PSEUDARTHROSION OF THE HIP JOINT

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The problem of disabling osteoarthritis of the hip is difficult when only one hip is involved, far more so when both are affected. The orthopaedic surgeon is largely concerned with the improvement of function, and with operations of choice rather than of necessity; but in cases of severe osteoarthritis of the hip, with its progressive interference in work, recreation and sleep, any relief that he can give by operation becomes a matter of necessity. The operations available include arthrodesis, arthroplasty, pseudarthrosis, osteotomy (McMurray 1935) and denervation of the joint (Tavernier and Godinot 1945). It is the object of this article to describe one of these methods—pseudarthrosis—and to report on the long-term results. It is well that every surgeon should appreciate the facts about each of these operations—its magnitude, reliability, capacity to restore activity and function of the hip, its demands upon other joints (particularly those of the lumbar spine) and the duration of the relief that can be expected.

In the past, the operation most frequently employed for the relief of osteoarthritis of the hip has been arthrodesis. This is often successful in relieving pain and securing stability at the expense of movement. But the hip was designed to move; and movement in or near the hip is desirable for both sitting and walking. When the hip is fused, excessive strain is thrown on the lumbar spine, which in elderly persons is frequently itself the site of degenerative changes. Cup arthroplasty of the hip joint, a severe operation designed to restore movement and preserve stability, is still under trial. It is possible that further advances may place it in the category of reliable operations with lasting benefit, but evidence is, as yet, incomplete. Osteotomy of the type advocated by McMurray (1935) relieves pain in selected cases but is by no means applicable to all. Prolonged post-operative plaster immobilisation is necessary but is not borne well by older patients. Cordotomy is a grave and uncertain expedient. Manipulation seldom relieves pain. Tavernier and Godinot (1945) claim success for denervation but confirmation is still lacking. The injection method of Waugh (1945) is only occasionally effective.

The operation of pseudarthrosis, as first performed by Girdlestone in 1923, was a modification of the method advocated by Sir Robert Jones (1921) for ankylosis of the hip joint, in which the greater trochanter with its attached muscles was attached to the stump of the femoral neck after excision of the head. The term pseudarthrosis of the hip joint implies in this paper excision of the head and neck of the femur and trimming of the acetabular rim. The advantages claimed are: 1) that it relieves pain; 2) that it corrects deformity; 3) that it restores free movement; and 4) that the benefit gained is permanent. Moreover, a remarkable degree of stability is preserved.

TECHNIQUE OF OPERATION

The approach employed is that originally described by Smith-Petersen (1936). This has the advantage of preserving the important medial rotator muscles—the tensor fasciae latae and the anterior fibres of the gluteus medius—with their nerve supply. The branches of the lateral femoral circumflex artery are caught before division and ligated. In extending the deep incision backwards round the crest of the ilium a sufficient margin of fascia is left to facilitate reattachment of the muscles. The joint capsule with its synovial lining is removed.
in front, above and below. With a broad gouge the anterior and upper rim of the acetabulum is removed. The gouge enters the bone half an inch above the upper margin of the acetabulum and is directed to reach the socket an inch or so inside. This is an important technical detail which permits easy dislocation of the head of the femur from the acetabulum and minimises the shock that is often associated with forcible dislocation. Rotation of the limb is controlled by an assistant who turns the head and neck of the femur out of the wound. The neck is divided at its distal end, preferably with a hand-saw or a Gigli saw, and the head and neck are removed (Fig. 1). Sharp edges of bone are smoothed with a nibbling forceps or fine chisel. The wound is closed, steady traction on the limb being maintained by an assistant.

**Fig. 1**

Typical radiographic appearances after pseudarthrosis. The head and neck of the femur have been excised completely and the prominent rim of the acetabulum has been bevelled off.

