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SYMPOSIUM: PAPERS PRESENTED AT THE ANNUAL CLOSED MEETING OF THE INTERNATIONAL HIP SOCIETY

# The Classic

## Acute Pyogenic Arthritis of the Hip: An Operation Giving Free Access and Effective Drainage

**G. R. Girdlestone B M OXFD, F R C S**

Dr. Gathorne R. Girdlestone is shown at a Wingfield Hospital fête. Figure reprinted with permission of the Oxfordshire Health Archives, Oxfordshire, UK.

Gathorne Robert Girdlestone was born in 1881, the son of the Rev. R.B. Girdlestone, Honorary Canon of Christ Church, Oxford [3]. His early education was at Charterhouse, then he read medicine at New College, Oxford. Girdlestone received his subsequent medical training at St. Thomas' Hospital, London, completing his house appointment there. He subsequently went to Oswestry, where he was influenced by Sir Robert Jones. During WW I he returned to Oxford to assume charge of a military hospital that eventually had over 400 beds. The Wingfield Convalescent Home, an "old fashioned institution," [3] was located in Headington, then a village near Oxford, and Girdlestone's initial military hospital consisted largely of open air huts on the Wingfield grounds. Girdlestone continued to work there and at the Radcliffe Infirmary after the war. These huts were, through the benefaction of Sir William Morris (the founder of Morris Motors and later elevated to Lord Nuffield), replaced with modern buildings beginning in 1930 with a bequest of £70,000 [4]. These new buildings, initially named the Wingfield-Morris Orthopaedic Hospital, were opened by the Prince of Wales in 1933. As a result of his work and stature and perhaps his relationship with Lord Nuffield, Girdlestone was appointed in 1937 the first British Professor of Orthopaedic Surgery. (Oxford Medical School eventually received £2,000,000 from Lord Nuffield [3].) The Wingfield-Morris Orthopaedic Hospital became part of the National Health Service in 1948, then was renamed the Nuffield Orthopaedic Centre in 1950, the year of Girdlestone's death. It is fair to say that Girdlestone was among the primary and most influential individuals creating a specialty of orthopaedic surgery in the first half of the 20th century.

Girdlestone wrote at least two articles describing excision arthroplasty of the hip. The first, from 1928, described a radical excision for draining tuberculous hips [1] and the second (reprinted here), from 1942, a related and perhaps at times even more radical operation for pyogenic infections [2]. Girdlestone emphasized these radical operations were intended only for severe infections, and readers are reminded these were both published in the preantibiotic era, when radical surgery was often required to save a patient's life. In the first article, he also emphasized the principle of "removal of diseased and devitalized tissues, flattening down of dead spaces, and leaving drainage so complete and lasting as will allow the wound to heal from the bottom" [1]. He excised the

greater trochanter and all involved muscles, suturing skin edges deep into the wound so as to achieve effective drainage. When necessary, he also "flattened" the edges of the acetabulum. In the second article he suggested less radical operations were often ineffective in pyogenic infections owing to the "miniature rabbit-warren of sinuses and cavities" [2]. The techniques were fundamentally similar to those he had earlier described for tuberculosis. He used a wide transverse incision (Fig. 2) to access the hip, excising all lateral musculature along with the trochanter and the lateral margin of the acetabulum (Fig. 1). In the presence of infection in the intermuscular planes, he avoided suturing the skin deeply, and rather packed the wound with Vaseline gauze and rubber drains (Fig. 4). The postoperative care included splinting either on a frame (if good nursing care was available) or spica casting with a large window. Readers familiar with operations for infected total hip arthroplasties will immediately recognize current procedures are far less radical than those typically used in Girdlestone's time. Rarely would an infected arthroplasty be treated with such radical excision of bone and muscle, open packing, and secondary healing. For that reason, I suggest the name Girdlestone not be used for contemporary operations except as they apply to what he described: excision arthroplasty more accurately describes current procedures.

