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HABITUAL DISLOCATION OF THE PATELLA TREATED OPERATIVELY AD MODUM GOLDTHWAIT

BY

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During the past decade, reports have been issued from various surgical clinics in the Scandinavian countries (Kapel 1936; Wiberg 1941; Vallinkoski 1942; and Sjövall 1943), in which the problems concerning the pathogenesis and treatment of the various forms of patellar dislocation have been discussed anew, and not unessential contributions have thus been added to the fairly extensive literature dealing with the subject. Besides these Scandinavian works, mention is to be made also of the rather broad, comprehensive monograph by Blumensaat (1938), which gives a very good illustration of the stand taken, in particular by European surgeons, with a view to the pathogenesis and treatment of this lesion.

When now we find it appropriate from this clinic to present our view concerning the treatment of the lesion, especially its habitual and recurrent forms, it is because we wish to emphasize the plastic operation given by Goldthwait, which has been adopted as the standard method in this clinic. Reckoning the therapeutic results in our material from the period of 1936—1945, we think they have been so satisfactory that it is quite safe to recommend the method.

It is not my intention here to discuss the various causes of the lesion. As to this question, the reader is referred to the works of Wiberg, Sjövall and Blumensaat. Only a few remarks are to be made about the lesion in general.

Considered quite superficially, the lesion may appear to some extent as a rather ordinary inconvenience, as it belongs

to that type of dislocations, the reposition of which the patient is able to manage by himself—a trick which he often likes to exhibit. But, taking into consideration that the patella is the largest sesamoid bone of the body, and that its location in the tendon of the quadriceps femoris brings it in intimate relation to the largest hinge joint of the body as the third bone of this articulation, it is easy to understand that the continuously repeated small traumatic injuries to the joint itself and its capsular apparatus may imply the source of secondary changes in the joint as arthritis deformans and patellar chondromalacia—let alone that also the normal statics and mobility of the lower extremity may indeed be compromised through this affection.

Certain authors refuse to recognize the concept “patellar dislocation” as evidently they reckon with the patella as the sesamoid bone only, so that any abnormal shift in the position of the patella to either side is to be looked upon as a torsion of the tendon of the rectus femoris. Objection has to be raised to this view, however, with reference to the part played by the patella as the third bone in the knee-joint. Indeed, a dislocation of this bone ought to be included in the general conception of dislocation. As to the latter point, we have to reckon with a *dislocation of the patella when, owing to traumatic injury, direct or indirect, a greater or smaller part of the articular surface of the bone has left its normal anatomical placing in the grooved facies patellaris femoris in such a way as to prevent the normal movements in the knee-joint.*

Even this definition of the lesion implies a reservation, abnormal placing of the patella in the sagittal plane being excluded. In this way we avoid to reckon also the minor changes in the position of the patella in proximal and distal direction which Payr has designated as “Patellarspiel” (“play of the patella”), and which are due to the circumstance that variations in the tonous of the quadriceps may temporarily place the patella at a high or low level in relation to the articular line, *patella alta spuriae*, by which the bone may passively be displaced more or less to either side. The above definition further

excludes the variations in the location of the patella that are due to differences in the site of its development in the rectus tendon, *patella alta verae*.

One would be inclined to believe that when a bone like patella is situated in a complicated capsular apparatus it is in a safe harbor. Numerous theories have been advanced, however, to explain why the bone still is able to slip out of its normal bed. So it is not to be wondered that numerous operative measures have been suggested to deal with such an abnormal condition. Many of these methods may be said to go far beyond their aim. Thus, in 1909, Huebscher enumerated no less than 35 methods, and, in 1928 Sommer found their number increased to 60 while Blumensaat in 1938 reckoned altogether 79 methods. These methods range from radical removal of the patella (Fowler, Lorenz), through osteoplasty on the femur—in the form of osteotomy on the diaphysis (Daries-Colley 1889) or chiseling of the facies patellaris femoris (Champonnières 1889), or elevation of the femoral condyles by driving wedge-shaped fragments of bone into the condyles (Thomas 1892; Albee)—to operations on the capsule itself or on the patellar ligament and the quadriceps (Heller, Le Dentu, and others). The simplest method suggested is application of a patellar bandage of special construction (Haudeck).

