

Original article

Clinical results of multiple fibrous band release for the external snapping hip

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Abstract

Background. External snapping hip is caused by snapping of the thickened iliotibial band or the gluteus maximus over the greater trochanter. We retrospectively reviewed results of the release of multiple fibrous bands of the iliotibial band or gluteus maximus for treatment of external snapping hip in 44 patients.

Methods. We wanted to evaluate the functional results of this technique in terms of resolution of symptoms, patient satisfaction, and complications. A snapping hip questionnaire was designed for the evaluation, and the results were evaluated at an average 62 months after surgery.

Results. All the patients had resolution of their symptoms after surgery and were satisfied with the treatment. Recurrence of snapping was reported in five patients, but they did not find it severe enough to require a second surgery. Ten patients reported some limp or weakness, and four patients had seroma formation, requiring reinsertion of a drainage tube.

Conclusions. We recommend release of multiple fibrous bands of the iliotibial band and gluteus maximus muscle for treatment of external snapping hip, as it has a low rate of recurrence and a high rate of patient satisfaction.

Introduction

Snapping hip (coxa saltans) is described as an audible or palpable snap about the hip, usually accompanied by pain. It is classified into three main categories based on the anatomical location of the offending structures: external snapping hip, internal snapping hip, and snapping hip due to intraarticular causes. External snapping hip is caused by snapping of the thickened iliotibial band (ITB) or the gluteus maximus over the greater trochanter (GT), and it is the most frequently encountered type of coxa saltans.¹ The internal snapping hip is

caused by the iliopsoas tendon snapping over the iliopectineal eminence, femoral head, or lesser trochanter.² Intraarticular causes include loose bodies, synovial chondromatosis, labral tears, or fracture fragments.²

Asymptomatic external snapping is not uncommon and should be considered a normal occurrence. Snapping becomes painful when the GT bursa (which lies between the IT band and GT over the tendinous insertion of the gluteus medius and the origin of the vastus lateralis) is inflamed as a result of repeated snapping. Conservative management provides good relief in many cases and is considered the mainstay of treatment by many authors.³ This includes stretching, physical therapy, activity modification, nonsteroidal antiinflammatory drugs, and injection of steroid into the trochanteric bursa.

Surgery is considered for patients refractory to conservative treatment. Various operative techniques have been described, ranging from release or resection of a portion of the IT band to Z-plasty lengthening of the IT band.²⁻⁸ Recently, one author described endoscopic release of the IT band.⁹ Each of these procedures has varied degrees of success and technical problems. Most of these reports are isolated case reports or small series of patients.

We retrospectively reviewed results of the release of multiple fibrous bands of the IT band or gluteus maximus for treatment of external snapping hip. We asked the following questions: (1) How are the functional results of this technique in terms of resolution of symptoms and patient satisfaction? (2) What are the complications associated with this technique?

Patients and methods

Patients

A total of 50 patients were operated on for external snapping hip from January 1995 to January 2007. Among

Table 1. Relevant patient demographics

No of patients:	44
Age:	14–71 years (average 30.7 years)
Sex (M/F):	24/20
Occupation	
Professional sports person:	2
Recreational athletes:	30
Active-duty military persons:	6
Other (active):	6
Side of snapping	
Right:	12
Left:	25
Bilateral:	7
Presenting complaint	
Pain:	20
Snapping:	14
Restriction of movements:	10
Pain	
Mild:	24
Moderate:	13
Severe:	6
Disabling:	1
Duration of symptoms	
<6 months:	14
6–12 months:	20
>12 months:	10

them, 44 were available for follow-up. Criteria for inclusion in the study were surgery performed using a multiple fibrous band release technique; follow-up duration of at least 2 years; and no previous history of hip fractures or surgery involving the hip or childhood hip pathology. Patients' charts were reviewed to record preoperative history, physical examination, radiological studies, operative notes, and progress notes. The history included duration of symptoms, occupation, preoperative diagnoses, and prior treatment history.

