Trochanteric reduction osteotomy as a treatment for refractory trochanteric bursitis

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We describe a new operative procedure for patients with chronic trochanteric bursitis. Between March 1994 and May 2000, a trochanteric reduction osteotomy was performed on ten patients (12 hips). All had received conservative treatment for at least one year. Previous surgical treatment with a longitudinal release of the iliotibial band combined with excision of the trochanteric bursa had been performed on five hips. None had responded to these treatments.

The mean follow-up was 23.5 months (6 to 77). The mean Merle d'Aubigné and Postel score improved from 15.8 (8 to 20) before to 27.5 (18 to 30) after operation, six patients showing very great improvement, five great improvement and one fair improvement. We conclude that trochanteric reduction osteotomy is a safe and effective procedure for patients with refractory trochanteric bursitis who do not respond to conservative treatment.

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Trochanteric bursitis is common in middle-aged patients and has been reported in all age groups. It is characterised by chronic, intermittent pain over the lateral aspect of the hip which increases on external rotation and abduction.¹⁻⁴ It can be associated with varying degrees of disability. Some patients may be confined to a wheelchair.⁵ Trauma is a known cause of trochanteric bursitis; in two series it was found to be related in 23% and 64% of patients.^{2,5} The condition is more often associated with repetitive microtrauma

related to overuse of the muscles which insert into the greater trochanter. This causes degenerative changes in tendons and muscles.^{2,5}

Most patients with trochanteric bursitis respond to conservative treatment, including non-steroidal anti-inflammatory drugs (NSAIDs), a heel raise on the affected side, injections of steroid and local anaesthetic and/or physiotherapy.^{3,5} The success rate of these treatments exceeds 90%.¹ For those who do not respond, however, many surgical procedures have been described, such as a longitudinal release of the iliotibial band combined with excision of the trochanteric bursa.^{1,4,5} In our experience the results after this procedure are disappointing. Five of 12 hips which were operated on with this technique did not respond satisfactorily. We therefore introduced a new technique involving a trochanteric reduction osteotomy. It was first used as a salvage procedure for a patient who had already undergone a release of the iliotibial band with bursectomy. Following the good result in this patient, we have used this technique in all patients with persistent trochanteric bursitis which did not respond to conservative treatment, and we now report its use and describe the technique.

Patients and Methods

Between March 1994 and May 2000 we treated ten patients with chronic trochanteric bursitis (12 hips). There were eight women (10 hips) and two men. Three underwent surgery in the Academical Medical Centre in Amsterdam and nine in Ziekenhuis Hilversum in Hilversum. The mean age of the patients at the time of surgery was 48.3 years (28 to 73). They had localised pain in the region of the greater trochanter. The onset of symptoms was spontaneous, except for one patient who had a history of trauma. The pain usually started on awakening, became worse during the day, particularly when standing or walking, and caused restriction of activities.

Clinical examination showed a full range of movement of the hip in all patients. Ten patients walked without a stick, but with a slight limp. Two walked with one stick, but for less than one hour and one patient could only walk with two crutches. There was tenderness over the greater trochanter in all patients. Radiographs of the pelvis and hip showed no abnormalities.

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Fig. 1a

Fig. 1b

Diagrams showing a) the removed slice of 5 to 10 mm in thickness (1, gluteus medius; 2, lateral circumflex femoral artery; 3, medial circumflex femoral artery; 4, deep femoral artery and 5, vastus lateralis) and b) after operation (6, cortical lag screws with washers).

All patients had shown no improvement after at least one year of treatment with NSAIDs, a heel raise on the affected side, physiotherapy and an injection of steroid and local anaesthetic. The mean duration of conservative treatment was four years (1 to 5) and the mean number of injections was three (1 to 6). Each injection gave temporary relief of pain.

A bursectomy and fenestration of the iliotibial band had been performed previously in five hips. One had been operated on twice. The pain had recurred at a mean of 6.3 months (1 to 23) after operation.

Operative technique. Spinal anaesthesia was administered in seven patients and general anaesthesia in five. Prophylactic antibiotics were given preoperatively. The patient was placed in the supine position and a longitudinal incision made over the greater trochanter. After incision of the tensor fascia latae, the greater trochanter was exposed. Osteotomy of the trochanter was undertaken with removal of a slice of bone deep to it of approximately 5 to 10 mm in thickness, depending on the prominence of the trochanter and the tension of the iliotibial band. Proximally, the osteotomy began medial to the posterior insertion of gluteus medius into the trochanter, so that gluteus medius remain attached to the proximal fragment. Distally, the osteotomy continued beyond the vastus ridge (Fig. 1a). After distal and medial transfer of the trochanter, fixation was achieved by two 4.5 mm cortical lag screws with washers (Figs 1b and 2). Image-intensifier assistance may be used. The wound was closed in layers, including the iliotibial band.

