for total synovectomy must be considered prevailing in cases 1, 2 (lipoma arborescens) and 10 (osteochondromatosis). In all the other cases there are relative indications and in those cases a conservative therapy preceded the operation bringing about a merely momentary improvement. In spite of the good result obtained in case 3 (synovial tuberculosis) it is, however, advisable to abstain from total synovectomy in similar cases.

The results of operations given here must be considered in all surviving cases as good. As a rule, the patients, when discharged, have had a normal or almost normal extension in the operated knee, and a flexion up to 90 degrees. From the information received from the patients this motility has remained constant or even increased.

Out of the patients whose progress has come to our knowledge, only two (cases 6 and 7) have been unable to work the whole time after the operation. Case 2, who was fully free from symptoms more than 3 years after the operation, could not be met at the present time, therefore, we know nothing about him. Case 8 was also free from symptoms 3 years after the operation, but since then has got a general chronic polyarthritis, and is consequently actually and surely for ever unable to work.

To sum up it will be found that out of 10 operated cases

(with 9 patients) one death occurred. In two cases, after the operation, complete disability prevailed the whole time. In two cases, no symptoms for 3 years (and in case 2, may be, longer), while the remaining 5 cases (50 %) are now fully able to work.

Contributing factors to the bad prognosis are the length of the time of illness and the nature of the process. In case 6, for instance, the patient had had symptoms from his knee-joint for 22 years. That a fairly long time of illness as 7 years, however, need not unfavourably affect good final results is shown by cases 3, 4 and 5.

SUMMARY

It is impossible to set forth absolute indications for synovectomy in non-specific knee-joint arthritis. Each case must be treated as a problem for itself, and synovectomy must not be resorted to before it is ascertained that conservative methods of treatment have not led to any result. In osteochondromatosis and the uncommon benign and malign capsular tumours, there are absolute indications for synovectomy. Roentgenography after the insufflation of air into the joint can be a good help, when diagnosing purely villous hypertrophy (*lipoma arborescens*). The author reports 10 cases of synovectomy (Tab. 1).

RÉSUMÉ

Il est impossible dans les arthrites non spécifiques de l'articulation du genou de déterminer quelles sont les indications absolues de la synovectomie. Chaque cas doit être considéré comme un problème particulier et il ne faut pas avoir recours à la synovectomie avant de s'être assuré que les méthodes de traitement conservateur ne donnent aucun résultat. Dans les osteochondromatosis et les rares cas de tumeurs capsulaires bénignes et malignes, la synovectomie est absolument indiquée. Après l'insufflation d'air dans l'articulation, la radiographie peut apporter une aide précieuse pour poser le diagnostic d'une hypertrophie purement maligne (*Lipoma arborescens*). L'auteur rend compte de 10 cas de synovectomie (Tab. 1).

ZUSAMMENFASSUNG

Es ist unmöglich, bei nicht-spezifischer Kniegelenks-Arthritis absolute Indikationen für eine Synovektomie aufzustellen. Jeder Fall muss als ein Problem für sich behandelt werden, und man darf erst dann zu einer Synovektomie seine Zuflucht nehmen, wenn man sich vergewissert hat, dass konservative Behandlungsmethoden zu keinem Ergebnis geführt haben. Bei einer Osteochondromatosis und bei den seltenen gutartigen und bösartigen Kapseltumoren besteht eine absolute Indikation für Synovektomie. Eine Röntgenographie nach Einblasen von Luft in das Gelenk kann zur Diagnose einer rein bösartigen Hypertrophie (*Lipoma arborescens*) gute Hilfe leisten. Verfasser berichtet über 10 Fälle von Synovektomie (Tab. 1).

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