Richard A. Brand MD

## References

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Richard A. Brand MD (✉)
Clinical Orthopaedics and Related Research, 3550 Market Street, Suite 220, Philadelphia, PA 19104, USA
e-mail: dick.brand@clinorthop.org

## Introduction

Severe persistent sepsis in or round the hip has been one of the bugbears of surgery; once the infection has seeped out of the joint, sinuses burrow among the tendons round the neck of the femur and the small trochanter, or having penetrated the acetabulum produce an intrapelvic abscess. The difficulty has been first of all to provide free drainage for these deep-seated lesions, then—still more difficult—to maintain that freedom continuously over the period which is required for internal healing. It is no longer now a matter of drainage of the hip-joint but of a much larger infected area which often represents a miniature rabbit-warren of sinuses and cavities.

In and after the last war I found none of the standard drainage operations satisfactory. The presence of the sciatic nerve so hampers the posterior approach that drainage can only be free for a few days, while it is futile to attempt to establish drainage of the hip by an anterior approach. The older methods do not give the surgeon a good view of the acetabulum; but their gravest fault is that it is impossible to maintain free drainage for more than a very short time. Furthermore, the posterior approach produces a discharging wound in a most awkward position.

In 1921, as a result of profound dissatisfaction with these cases, many of which resulted from gunshot wounds of the war, I worked out a method which has proved effective and reliable ever since. I have described it briefly elsewhere with special reference to secondarily infected tuberculosis[1]; but the method is little known and surgeons who have seen it in use believe that if it were widely known it would prove of great value in the surgery of infected wounds involving the hip.

Acute pyogenic arthritis of the hip is rare in times of peace. An early haematogenous infection of the joint, especially if the organism is a streptococcus rather than the *Staphylococcus pyogenes aureus*, will often subside if the joint is immobilised and aspirated every day (under anaesthesia). My colleagues and I have had a number of such cases in which immobilisation on a frame and daily aspiration (for 3 or 4 days) has led to recovery with full movement. If, however, the illness is severe and high fever persists in spite of this treatment radical drainage is quickly indicated. This outcome is to be expected where the infective organism is the *Staph. pyogenes aureus*, and in particular where there is infection associated with devascularisation of bone within the joint: this may be the result of an infective embolus leading to infarction and septic necrosis, or of the shattering

[1] The Robert Jones Birthday Volume, Arthrodesis and other operations for Tuberculosis of the Hip, London, 1928, p. 347; also Tuberculosis of Bone and Joint, London, 1940.

effect of a gunshot wound. Whether in war or in peace, the illness is severe, painful and dangerous; its course may prove long, exhausting and bitterly disappointing; its victim greatly needs effective succour.

## Principles of the Method

By the technique to be described something approaching saucerisation of the joint is achieved; and the advantage of the method lies not only in the full exposure it can give to the acetabulum after excision of the head, but in the access it affords for the adequate drainage of a still deeper intrapelvic abscess via ilium or acetabular floor.

### Indications

The operation is called for in acute pyogenic infection of the hip—haematogenous, from compound fracture, or from gunshot wound—in which the fever has not given way to more conservative measures, such as immobilisation, daily aspiration, and chemotherapy by sulphanilamides or penicillin Such a condition is dangerous and demands radical drainage. Cases can be divided into two groups. In the first, group A, the hip-joint is not yet ankylosed; the cavity may be distended with pus, or suppuration may be almost absent with symptoms just as severe and threatening as if it was considerable. In others infective materia may already have leaked out to spread further sepsis between the muscular planes. In order to ensure effective drainage the excision of the head and neck, with erasion and saucerisation of the acetabulum, is almost always indicated as the final part of the operation. Occasionally it is better to stop after the wide exsection of capsule and synovia in the hope that it will suffice. I am still diffident of laying down the indications for this less radical procedure, but it is clearly contraindicated wherever there is evidence of partial or complete necrosis of the head. Group B contains those cases in which ankylosis has already developed, and in which pus has escaped from the joint and burrowed into the intermuscular planes in various directions. Deep-seated sepsis round the hip is very resistant to moderate surgical measures. Abscesses are opened with but temporary relief; there is surface healing; sinuses become established; from time to time these tend to close; the pus is bottled up; there is persistent sepsis, with recurrent flares. It is a miserable prospect.