Fig. 2

Postoperative radiograph after trochanteric reduction osteotomy.

Table I. The Merle d'Aubigné and Postel scoring system

Symptoms	Score
Pain	
Intense and permanent	0
Severe even at night	1
Severe when walking; prevents any activity	2
Tolerable with limited activity	3
Mild when walking; it disappears with rest	4
Mild and inconstant; normal activity	5
None	6
Mobility	
Ankylosis with bad position of the hip	0
No movement; pain or slight deformity	1
Flexion	
<40°	2
40° to 60°	3
60° to 80°; patient can reach his foot	4
80° to 90°; abduction of at least 15°	5
>90°; abduction to 30°	6
Ability to walk	
None	0
Only with crutches	1
Only with sticks	2
With one stick, less than one hour; very difficult without a stick	3
A long time with a stick; short time without stick and with limp	4
Without stick but with slight limp	5
Normal	6
Final score*	
Very great improvement	>12
Great improvement	7 to 11
Fair improvement	3 to 7
Failure	<3

*in order to grade the degree of improvement the change in the score for pain and ability to walk is multiplied by two and added to the change in mobility score, which is not multiplied by two

All patients received routine anticoagulant prophylaxis. Postoperative immediate partial weight-bearing with two crutches was allowed. After six weeks a radiograph was taken and the patients allowed to bear weight fully under supervision of a physiotherapist. Six to eight weeks later they were able to return to normal daily activities. If the screws became uncomfortable, they were removed one year after operation.

Results

The mean length of follow-up was 23.5 months (6 to 77). All patients were scored by the Merle d'Aubigné and Postel system (Table I, Fig. 3). The mean score improved from 15.8 (8 to 20) before to 27.5 (18 to 30) after operation. The mean difference between the pre- and postoperative scores was 11.7 (6 to 16; Table II).

Before surgery seven patients had severe constant pain (score 0), three had severe pain and pain at rest (score 1), and two patients had pain on walking (score 2). The range of movement was normal in all patients (score 6). Nine patients had a slight limp (score 5), two walked with one stick for less than an hour (score 3) and one walked with two crutches (score 1).

Fig. 3

Bar chart showing the preoperative and postoperative Merle d'Aubigné and Postel¹³ pain scores.

Table II. Details of the ten patients (12 hips) who underwent trochanteric reduction osteotomy as a treatment for refractory trochanteric bursitis

Case	Gender	Age at surgery (yrs)	Preoperative score	Postoperative score	Change in score	Follow-up (mths)
1	F	28	8	24	16	7
2	M	39	16	24	8	77
3	F	41	20	30	10	7
4	F	41	20	30	10	15
5	F	47	18	28	10	14
6	F	73	18	30	12	22
7	F	72	16	30	14	34
8	F	41	16	30	14	63
9	F	37	12	18	6	14
10	F	57	14	30	16	16
11	F	66	16	26	10	6
12	M	38	16	30	14	7

After surgery seven patients had no pain and two had mild pain during daily activities. The range of movement and walking ability were normal in these patients and seven were satisfied with the results and would have undergone the procedure again. Two had already had the procedure on the contralateral hip and had returned to normal daily activities.

The remaining three patients had tolerable pain with limited activity after surgery. In one of these the pain appeared to relate to the heads of the screws which will be removed shortly. Another patient developed a haematoma two weeks after surgery, because of poorly controlled anticoagulant prophylaxis. The haematoma was surgically drained with the subsequent development of some ectopic calcification. Nine months later the calcification was excised and the two screws removed. The patient was 80% satisfied, but could not return to his job as a gardener. In one further patient the pain became localised in the gluteal region. This patient still walks with one stick, but for longer distances. She is 50% satisfied.

One patient fell six months after surgery, causing displacement of the greater trochanter. Further fixation was carried out after which she was free from pain.

Discussion

Chronic trochanteric bursitis presents a characteristic pattern of symptoms and signs which result from pathological changes in the bursae and tendons related to the attachment of the gluteal muscles to the greater trochanter.⁶ It develops because of repetitive friction between the iliotibial band and the greater trochanter. The condition can be treated conservatively with a rate of success exceeding 90%,¹ but many operative procedures have been described for those who do not respond to conservative treatment.

