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PINNING FOR SLIPPING OF THE EPIPHYSIS OF THE FEMORAL HEAD

BY

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The method of pinning slipped capital epiphyses of the femur, which was recommended by Wilson, was adopted for trial in the Orthopaedic Clinic in Stockholm in 1938. By 1941 15 cases had been operated and 9 had a sufficiently long follow-up for a judgment of the end-result. The follow-up of these cases encouraged further use of the method.

The material which I am presenting here consists of cases operated in the Vanföreanstalten in Stockholm during the years 1938-44, which Professor Friberg made available to me, and cases which were operated in the Orthopaedic Clinic in Lund, during the years 1942-46.

There are in all 38 cases, and, of these, 36 were pinned without previous reduction, one had had a closed reduction, and one an open reduction.

I will not discuss the indications for pinning in the 36 cases, but will only say that in no case was the slipping so far advanced that the operation seemed to be technically too difficult. Complications occurred in 3 cases: in one, necrosis, and in two, fracture of the femur at a place which made one attribute it directly to the pinning. I shall discuss these cases briefly.

1. A 12-year-old boy of adiposo-genital type. Had limped for 6 months. Radiography showed 2 mm. slipping of the L. femoral epiphysis.

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Pinning on 4.4.45. The first pin was inserted out of the joint's direction and went right into the posterior cortex, so that it was changed to a more central position. The final position of the pin was about 3 mm. below the joint surface of the epiphysis. In November of the same year signs of necrosis running out from the tip of the pin began to appear. In August 1946 there were more marked necrotic changes. (Fig. 1).

Fig. 1.

2. An 11-year-old girl. Symptoms for 6 months. Radiography showed very slight slipping of the R. epiphysis. Pinning on 8.11.43. Began walking with a stick on 11.12. and managed well until she fell on 11.2.44 and fractured the femur level with the head of the pin. The fracture healed in good position and at the last examination there were no symptoms from the hip. (Fig. 2).

3. A 16-year-old boy. Symptoms for 6 months. Radiography showed moderate slipping of the epiphysis. Pinning on 31.3.44. He used crutches and had not put any weight on the leg when, on 25.5.44, he fell, hitting

the hip and R. foot and fracturing the calcaneus without dislocation. A slight tendency to adduction contracture of the hip was found and he was admitted and treated with traction. On 7.8.46 the pin was removed with difficulty, the head being deeply buried in the cortex. So much of the cortex had to be chiselled away that it was not considered advisable to allow him to bear weight for quite a long time. On 15.11.46 a few days

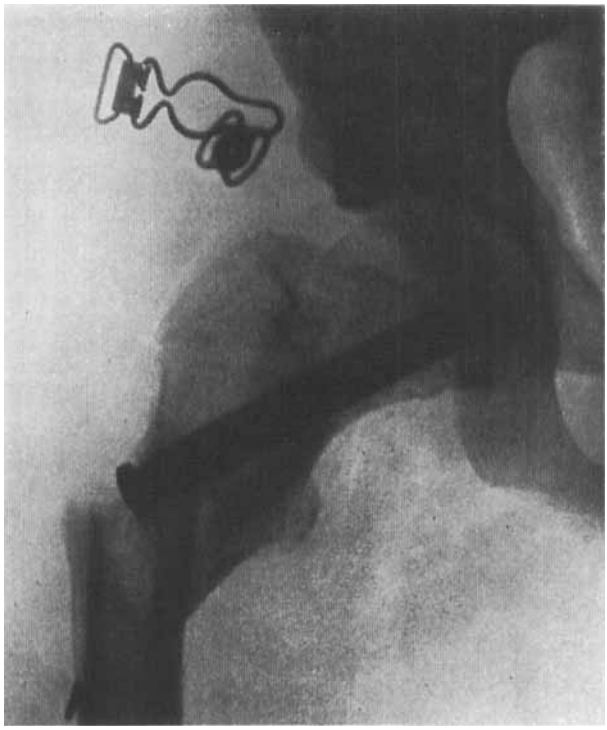

Fig. 2.

after he had been allowed to begin weight-bearing, he fell and fractured the R. femur at the site of the chiselling. The fracture healed in a good position and the hip-joint has since been symptom-free.

