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Clinical Value of External Snapping Hip Treated by Arthroscopic Technique

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Abstract

External snapping hip is a clinical syndrome that causes restriction of hip movement. It has many causes and is demonstrated by characteristic gait and audible snap heard with hip movement. The aim of this study was to introduce an easy arthroscopy technique to treat the external snapping hip syndrome and evaluate the statistical outcome of the treatment. A retrospective study was conducted on 117 patients with 113 bilateral and 4 unilateral external snapping hips from January 2013 to January 2014. Mean age of the patient was 24years (range 14 -40) years. The median duration of the symptom was 8 years (range 1 year- 25 years). Mean follow-up period after surgery was 12 months (1 month-24 months). The adduction range of the hip was 3.7° and the flexion range of the hip was 80.9° preoperatively, which increased to 38.8° and 113.2°, respectively post-operatively ($P < 0.0001$). All the patients had are solution of the external snapping hip syndrome, gait abnormality, frog leg position, unable to sit with leg crossed and positive ober sign was absent. There was no major complication and no recurrence of the symptoms was found after the operation. We recommend the use of the arthroscopic procedure. It is effective, easy, less time consuming, a small scar and fast post-operative recovery.



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Introduction

External snapping hip (ESH) is a clinical syndrome characterized by an audible snapping heard or palpable snap felt at the greater trochanter (GT) during the hip movement [1]. It generally occurs when the posterior border of iliotibial band and anterior border of gluteus maximus (GM) gets thickened and slips over GT when the hip is extended from flexion position [2]. Pain is not present in ESH syndrome; however, some patients complain of pain that associates with tendinitis or bursitis caused by irritation and inflammation due to repeated friction [3, 4]. The ESH syndrome has been reported worldwide. It occurs around 5 to 10% of the population [5, 6]. There is an increased incidence in women, tennis players, dancers, especially 91% of the ballet dancers have been reported of snapping hip [6, 7]. To determine the cause of ESH, many hypotheses have been reported as idiopathic, acquired or congenital [8, 9]. It is generally seen in children and teenagers. Several cases have been reported in China due to the use of intramuscular penicillin injection in the buttock region during 1970's and 1980's to treat the febrile condition in children [10]. An article in 2012 reported that 18% of the children from China that were adopted in the United States had an injection induced gluteus muscle contractures [11]. In Africa, 28 cases were reported of snapping hip. All had a history of malaria treatment by intramuscular injections; 26 quinine, one penicillin, one streptomycin prior to the onset of snapping syndrome [12].

The ESH need to be treated as patients present with restriction of daily activity like unable to sit with cross leg, cannot walk in a straight line, difficulty in tying shoe laces and knee pain (Fig.1). The long duration of the disease can lead to lateral epicondyle pain in the knee due to repeated friction caused by thick taut ITB during flexion and extension movement [13]. The first line of treatment is conservative that includes rest, anti-inflammatory drugs, and corticosteroids injection. If there is no pain, then stretching exercise is done. After the failure of the conservative treatment operation must be done which includes cutting the contracted band

completely or just lengthening the band by partially cutting it. Various open surgeries have been reported as Z-plasty and N-plasty [2, 14, 15]. As the advancement in surgery has occurred, arthroscopic surgery is being preferred as it reduces the complication during and after surgery and also post-operative recovery is fast. In this study; we retrospectively review the result of arthroscopic surgery for the release of multiple fibrosis of iliotibial band or gluteus maximus for the treatment of external snapping hip. Using this arthroscopic technique the surgery becomes simple, fast, decreases the complications of open surgery and provides adequate hip adduction and flexion range of motion (ROM) with better patient satisfaction.

Materials and methods

Patient's details and diagnosis

A retrospective study was conducted on 117 patients (49 male and 68 female) with 113 bilateral and four unilateral external snapping hips. The patients had undergone contraction excision with radiofrequency energy under arthroscopic guidance from January 2013 to January 2014. The mean age of the patient was 24 years (range 14-40 years) with average body mass index (BMI) of 23kg/m² (range 16.4-28 kg/m²). The median duration of symptoms was 8 years (range 1-25 years) and the average hospital stay post-surgery was 3 days (range 1-8 days). The mean follow-up period after surgery was 12 months (range 1 month -24 months).

The diagnosis was based on physical examinations and radiological investigations. All patients were medically fit and had no contraindications to surgery or other orthopedic conditions. The institutional board of Shanghai Tenth People's Hospital affiliated to Tongji University had approved this study. All the subjects included in this study provided their written informed consent.