Relevant patient demographics are summarized in Table 1. Six (13.6%) patients had a past history of frequent intramuscular injections in the gluteal region during their childhood. Trochanteric tenderness was present in 24 patients. Altogether, 15 patients had snapping at 0°–45° of flexion, 21 had snapping at 45°–90° of flexion, and 8 patients had snapping after >90° of flexion. Plain radiographs were normal in all patients. Three patients had a magnetic resonance imaging (MRI) examination before referral. One showed marked atrophy of the affected gluteus maximus (Fig. 1). MRI of the other two patients showed thickening of the fascia lata on the affected side. All of the patients had undergone some form of conservative treatment before being referred to our institution, which included physiotherapy, antiinflammatory medication, and/or local steroid injection. We did not attempt conservative treatment in any of these patients because their symptoms were severe enough to offer surgery. All of the patients were operated on by the senior author; and before the surgery,

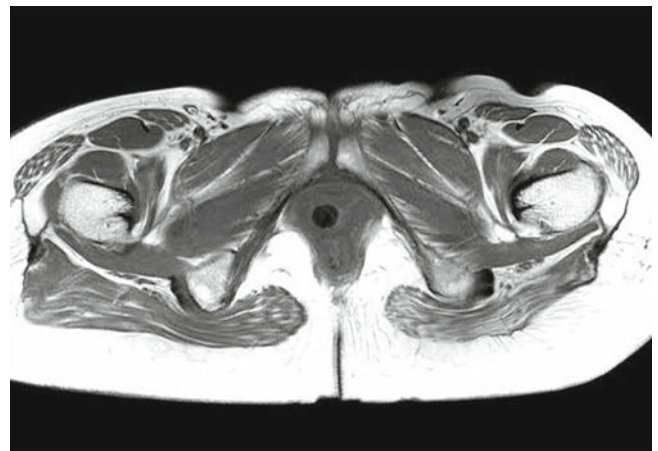


Fig. 1. T1-weighted axial magnetic resonance imaging shows extensive fibrosis and atrophy of the left gluteus maximus muscle

we explained the operation to all patients and obtained their consent.

Surgical technique

The patients were operated on in a lateral position under general or spinal anesthesia. Before anesthesia, we asked the patients to reproduce the snapping, and the surgeon also checked for snapping with a provocative maneuver. The limb was prepared and draped using contemporary techniques. An approximately 8–10 cm incision was made over the lateral aspect of the greater trochanter extending for an equal distance on either side of the vastus ridge. The superficial fascia was cut in line with the incision. Electrocautery was used to minimize blood loss. The fascia lata was cut longitudinally for the length of the incision (Fig. 2a) and three or four transverse cuts, evenly spaced, were made along the longitudinal incision anteriorly and posteriorly (Fig. 2b). If the fascia is still tight, fascial release can be extended distally in a subcutaneous manner using a scissor. Fascia lata was palpated for areas of thickening (usually situated posteriorly), and those areas were released.

If snapping still occurred in response to provoking maneuvers, the hip was extended, abducted, and internally rotated to visualize and palpate the tendinous insertion of the gluteus maximus. Usually the fibrous bands were found extending proximally toward the muscle belly. These bands were released perpendicular to the line of muscle fibers (Fig. 2c). The hip was then again taken through provocative maneuvers, including flexion, adduction, and internal/external rotation to try to reproduce snapping. If snapping persisted, further release was performed. The fascia was loosely approximated using intermittent absorbable sutures. The wound

