G. WIBERG:

SIGNIFICANCE OF THE CONTACT OF THE ARTICULAR SURFACE TO THE DEVELOPMENT OF CHONDROMALASIA PATELLAE

(See Wiberg: "Roentgenographic and Anatomical Studies on the Femoropatellar Joint." Acta Orthopaed. Scandinav. 12: 319, 1941)

H. SJÖVALL:

REEXAMINATION OF PATIENTS WITH MENISCAL LESIONS WHO WERE TREATED OPERATIVELY IN THE ORTHOPEDIC CLINIC IN LUND IN THE PERIOD OF 1929—1938

(See Sjövall: "Die Spätergebnisse nach totaler Meniscusexstirpation." Acta Orthopaed. Scandinav. 13: 153, 1942)

DISCUSSION

Lagergren, K.-A.:

MENISCUS OPERATIONS AND SECONDARY ARTHROSIS DEFORMANS

Some years ago I worked up the patient material of meniscal lesions treated operatively in the Serafimer Hospital, Stockholm, during a period of 25 years. For various reasons this work has not been published. When the meniscal problem, elucidated through a fairly large material of reexamined patients, is again the subject of discussion at the Congress of the Scandinavian Orthopedic Association, I beg to present, within the brief time allowed for the contribution to the discussion, some figures from my reexamination and some points of view concerning a couple of details, in particular, the question about meniscal extirpation and secondary arthrosis deformans.

For the sake of time, a schematic survey of the material is given in Table 1.

TABLE 1.

The Functional Results in 97 Cases of Meniscal Affection Reexamined 5-25 Years after the Operation.

Age of patient at operation (years)	Complete recovery with tolerance for severe strain, sport, etc.	No discomfort on manual labor, but on severe strain.	Slight discomfort but full capacity for manual labor.	Severe discomfort; not fully capable of manual labor.
	62 64 %	20 21 %	10 10 %	5 5 %
∠ 15	1	1		
15-20	13	1		
21-30	21	11	6	4
31-40	12	4	2	
41-50	11	3	1	1
51-60	3		1	
> 50	1			

Table 1 presents the material in each group and the functional results as ascertained on reexamination of the patients. The original operating material comprises 120 patients, but for various reasons only 97 of them could be reexamined. Some of the earlier operated patients have died from intercurrent affections in the meantime. The patients admitted to the Serafimer Hospital come from various parts of the entire country; several of the non-reexamined patients were seamen; a couple emigrated, and so on.

Of the present 97 patients, 54 were examined by me personally; and in every instance *both* knee-joints were examined roentgenographically. The remaining 43 have answered a detailed questionary, sometimes supplementing it by additional correspondance; and in a couple of cases, X-ray examination was carried out in another hospital. In the question about secondary

arthrosis deformans, the roentgenograms taken before the operation have served as comparative material.

For estimation of the functional result I have attempted to classify the reexamined patients into 4 groups. In *Group I* I have recorded the patients who have fully recovered and who are able to stand even severe strain, athletic contests, etc. *Group II* comprises the patients whose subjective physical condition enables them to do even hard manual labor but not, without discomfort, the more exerting athletic feats just mentioned. Several of the patients entered in Group II come very near to belonging to Group I (for instance, a fireman, doing full active service, who thinks his knee fails somewhat in forced exercises on the ladder; further some sportsmen who play excellent tennis but do not consider themselves qualified for football, etc.). On the other hand, this group also includes some instances of arthrosis deformans, which is still latent as far as the subjective inconvenience is concerned.

If, as I have done in some cases, the reexamination is repeated after an additional period of 5 years, it will be found that an increasing number of these patients will move downwards in the tabullary gradation as far as the functional result is concerned, and that this is due to a late-appearing unilateral arthrosis deformans.

Group III covers the patients who have been fully able to support themselves by ordinary manual labor, although they are not free from inconvenience in doing this. In these cases, manifest arthrosis deformans is a frequent finding.

Group IV comprises reexamined patients with more severe discomfort, who are not fully capable of manual labor. Of the patients belonging to this group, 1 is markedly disabled (postoperative ankylosis); 1 receives a 10 % invalidity benefit from the insurance company. In the remaining 3 cases the invalidity has not been reckoned as amounting to 10 %.

The results outlined here are by no means brilliant. They include cases, however, from the earliest days of meniscal surgery (Professor John Berg has operated 8 of them), and a good many surgeons—no less than 25—have contributed to this mat-

erial. But as meniscal operations nowadays, according to the yearly report, are performed in practically every one of our hospitals, the present material seems rather suitable for the estimation of the functional results as they are a chain in general surgical practice.

The main purpose of this investigation has been to find out, if possible, whether arthrosis deformans occurs more often and earlier in the meniscus-operated knee than in the non-operated one. For this reason a long observation period has been desirable. In 30 % of the cases the length of the observation period has been 15 years or more.