Arthroscopic technique

The operation was done under general anesthesia. Patient after being placed in lateral decubitus position Ober test was performed. Due to the contracture, there was fixed abduction of the hip joint while doing Ober test and operation was performed in that



Fig. 1 Preoperative assessment of patients. (A) Severe gluteal muscle wasting with dimpling sign; (B) The patient is unable to sit with leg crossed and (C) The patient is unable to squat with knees together showing frog leg position.

position. This position was selected as the contracted band can be felt easily and there is less chance of sciatic nerve injury. In the supine position, there was a high chance of sciatic nerve injury during arthroscopy. Two portals were marked; one on the GT and another one was 4cm below and posterior to GT. When contracture could not be reduced by two portals then the third portal was made in the area where the contracture band was felt. A 3mm incision was made on the skin for portals. 30° scope was inserted along with 40ml normal saline for clear vision. From another portal shaver was introduced that cleared subcutaneous tissues and fat above the iliotibial band. After a clear vision of iliotibial band radiofrequency device was introduced to cut it completely (Fig. 2). Generally, after this procedure ESH syndrome is corrected, but sometimes when deeper structures are involved surgeons need to dig deeper to cut the contracted structures. While dealing with deeper structure sciatic nerve should not be damaged. After the procedure was completed no drainage tube was inserted and portal sites were sutured. The total duration of operations was approximately 30 minutes.

Rehabilitation

After completing the surgery patient was placed in supine position. Both the legs were tied together to prevent external rotation. Ice packing and anti-inflammatory drugs were used to reduce pain and inflammation. The leg was released the next day and

suture site was examined. Exercise like squatting with both knees together, walking in a straight line and sitting with cross leg was promoted (Fig. 3, 4). Complete recovery took less than 2 weeks. Patients were follow-up in 2 weeks, 6 weeks, 6 months and 12 months. There was full recovery of all the symptoms and signs of snapping.



Fig. 2 Position of patient and portals during arthroscopic surgery. The patient lying in lateral decubitus position and operating leg is in maximum abduction position. Arthroscopic surgery was performed using two portals.

Statistical analysis

Statistical analysis was carried out using the PRISM5 software. Continuous variables were expressed as a mean \pm standard deviation.

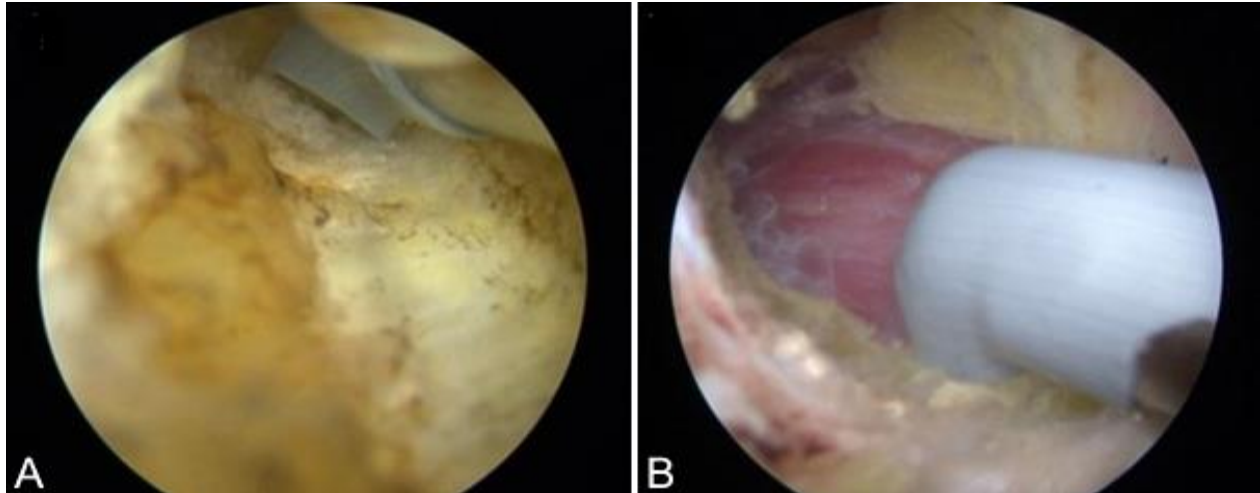


Fig. 3 Intraoperative view of arthroscopy surgery.(A) The image of the iliotibial band before cutting and (B) arthroscopic image showing the iliotibial band being cut.