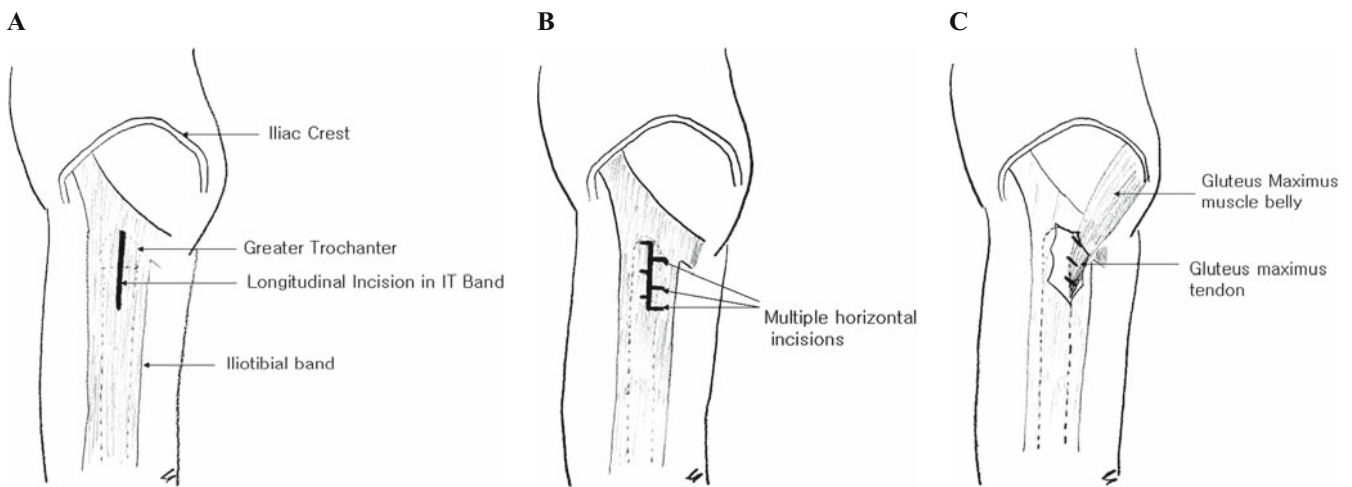


Fig. 2. Surgical technique. **A** Approximately 8–10 cm initial longitudinal incision in the iliotibial (IT) band. **B** Multiple horizontal incisions are made on either side of the longitudinal

incision. **C** Multiple incisions are made in the tendon of the gluteus maximus near its insertion site

Table 2. Snapping hip questionnaire

Is there a recurrence of snapping?
If so, how long after surgery did the snapping first occur?
Have you returned to your previous occupation/sports?
Do you have pain in the hip?
Are your symptoms worse than those you had before the operation?
Do you have a limp or weakness in the affected hip?
Are you satisfied with the surgery performed in regard to the resolution of your symptoms and appearance of the scar?
Would you undergo the surgery again if your symptoms were similar to those before the surgery?

was closed over a suction drain, which is kept in place for 5–7 days to decrease the possibility of seroma formation due to dead space.

Postoperatively, range of motion (ROM) exercises were started, and walking with tolerable weight bearing was allowed on the same day. If required, crutches were recommended to aid in ambulation. Patients were discharged 7–10 days after surgery, as health insurance allows the patients to stay longer in Korea. Postoperative evaluation was performed at 1, 3, and 6 months and then each year. Most of the patients included in the study were young people in active jobs, so it was not possible to call patients for final evaluation. We used a snapping hip questionnaire for evaluation of function and patient satisfaction (Table 2). Results were evaluated from postoperative charts for those patients who could not be contacted by telephone, provided they had been followed for a minimum of 2 years.

Results

The final follow-up was conducted at an average 62 months (24–144 months). In all, 8 patients were avail-

able for physical examination at the final follow-up, 26 patients were contacted by telephone, and the 2-year follow-up data were obtained from hospital charts in the remaining 10 patients.

Altogether, 14 patients had fascia lata release only; the other 30 patients had additional gluteus maximus release. All of the patients had resolution of their symptoms after surgery. Recurrence of snapping was reported in five patients: one within 3 months, three at 3–6 months, and one at 6–12 months after surgery. In all five patients, the symptoms were not as bad as before surgery. When they were asked if a second surgery was needed, none thought it was necessary. Thus, the success rate for resolution of snapping was 88.63% and overall patient satisfaction rate was 100%. All of the patients returned to their previous occupations.

Three of the patients with fascia lata release only and seven of the patients with additional gluteus maximus release reported some limp or weakness, but it was not interfering with their work and they walked normally on gross examination. Four patients had seroma formation after early removal (third postoperative day) of the drainage tube. The drainage tube was reinserted and kept in place for 6 days in those patients. The wound healed well thereafter.

The average duration of surgery was 28 min (20–39 min). The average perioperative blood loss was 40 ml (20–100 ml). There were no postoperative infections.

Discussion

Various surgical techniques have been described to treat external snapping hip. We performed multiple fibrous band releases for treatment of external snapping hip. We wanted to evaluate the functional results of this technique in terms of resolution of symptoms, patient satisfaction, and complications.

The strength of our study is the large number of patients operated on by a single surgeon and followed up for a reasonably long duration. However, our study has certain limitations. This is a retrospective study with no control group available for comparison. Six patients were lost to follow-up, and only 10 patients were available personally for follow-up examination. That made objective assessment of results difficult, and we had to rely on subjective data from the patients. This weakness is because ours is a university hospital, and most of the patients were referred from other regions, so they were followed by their referring physicians after surgery.

