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## ON LATE RESULTS FROM INFORMATION OF THE HIP IN ARTHROSIS COXÆ

Information of the hip, as is well-known, consists merely in a simple drilling through the neck of the femur up in the head. The method was given first by Graber Duvernay in 1932. In 1935 Duvernay published the results obtained with an observation period of 3 years. The material comprised 10 patients; relief from the pain was obtained in 60 % of these cases. Another series, comprising 10 patients with an observation period of 1 year was published at the same time; and here too an improvement of the condition was recorded in 60 % of the cases.

In the Scandinavian countries Hybbinette reported in 1935 some encouraging results from this treatment, with improvement in 10 out of 11 cases, and, in 1936 his assistant, Lidström reported "nearly 100 %" relief through drilling in a material comprising 41 patients.

In the Orthopedic Hospital, Copenhagen, we adopted the method, and in 1936 I reported the result of drilling in 14 patients, with primary improvement in 12 of these cases.<sup>1)</sup> In 1937 I supplemented these results, reporting a material of altogether 29 patients, with an observation period of only 1 year. There was improvement in 24 cases, relapse of the pain in 5 cases.<sup>2)</sup>

In all essentials our *technique* has been the same throughout this period. We have been well satisfied with our measuring

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<sup>1)</sup> Ugeskrift f. Læger, 1936, No. 28, p. 622.

<sup>2)</sup> Acta chirurgica Scandinav. 80: 82, 1937. These two papers give references to the literature.

technique for reaching a good way up into the head of the femur, and we have employed it with advantage also for osteosynthesis in fracture of the neck. The method has been extremely simple, as it has not been necessary to employ any sort of aiming apparatus whatever. By means of lead marks placed on the skin for roentgenography of the hip we have located the centre of the head and determined that spot on the lateral surface of the femur where the drill is to enter. The centre of the head is marked by means of a hypodermic needle in a little skin fold, or by means of an agraffe, and the entrance for the drill is marked by means of a long needle going in to the periosteum. Later, when the patient is anesthetized the latter needle is replaced by a long nail, which is driven in firmly, so that one gets precisely the optimal site for the drilling without running any risk of deviating from the proper direction (see the previous papers with reproductions of control roentgenograms).

We have used a drill with a diameter of about 6 mm. In the last year we have employed a drill with a coarse thread, which is driven in more easily than our first type of drill (with too fine a thread), and it traumatises more effectively the passage through the neck and head of the femur.

The drill is fastened in Sven Johansson's osteosynthesis apparatus and introduced under the guidance of a level ad modum Sven Johansson, corresponding to the oblique plane of the neck, which has been determined beforehand by roentgenography. As a rule a light ether anesthesia has been employed. The operation itself takes less than half an hour.

My *material* comprises 39 patients, 35 of whom have been reexamined (most of them physically, a few by questionnaire). In our estimation of the results we have taken into consideration only whether the operation has given relief from the pain; as a rule the objective findings have remained unchanged since the discharge of the patient from the hospital. According to the statements of the patients we have divided the results into *negative*, signifying that the operation has been ineffective, and *positive*, which are graded so that +++ means absence of pain, and (+) that pain is present though decidedly mitigated.

Considering this material under one—all 35 *reexamined patients*—it is found that 23 have stated they were *relieved from pain after the operation*, that is 59.8 %, with an *observation period of more than 1 year*. This figure is quite in harmony with Graber Duvernay's 60 %.

If we divide the material after the observation period, 22 patients have been under observation for more than 2 years. Of these, 13 are relieved from pain—including 2, strange to say, in whom there was no improvement primarily.

In 9 patients there has been a recurrence of the pain, within half a year in 7, within one year in 2. Percentally, then, the improvement for this whole group amounts to 56 %.

13 patients have been under observation only 1 year. In this group 10 have been relieved. In 2 cases there has been neither primary nor secondary improvement; 1 patient improved primarily, but the pain returned with half a year. Expressed in percentage the improvement for this group is 76.9 %.

In the group with an observation period over 2 years the results obtained in those patients who were relieved were classified as follows: in 2 cases the result is designated as + + +; in 5 the result was + +; in 5 it was +; and in 1 it was (+).

In the group with an observation period of one year the result was + + + in 2; + + (+) in 4; + + in 3; and + in 3.

In 1 case the post-operative course was *complicated* by phlebitis, in 1 case by slight infarction.

We now may analyse the material a little more thoroughly in order to try to find out what factors may be decisive of the result of the operation. We will look into the possible relation between the result obtained and the following conditions: age, sex, obesity, presence of contracture, unilateral or bilateral arthrosis, type of arthrosis, and number of drill channels.

To facilitate the survey, the material will be presented schematically:

|                                              | + Improvement<br>(23 patients) | No improvement<br>(12 patients) |
|----------------------------------------------|--------------------------------|---------------------------------|
| <i>Age:</i>                                  |                                |                                 |
| Under 40 years .....                         | 6                              | 3                               |
| 40—60       " .....                          | 12                             | 9                               |
| Over 60       " .....                        | 5                              | 0                               |
| <i>Sex:</i>                                  |                                |                                 |
| Women .....                                  | 17                             | 8                               |
| Men .....                                    | 6                              | 4                               |
| <i>Obesity</i> .....                         | 5                              | 2                               |
| <i>Contracture</i> .....                     | 9                              | 4                               |
| <i>Arthrosis, bilateral</i> .....            | 7                              | 3                               |
| "     right .....                            | 8                              | 6                               |
| "     left .....                             | 8                              | 3                               |
| <i>Type of arthrosis:</i>                    |                                |                                 |
| Head of femur preserved .....                | 12                             | 3                               |
| Head flattened and subluxated ...            | 11                             | 9                               |
| <i>Number of drill channels:</i>             |                                |                                 |
| 1 channel .....                              | 11                             | 7                               |
| 2 channels .....                             | 11                             | 3                               |
| 3     " .....                                |                                | 1                               |
| 4     " .....                                | 1                              |                                 |
| <i>Drilling up into the acetabulum</i> ..... | 2                              | 1                               |
|                                              | (both +++)                     |                                 |

*Age:* The idea suggests itself that this operation would not give so good results in elderly patients as in the young. This is found not to be the case, however, as 5 of the patients who improved were over 60 years old. In one patient, aged 66, the effect was +++ ; in two patients, respectively 60 and 63 years old, the effect was ++ ; in another patient, aged 64, it was + ; and in one patient, aged 70, it was (+). Among the patients who were not relieved by the operation none was over 60 years old. Indeed it is cheering to know that we are able to offer also old patients a chance of improvement through information.