Brooker¹ reported five patients with trochanteric bursitis who did not respond to conservative treatment for a period of between two and five years. Surgical treatment consisted of release of the iliotibial band, removal of trochanteric osteophytes and debridement of the bursa of gluteus maximus. In one this was accomplished by a fenestration procedure, creating a large circular defect. In the others a simple 'T' or cross incision was used. Follow-up was for one year. The mean Harris hip score improved from 46 before to 88 after operation. All patients were satisfied with the result and returned to nearly normal function. There was no adequate description of the procedure and it was not clear why two different techniques were used.

Zoltan, Clancy and Keene⁷ presented a new procedure which involved the excision of an elliptical portion of the iliotibial band overlying the greater trochanter, and removal of the trochanteric bursa. They described seven athletes with a painful hip because of snapping of the iliotibial band over the greater trochanter which had caused bursitis. Of five patients who were assessed at a mean follow-up of 55 months, four had improved and in one the symptoms had recurred. This patient underwent further more extensive excision of the iliotibial band and was free from symptoms one year later. The snapping was eliminated in all patients. No standardised hip score was used in this study. A snapping hip should not be confused with trochanteric bursitis, which may occur secondary to snapping. Snapping may be caused by a variety of conditions.⁸ Patients with a snapping hip were excluded from our study.

Clancy⁹ noted that trochanteric bursitis is most commonly seen in runners who train on the roadside, and usually is found in the so-called downside leg. The procedure described by Zoltan et al⁷ was recommended for athletes who do not respond to prolonged conservative treatment. They were usually able to resume running within six to eight weeks of surgery.

Slawsky⁴ reviewed a single surgeon's experience of the surgical management of patients with refractory trochanteric bursitis who underwent a simple longitudinal release of the iliotibial band over the greater trochanter and excision of the subgluteal bursa. There were seven hips in

five patients with a mean follow-up of 20 months (12 to 30). The mean Harris hip score improved from 51.7 to 95.0 (84 to 100) in four patients (six hips). All were satisfied with the result and would undergo the procedure again. One patient had a follow-up of six months during which the Harris hip score improved from 49 to 84.

Although the literature shows reasonable results for this procedure,^{1,4,7,9} in our series five of the 12 hips did not respond to this form of treatment. The mean duration of relief from symptoms after this procedure was 6.3 months (1 to 23). After longitudinal release, the condition may recur because of regeneration and fibrosis of the iliotibial tract. A trochanteric reduction osteotomy, however, seems to provide long-lasting symptomatic relief in all patients.

It is effective for three reasons. First, the reduction of the greater trochanter reduces friction between the iliotibial band and the prominence of the trochanter.¹⁰ Secondly, the distal transfer increases the strength of the hip abductors with biomechanical benefit.⁶ Thirdly, there is postoperative hyperaemia which allows resolution of the tendonitis.

Distal transfer may be used in the treatment of the high-riding trochanter which sometimes occurs as a late complication of congenital dislocation of the hip or Perthes' disease.¹⁰ The relative overgrowth of the greater trochanter can cause symptoms similar to trochanteric bursitis, such as limping, weakness of the abductor muscles and pain. Macnicol and Makris¹⁰ treated 26 patients (27 hips) with a mean follow-up of eight years. The operation consisted of a trochanteric osteotomy with the removal of a trapezoidal wedge of bone and distal transfer of the trochanter. In the 26 patients (27 hips) whom they reviewed, relief from pain and improvement in gait were seen in 74%. The poor results were largely because of progression of osteoarthritis. Distal transfer of the greater trochanter increases the range and strength of abduction of the hip, which will relieve pain and improve gait.

In our series there were no complications which could be directly related to the osteotomy. In theory, nonunion is a potential complication. The incidence of trochanteric nonunion in total hip arthroplasty has been variously reported to be between 5% and 32%.¹¹ In our series, there was union in all patients. Because of the technique, with replacement of the trochanter¹¹ and the good quality of cancellous bone at the site of the osteotomy, nonunion is unlikely.¹² A second complication could be impaired abductor function. According to Free and Delp⁶ distal transfer of the greater trochanter provides an effective method of maintaining the length and power of the hip abductors. In our series there was no impairment of abductor function in any patient. Care should be taken to avoid damage to the trochanteric vessels. The osteotomy is best placed sufficiently lateral to the femoral neck (Fig. 1a).

Chronic trochanteric bursitis may be a debilitating condition. For those patients who do not respond to conservative treatment, reduction osteotomy is a safe and effective treatment.

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