

SOME VIEWS ON THE TREATMENT OF KNEE-JOINT EXUDATE

By

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It is at the same time both easy and difficult to discuss the treatment of knee-joint exudates. It is easy if one regards the task purely from the point of view of giving a simple account of the generally accepted methods of treatment. However, when one realizes that so little is known about the circumstances connected with the genesis of hydrops genu, and consequently what little possibility there is of effecting a truly causal therapy, the task of discussing the treatment becomes considerably more difficult.

Hydrops genu has a unique position in its relation to exudates in other joints. The reason for this is partly that the knee-joint is more easily accessible for examination and treatment than other joints, and partly that without doubt it is the most usual place for an exudate to occur. When I use the word exudate in this paper, I entirely disregard those that are caused by specific and unspecific infections, tumours in the articular capsule or in the vicinity of the joint. I shall only briefly mention exudation in polyarthritis. That leaves us only with what we call, in common parlance, hydrops incertae causae. But behind this nondescript term there is certainly hidden, from the point of view of aetiology, an especially incongruous mixture of exudates. A clue as to the probable aetiology may sometimes be obtained from the anamnesis, as, for example, in cases where the exudate occurs in connection with trauma. In other cases where organic changes have been found, such as those which occur in chondromalacia patellae and arthrosis deformans, these are considered in connection with the exudate even though it is known that such changes occur just as often without an exudate as with one. We do not know the real reason for the occurrence of an exudate. As yet we have not discovered how normal synovial fluid is produced. Nor do we know whether an exist-

ing exudate originates from an over-production of synovial fluid or whether it depends on a retarded or totally suspended reabsorption, nor if the cause of the exudate is to be found in a combination of both these factors. For the present we are unable to form any opinion as to whether both or either of these presumed causes is the actual origin of the exudate. In the following account there must necessarily be large gaps both on account of the size of the subject and the limited time available.

We can conveniently consider the principles of treatment under two headings i.e., the conservative and the operative. It will mainly depend on the length of time that the exudate has been present which one will be chosen in an actual case, (I do not count tapping as an operative procedure). In the case of an exudate of short duration it is usual to choose the conservative method, whereas in cases of prolonged exudates, one or other of the operative measures is generally resorted to. Exactly which method of treatment is chosen will depend more on the surgeon's personal attitude than upon objective findings. This, perhaps, is not so clearly evident when it is a matter of conservative therapy as when it concerns the choice of the operative method and, more especially, the time when surgical intervention should be resorted to.

The different methods of conservative therapy, the various details of which are too well known to be mentioned here, are concerned with the exudate itself and also with the degree of atrophy of the quadriceps. Warmth, rest in bed and even immobilisation are measures that are known from experience to exercise a favourable influence on an exudate. If one has been successful in eliminating an exudate in this manner, sometimes in conjunction with tapping, it is nevertheless only the first stage of the treatment. Of equal importance is the treatment of the quadriceps atrophy which is always a secondary occurrence in every form of disturbance in the normal function of the knee-joint. An atrophy of this nature always results in insufficiency of the quadriceps muscles. Even when the degree of insufficiency is slight, it may result in the joint's becoming unstable upon movement, eventually followed by a small degree of subluxation. This functional disharmony can lead to a recurrence of the exudate and we know from experience that this occurs more easily if there has been an exudate on a previous occasion. In such cases one can almost talk about an "exudate preparedness". Energetic exercise of the quadriceps should be commenced at an early stage, and the sooner this is done the better. There is an additional reason for this particular therapy. It is thought, and perhaps not without a certain degree of justification, that re-

absorption from the knee-joint occurs mainly from the pockets and bursae formed by the capsule, and to a great extent from the suprapatellar bursa. This bursa is enveloped by a loose and flaccid connective tissue, with the exception of one place, i.e. on the posterior aspect of the quadriceps tendon to which the bursa is firmly attached. Thus, on moving the knee-joint, pump mechanism is created which is thought to favour reabsorption of the synovial fluid.

The operative methods used in knee-joint hydrops are synovectomy, partial or total, capsular fenestration or intramuscular drainage. As previously pointed out, we are not yet in possession of the facts which might help us to decide whether the cause of the exudate is due to some factor which prevents reabsorption, or if it is due to an increased production of synovial fluid. Many attempts have been made to evolve methods which would enable us to clarify in each individual case whether reabsorption is merely delayed or whether it has ceased entirely. One method which seems to be well-favoured by a number of writers is to inject a contrast medium into both knee-joints and then, by repeated roentgenography, to see if there is any difference in the speed of reabsorption between the healthy and the diseased side. The method has also been used in order to study conditions in a joint after a synovectomy has been performed. It is not necessary to devote much time to such investigations before coming to the conclusion that they are of very little practical value. In some cases of hydrops a more rapid reabsorption is noticed in the healthy knee, whilst in other cases the condition may be the reverse and it would not be possible to say whether there is any clinically definable difference between the two series. Similar mixed results may also be obtained in cases of synovectomy. One case may show an increase in the speed of reabsorption after synovectomy, whilst another may show a retardation of reabsorption. Added to this is the fact that contrast media are foreign to the body, the reabsorption of which it is not possible to determine; and also that the media are crystalline substances which, according to most authors, are absorbed via the blood channels, whereas substances the size of a molecule and larger are mainly absorbed via the lymph channels. Both in synovectomy as well as in capsular fenestration it is the latter channels which one endeavours to reopen.

