

From the Norfolk and Norwich Hospital, England.

ISCHIOFEMORAL "V" ARTHRODESIS OF THE HIP JOINT POSTERIOR APPROACH

By

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Ischiofemoral "V" Arthrodesis of the hip joint was originally described by *Brittain* and used mainly for osteo-arthritis. A long Smith-Petersen nail is used to fix the joint, and an infra-articular ischiofemoral bone graft inserted. *Brittain* kindly allowed me to make a preliminary report on the short-term results in 37 patients at the Spring Meeting of the British Orthopaedic Association in 1950. In this series there was an 82 per cent rate of fusion of the graft which was considered sufficiently encouraging to continue using this method, and between June 1948 and January 1955 the operation was done 123 times at the Norfolk & Norwich Hospital.

It was possible to review the late results in 105 of these 123 patients and of these 95 had satisfactory bony union of the graft, indicating a 90 per cent rate of bony fusion. One patient had a satisfactory clinical result, but fusion was not confirmed by recent X-ray. Four patients had established non-union.

One advantage of this type of arthrodesis, where knee-bending is encouraged early, is that stiff knees do not occur. 75 per cent of the patients regained full movements of the knee joint and the remainder regained at least 90° of flexion.

The problem of backache must be mentioned as some Surgeons consider it a contra-indication to fixation of the hip joint. After reviewing these 105 patients I found that if mild recurrent low backache was present before the operation it often improved or disappeared once the deformity had been corrected and the hip rendered stable and painless. Sometimes backache persisted but most patients considered it a minor disability. I consider that lumbar backache with radiological signs of osteo-arthritis of the lumbar spine is not a contra-indication to arthrodesis of the hip.

COMPLICATIONS

The two most frequent complications in this series were:—

1. *Fracture of the femur at the site of insertion of the graft.* This occurred in fourteen patients as a result of torsion or angulatory strains at varying times after operation.
2. *Fracture of the bone graft.* This occurred fourteen times. The fracture consisted of a crack and was always due to an injury or fall occurring during convalescence. Eleven of these crack fractures joined up rapidly, three with enlargement of the graft. Two fractures formed a fibrous union with good clinical results. One graft absorbed and a further graft was inserted with a successful result.

Sciatic Palsy:

The sciatic nerve has been damaged twice. In spite of exploration and removal of the nail, one patient is left with a permanent total sciatic nerve palsy. The other patient made a partial recovery but has weakness of dorsi-flexion of the foot and has to wear a toe-raising splint. Clearly this is by far the most serious complication and in my opinion one sciatic palsy is one too many.

The analysis of the results in these 105 patients made it clear that this was a successful operation, giving bony fusion of the ischiofemoral graft in 90 per cent of patients. The most serious complication of sciatic palsy appeared to be under the control of the Surgeon if the operative approach to the hip joint was altered. This dreadful hazard could be eliminated by seeing the sciatic nerve and retracting it away from danger.

Because of this, in 1956 I began to do the operation from behind with the patient lying prone (Fig. 1). Through a postero-lateral incision I was able to see the sciatic nerve and retract it. Soon certain other advantages became apparent. Correction of the common deformity of external rotation was made possible by dividing the posterior capsule, a correction which is impossible through the lateral approach. Division of the ilio-psoas tendon was still possible if this proved necessary as the lesser trochanter lies posterior to the inferior part of the femoral neck. Under direct vision the bone graft could be steered into the ischium without any doubt about its position in bone, whereas with the original technique there was often difficulty in obtaining adequate lateral radiographs in obese patients and sometimes the graft did not

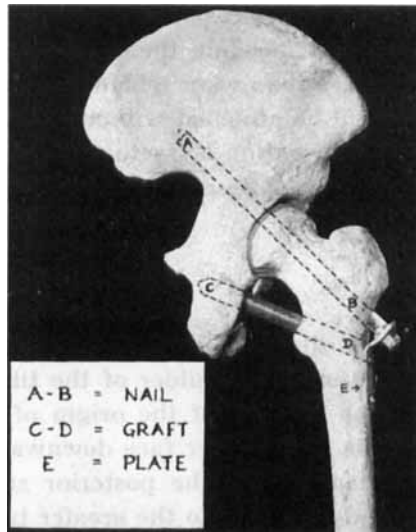


Fig. 1.

Posterior view of specimen of right hipjoint and pelvis on which this arthrodesis has been done.

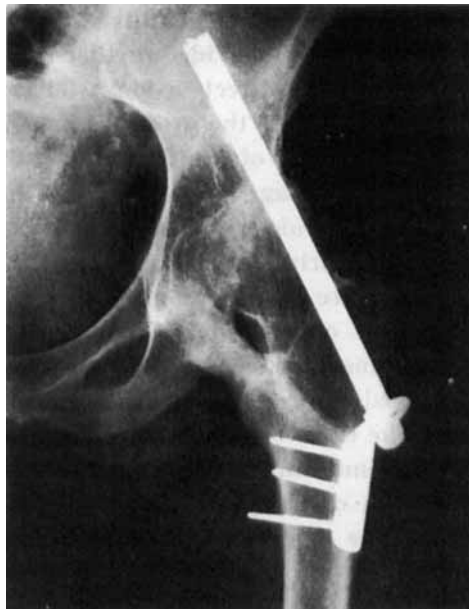


Fig. 2.

Radiograph of left hipjoint in man aged 70 two years after operation, with sound ischiofemoral bony union.

enter bone, or its position was equivocal. The muscle-splitting postero-lateral approach caused less bleeding than the muscle cutting lateral approach and blood transfusions were seldom necessary (Fig. 2).

A three-hole plate could be attached without difficulty to the outer end of the nail, thereby preventing a fracture of the femur at the site of insertion of the graft though I agree that this can be done equally well through a lateral incision.