Here in Denmark the operative methods preferred appear to be either the one given by Krogius or the one given by Goldthwait, occasionally a combination of both (Kapel). As to the former method, it is to be emphasized that it is not employed in our clinic, as Goldthwait's method has always been found preferable here. The reason why this plastic method has been chosen may be stated most simply by citing Goldthwait (1899) himself: "*In cases, however, similar to the one to be reported the object is not only to remedy the undesirable condition but also to leave the joint with as near the normal amount of motion as is possible, the perfection of the result being measured very largely by the freedom of movement.*"

Furthermore, the method of Goldthwait has to be looked upon as a very lenient measure that is carried out extra-arti-

cularly and extrasynovially, thus reducing the risk of infection of the joint. On the other hand, one is inclined to doubt whether this also will always apply to the method of Krogius, although both Krogius and Kapel claim that with the proper technique this method has the advantage of being extrasynovial.

Finally, the method of Goldthwait mutilates the capsular



Fig. 1.

apparatus and osseous part but very little; and, owing to the small incision in the skin, the cosmetic result is absolutely satisfactory in a great majority of the cases (Fig. 1).

Goldthwait has given two methods for the operation, the first in 1899, the second in 1904, both involving the same principles: a medial shift in the insertion of the inferior patellar ligament, so that the patella becomes tethered. After the method of 1899 the entire insertion of the ligament was moved, either by detaching the tendon from the tibial tuberosity and suture it to the insertion of the satorius (pes anserinus) or by transplanting the tibial tuberosity with the attachment of the tendon to the medial aspect of the tibia. At the same time the joint capsule was incised laterally and capsulorrhaphy performed medially.

The principle of this method cannot be said to have been worked out by Goldthwait, as Golding-Bird (1884) was the

first to suggest and perform transplantation of the insertion of the patellar ligament; and later, in 1891, Heinecke gave his method, in which the medial transplantation of the tibial tuberosity is combined with suturing of the fascia between the vastus internus and the satorius.

In 1904 Goldthwait reported that his results were equally good whether he performed the total or a partial shift of the patellar ligament. For the latter procedure he divided the ligament sagittally in the middle, detached the insertion of the latter part, made it cross the medial part and attached it by suturing beneath the insertion of the satorius. Kapel states that the lateral part of the ligament ought to cross in front of the medial part, as the anterior surface of the patella normally turns somewhat laterally, and this turn would increase if the lateral part of the ligament crossed behind the medial. In our plastic operation in this clinic we have paid no regard to this point, letting the lateral part cross in front of or behind the medial as seems most convenient in the individual case.

Our indications for this plastic operation have been:

1) Repeated definite instances of dislocation, regardless of whether or not this is accompanied by a joint reaction.

2) Cases in which the patients complain of a sensation of instability in the knee-joint, and in which the physical examination reveals such a pronounced movability of the patella when the quadriceps is contracted as to suggest that several slight instances of subluxation have brought about the sensation of instability.

3) Impairment of the working capacity.

4) Protracted duration of the symptoms.

Before operating on the patient, we have made sure that any possible signs of a present joint reaction in the form of hydrarthrosis or hemarthrosis have become quiescent on confinement to bed or application of heat. Further, through roentgenography in frontal, sagittal and axial directions we have tried to exclude the presence of deforming processes, which would otherwise prevent a good result. After the plastic operation—the proce-

ture of which is outlined in the drawing (Fig. 2)—we have always applied a circular plaster bandage, extending from the upper part of the thigh to the ankle, and the extremity has then been placed on an oblique wedge-shaped firm pillow. Usually the skin sutures are removed on the 10th day through a fenestrum in the plaster cast over the paella, and the patient