The case in which it seems that the complication could have been avoided is the last fracture case. It is surely better to leave the pin in, when the head is so deeply buried as in this case. In the 8 cases where it has been left, there appears

to have been no trouble from it. In the other case, where the femur fractured, one cannot blame the operation, but it is significant that the femur was less resistant due to the cortical defect produced by the pinning.

In the case where necrosis developed, one must wonder

Fig. 3.

whether the alteration of the position of the pin during operation could have damaged the vessels and caused the necrosis. All one can say is that such changes of the pin's position were also done in two or three other cases without any complication, but one must admit that the less the trauma done to the bone, the smaller must be the risk of this complication. One may also wonder whether one ought not to drive in the pin to only just within the epiphysis. I have stated elsewhere that it is

certainly not necessary to aim at the same firm fixation as in a fracture of the femoral neck, where the pin must go as far as possible into the capital fragment; it is probably sufficient if the epiphysis is attached to the neck by allowing the pin just to enter the epiphyseal cartilage. It is often difficult to deter-

Fig. 4.

mine from the radiographs when this position is reached, but it is certain that both the spongiosa and the vessels are spared if such a position is achieved.

Before the pinning method was introduced a conservative treatment which consisted of sparing the affected hip, so that the slipping should if possible not increase, was used. This, of course, led to increased weightbearing by the healthy side

and in 15-25 % of cases slipping occurred also in the healthy hip. Even if pathological changes in the region of the epiphysis are the main reasons for the slipping, it has been thought that the weight-bearing factor also plays a part. If, after pinning, the patient is allowed to weightbear on the operated hip rela-

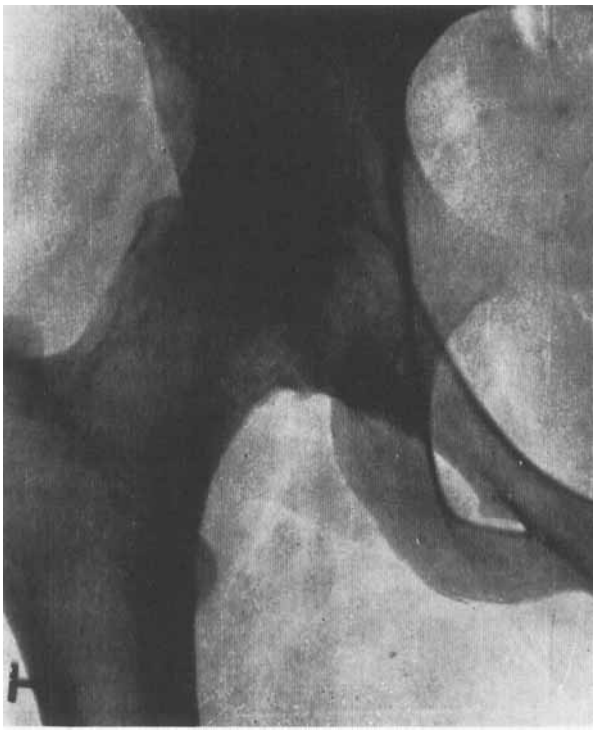

Fig. 5.

tively early, weightbearing should be reduced on the other, healthy side and thus one might expect that there would be less bilateral involvement in pinned than in conservatively-treated material. 24 patients have now reached the age of closure of the epiphyses, so that one can judge in them the incidence of bilateral involvement. In 5 cases slipping has occurred on the second side so that there is no difference in

the incidence of bilateral involvement compared with earlier reports. The material is, however, still too small to allow one to say whether slipping occurs on the sound side less frequently in the cases where weight-bearing on the operated side was begun especially early. However, it certainly appears to be so, and I now allow the patient to get up and begin weight-bearing so soon as the wound is healed, that is to say after about 1 week.

Finally, I will briefly discuss the 2 cases which had reductions.

Both were cases in which there appeared to have been an acute slipping a few days before admission.