Operative Technique:

Under a tourniquet with the patient lying on his back, a 5" long graft is taken from the antero-medial shoulder of the tibia. Any adduction deformity is corrected by division of the origin of adductor muscles after which the patient is turned over face downwards.

The skin incision extends from the posterior superior iliac spine obliquely downwards and outwards to the greater trochanter and then downwards along the femur for five inches. The underlying fibres of the gluteus maximus are divided and split and the incision extended down the lateral aspect of the upper femur. The sciatic nerve is found and retracted medially, revealing the posterior aspect of the hip joint, ischium, pelvis and greater trochanter. At this stage the posterior capsule or the ilio-psoas tendon can be divided further to correct deformity before the joint is fixed. Under direct vision a 30 cm. guide wire is inserted from the lateral aspect of the greater trochanter through the upper posterior part of the neck of the femur into the femoral head and on into the pelvis. At this stage an antero-posterior X-ray is taken to check the position of the guide wire, and if it is satisfactory a nail of the appropriate length is driven over the guide wire into the pelvis to fix the hip. The guide wire is then removed.

One inch below the site of insertion of the nail a hole is drilled through the outer and inner cortices of the femur into the ischium. This drill track is enlarged with successive drills until there is a track a half-inch in diameter. The tibial bone graft is pointed and driven along the track through the femur into the ischium. This produces sound three-dimensional fixation of the hip. The outer end of the graft is trimmed, a three-hole plate applied and the wound closed.

Post-Operative Care:

The patient is encouraged to bend the knee over the side of the bed as early as possible, usually three or four days after the operation. This

is important as a means of obtaining early full movements of the knee. One joint has been fixed and therefore the patient must rely on the adjacent joint being fully mobilized.

The stitches are removed at two weeks and the patient is allowed up on crutches at three weeks.

Discussion on Operative Technique:

Between January 1956 and December 1961 I have used this technique in 23 patients and in reviewing the results I have been convinced that this approach has certain advantages.

There has been no damage to the sciatic nerve. The inner end of the bone graft has always been in bone. Deformities have been easier to correct and therefore a more ideal position of arthrodesis has been obtained. In none of them has a fracture of the femur occurred. As in the original series mentioned above, there was a high rate of ischiofemoral bony fusion and all 23 patients obtained radiological ischiofemoral fusion, one patient developing intra-articular fusion as well. All patients regained pre-operative range of movements of the knee.

Unfortunately, there is one complication which has not been avoided by this method, this being a stress fracture of the bone graft as in the original series, and it still seems to occur because of the angulatory strains before the graft has become vascularized and strong. The danger period is about ten weeks after the operation, and perhaps a short hip spica might prevent this tiresome though not serious complication.

In this series the graft sustained a stress fracture in 4 patients in the first three months. Three joined up solidly without immobilization or special treatment. The fourth failed to unite but the patient gained intra-articular fusion, which was satisfactory.

Mechanical failure of metal fatigue in the bending of metal nails has occurred but this does not seem to affect the end result and is usually discovered by chance on the radiograph which is taken at intervals after the operations. In this series the nail has bent a little in three patients and cracked in three patients, but this made no difference to the sound bony fusion of the graft. Recently I have designed some stouter Triffin nails made of Titanium which may prove to be stronger than the original stainless steel S.M.O. nails, and thereby prevent this fault.

One patient developed a swollen leg from deep venous thrombosis, a complication which, unfortunately, can occur after any major operation on the hip joint.

CONCLUSION

This is a small series, but I feel justified in publishing the results for two reasons. Firstly, the indications for arthrodesis are diminishing and one has to wait longer to obtain the larger figures mentioned in the original series. Secondly, this posterior approach for ischiofemoral "V" arthrodesis has made the operation not only easier, but less hazardous and my experience of having done the operation 63 times through the lateral approach endorses this view.

Arthrodesis is only a partial solution to the problem of unilateral osteo-arthritis of the hip joint, but it cannot deteriorate as an arthroplasty can, and its chief merit is its permanence. The patients can be discharged once bony fusion has taken place and I believe it will always have a place in the treatment of arthritis of the hip joint until an operation is found which produces a permanently painless, stable, mobile hip joint.

My experience with ischiofemoral "V" arthrodesis has convinced me that when an arthrodesis is indicated this is a relatively sure way of achieving the desired result with a high rate of bony fusion of 95 per cent.

SUMMARY

1. An account of a new posterior approach to the operation of ischiofemoral "V" arthrodesis designed to avoid certain complications occurring in the original series of 105 patients operated on between 1948 and 1955.

2. A review of the results of 23 patients operated on between 1956 and 1961 by the new posterior approach.

RESUME

1. Compte rendu d'une nouvelle approche postérieure dans l'opération de l'arthrodèse ischio-fémorale « V », désignée comme permettant d'éviter certaines complications constatées dans une série de 105 malades opérés entre 1948 et 1955.

2. Examen des résultats obtenue chez 23 malades opérés entre 1956 et 1961 par la nouvelle approche postérieure.

ZUSAMMENFASSUNG

1. Ein Bericht über einen neuen rückwärtigen Zugang bei der ischiofemorale „V“ Arthrodesis, der entworfen wurde um gewisse Komplika-

tionen, die bei der ursprünglichen zwischen 1948 und 1955 operierten Reihenfolge von 105 Patienten auftraten, zu vermeiden.

2. Eine Übersicht der Ergebnisse bei 23 mittels des neuen rückwärtigen Zuganges in den Jahren 1956 bis 1961 operierten Patienten.

ACKNOWLEDGEMENTS

I am grateful to the followings Surgeons for having allowed me to follow up their cases: Mr. S. W. Davidson, Mr. A. B. King, Mr. J. G. Taylor.

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