

## GIRDLESTONE'S OPERATION: A FOLLOW-UP STUDY

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A study was made of 43 patients (48 hips) operated for diseases of the hip using Girdlestone's method. The follow-up time ranged from 2.5 to 13 years. For assessment of the post-operative results the following parameters were taken into consideration: pain, range of movement, gait and the patient's opinion. These were studied separately and in relation to the type of disease, the patient's age, and the time which had elapsed since the operation. Pain decreased in a considerable number of the patients and range of movement and gait improved. The patients were generally in favor of the operation, and felt it had had a beneficial effect on their condition.

*Key words:* Girdlestone's operation, assessment of results; hip disease

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The removal of the head and neck of the femur is one of the time-honored operations used for the management of diseases of the hip (Schmalz 1817 and White 1824, quoted by Francillon 1934, Fock 1861, Blenke 1899). It was brought to notice by Girdlestone (1945), whose name it now bears, and has been used by him in cases of tuberculosis and/or a variety of painful conditions of the hip joint which were resistant to conservative treatment.

As a method of operative treatment of osteoarthritis of the hip, Girdlestone's operation has lost much of its appeal in the last few years, with the coming of total arthroplasties of the hip. However, there appears to be a renewed tendency to use this method, since the period of completely satisfactory function of total prostheses has passed, and there are instances where this operation has been unsuccessful.

## MATERIAL

Between the years 1958 and 1969, 54 patients underwent Girdlestone's operation for a variety of diseases of the hip. Forty-three of these patients were re-examined. Out of the remaining 11, two had died, one had a total arthroplasty at another hospital, and eight could not be traced. Out of 43 patients followed up, 40 were female (93 per cent) and three were male (7 per cent). The age of the patients ranged from 17 to 79 with an average of 50. Thirty-two patients presented with bilateral lesions, five with right hip and six with left hip lesions.

In the majority of patients with bilateral involvement (osteoarthritis) only the hip with the more severe symptoms was operated upon. However, five patients underwent bilateral surgery, four of them because of osteoarthritis and one because of rheumatoid arthritis. Thus the operation was performed on 48 hips, 27 right and 21 left hips. In two cases of high congenital dislocation of the hip the procedure was followed by subtrochanteric osteotomy of the Milch-Batchelor type.

The patients suffered from the following conditions: Osteoarthritis (O.A.) secondary to congenital dislocation of the hip (C.D.H.); O.A. second-

dary to osteochondritis; O.A. after cup arthroplasty (cup and neck removed elsewhere); high C.D.H.; pseudarthrosis following fracture of the femoral neck; operated neck fracture—aseptic necrosis; operated neck fracture with pseudarthrosis—aseptic necrosis; operated fracture of the neck, pseudarthrosis infection; pseudarthrosis of the neck and fracture—Austin-Moore removal; rheumatoid arthritis with dysplasia of left hip; aseptic necrosis of head because of sickle cell anemia; septic arthritis of the hip.

All patients presented with severe limitation of movement, severe or very severe pain and limp. Some were crippled to such an extent that they were unable to get out of bed unaided.

## METHODS

Skeletal or skin traction was applied for 12 weeks, and the patients received a course of physiotherapy. Weightbearing was gradually started 3 months after the operation.

The long post-operative period was aimed at:

1. Avoiding marked shortening and lateral rotation of the limb.
2. Achieving a satisfactory range of active movement.
3. Reducing the instability of the hip to some extent.

Additional operations on the operated hips were performed in five cases (two subtrochanteric osteotomies, two iliopsoas transfers and one tenotomy of adductor). Five operations were performed on the contralateral hip (one arthrodesis of the hip, one Pawel's osteotomy, one intramedullary nailing of the femur, one arthrodesis of the knee and one triple arthrodesis). There were six post-operative complications, viz., one thrombophlebitis, one pulmonary embolism and four infections, all of which were treated conservatively except for two of the infections which were treated by surgery.

## RESULTS

The following parameters were taken into consideration for the assessment of the results of the operation: pain, range of movement, gait, patient's opinion. These were studied separately and in relation to the type of disease, the patient's age, and the time elapsed since the operation. The final assessment of our results was based on the above-mentioned factors.

## Pain

This is assessed in various ways by the different patients, a fact which renders its grading difficult and inaccurate. Our patients were, nevertheless, divided into five groups.

1. *No pain*: The operated hip was not painful even after exercise.