In recent years not a few authors have urged a certain degree of restraint in meniscal extirpation, claiming that this form of operative treatment has reached all to great proportions; indeed, 400 meniscal extirpations in one year have recently been reported from a German clinic (Uebermuth).

Taking for granted that the establishment of indications for operative treatment has failed in some places, the admonition of increased restaint should be due to the circumstance that secondary arthrosis deformans has proved to follow this operative treatment to a considerably greater extent than admitted in previous comparative accounts. Is it permissible in a case of not positively ascertained meniscal defect to proceed according to the maxim: "it may just as well be extirpated as there is no harm in that"? Lately (this year) a warning to this effect was issued from the Payer Clinic where a critical analysis of the material showed that no less than 25 % of the operated patients acquire an arthrosis deformans which etiologically must be attributed to the meniscal extirpation (Uebermuth).

Will our Swedish materials show an equally frequent occurrence of sevondary arthrosis deformans after meniscal extirpation?

In the material I have worked up I have attempted to look into the frequency of secondary post-operative arthosis deformans. In making the diagnosis arthrosis deformans, consideration has been paid to the anamnestic features as well as to the clinical and roentgenological findings. Thus, the absence of

roentgenological signs of arthrosis deformans has not been decisive. When roentgenological signs of arthrosis deformans have been absent, while clinical signs of this lesion have been present or the patient has described his complaints as indicating the presence of arthrosis deformans, his case is revorded as belonging to this group. Bircher claims that roentgenological signs of arthrosis deformans are absent in up to 70 % of the knee-joints showing clinical signs of this affection.

On the other hand, a post-operative roentgenographic finding limited to a slight bracket-like addition to the articular margin of one tibial condyle has not been recognized as the proof of the presence of arthrosis deformans when clinical symptoms of this affection have been absent. For in my reexamination of these cases I found that such a bracket-like addition to the articular margin of the tibial condyle on the side where the meniscal extirpation had been performed appears in a great majority of the cases when a sufficient number of years have passed since the operation, that is, also in cases of complete subjective and objective recovery. This roentgenographic phenomenon, I think, may be an expression of the alteration of the static conditions brought about by the meniscal extirpation, not a sign of beginning arthrosis deformans. This finding is probably the same as is described later by Efskind.

Once the frequency of this change is realized, it is possible, merely from the roentgenograms taken at the reexamination alone, to deduct in which knee and in which side the meniscal extirpation was performed. For the occurrence of this phenomenon is so regular, even though it is subject to considerable variation in degree, that one or two years after the operation is it practicable from study of the roentgenograms to draw the mentioned conclusion with a very slight risk of an erroneous conclusion.

When it comes to judge of a secondary arthrosis deformans, those cases have been omitted from the present material (altogether 4 cases) where clinical and roentgenological signs of arthrosis deformans were present even *before* the operation, and also those cases (4 altogether) in which the changes of arthrosis

deformans in the operated knee at the reexamination seemed most likely to have been a partial symptom of chronic arthritic changes in the knees and hips on both sides.

Of the remaining 89 cases, 6 (*i.e.*, 6.6 %) presented only some scanty, soft, often solitary, crepitations but otherwise no signs of arthosis; and 19 cases (21.3 %) showed clinical or roentgenological, or both clinical and roentgenological signs of arthrosis deformans.

Of the 19 cases in which the meniscal operation was probably of etiological significance to the development of a distinct unilateral arthrosis deformans,

1 patient belonged to the age-class of 15—20 years,
12 „ „ „ „ „ „ 20—30 „ , and
6 „ „ „ „ „ „ 30—40 „ .

Of the same 19 cases
10 had an observation period of 10 years or more,
6 „ „ „ „ „ 7—9 „ , and
3 „ „ „ „ „ 5—6 „ .

So the number of patients with arthrosis deformans increases distinctly with the length of the observation period.

In several of the cases here recorded the patients stated that they were entirely free from any inconvenience from the knee for several years. The complaints which then turned up could be interpreted as due to a beginning unilateral arthrosis deformans.

My material appears also to furnish some evidence to the effect that secondary arthrosis deformans as a sequela of a meniscal operation is essentially more frequent in women than in men. Of the 89 patients, 71 were men, 18 women. Arthrosis deformans was ascertained in 10 of the 18 women = 55 %, but only in 9 of the 71 men = 12.6 %.

The interval between the first injury with dislocation of the meniscus and symptoms of a locking *and* the operation might conceivably be likely to be of significance to the development of arthrosis deformans in this way: that repeated locking of the joint might form the first basis for the arthrosis deformans.

