The Journal of Foot & Ankle Surgery 54 (2015) 13–16

Contents lists available at ScienceDirect

The Journal of Foot & Ankle Surgery

journal homepage: www.jfas.org

Effect of Obesity on Arthroscopic Treatment of Anterolateral Impingement Syndrome of the Ankle

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ARTICLE INFO

Level of Clinical Evidence: 4

Keywords:
anterolateral impingement syndrome of the ankle
arthroscopy
chondral lesion
obesity

ABSTRACT

The present case series study was performed to evaluate the effect of obesity on the arthroscopic findings and the functional outcome after arthroscopic treatment of anterolateral impingement syndrome of the ankle. The study was conducted on 36 patients (26 were classified as obese [body mass index $\geq$30 kg/m^2] and 10 as not obese [body mass index $<$25 kg/m^2]) who had previously undergone arthroscopic treatment of anterolateral impingement syndrome of the ankle. The arthroscopic findings and demographic features were recorded. The patients were examined postoperatively at 6 and 12 months postoperatively, and AOFAS scores were obtained. Our data showed that obese patients had the same arthroscopic findings as nonobese patients, except for chondral lesions. At 1 year of follow-up after performing arthroscopy, the presence of obesity had no effect on the functional outcome of arthroscopic treatment of anterolateral impingement syndrome of the ankle.Obesity has no effect on the effectiveness of arthroscopic treatment.

Obesity is a serious problem throughout the world, affecting 1 in 3 adults in some countries. It is, therefore, important to evaluate the potential risks and pitfalls when caring for obese patients (1). Obesity increases the likelihood of cardiovascular, endocrine, respiratory, and oncologic disease and can also have adverse influences on some orthopedic conditions (1,2). Obesity can have a significant effect on certain orthopedic conditions and should be viewed as a modifiable risk factor of disease during treatment.

Frey and Zamora (3) compared the incidence of orthopedic foot and ankle complaints with the body mass index (BMI) of patients. They found that obesity and being overweight significantly increases the chances of developing tendinitis, plantar fasciitis, and osteoarthritis and increase the stress on the soft tissues and joints. This can be directly related to the increased weight on these structures (3).

It has been reported that obese individuals could have an increased number of foot and ankle problems (3). One of the most common intra-articular ankle lesions is anterolateral impingement syndrome of the ankle (ALISA) (4). This is a condition in which the patient experiences chronic pain secondary to hypertrophy or disruption of the anterolateral ligament or capsule of the ankle that can be consecutively caused by repeated traumatic injuries or tension (5). Previous studies have reported arthroscopy to be a useful technique in the diagnosis and treatment of ALISA (5).

Owing to the increase of obesity in many societies (6), physicians should recognize the role that obesity plays in the presence of lesions. The purpose of the present study was to determine the effect of obesity on the arthroscopic findings and functional outcomes after arthroscopic treatment of ALISA.

Patients and Methods

A case series study was conducted of 36 patients with ALISA who had been referred to the orthopedic clinic at Poursina Hospital in Rasht, Iran from March 2008 to March 2011. The ethical committee of the Guilan University of Medical Sciences approved the present study (approval no. 1547). The diagnosis of the ALISA was confirmed by clinical examination. The patients had had chronic ankle pain for $>$3 months, with tenderness of anterolateral region of the ankle that worsened with dorsiflexion. All the patients had a history of $\geq$1 traumatic inversion injuries of the ankle and were unresponsive to conservative therapy with nonsteroidal anti-inflammatory drugs, physiotherapy, and intra-articular injections for a minimum of 3 months of treatment. All the patients underwent simple radiographic examination of the frontal and lateral aspects of the ankle and magnetic resonance imaging for evaluation of osseous spurs or other possible lesions. Finally, the diagnosis was confirmed by the arthroscopic findings. The impingement of the osseous spurs in the ankle was evaluated at 4 levels using the Scranton criteria, which consisted of impingement of the soft tissue or spurs of $<$3 mm,

Financial Disclosure: None reported.
Conflict of Interest: None reported.

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http://dx.doi.org/10.1053/j.jfas.2014.09.005

tibial spurs of >3 mm, fragmentation or tibial and talar spurs of >3 mm, and tibiotalar osteoarthritis (5).

All the patients were examined for instability of the talofibular ankle joint and synovial joint. Some patients had slight inflammation of the ankle joint and a slight limitation in dorsiflexion movement. All the patients fulfilling these criteria were selected for arthroscopic treatment. The patients with instability of the ankle joint and osteoarthritis of the ankle (Scranton grade IV) were excluded from the present study. Because we only wished to compare the findings between obese and normal patients, the overweight patients, defined as those with a BMI >24.9 kg/m^2 but <30 kg/m^2, were also excluded from the present study. All the physical examinations were performed by 2 of us (A.M., M.K.M).