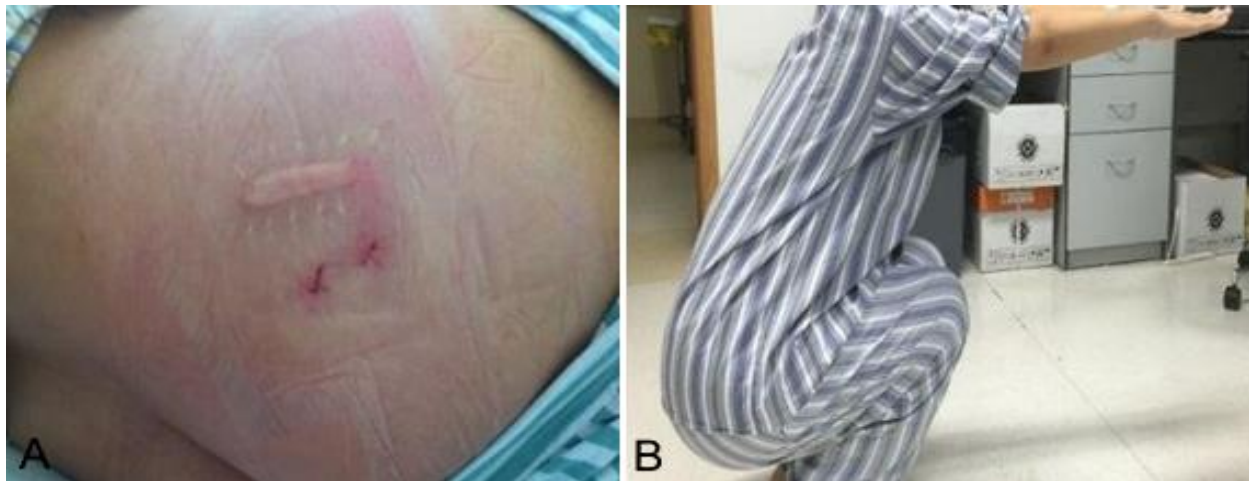


Fig. 4 Assessment of range of motion after surgery. (A) Two portal sites after arthroscopic surgery performed on failed open surgery that has an ugly scar; (B) Patient is able to squat with knees together.

Enumerated data were analyzed using the two-tailed paired t-test. $P < 0.05$ was considered statistically significant. Enumerated data were analyzed using the two-tailed paired t-test. $P < 0.05$ was considered statistically significant.

Results

A total of 230 hips of 117 patients underwent arthroscopic procedures from January 2013 to January 2014. Three patients had a mild hematoma and four patients had mild skin burns at the operating site which resolved on its own in 2-3 days without any surgical intervention. There were no other postoperative complications such as pain,

swelling, sciatic nerve injury, numbness, neurological defect, keloid formation at the surgical site, muscular weakness, trendelenburg gait or permanent gluteal muscle weakness. The mean follow-up period after treatment was 6 months (range 1 month-24 month). The adduction and flexion ranges of the hip were $3.7^\circ \pm 8.9^\circ$ and $80.9^\circ \pm 10.2^\circ$ preoperatively, while the ranges increased to $38.8^\circ \pm 4.8^\circ$ and $113.2^\circ \pm 7.3^\circ$, respectively after operation ($P < 0.0001$). Complete recoveries of patients were less than 2 weeks (range 4 weeks-6 weeks) (Fig. 4, 5). During the follow-up period, no patient had disease recurrence and therefore, no revision was performed. All patients

could sit with their leg crossed, no out toe gaits, no Ober sign or clicking sound heard during movement of the hip, no recurrent contracture of hip abductors, no residual hip pain or gluteal muscle wasting were seen.

Discussion

The ESH is caused due to the contracture of the tensor fascia lata, iliotibial band, and GM tendons. Apart from trauma due to over stretching exercise and genetic reason repeated intramuscular injection in the gluteal region becomes the most common cause. All the patients mentioned in this study have the history of intramuscular injections that used benzyl alcohol as a dissolvent. Benzyl alcohol causes necrosis and fibrosis of the tissue [10]. The diagnosis is mainly done by clinical features. When a patient enters the doctor's room abnormal gait can be observed; out toe gait pattern with slightly abducted and extensor walk. On inspection: buttock looks flat; dimpling can be seen due to wasting of gluteal muscle and slight pelvic tilt with the loss of lumbar lordosis. On examination, in some patients snapping phenomenon can be visible under the skin and in some patients, it can be palpated over the greater trochanter. Ober test is done to detect tight iliotibial band. It is done in lateral decubitus position with hip and knee in 90-degree flexion. The hip is extended and then abducted, in ESH knee fails to adduct and is called a positive Ober test. During the hip rotation test, the clicking sound is heard. The patient cannot sit in a chair with leg crossed while squatting knees cannot be brought together. Patients cannot touch the toe with knees straight.