### Radiology

In the cases seen at a late stage with one or more sinuses it is generally wise to obtain all possible evidence as to the ramifications of the tracks, and the situation of any deep-seated abscesses, by iodised oil injection followed immediately by stereoscopic radiography. These injections are carried out on the X-ray table; and the iodised oil is injected slowly without much pressure. Sometimes the nozzle of the syringe is applied to the opening of the sinus, at other times a small rubber catheter is inserted to carry the oil in as deeply as possible.

### Technique

The new method of drainage differs from the older ones in three ways: the approach is lateral; the incisions are at right angles to the muscle and fascial planes; and a large mass of muscular tissue is exsected. In most cases the approach is external only, with a wide exsection of the abductors and the great trochanter; but an additional mesial approach is sometimes indicated with a similar wide exsection of the adductors. The main nerves and arteries in front and the sciatic nerve behind are in no way disturbed or endangered. The considerable loss of abductors and adductors is of no consequence if the hip is ultimately ankylosed; and of little consequence if pseudarthrosis is established, since active weight-bearing abduction is in any circumstances impracticable, and adduction useless. Thus the great virtue of saucerisation of this deep-seated joint is achieved by the sacrifice of muscles which are no longer valuable.

## Group A

### Position and splintage

During the operation the patient lies undisturbed on a Robert Jones double hip. frame or in a long plaster spica with a big window (Fig. 1). Alternatively, if the hip infection is acute and the patient only seen at a stage when operation is urgent, he may come to the theatre unsplinted;

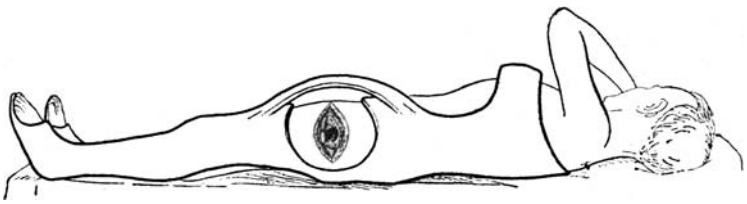

**Fig. 1** Plaster spica with window. (Courtesy, Library of the College of Physicians of Philadelphia.)

he is then put on a frame or in plaster at the conclusion of the operation while still anaesthetised. In such a case the pelvis and the knee of the affected limb are raised from the operation table on sandbags to give free access to the outer aspect of the gluteal region. Occasionally one has to deal with unfortunate patients with bedsores behind the pelvis or spine; here neither frame nor plaster can, for a time, be used; in this event after the complete operation the limb can be suspended in a Hodgen, flexed 20° or 30° at the knee. If a Hodgen is not available a flexed Thomas can be used "Hodgen fashion," but the ring must not be pushed up into its normal position or it will intrude upon the wound.

## Operation

A long transverse incision is made from about 1 in. behind and below the anterior superior spine backwards with the centre about 1 in. above the great trochanter. The skin edges are retracted up and down to expose a wide elipse of gluteal fascia covering the gluteus medius and the anterior inch or two of the maximus. Two deep transverse incisions are now rapidly made by successive sweeps of the knife between each of which any bleeding vessels are clamped. The upper incision, directed inwards and slightly downwards, divides the glutei down to the ilium just above the acetabulum; the first sweep of the lower incision, which is directed inwards and slightly upwards, exposes the outer side of the base of the great trochanter, which is at once divided by a wide chisel directed obliquely upwards to the digital fossa; the trochanter is retracted up and the division of the soft tissues completed (Fig. 2). The knife does not approach the anterior crural (femoral) nerve in front or the sciatic behind. The whole mass of tissues, consisting of glutei and great trochanter, is now removed and haemostasis carried out by diathermy, by ligature, or by interrupted haemostatic sutures of finest catgut in small fully curved round-bodied needles. The whole upper and outer aspect of the capsule of the hip lies exposed. The capsule and synovia are removed and the underlying portions of neck, head, and acetabular rim are seen. The neck is then divided near its base by a 1 ½ in. chisel, and the femoral head removed. The removal of the head is greatly facilitated (as it is also in performing pseudarthrosis for osteoarthritis) by the oblique removal of the upper acetabular rim by a 1 ½ in. or 2 in. gouge of suitable curvature (this step is in either case beneficial). All the cartilage is gouged or scraped out of the acetabulum and the rotten bone curetted. The discovery of an intrapelvic abscess indicates the removal of the acetabular floor with as much of the neighbouring ilium as will ensure free drainage. It is the rule in this operation to leave no cartilage, no diseased bone, no dead tissue and no dead spaces. The erasion of the acetabulum should leave raw surfaces of vascular cancellous bone. The operation can be done very quickly if the chisels and gouges are large, sharp, and of fine material and thin section. The exsection of the broad wedge of abductors and great trochanter provides really good drainage (Fig. 3);