2. *Slight pain*: Temporary pain, especially after exercise, which did not interfere with the patients' activities and was not taken into consideration by them.

3. *Medium pain*: Pain even after light exercise, which interfered with normal activities, but disappeared with rest or analgesics.

4. *Severe pain*: Continuous pain, worse after exercise, greatly influencing the patients' activities, and only improving with rest or analgesics.

5. *Very severe pain*: Continuous pain, rendering work impossible, keeping the patient bedridden for long periods and finally causing complete disablement.

All patients presented pre-operatively severe or very severe pain. Reference is made to 43 patients, not to 48 hips, as it was found that the bilateral operations gave similar results in both hips.

*Assessment according to the type of disease.* The results of Girdlestone's operation regarding pain are as follows: No pain, 11 patients (26 per cent); slight pain, 20 patients (46 per cent); medium pain, 8 patients (19 per cent); severe pain, 3 patients (7 per cent), and very severe pain, 1 patient (2 per cent), i.e. 72 per cent of the patients were relieved from pain or had only slight complaints. The nature of the disease does not seem to be correlated with the results of the operation. It is interesting to note that very severe and paroxysmal pain in the case of sickle-cell anemia was not modified by the operation.

*Assessment according to the age of the patients.* The patients were divided into three groups. The first group included

patients operated upon between the ages of 15 and 35 (7 patients), the second group included patients aged 36 to 55 (28 patients) and the third group included patients over 56 (8 patients).

Three of the seven patients (42.8 per cent) in the first group were free of pain while 13 patients (44.8 per cent) in the second group (middle age) and 5 (62.5 per cent) in the third group (old age) had only slight pain.

*Assessment according to time elapsed since the operation.* The patients were divided into three groups: 1st group: reviewed 2.5 to 6 years after operation (14 patients), 2nd group: reviewed 7 to 9 years after operation (12 patients), 3rd group: reviewed 10 to 13 years after operation (17 patients).

Severe pain was noted in the recently operated patients: In the 1st group there were three patients with severe pain (21 per cent); in the 2nd and 3rd groups there were no patients with severe pain. The percentage of patients with medium or slight pain did not seem to be related to the time elapsed since the operation. There were slightly more patients with no pain in the 3rd group (5 patients, 29.4 per cent). Thus the pain seemed to diminish with the passing of time.

### *Motion*

To assess the results of the operation on hip movements the following parameters were taken into consideration:

1. Active movement of the joint pre- and post-operatively.
2. The range of passive movement which was achieved.

Assessment of movement was made according to the criteria of Shepherd (1954) and Gade (1947).

*Assessment according to the type of disease.* In 48 operated hips the smallest active motion index, pre-operatively, was nil and the largest 61 (average 29.8). The operation was obviously performed on

patients with severe or very severe pain who presented also a marked limitation of hip movement.

Post-operatively the smallest index was 12 and the largest 69 (average 41.5). Thus the operation caused a marked improvement in active movement of the hip (79 per cent). In 10 cases (20 per cent) the range of movement was reduced and this applied to seven hips with O.A., one hip with lesions of Legg-Calvé-Perthe's disease, one with pseudarthrosis of the femoral neck and one infected fracture.

Pre- and post-operative comparison of passive movement showed that this increased to a much greater extent than active movement. Only a small number of patients had reduced or unchanged passive movement.

Generally speaking, the operation resulted in an increased passive and active range of movement of the hip, and this was independent of the type of hip disease.

*Assessment according to age.* The patients were divided into three groups, as already mentioned, but in this case the number of operated hips is recorded. *1st group* (9 hips). The active motion index increased in eight and decreased in one hip (average pre-op. 27.8, post-op. 42.2). *2nd group* (30 hips). The index increased in 23 and decreased in seven hips (average pre-op. 29.4, post-op. 41.7). *3rd group* (9 hips). The index increased in seven and decreased in two hips (average pre-op. 33.3, post-op. 39.9).

Pre-operatively the smallest index was in the 1st group, and there was a progressive increase in the index in groups 2 and 3. Post-operatively in all groups there was an increase in the index average which was marked in the 1st group but less so in the 2nd and even less noticeable in the 3rd group.

*Study according to time elapsed since the operation.* The first group includes 14 hips, the second 14 and the third 20. (The patients were divided into three

groups as already mentioned, but in this case the number of operated hips is recorded).