Radiological examination is done to confirm the diagnosis and to rule out other pathologies [5, 16]. It also confirms the location and extends off the contracture. Plain X-ray is not very useful in ESH. It may show calcification in GT and bony degenerative changes and other bony abnormalities [17]. Dynamic ultrasound is helpful in determining the structure causing ESH. It also rules out tendinitis, bursitis or muscle tears [16, 18, 19]. Magnetic resonance imaging (MRI) is mainly used to rule out other pathologies as tendon abnormalities,

muscle degeneration, dysmorphism etc. After confirmation of diagnosis, treatment is planned. The first line of treatment is conservative when investigation shows calcified tendon then surgery remains the only option. Various open surgeries have been reported over time. Faraj et al. reported open surgery on 10 patients with 11 hips out of which three patients developed painful scars that required desensitization treatment [20]. Kim et al. reported three active duty soldiers with a successful result in only one case [21]. Provencher et al. performed open surgery on eight patients with nine hips; seven were active duty military personnel and one civilian. Out of seven military personnel, one underwent subsequent surgical intervention and was eventually medically discharged from his service and one had persistent groin pain [22]. All those open surgeries described the iliotibial band lengthening by Z-plasty. Apart from open surgery complications, the results were not as good as our result. Arthroscopy surgery is being preferred over open surgery [10, 15, 23, 24]. An article by Poleselle et al. [15] described two portals approximately 10cm apart and use of spinal needle as a guide wire. His study had nine patients out of which one had to undergo revision surgery as snapping and pain had not been corrected and another patient had mid ischium snapping and pain after surgery. In the arthroscopic technique, the radiofrequency device is used to maintain hemostasis. If it comes into direct contact with the spinal needle, there is a high degree of cutaneous burn [25]. Our study used a large number population of 117 patients. Portals were marked closer which did not require spinal needle as a guide wire and the iliotibial band was cut completely that gave a better outcome in a short period of time and fast post-operative recovery.

In this study, a single surgeon in one hospital did mild skin burn and three patients had a mild hematoma, apart from seven patients none had any complications. All patients were fully recovered and no correction surgery was required. However, there are some limitations to our study. It was a retrospective study; some factors that could influence the outcome might have been missed. There was no control group to compare our study. Despite these

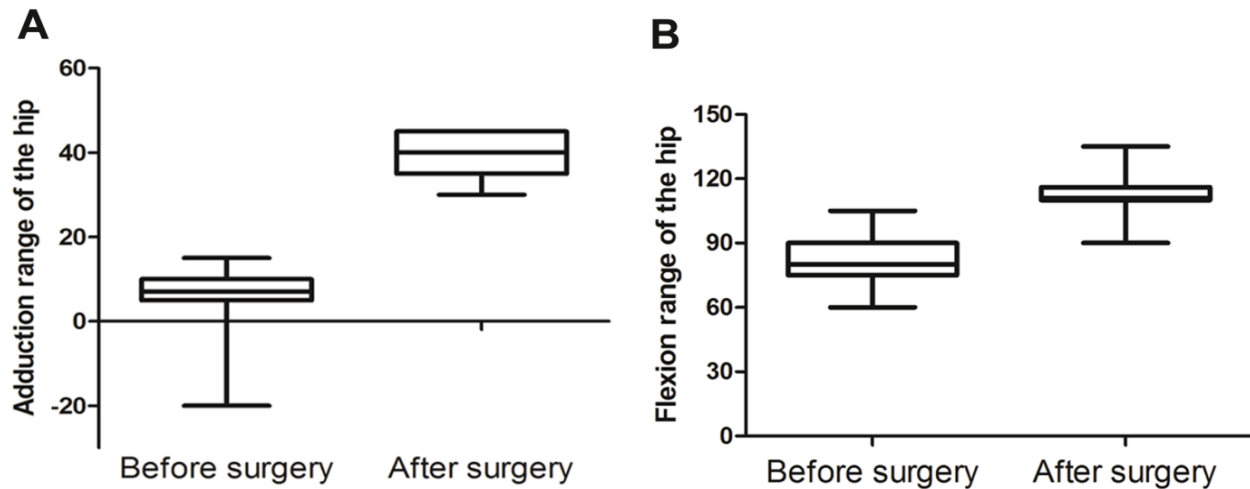


Fig. 5 The adduction range of hip (A) and the flexion range of hip (B) after surgery ($P < 0.0001$).

limitations, our study was conducted on a fairly large number of patients (117 patients with 230 hips) and follow-up was at least six months. The further prospective study should be done to confirm our results. Arthroscopy surgery mentioned in this study is effective. It is less time consuming, simple, easy, and all patients were relieved from the symptoms and were satisfied. We recommend using this arthroscopy technique to treat ESH.

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Conflict of Interest

The authors declare that they have no conflicting interest.

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