But tabulation of the material with regard to the time interval between the initial injury and the operation ascertained as exactly as possible affords no evidence of any such relation. In the 19 cases where arthrosis deformans was ascertained as a probable result of the meniscal extirpation, the period between the initial injury and the operation varies from a few days to 14 years, namely:

< 2 months	in 5 cases	2 years	in 1 case
2—6 „	„ 4 „	4 „	„ 1 „
½—1 year	„ 6 „	7 „	„ 1 „
		14 „	„ 1 „

Among 70 cases in which no post-operative arthrosis deformans could be demonstrated, the time interval between the initial injury and the operation shows a similar variation from a few days to 20 years. In 8 of the cases the operation was performed 5—20 years after the initial injury, and in 12 cases 2—5 years.

That secondary arthrosis deformans develops in a relatively large percentage of the meniscus-operated patients appears thus to be evident also from this investigation. It is late in its appearance, however, not infrequently first 7—8 years after the operation, and it is considerably more frequent in the female patients than in the male.

Is it conceivable that the frequency of the secondary arthrosis deformans may be reduced through the diagnosis and operative treatment? While this question is not easy to answer, I think that certain details concerning it may be of importance.

The detailed diagnosis should be made most carefully, attention being paid also to the possible presence of injurious combinations. Arthrography should be a routine examination in all cases where the meniscal lesion is not fully ascertained clinically. The operation must be performed by an expert and traumatize the joint as little as possible. The removal of the so-called abnormally mobile meniscus should generally be reckoned among the non-permissible tentative operations, in which cases the surgical measure should be limited to an explorative arthrotomy.

In cases with defects and ruptures in the anterior and middle parts of the menisci, no total extirpation should be attempted. In extirpation or resection of the meniscus, its fibrous, vascular, paracapsular layer should be left in situ except when a more peripheral rupture is present. The last mentioned point of view, I think, has really been adopted long ago, but it has been emphasized again this year by Uebermuth in "Der Chirurg". For it seems reasonable to assume that this fibrous vascular layer of the meniscus is of the greatest importance to its subsequent, more or less complete, regeneration. There can be no doubt that the formation of such a regenerated meniscus is of great significance to the static conditions and thus to the prevention of a secondary arthrosis deformans, too.

It goes with saying that clear-cut meniscal lesions that give rise to symptoms of lock-joint should not only be operated, but operated early. On the other hand, it has been fully established —through explorative arthrotomy as well as observation for a good many years—that slight breaks of a recent date and blood imbibed fissures in the menisci which have not given rise to any detachment or dislocation heal spontaneously without giving any symptoms. I have seen several cases of this kind in the patient material of the Serafimer Hospital—outside the material under consideration here, of course. So, recent hemorrhagic injuries to the knee suspect of damage to the meniscus *without* combination damage do not positively belong to the group of requiring immediate operative treatment.

Waldenström, H.:

In his introductory lecture, Sjövall touched upon the risk of arthritis deformans after meniscectomy—merely as a remark made in passing. Hence it is not his lecture but the contribution to the discussion given by Lagergren that has prompted me to take part in the discussion.

Lagergren has gone through a large material in order to see how often arthritis deformans made its appearance in the operated joint and not in the other one, and in the cases where

he found arthritis deformans he thinks it is ascribable to the operation.

This can by no means be taken for granted, however. In a great majority of the cases, indeed, the operation has been preceded by functional disturbances in the joint for some length of time: locked joint, hydrops, etc. And it is well known that chronic, irritative conditions in a joint may give rise to arthritis deformans. In order to settle the question concerned here, it will first be necessary to go through all the cases and note how long before the operation the patient had had his complaints, besides the nature and degree of these complaints (*e.g.,* how often he had had locked joint, hydrops, etc.) and then classify the cases accordingly.

Perhaps we then would find that the patients with a history of severe protracted complaints prior to the operation have arthritis deformans of the operated knee, while the patients operated at once after an acute rupture in a non-degenerated meniscus had no arthritis deformans. Further a protracted chronic irritation as in dislocation of the meniscus seems far more likely to give arthritis deformans than does such a slight operation as meniscal extirpation—of course, when it is performed well and free from complications (infection, hemarthros, etc.).

Richter, Sölve:

An interesting point in the lecture was that Payer's incision was employed in all the cases. It is quite true that this incision gives an excellent survey of the conditions, but it is all too traumatizing and also unnecessary. A small longitudinal incision of a few centimeters is sufficient indeed for medial as well as lateral meniscal operations.

The long stay in the hospital—30 days—and the inability to work for more than two months—besides the frequent complaints on reexamination—sensory disturbances, lateral staggering in 19 %, and muscular weakness in 36 %—are largely attributable to the incision employed here. For that matter, Payer does not employ it himself in simple meniscal operations.

The lecture shows the subjective results in patients submitted to meniscal operation + Payer's incision.

It seems reasonable to assume that a reexamination of a similar patient material in which the incision had been more lenient would give a considerably better late result and a shorter convalescence.