

Endoscopic versus open bursectomy of lateral malleolar bursitis

Jae Hyuck Choi · Kyung Tai Lee · Young Koo Lee ·
Dong Hyun Kim · Jeong Ryoul Kim ·
Woo Chull Chung · Seung Do Cha

Received: 25 January 2011 / Accepted: 9 June 2011 / Published online: 28 June 2011
© Springer-Verlag 2011

Abstract

Purpose Compare the result of endoscopic versus open bursectomy in lateral malleolar bursitis.

Materials and methods Prospective evaluation of 21 patients (22 ankles) undergoing either open or endoscopic excision of lateral malleolar bursitis. The median age was 64 (38–79) years old. The median postoperative follow-up was 15 (12–18) months.

Results Those patients undergoing endoscopic excision showed a higher satisfaction rate (excellent 9, good 2) than

open excision (excellent 4, good 3, fair 1). The wounds also healed earlier in the endoscopic group although the operation time was slightly longer. One patient in the endoscopic group had recurrence of symptoms but complications in the open group included one patient with skin necrosis, one patient with wound dehiscence, and two patients of with superficial peroneal nerve injury.

Conclusions Endoscopic resection of the lateral malleolar bursitis is a promising technique and shows favorable results compared to the open resection.

Level of evidence Therapeutic studies—Investigating the result of treatment, Level II.

Keywords Ankle · Lateral malleolar bursitis · Endoscopy · Open bursectomy

J. H. Choi · D. H. Kim · J. R. Kim · W. C. Chung
Department of Orthopedic Surgery, Veterans Hospital,
Jurye 2 dong, sa sang gu, Busan 617-717, Korea
e-mail: boram20@gmail.com

D. H. Kim
e-mail: gudong9@hanmail.net

J. R. Kim
e-mail: duke419@hanmail.net

W. C. Chung
e-mail: wctoilets@hanmail.net

K. T. Lee
Foot and Ankle Clinic, KT Lee's Orthopedic Hospital,
Seoul, Republic of Korea
e-mail: Lkt2408@hanmail.net

Y. K. Lee (✉)
Department of Orthopedic Surgery, Soonchunhyang University 4
Jung-Dong, Wonmi-Gu, Bucheon-Si, Gyeonggi-Do 420-767,
Republic of Korea
e-mail: brain0808@hanmail.net

S. D. Cha
Department of Orthopedic Surgery, Kwandong University
Hwajung dong, Dukyang-Gu, Koyang-Si, Gyeonggi-Do,
Republic of Korea
e-mail: bladeplate@hanmail.net

Introduction

Arthroscopy has been used to treat ankle joint problems since the early 1980s [19, 20]. Minimally invasive techniques enable treatment of problems as diverse as anterior impingement syndrome, acute fracture, talar osteochondral lesions, and ankle arthritis [13–20]. In addition to ankle arthroscopy, extra-articular endoscopy of the hindfoot enables treatment of recurrent peroneal dislocation, posterior talar cysts, posterior impingement, isolated flexor hallucis longus tenosynovitis, and synovial osteochondromatosis [4, 7–10, 13–15, 17–20]. There are few reports published dealing with the results of endoscopic resection of lateral malleolar bursitis.

The lateral malleolar bursa of the ankle is located subcutaneously and bursitis is prone to occur from repeated irritation, trauma, excessive compression, or shear forces

between malleoli and boots. This is particularly problematic in skaters and also Asians who may sit cross-legged [2].

The first line of treatment for lateral malleolar bursitis includes changes in life style, with avoidance of the sitting position, aspiration or a compressive wrap. Failure of conservative treatment may lead to consideration of surgical intervention [1, 2].

Until now, open resection has been the only surgical option. Endoscopic methods may also be considered and combination with an ankle arthroscopy allows assessment as to whether the bursitis communicated with the ankle joint. It is postulated that endoscopic techniques may enable quicker recovery and reduce morbidity when compared to the open procedure. The purpose of this study was to prospectively compare the clinical results of endoscopic and open resection of lateral malleolar bursitis and provide a review of the literature.

Materials and methods

Sixty patients with lateral malleolar bursitis were treated conservatively with aspiration and compression. 21 patients failed to settle with nonoperative management (one patient having bilateral bursitis). From 2008 to 2009, 21 patients (22 ankles) were then randomized into endoscopic or open lateral malleolar bursitis resection. Eleven ankles were in group A (endoscopic excision) and 11 ankles were in Group B (open excision) (Fig. 1). All patients had at least 3 months of conservative management, and diagnosis was confirmed by ultrasound. Patients with diabetic foot ulcers and ganglions were excluded. The median age was 64 years (38–79). The median postoperative follow-up was 15 months (12–18). The study was approved by the institutional review board and all patients provided informed consent to participate.