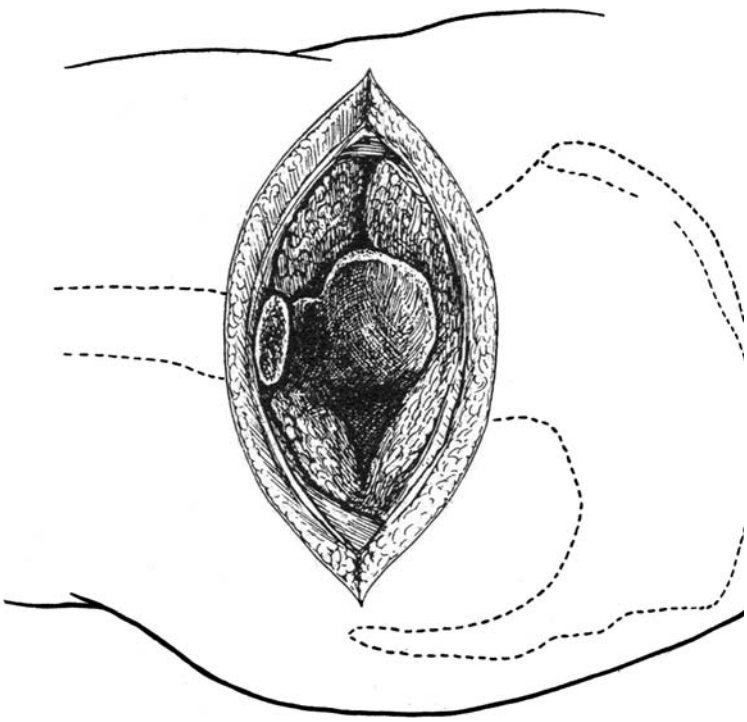

**Fig. 2** The operation completed. (Courtesy, Library of the College of Physicians of Philadelphia.)

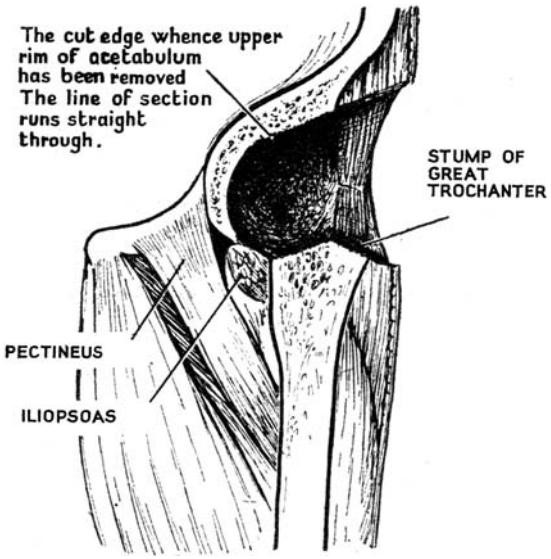


**Fig. 3** The operation cavity seen in section. (Courtesy, Library of the College of Physicians of Philadelphia.)

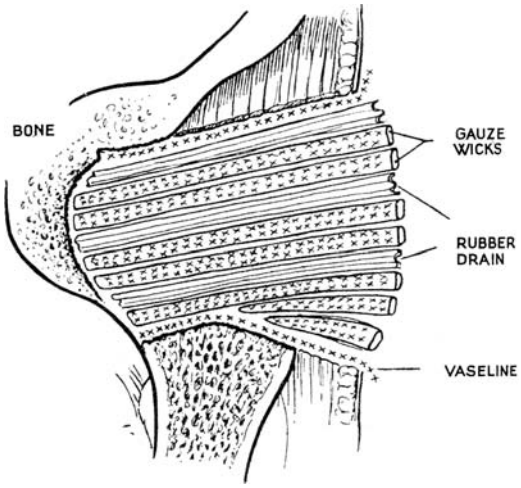


**Fig. 4** Rubber drains and gauze wicks in place. (Courtesy, Library of the College of Physicians of Philadelphia.)

the gluteal stumps retract, for the incisions are analogous to the first cuts in a shoulder or leg of mutton.

After the excision of the deep tissues, I used to draw the upper flap of skin fairly far down into the wound by a continuous catgut suture, and often the lower flap too. The sutured skin-flaps thus cover the freshly cut muscular surfaces. I found this point in technique very valuable in this and similar drainage operations as it reduced the pain of dressings, and covered the more superficial raw areas from which granulations grew excessively. When however there has been infection of the intermuscular planes, the skin flaps should not be sutured deep to the deep fascia; and nowadays the use of vaseline or paraffin wax and the infrequency of dressings have made this step less often worth while.

## Group B

The hip is ankylosed. with two striking advantages—the obliteration of the joint cavity and the stabilisation of the limb. It is therefore most undesirable to dig out the head. But there may well be sinus tracks ramifying round the neck and the small trochanter. In such cases, after the lateral drainage down to, but not through, the neck, it may be necessary to carry out a similar additional exsection of muscular tissue on the inner side. Portions of the pectineus and of the adductor longus and brevis are then exsected on the inner side as well as of all three glutei on the outer. When this double drainage has been performed, the skin in front remains intact over the tensor fasciae femoris, sartorius, and rectus, with the lateral cutaneous and anterior crural nerves, and the superficial and deep femoral arteries, veins and lymphatics, and the skin behind covers the posterior part of the gluteus maximus together with the hamstrings, the adductor magnus, and the sciatic nerve. As ankylosis exists, splintage is unnecessary.