*Sex:* Our material includes 25 women and 10 men. The opera-

tion brought relief to two thirds of the women, but only to half of the men. These figures are too small, however, to allow of any conclusion.

*Obesity:* Graber Duvernay holds that obesity is a contraindication to the performance of this operation. Obviously, extreme obesity will constitute a contraindication to this operation as well as to others. Moderate obesity does not exclude a good result, however, as our group of improved patients includes 5 obese.

*Contracture:* Also contracture has been pointed out as a contraindication to the operation, as the unfavourable static condition of the joint would be able to more than counterbalance the operation. Still, our material includes 9 cases of more or less pronounced contracture of the flexors and adductors of the hip. Nevertheless, good results may be obtained. So drilling, I think, ought to be tried as the first measure of treatment in any case of contracture. If necessary, supplementary resection of the obturator nerve may be performed later on.

*Arthrosis, bilateral:* Also this condition has been mentioned by Graber Duvernay among the contraindications to the performance of information. Our material includes 7 patients with bilateral arthrosis in whom the operation gave a good result, whereas 3 other patients were not benefited by it. Therefore, bilateral arthrosis, I think, is not to be looked upon as a contraindication. Among the patients with unilateral arthrosis improvement was obtained in 8 right-sided cases and 8 left-sided, while no improvement was found in 6 right-sided and 3 left-sided. But these figures may hardly allow of any conclusion.

*Type of arthrosis:* As far as I know this question has not been looked into before. But it would be very interesting if here we might find some suggestion as to what type of arthrosis offers the best chance for successful information.

Naturally cases of arthrosis may be classified in many ways. Here we have found it suitable to divide them in two main groups according to the roentgenographic findings.

Largely, the various forms of arthrosis may be divided into:

1) the type in which the head of the femur is preserved, the joint slit usually narrowed, and here as a rule osteophytes are present along the margins of the head of the femur and the acetabulum; 2) the type in which the head of the femur is flattened and as a rule subluxated upwards or outwards, or in both directions at the same time. In the latter type, marginal osteophytes are rare except for an occasional "eave-formation" on the upper margin of the acetabulum. A priori it would not seem unlikely if the unfavourable statistical data in the latter group would be found also to apply to the result of information.

Turning to the group in which the operation has not been successful, one might indeed be inclined to think that this was really the case, as 9 of the 12 poor results fall in this group. But, when then we consider the "successful group" we find a good effect from the operation in nearly the same number of cases of the two types of arthrosis. Additional investigation of larger materials will have to elucidate this particular point—and it is to be hoped that other investigators will take these conditions into consideration in analysing their materials.

*Number of drilling channels:* As yet we do not know the factors upon which the good results depend—excepting that the drilling most likely alters the circulatory conditions in the head of the femur. Several authors think it is particularly profitable to drill several channels. Considering the group of "no improvement" one might indeed feel convinced about the correctness of this view, as here we have 7 cases with only 1 drilling channel as against 4 cases with more than one channel; but these figures are rather small. Looking then upon the "successful group" we find a good effect in nearly half of the cases with only 1 channel. When the drill has a diameter of 6—7 mm. and a coarse thread, one channel probably injures the osseous structures sufficiently. The shorter the time for performance of the operation and anæsthesia in these cases, the better for the patient. At any rate, several drill channels may give an unfortunate effect—a colleague (Professor Morville) has told me about a case in which the drilling of two channels with a coarse drill was followed by a secondary fracture.

How far is the drill channel to extend? In our material it extended up through the joint slit in 3 cases; in two of these the result was + + +, in one it was negative. But, of course, these figures are all too low to allow of any conclusion whatever. We intend, however, to try to drill up through the joint slit in all the future cases, in order to see what the effect will be. It may be that this procedure will cause an increase in the exudation in the joint and in this way, perhaps, relief from the pain.

Presumable we are justified in summarizing our results as follows:

In information of the hip we have the means for relieving many patients with arthrosis coxæ from the severe pain associated with this lesion.

In a material comprising 35 patients with an observation period of 1—2 years, we have obtained a favourable effect by drilling in about 60 % of the cases. This result is in perfect harmony with the findings reported by Graber Duvernay.

In some cases the operation gives no improvement, neither primary nor secondary. In some cases the improvement comes but secondarily. In cases of relapse, this usually appears within the first six months after the operation.

Age over 60 years is no contraindication to this operation; and the same applies to obesity and the presence of contracture. Good results may be obtained in cases of bilateral arthrosis as well as unilateral.

Good results may be obtained in the two main groups of arthrosis: 1) where the head of the femur is still preserved; 2) where the head is flattened and subluxated.

Good results may be obtained by drilling only one channel by means of a coarse drill with a diameter of 6—7 mm.

It may be of advantage to drill up through the joint slit. If this operation gives no relief, we have other methods to fall back upon: resection of the obturator nerve (especially in cases of adduction contracture), arthroplasty, or arthrodesis.