Outcome measures included patient satisfaction which was classified by patients into excellent, good, fair, or poor at 12 months postoperatively. The length of surgical procedure, time to complete wound healing and postoperative complications were recorded. Patients were mobilized full weight-bearing immediately with a compressive elastic bandage. Sutures were removed at 13 days postoperation in both groups.

Surgical technique

In Group A, after regional popliteal anesthesia or spinal anesthesia, a 16 gauge needle was inserted into the ankle bursa and the presence or absence of an effusion was assessed. To reduce bleeding and poor endoscopic visualization, 0.5% bupivacaine containing epinephrine was injected into the bursa. After 5 min, the arthroscope was



Fig. 1 **a** This photograph shows the right ankle lateral malleolar bursitis. **b** Arthroscopic light sources shows the superficial peroneal nerve

inserted into the first portal at the 6 o'clock direction below the tip of the fibula. The second portal was placed at least 2 cm away at the 3 o'clock direction anterior to the lateral malleolus. Through this, a shaver was inserted and the inner wall of the bursa was removed (Fig. 2). In addition to endoscopy, an anterior ankle arthroscopy was performed. Patients in Group B underwent standard excision of the bursa through a longitudinal incision over the middle of the fibula.

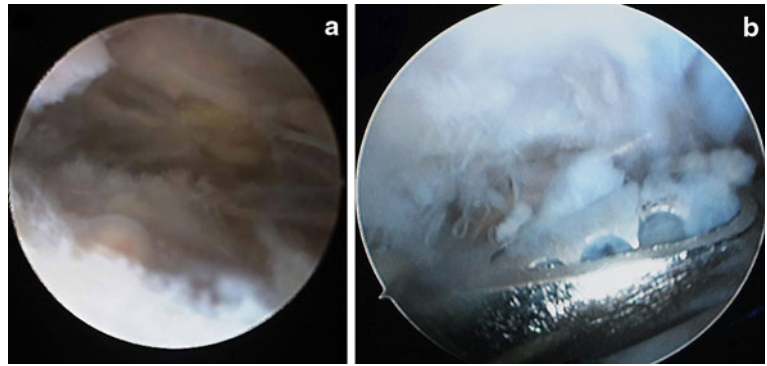
Statistical analysis

The data was analyzed using SPSS 16.0 for Windows. The Mann–Whitney U test was used and a statistically significant difference was accepted at $P < 0.05$.

Results

Patient satisfaction was excellent in nine and good in two patients in Group A while in Group B four were excellent, three good, one fair and three poor. The Group A complete wound healing median time was 12 days (8–14) and median operation time was 35 min (25–52), The group B

Fig. 2 a Arthroscopic finding demonstrate a bursa sac and fibrous tissue. **b** After shaving, arthroscopic view of resected bursa space



complete wound healing median time was 14 days (14–98) and median operation time was 23 min (18–26), respectively. Both of these results were significantly different ($P < 0.05$).

There was once case of recurrent bursa formation in Group A. Ankle arthroscopy in this group demonstrated anterolateral synovial impingement/fibrofatty scar tissue in two patients and this was debrided. Complications associated with open excision included one patient with skin necrosis, one patient with wound dehiscence, and two patients with superficial peroneal nerve injury.

Discussion

The authors highlight the importance of identifying the superficial peroneal nerve which may have a variable course across the anterolateral aspect of the ankle and its position may change with altered position of the ankle [3]. The light source should enter from 6 o'clock, below the lateral malleolus bursa, and directed toward 12–5 o'clock direction. This will help to visualize the nerve through the skin and allow safe placement of the second portal for the introduction of the shaver.

Epistein et al. [6] reported improved recovery following endoscopic resection of pre-patellar bursitis. The recovery period was short, which also served to shorten hospital stay. Open resection of olecranon bursitis has reported wound healing problems in 27% (10/37), recurrence 22% (8/37), and skin complication up to 20% [5]. Endoscopic resection has reported reduced postoperative pain, no recurrence or wound problems and no loss of joint motion [11, 12]. Avci et al. [1] have reported complications from open lateral malleolar bursectomy which include hyperaesthesia, wound dehiscence and skin necrosis. The current study supports the use of endoscopic resection of lateral malleolar bursitis combined with ankle arthroscopy. It demonstrates that endoscopic resection reduces the wound healing and soft tissue complications that may be encountered with open procedures.

In Group B, one patient had skin necrosis and a required split thickness skin graft was performed, and the complete skin coverage was not achieved until 10 weeks postoperatively. Another patient had wound dehiscence which necessitated wound dressings every other day dressing and antibiotic treatment. Two patients had numbness on superficial peroneal nerve territory, one of which improved after 8 weeks while the other was permanent. The limitations of this study include the small number of subjects and the association between ankle joint synovial hypertrophy and lateral malleolar bursitis could not be proven. The endoscopic procedure does increase operation time, and limited visual field during the procedure could lead to incomplete excision of the bursa and recurrence. However, in this study it has yielded high satisfaction rates and reduced complications.