The first case, where closed reduction was done, was that of a 14-year-old girl, who fell off her bicycle on 31.7.44; on admission the same day radiography showed a complete slipping of the epiphysis on the R. side. The hip was pinned on 4.8.44 after closed reduction of the epiphysis to a better position. The pin was driven a little too far in and was pulled out ½ cm. during the operation. Control radiography after operation showed that the pin was still too far in, and on 18.9.44 it was removed. On 26.10.44 she began weightbearing. Later, necrosis appeared; it was already visible on the radiographs in Dec. 1944 and in April 1945 it involved a larger part of the epiphysis. (Figs. 3, 4, 5).

One can hardly draw conclusions from one case. Reduction has earlier been shown to be risky, and in addition the pin was unnecessarily long.

The other case was that of a 15-year-old boy, who had had symptoms from the R. hip for 9 months; they had become more acute after a long walk 14 days before admission on 15.6.45. The hip was pinned on 20.6. and there were no postoperative complications. On 10.8. he sat on a sofa which fell over; there was severe pain in the L. hip and radiography showed complete slipping of the L. capital epiphysis. At operation on 14.8. arthrotomy showed that the epiphysis was completely separated. It was easily replaced in correct position and was joined to the neck with a pin. He began weightbearing after 6 weeks, and there were no post-operative complications. Examination now, 10 months after operation, shows no signs of necrosis and the joint is symptom-free.

My only comment on these 2 last cases is that an open reduction can be more gentle than a closed. The manipulation

of reduction may risk damage to the ligamentum teres. which in such a condition as an acute separation plays an important part in the vascular supply of the head. I should think that in fresh, complete separations of the epiphysis an open, very gentle reduction is indicated.

I consider that the results of pinning slipping capital epiphyses of the femur are so satisfactory, and the advantages to the patients so evident, that the complications described do not constitute contraindications to its use. Consideration of these observations may perhaps lead to better results.

SUMMARY

The author reports 38 cases of slipping of the capital epiphysis of the femur treated by pinning according to Wilson's method. 36 cases were pinned without preliminary reduction, and 2 after reduction, one open and one closed. Complications developed in 3 out of the group of 36 cases: one partial necrosis of the head, and 2 fractures of the femur at the level of the head of the nail. The final result was good in all. Of the 2 cases with preliminary reduction the case with open reduction had a normal post-operative course, while the closed case developed extensive necrosis of the epiphysis.

From these complications one may perhaps draw some conclusions on the operative treatment of slipping of the capital epiphysis of the femur.

RESUME

L'auteur rend compte de 38 cas d'épiphysiolyse de la tête du fémur traitée par enchevillement d'après la méthode Wilson. 36 cas ont été enchevillés sans reposition préliminaire et 2 après reposition, l'une ouverte, l'autre fermée. Sur un groupe de 36 cas, il y a eu des complications dans 3, une nécrose partielle de la tête fémorale et 2 fractures du fémur au niveau de l'enchevillement. Le résultat final a été bon dans tous les cas. Sur les deux cas avec reposition préliminaire, il

se développa une nécrose extensive de l'épiphyse dans le cas à reposition ouverte.

Ces complications permettent de tirer des conclusions quant au traitement opératoire de l'épiphysiolyse de la tête fémorale.

ZUSAMMENFASSUNG

Verfasser berichtet über 38 Fälle von Epiphysiolyse des Caput femoris, die durch Nagelung nach der Wilson'schen Methode behandelt wurden. 36 Fälle wurden ohne vorhergehende Reposition genagelt und 2 nach Reposition, einer blutig und einer unblutig. Unter diesen 36 Fällen entstanden Komplikationen in 3 Fällen, eine partielle Nekrose des Caput und 2 Femurfrakturen in Höhe des Nagelkopfes. Das Endergebnis war in allen Fällen gut. Von den beiden Fällen mit vorhergehender Reposition hatte der Fall mit blutiger Einrichtung einen normalen postoperativen Verlauf, während sich in dem unblutigen Falle eine ausgedehnte Nekrose der Epiphyse entwickelte.

Aus diesen Komplikationen darf man vielleicht für die operative Behandlung der Epiphysiolyse des Caput femoris einige Schlüsse ziehen.