### Haemorrhage

The operation causes some loss of blood but only for a very short time, and one of its great virtues is that the surgeon can see and catch the bleeding points; any oozing from the vascular can cellous bone of the ilium ceases with a temporary gauze pressure followed by the much gentler pack. Some of these patients are exhausted by pain and toxaemia; these have been transfused during the operation. Of late years I have used the continuous drip method in almost all cases; the rapidity of intake of blood can be matched to the loss during the operation, and after the patient's return to his ward a much slower drip is kept up for 6 or 12 hours.

## Subsequent Treatment

The success of this operation and the comfort of the patient depend on good splintage, nursing and dressing. The double hip frame is best, but only if the nurses thoroughly understand the care of a patient on a frame; a big plaster spica, with ample window and bridge (Fig. 1) comes next, and the suspension and traction of the limb on a Hodgen (or Thomas) is reserved for patients to whom neither of the former methods is applicable.

After the removal of the head and most of the neck, upward displacement of the femur in relation to the

innominate *must not* be permitted, for such a movement would close the opening, spoil the saucerisation, and bottle-neck the acetabulum. The position is maintained by fixed traction on the frame, by suspensory traction on the Hodgen, or by a well-fitting long plaster spica with the knee in flexion, and a good hold on both ischial tuberosities.

## Dressing

The sides of the entrance should be lined with fine-mesh bandage impregnated with soft paraffin: two or three 1-inch strips of corrugated rubber tissue and ample gauze drains reach to the bottom of the cavity (Fig. 4). The main gauze pack should be enough to fill the funnel-shaped wound, but each piece of gauze should run straight in from the surface, and never be a long wick packed in by repeated pokes of a probe; for this ancient packing technique leads to the formation of a big cavity which with its narrow neck resembles a chemist's flask.

## Result

If the operation is well done the relief from illness and distress is dramatic. If the subsequent treatment is good most of the cases will heal soundly in a few months. The great gaping wound becomes a narrow scar.