Endoscopic bursectomy and arthroscopic procedure of lateral malleolar bursitis is preventive procedure for delayed wound healing than that of the open bursectomy, as this surgical operation reduces the peroneal protrusion due to the mini-incision. In addition, the endoscopic bursectomy of lateral malleolar bursitis of ankle joints is considered as one of safe surgical procedures, Far lateral portal of anterolateral portal makes it possible to check out peroneal nerve during the operation using an endoscopic light source and thus to avoid personal nerve injury. It also reduces the possibility of complications such as skin necrosis with quick recovery, enabling the patient to wear normal shoes. For lateral malleolus bursitis of the ankle, endoscopic resection combine ankle arthroscopy appears to be a safe alternative to open bursectomy. Nonetheless, the difference in operation time between open bursectomy and endoscopic resection was statistically significant.

Conclusions

Conservative management of lateral malleolar bursitis remains the treatment of choice. But for patients unresponsive to conservative treatments, endoscopic resection

is a safe technique which reduces the risks of soft tissue complications which may occur following open techniques. The operation does take longer to perform and careful planning of portals is required in order to avoid damaging the superficial peroneal nerve but this method offers favorable results and has high rates of patient satisfaction.

References

1. Avci S, Sayli U (2001) Lateral premalleolar bursitis as a result of sitting on the foot. *Foot Ankle Int* 22:64–66
2. Brown TD, Varney TE, Micheli LJ (2000) Malleolar bursitis in figure skaters. Indications for operative and nonoperative treatment. *Am J Sports Med* 28:109–111
3. de Leeuw PA, Golano P, Sierevelt IN, van Dijk CN (2010) The course of the superficial peroneal nerve in relation to the ankle position: anatomical study with ankle arthroscopic implications. *Knee Surg Sports Traumatol Arthrosc* 18:612–617
4. de Leeuw PA, van Sterkenburg MN, van Dijk CN (2009) Arthroscopy and endoscopy of the ankle and hindfoot. *Sports Med Arthrosc* 17:175–184
5. Degreef I, De Smet L (2006) Complications following resection of the olecranon bursa. *Acta Orthop Belg* 72:400–403
6. Epstein DM, Capecci CM, Rokito AS (2010) Patella tendon rupture after arthroscopic resection of the prepatellar bursa—a case report. *Bull NYU Hosp Jt Dis* 68:307–310
7. Frey C (2009) Surgical advancements: arthroscopic alternatives to open procedures: great toe, subtalar joint, Haglund's deformity, and tendoscopy. *Foot Ankle Clin* 14:313–339
8. Hua Y, Chen S, Li Y, Chen J, Li H (2010) Combination of modified Brostrom procedure with ankle arthroscopy for chronic ankle instability accompanied by intra-articular symptoms. *Arthroscopy* 26:524–528
9. Lui TH (2007) Arthroscopy and endoscopy of the foot and ankle: indications for new techniques. *Arthroscopy* 23:889–902
10. Moustafa El-Sayed AM (2010) Arthroscopic treatment of anterolateral impingement of the ankle. *J Foot Ankle Surg* 49:219–223
11. Nussbaumer P, Candrian C, Hollinger A (2001) Endoscopic bursa shaving in acute bursitis. *Swiss Surg* 7:121–125
12. Ogilvie-Harris DJ, Gilbert M (2000) Endoscopic bursal resection: the olecranon bursa and prepatellar bursa. *Arthroscopy* 16:249–253
13. Ogut T, Ayhan E (2011) Hindfoot endoscopy for accessory flexor digitorum longus and flexor hallucis longus tenosynovitis. *Foot Ankle Surg* 17:e7–e9
14. Ogut T, Ayhan E, Irgit K, Sarikaya AI (2011) Endoscopic treatment of posterior ankle pain. *Knee Surg Sports Traumatol Arthrosc*. doi:10.1007/s00167-011-1428
15. Ortmann FW, McBryde AM (2007) Endoscopic bony and soft tissue decompression of the retrocalcaneal space for the treatment of Haglund deformity and retrocalcaneal bursitis. *Foot Ankle Int* 28:149–153
16. Richards DT, Guerra JJ, Council D (2010) Arthroscopic excision of the os trigonum: using the posteromedial portal safely. *Am J Orthop (Belle Mead NJ)* 39:379–381
17. van Dijk CN (2006) Hindfoot endoscopy. *Foot Ankle Clin* 11:391–414
18. van Dijk CN (2006) Hindfoot endoscopy for posterior ankle pain. *Instr Course Lect* 55:545–554
19. van Dijk CN, de Leeuw PA, Scholten PE (2009) Hindfoot endoscopy for posterior ankle impingement. Surgical technique. *J Bone Joint Surg Am* 91(Suppl 2):287–298
20. van Dijk CN, van Bergen CJ (2008) Advancements in ankle arthroscopy. *J Am Acad Orthop Surg* 16:635–646