**Post-operative management**—The limb is suspended from a suitable beam in a Thomas’s splint with Pearson knee-flexion attachment, the knee resting in about 30 degrees flexion. Traction is maintained throughout the period of splintage; it must be sufficient to preserve normal length. The patient lies flat at night to prevent flexion deformity, but sits up freely during the day. It is important that lateral rotation be avoided; the limb should rest in the neutral position. Two weeks after operation, quadriceps exercises with assisted active flexion and extension of the limb are begun. The Thomas’s splint is retained for four weeks, after which it is replaced by Russell traction, using pulleys as advocated by Dommisse and Nangle (1947). This allows for massage and for graduated active and passive exercise.
of the hip and knee. After eight weeks the patient is encouraged to stand on the sound leg; a week later he walks in a bucket-top caliper with crutches, and after a further week two sticks are substituted for the crutches. Ultimately he learns to walk with the aid of one stick held in the opposite hand. He is advised to wear the caliper constantly during the day for the first six months and afterwards for all active pursuits. It should be regarded as a friendly and helpful tool designed to give greater activity and to spare the limb from strain and undue shortening. The importance of efficient post-operative treatment cannot be over-emphasized. Without it the most technically brilliant operation may be useless.

RESULTS

Ninety-three patients have been reviewed. The average age at the time of operation was fifty-five years; the oldest was seventy-five years and the youngest twenty years. Thirty-nine patients were men and fifty-four women. The indications for operation are shown in Table I.

**TABLE I**

**Classification of Primary Disease in Ninety-three Patients Treated by Pseudarthrosis**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Patients Treated by Pseudarthrosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteoarthritis:</td>
<td></td>
</tr>
<tr>
<td>Unilateral</td>
<td>59</td>
</tr>
<tr>
<td>Bilateral</td>
<td>14</td>
</tr>
<tr>
<td>Ankylosing spondylitis</td>
<td>11</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>1</td>
</tr>
<tr>
<td>Septic arthritis</td>
<td>1</td>
</tr>
<tr>
<td>Ununited fracture of femoral neck</td>
<td>5</td>
</tr>
<tr>
<td>Unreduced fracture-dislocation</td>
<td>1</td>
</tr>
<tr>
<td>Tuberculous arthritis</td>
<td>1</td>
</tr>
</tbody>
</table>

Patients classed as having good results gained complete relief from pain and were able to walk well with the aid of a stick. About 30 degrees of active flexion was regained. Passively, there was flexion to 80 degrees, abduction and adduction to 30 degrees, medial rotation to 10 degrees and lateral rotation to 30 degrees. The average shortening of the limb was one and a half inches. The result was classed as good in eighty-three cases and poor in seven cases. Three patients died as a result of the operation.

In cases of bilateral osteoarthritis six patients whose more painful hip had been operated on gained satisfactory relief and were able to walk with the aid of two sticks or crutches. Five patients whose opposite hip had previously undergone arthrodesis walked with the aid of two sticks; it is noteworthy that of these five, two later developed stress fractures in the subtrochanteric region on the side of the fusion. One required abduction osteotomy, but both are now walking well with the aid of two sticks. Although the results are less satisfactory in bilateral disease the relief that can be gained—if only in one hip—is nevertheless sufficient to make the operation well worth while. The best results so far obtained in bilateral osteoarthritis are those in which arthrodesis was performed on one side and pseudarthrosis on the other.

*Unreduced fracture-dislocation of the hip joint*—The single patient in this category gained an excellent result. The operation was performed at the age of twenty-six years. Six years later she stands and walks well without pain, and there is active hip flexion of 80 degrees.

*Tuberculosis*—One patient with tuberculosis of the hip was operated upon. There is no sign of reactivation four years later. She walks well with a stick; she is able to climb stairs and to walk short distances without a stick. The hip is painless, but there is a shortening of one and a half inches. Pseudarthrosis in this case was an alternative to amputation; the destruction was so extensive as to make arthrodesis impracticable.

*Septic arthritis*—The first patient in this series, submitted to operation in 1923 for septic
arthritis, is able to walk quite long distances even at his present age of seventy-eight years. *Rheumatoid arthritis*—Only one patient has been operated upon. The result was unsatisfactory owing to the polyarticular nature of the disease. Pseudarthrosis is probably not advisable in this disease.