Our technique was developed on the basis of the observation that the thickened IT band is not always the culprit, as snapping sometimes persists after extensive release of the IT band. We have observed that fibrous bands often involve the gluteus maximus muscle and tendon. These bands often flick over the GT and cause snapping. Release of this fibrous portion of the gluteus maximus is essential to ensure complete resolution of symptoms. This observation was supported by Brignall et al. in a case report, who observed persistent snapping after Z-plasty lengthening of the fascia lata.¹⁰ They released a band of fibrous tissue within the substance of the gluteus maximus, after which symptoms could not be elicited. Choi et al. evaluated dynamic sonographic findings of external snapping hip syndrome and found abnormal jerky movement of the gluteus maximus muscle in two of seven patients.¹¹ We believe that incomplete release of fibrous bands is the reason for poor results in some of the previously reported series.^{5,12}

Release of the iliotibial band was performed by Dickenson as early as 1929.³ Since then, various authors have described different techniques for this condition, which can be broadly classified into two groups. The first group involves release or resection of the IT band, and the second involves lengthening and repairing the IT band. The IT band can be released by simple longitudinal incision, a transverse incision, or a cruciate incision. Release of the IT band with reattachment to the GT

provided complete relief in 16 of 20 patients reported by one author.⁷ In other report, authors performed an elliptical-shaped resection of the IT band over the GT.⁸

Larsen and Johansen operated on 27 patients and resected the posterior half of the IT band at the insertion of the gluteus maximus; a posterior flap of the IT band was sutured to the anterolateral surface of the fascia in another 4 patients.⁶ Brignall and Stainsby described Z-plasty lengthening of the iliotibial band in eight patients.⁴ A similar technique was used by another author in nine hips, with complete resolution of symptoms in all but one patient.³ White et al. used a new technique to release the IT band, with improvement in 14 of 16 hips.² They made a 10-cm longitudinal incision overlying the trochanter, followed by six transverse step cuts, each 1.5 cm long and evenly spaced along the longitudinal incision, with three being anterior and three posterior. Recently, one author reported use of endoscopy to create a diamond-shaped defect in the IT band over the GT.⁹

Results of previously published series are summarized in Table 3. Only five of them had a success rate of more than 85%, but, those series have limited numbers of patients and shorter follow-ups.^{2–4,8,9} We have obtained 88.63% success rate for resolution of snapping and an overall 100% patient satisfaction rate. In addition, the surgical technique is minimally invasive, simple, and causes minimal blood loss. Patients do not require supervised physiotherapy; and if fibrous tissue is adequately released, the results are quite predictable. Considering the large number of patients studied, our results are more favorable than those published earlier. The five patients with recurrence had snapping, but it was not as bad as before surgery and the cause of the recurrence was thought to be reformation of some of the fibrotic bands during soft tissue healing.

None of the previous authors mentioned a feeling of weakness or a limp after surgery. Ten patients in our study noted that they felt some weakness, but it was a subjective finding and the degree of limp was unnoticeable. We believe that preexisting extensive fibrosis of the gluteus maximus or extensive release of the fascia lata and gluteus maximus insertion might have led to weakness in those patients. However, there was no correlation between soft tissue release and the feeling of weakness. We recommend active strengthening exercises for the gluteus maximus and medius in all patients.

Conclusions

We recommend a technique of multiple fibrous band release for external snapping hip. We obtained a high

Table 3. Literature review

Study	Year of publication	No. of hips	Technique	Follow-up	Success rate (%)
Orlandi ⁷	1981	20	Release of IT band with reattachment to GT	^a	80
Dederich ⁴	1983	6	Z-plasty	^a	100
Bruckl ²	1984	24	Diagonal osteotomy of trochanter	^a	50
Bruck ²	1984	27	Anchoring of the iliotibial tract to the trochanter	^a	21
Larsen ⁶	1986	27	Resection of the posterior half of the tract at the gluteus maximus insertion	4 years	71
Zoltan ⁸	1986	7	Ellipsoid resection of tract over the trochanter	55 months	57–100
Féry ¹⁵	1988	35	Cruciate incision with sutures flaps to tract	7 years	30
Brignall ⁴	1991	8	Z-plasty incision and transposition of the tract	3 years	88
Faraj ¹³	2001	11	Open Z-plasty	12 months	72.72 (pain in 3 patients) ^b
White ²	2004	16	Step cut iliotibial tract over greater trochanter	32.5 months	88
Provencher ³	2004	9	Open Z-plasty	22 months	88.8 (pain in 1 patient) ^b
Ilizaliturri ⁹	2006	11	Cross cut + flap resection (endoscopic)	25 months	90.9
This study		44	Multiple fibrous band release	62 months	88.63

IT, iliotibial; GT, greater trochanter

^a Average follow-up duration was not mentioned in the report

^b No recurrence of snapping, but the presence of pain was considered a failure

rate of success with this technique. Still, patients should be informed about the possibility of recurrence and postoperative complications.

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