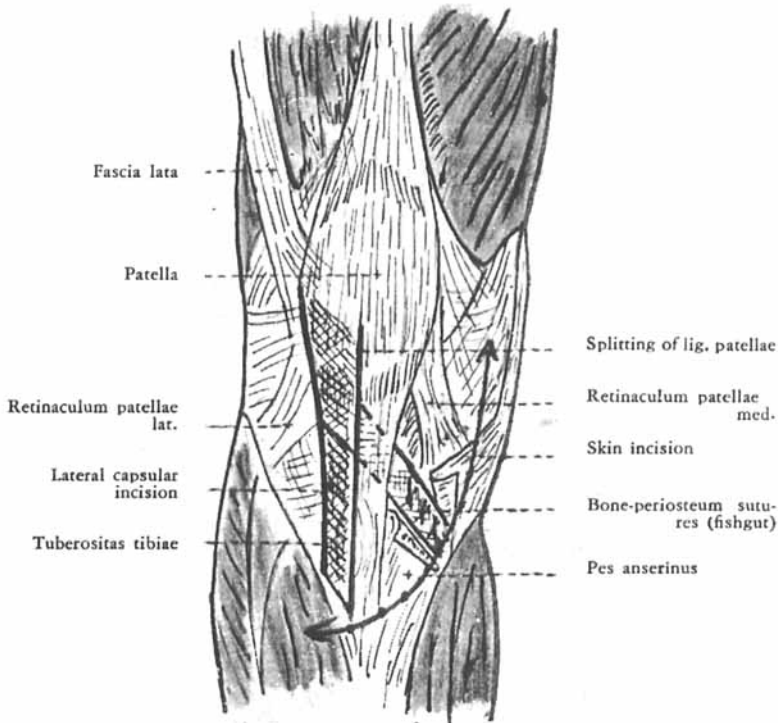


Fig. 2.

Operatio plastica a. m. Goldthwait II.

is then to perform rhythmic contractions of the quadriceps (quadriceps gymnastics). The plaster cast is removed 3 weeks after the operation, and then massage is instituted together with training in movements in the joint. The patient is not discharged from the hospital till the extension in the joint is normal and the flexion amounts at least to 90°.

On an average, the stay in the hospital has lasted 55 days (minimum, 38; maximum, 70). On reexamination, half a year later, the patients were generally found, 5—6 months after the operation, to be able fully to resume their usual work.

Our Material in the Period of 1936—1945

comprises altogether 32 patients, 23 female and 9 male. Of this total, 25 were treated operatively, while 6 female patients either refused to be operated on or presented marked roentgenographic changes in the knee-joint, so it was found more proper not to operate on them but refer them to conservative treatment with tentative bandaging or X-ray treatment. Further, 1 male patient was not operated on because, besides his patellar affection, he also presented a typical spastic hemiparesis; moreover, he was not particularly interested in operative treatment. A survey of the patient material is given in Table 1.

TABLE 1
Schematic Survey of the Patient Material.

No. of patients	Preceding Traumatic Injury			Knee			No. of patients operated	Average age (years)
	Direct	Indirect	Uncertain	R. + L.	L.	R.		
Men 9	4	4*)	1	2	3	0	8	24.5
Women 23	3	7	7	9	4	4	17	21

On reexamination of these patients, which was performed at least 2 years—and, at the most, 7 years—after the operation we have insisted on the following requirements in order to characterize the therapeutic results as good:

1. On flexion in the knee-joint to an acute angle, the patella must remain in its place between the condyles.
2. The movements in the knee-joint must be free.
3. The patient must be able to work.

*) 1 patient had typical symptoms of habitual dislocation after an amputation of the leg, at which a stump of 20 cm. was left.

4. Muscular atrophy and possible sensation of discomfort must be minimal.

The following findings were recorded:

In 1 case there was a typical relapse.

In 8 cases the patients had no complaint whatever.

In 11 cases the result was likewise fully satisfactory, but the patients complained of pain and tenderness corresponding to the site of the crossing of the two halves of the ligament when working on the knees. This applies in particular to the patients with a relatively short observation period. The patients with a longer observation period complained merely of tenderness on protracted kneeling—something which we take to signify that this after-effect is merely of transitory character.

In 3 cases there had been no patellar dislocation, but the patients complained of discomfort and a sensation of instability in the knee-joint.

All told, in our opinion, the plastic operation of Goldthwait may safely be recommended because of its simplicity and apparent effectivity.

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