The average index of active movement in the first group was pre-operatively 28.7 and post-operatively 41.4; in the second group it was 31.9 and 43.4 and in the third group 27.5 and 40.3, respectively. Thus it is obvious that the period of the time elapsed since the operation does not influence the range of movement of the hip. The improvement in range of movement, which was achieved with the operation, remained almost unchanged with the passing of time.

### *Gait*

The following factors make the influence of the operation on gait difficult to assess:

1. Lesions of the contralateral hip (bilateral O.A.) may influence the gait with the passage of time.
2. An operation may have to be performed on the contralateral hip.
3. Operations on a lower limb may influence the gait. Such cases were included in our series.

At follow-up in all cases limping was noted to a varying degree.

The patients were divided into three groups according to the following parameters:

Stick, crutches, wheelchair, distance, activity.

*1st group:* Patients with a slight limb and good stability of the hip, walking without help and coping well with daily activities. *2nd group:* Patients with an obvious limp and a degree of instability, walking with a stick, looking after themselves, but unable to work. *3rd group:* Patients with a marked limp and great instability, walking with sticks or crutches or in a wheelchair, and having difficulties in looking after themselves.

*Assessment according to the type of disease.* Out of a total of 43 patients, 15

belonged to the first group (35 per cent), 14 to the second (33 per cent) and 14 to the third group (33 per cent).

A careful study of the results as regards walking in relation to the type of disease showed that the gait was unaffected by the particular disease for which the operation was performed.

*Assessment according to age.* When the patients were divided according to the classification given above, there were 15 in the first group (35 per cent), 14 in the second (33 per cent), and 14 in the third group (33 per cent).

A careful assessment of the results of the operation in relation to walking ability in the various age groups showed that there was a greater percentage of young patients in the 1st group (age 15–35, 57 per cent), while middle-aged patients predominated in the 2nd group (age 35–55, 39 per cent) and there were more older patients in the 3rd group (age 55 and over, 50 per cent). Thus the walking ability was worse in the older patients.

*Assessment according to time elapsed since the operation.* Division of the patients according to the same classification of walking ability showed that 15 patients belonged to the 1st group (35 per cent), 14 to the second (33 per cent) and 14 to the third group (33 per cent).

A careful study of the results of the operation as regards gait (with reference to the period of time elapsed since the operation) showed that the number of patients in the 1st group decreased with the passage of time, whereas the number of patients in the second group increased, and the number in the third group remained stable. Thus, the longer the period of time since the operation the poorer the walking ability. (The patients pass from the first group to the second.)

### *Personal opinion of the patients*

The opinion of the patient should be seriously considered in the general as-

assessment of the operation results. The follow-up showed that improvement in pain, regardless of the other results, was the main reason for satisfaction on the part of the patients. The patients were divided into four groups: Extremely satisfied: 31 (71 per cent). Satisfied: 4 (9 per cent). In doubt about the results: 5 (12 per cent). Not satisfied: 3 (7 per cent).

## DISCUSSION

Resection of the femoral head and neck proved useful in the hands of the orthopaedic surgeon as a method of treatment for diseases of the hip. This was especially true in cases of unsuccessful total arthroplasties.

Pain was found to decrease in a large number of the patients (72 per cent). It was not clear whether the nature of the disease had any bearing on the results of the operation as regards pain. As to the influence of the age of the patients on pain, it was found that there were a considerable number of patients in the first group (i.e. patients who underwent surgery when young), who were without pain. The majority of patients with mild pain were in the second and third groups (i.e. of middle and advanced age). At follow-up there were very few patients with severe pain and all were amongst those most recently operated. The number of patients with medium or slight pain seemed to be unrelated to the period of time elapsed since the operation. There was a slight increase in the number of patients with no pain, with the passing of time.

The range of movement was generally improved by the operation. Passive movements were almost certainly improved, and also active movements in a considerable number of patients (79 per cent). Hip mobility increased and this was not related to the nature of the disease, but to

the patient's age. Greater improvement was noted in young patients; it was less marked in middle-aged patients and even less noticeable in older patients.

Improvement in post-operative active hip movements remained constant with the passing of time. Walking with a degree of limping was always present, but this improved because of the decrease in pain.

The main disadvantages of this method are an unstable joint and a shortened limb, which result in a difficult gait. These are counter-balanced by improvement in pain and hip movement.

The results of the operation as regards gait did not seem to be related to the nature of the disease, but to the patient's age, especially in the younger age group.

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