The usual form of synovectomy is partial synovectomy, in which one is generally satisfied with the extirpation of the suprapatellar bursa. The operation is a simple one and is for that reason tempting to perform when no headway has been made with an exudate after a lengthy period of conservative treatment. A technical detail is worthy

of mention. Following a synovectomy, a reforming of the synovial membrane occurs quite quickly and most probably takes place by metaplasia of the underlying tissues. If no steps are taken it will be found that, within a week or two, the bursae have formed again; this is considered undesirable as then one has to tackle bursae that are much enlarged. Naturally, one can place some plaster of paris or an elastic bandage round the knee but this only prevents early exercise of the quadriceps. If, instead, one draws together the anterior and posterior resection flaps of synovial membrane with two or three catgut stitches, it is usually found that this is sufficient to keep the size of the bursae within reasonable limits.

The question is, in which cases should a synovectomy be performed? Generally speaking, this should be done in cases of so-called *hydrops incertae causae*, or in those having a post-traumatic genesis where, for a long time, there has been an exudate that has not yielded to the ordinary conservative methods of treatment. Even cases of so-called "hydrops intermittens" have been freed from exudate by partial synovectomy. As a rule, one can say that synovectomy is unsuitable in cases of exudate in *arthrosis deformans*, even though one sometimes obtains good results in these as well.

What results do we obtain from synovectomy? If one examines the results obtained from different writers—most of whom are American—it will soon be found that it is difficult, not to say impossible, to find a common viewpoint from which to be able to judge the results. Obviously, the main reason for this is the pronounced personal attitude towards the indications for operation, which I have referred to previously. As a rule, the results have been good in 60%-80%. In a material from synovectomies, re-examined by myself, freedom from exudate has been achieved in 75%. This material comprised 21 synovectomies performed on 20 patients and the time of observation was on an average about 6 years. The average duration of the exudate was at least 5½ years. It may be asked if synovectomy should not have been performed earlier, as it might be expected that an exudate of long duration, with regard to its morphological composition and probably its biochemical-pathological aspects as well, would in one way or another exercise an injurious influence on the synovial membrane and articular cartilage. The material, however, does not give any support to the idea that cases with a relatively short-lived hydrops are in a better position in this respect than cases which have had an exudate for a lengthy period. Nor does this material lead one to suppose that there is a greater frequency of *arthrosis deformans* among the cases of lengthy hydrops than among cases of shorter duration.

I shall also say a few words about partial synovectomy in connection with polyarthritis. In the post-examination just mentioned, 15 synovectomies had been performed on 14 patients. The disease had lasted for $5\frac{1}{2}$ years. Freedom from exudate was found in only 6 cases which corresponded to 40%. Even these figures compare favourably with those given by other writers. One can well imagine that there are many reasons why the results of the operation in polyarthritis are relatively poor, but the most important one seems to be that the disease has a great tendency to relapse. If, in the dawn of hormonal treatment, we may dare talk about the indications for synovectomy in polyarthritis, this operation should, in the first place, never be undertaken during the acute stage and, secondly, the disease, even though it is of a primary chronic type, should be in a passive stage when the exudate is indolent and shows no signs of being acute. It would seem that the E.S.R. is of lesser importance, as far as the prognosis after synovectomy is concerned. On the whole, the attitude towards indications for surgery in polyarthritis should be more conservative than in exudates of the previously-mentioned type and the cases should be selected with great care.

Total synovectomy is performed to a considerably lesser extent than partial. It seems to be best suited for such cases where there are more radical changes in the articular capsule than can be accounted for by the exudate. By this I mean such changes as osteo-chondromatosis and the villose hypertrophy known as "lipoma aborescens". Good results are reported in cases of total synovectomy. Nevertheless, the operation is more comprehensive than is the case with partial synovectomy and the duration of post-operative treatment is longer in the total than in the partial.

I would also like to say something about capsular fenestration or intramuscular drainage. The operation is, as everyone knows, most simple. When making re-examinations of eight cases upon which capsular fenestration had been performed, the observation time stretched over a period of more than ten years and in each case the hydrops had disappeared. Some writers consider that a chronic hydrops of unknown genesis should be regarded as being due to an increase in the production of synovial fluid. One might therefore think that a capsular fenestration would be an inadequate surgical intervention. That this is not necessarily so has been shown in this series.

This short résumé has not offered anything fresh as far as the treatment of knee-joint exudate is concerned nor, for that matter, any new ideas concerning it. During late years, the problem has neverthe-

less gained an increased interest and it is being tackled on different lines than before. We must hope that the investigations that are being carried out everywhere, will gradually give us a directive for a truly causal therapy in knee-joint exudates of different geneses.

S U M M A R Y

A short survey of the treatment of knee-joint exudate. In respect of conservative treatment the importance of exercising the quadriceps muscles is pointed out. With regard to my material upon partial synovectomy in *hydrops incertae causae* 75% of those re-examined were found to be free from exudate. In the case of *polyarthrititis* the percentage was only 40%.

Z U S A M M E N F A S S U N G

Kurzgefasste Übersicht über die Behandlung von Kniegelenksexsudaten. Hinsichtlich der konservativen Behandlung wird die Bedeutung des Quadricepstrainings hervorgehoben. — In einem Material von partiellen Synovektomien verbunden mit *Hydrops incertæ causæ* waren 75 % exsudatfrei bei der Nachuntersuchung. In Fällen von *Polyarthrititis* waren nur 40 % ohne *Hydrops* geblieben.

R E S U M E

Compte rendu sommaire du traitement des exsudats du genou. Par rapport au traitement conservateur, on souligne l'importance de l'entraînement du quadriceps. Dans des cas de synovectomie partielle à la suite d'hydropisie de cause incertaine, on a trouvé aux examens complémentaires qu'il n'y avait pas d'exsudat dans 75 % des cas, mais dans 40 % seulement des cas de *polyarthrites*.