*Ununited fractures of the femoral neck*—Pseudarthrosis has been employed in cases of non-union as well as in those in which union has occurred but degenerative arthritis has supervened. It has also been used when degenerative arthritis has followed osteotomy performed to obtain union of the femoral neck. Avascular necrosis in the femoral head is usually responsible for complications of this kind. The results in cases of non-union, as in cases of osteoarthritis, were good.

![Fig. 2](image)

In this case of ankylosing spondylitis a satisfactory range of movement at both hips has been regained after bilateral pseudarthrosis.

*Ankylosing spondylitis*—Eleven cases have been reviewed—seven after unilateral pseudarthrosis and four after bilateral pseudarthrosis. With one exception the results were satisfactory. In the ten successful cases the patient was able to walk reasonably well with two sticks and to sit with comfort. Passive flexion at the hip level averaged 70 to 80 degrees; and there was adequate stability. In this distressing disease skeletal rigidity may extend from the skull to the ankles. In these circumstances movement at one or both hips is essential if the patient is to walk or sit. One case in the series was of this type. After bilateral pseudarthrosis he is able to walk with the aid of two sticks and has regained 50 to 60 degrees of movement at both hips six years after operation (Fig. 2). Another patient has a good range of well-controlled movement in the pseudarthrosis twenty years after unilateral operation. In the light of more recent work bilateral pseudarthrosis is recommended in this disease. Moreover, a raised sedimentation rate is not regarded as a contra-indication to operation; in one case with persistent severe pain in the hip, operation was performed in the presence of a sedimentation rate as high as 120 millimetres in one hour (Westergren).

**Comment on poor results**—Seven poor results were recorded. One patient with rheumatoid arthritis, although relieved of pain in the hip, was subsequently unable to walk well because of involvement of other joints. In two cases a spur developed on the femoral stump which impinged against the acetabulum—a complication that would have been avoided by careful bevelling. Operative remodelling of the surfaces is advised in these circumstances. Two patients with bilateral osteoarthritis, who had arthrodesis of one hip and pseudarthrosis on
the other, subsequently developed stress fracture of the subtrochanteric region on the side of arthrodesis. In each case satisfactory union was secured, and both patients are able to walk with the aid of sticks. In one of the earlier cases the head of the femur was left in the acetabulum; this led to ankylosis. Strict adherence to standard operative technique would have prevented such a result. One patient so obese that post-operative management was difficult—and satisfactory fitting of a caliper impossible—had a residual lateral rotation deformity and poor function. Adequate post-operative traction through a Steinmann's pin would probably have prevented this. Another patient classed as having a poor result was a man of fifty-seven who was disappointed in not being able to play games after the operation, although he was able to walk with the aid of sticks and was relieved of pain. It is felt that the scope and nature of this operation is to relieve pain and to restore mobility and limited function. It does not restore normality.

SUMMARY

1. The operation of pseudarthrosis of the hip joint is described and the results are assessed in ninety-three patients.
2. The result was good in eighty-three cases and poor in seven cases. Three patients died as a result of the operation.
3. Pseudarthrosis is the most satisfactory and the most reliable operation: 1) in ankylosing spondylitis, and 2) in patients over sixty years of age with disabling osteoarthritis.
4. The more formidable operation of cup arthroplasty may prove to be superior in younger patients with osteoarthritis.

I am indebted to Mr G. R. Girdlestone, Mr W. B. Foley, Mr J. C. Scott and Professor J. Trueta for permission to investigate their case records, and for advice and criticism in the preparation of this paper: and to Dr F. H. Kemp of the Radiological Department. I also wish to thank members of the photographic and secretarial staff of the Wingfield-Morris Orthopaedic Hospital for their help.

REFERENCES

GIRDLESTONE, G. R. (1945): Proceedings of the Royal Society of Medicine, 38, 363 (Section of Orthopaedics, 17).