After undergoing general or spinal anesthesia, all patients underwent arthroscopic surgery (by M.M.K.) in supine position with a sand bag placed under the ipsilateral position of the hip. The operation involved the standard portals of the anterolateral and anteromedial impingement of the ankle joint, debridement of the synovial hypertrophy and anterolateral scarring, and scraping of any possible spurs using a 4-mm, 30° lens. The patients remained motionless with elastic bandages and ice bags for 24 hours postoperatively. On the second day, the patients were allowed to bear weight as tolerated. From the third week postoperatively, rehabilitative physiotherapy began with ankle movement and muscle strengthening exercises. By the sixth postoperative week, the patients were allowed to begin their sports training. The patients were examined at the second, fourth, and sixth postoperative weeks and then at 3 and 6 months postoperatively.

During the preoperative visit, the following information was recorded: age, sex, height, weight, BMI, sports injuries, type of sport, and radiographic information of the ankle according to the Scranton criteria. At the postoperative visit, all arthroscopic findings (i.e., the presence of any chondral lesions and its degree, the presence of generalized synovial hypertrophy, localized synovial hypertrophy in the anterolateral side of the ankle, an abnormally thickened distal fascicle of the anterior inferior tibiofibular ligament [AITFL]), a synovial shelf, and meniscoid lesions) were recorded. The patients were divided into 2 groups: patients with a BMI of 18.5 to 24.9 kg/m^2 (nonobese group) and patients with a BMI of ≥30 kg/m^2 (obese group) (3). The ability of the patient to return to work or regular physical activity was examined postoperatively at 6 and 12 months. The function of the ankle was recorded using a predetermined questionnaire according to the American Orthopaedic Foot and Ankle Society (AOFAS) hindfoot and ankle questionnaire (5,7) at the preoperative visit and 6 and 12 months postoperatively. The confidentiality of the patient information and ethical issues were considered, and all patients signed informed consent forms.

The data were subjected to descriptive and statistical analyses using the Statistical Package for Social Sciences for Windows, version 19 (SPSS, Chicago, IL). The analysis and interpretation of the qualitative variables were based on relative and absolute frequencies. All quantitative numeric values are expressed as the mean ± standard deviation.

Results

A total of 36 patients with ALISA and arthroscopic treatment were included in the present study. None of these 36 patients left the study, and their follow-up data were complete to the last visit. The demographic data and the arthroscopic results, stratified by the Scranton stage criteria, are listed in Table 1.

Changes in the AOFAS score during the follow-up visits of the patients were analyzed using repeated measures analysis. The preoperative mean AOFAS score was 62.78 ± 10.26. It showed significant improvement ($p < .001$) at the 6- and 12-month postoperative visits, with a score of 85.37 ± 6.87 and 89.71 ± 6.89, respectively (Fig.). Repeated measures analysis of variance revealed no significant difference between the obese and normal patients using the Scranton criteria ($p = .1$).

The arthroscopic results stratified by the BMI are listed in Table 2. Only the chondral lesion had a significantly different mean value when stratified by the BMI. The patients with a chondral lesion had a greater BMI than did those without this lesion ($p < .05$). After arthroscopic treatment, 18 of the 36 patients (50%) were able to work or perform physical activity similar to their pre-ALISA levels. Of the remaining 18 patients, 14 (38.8%) could perform their work or physical activities at pre-ALISA levels with less pain. Only 4 of the 36 patients did not return to work at their preinjury level. Analysis of variance showed differences when the results were stratified by the BMI of the patients and their ability to return to work and physical activity. Patients with normal physical ability restored after arthroscopy had a lower BMI than did the patients with relative restrictions (21.25 ± 1.98 kg/m^2 versus 28.08 ± 1.68 kg/m^2, $p < .01$).

Table 1
Summery of demographic, Scranton criteria stage, arthroscopic findings, and patient ability (N = 36 patients)

Variable	Value (%)
Age (y)	
Mean ± standard deviation	36.48 ± 6.43
Range	27 to 56
Sex	
Male	15 (41.7)
Female	21 (58.3)
Weight (kg)	74.31 ± 9.09
Involved side	
Right	20 (55.6)
Left	16 (44.4)
Height (cm)	169.67 ± 10.23
BMI (kg/m^2)	29.18 ± 3.99
BMI <25 kg/m^2	10 (27.7)
Inversion injury	
Sport	20 (55.6)
Football	10 (50)
Volleyball	4 (20)
Combat sport	1 (5)
Other	5 (25)
No inversion injury	16 (44.4)
Scranton criteria stage	
I	16 (44.4)
II	14 (38.9)
III	6 (16.7)
Arthroscopic findings	
Chondral lesions	18 (50)
Generalized synovial hypertrophy	35 (97.2)
Localized synovial hypertrophy in anterolateral side of ankle	30 (83.3)
Anterior inferior tibiofibular ligament	12 (33.3)
Synovial shelf	4 (11.1)
Meniscoid lesion	15 (41.7)

Most patients with a chondral lesion (83.3%), generalized synovial hypertrophy (74.1%), localized synovial hypertrophy on the anterolateral side of ankle (70%), AITFL (75%), a synovial shelf (75%), and a meniscoid lesion (66.7%) had an elevated BMI (>30 kg/m^2). However, the increased incidence was not significantly different from that in the normal group. The AOFAS scores of the nonobese and obese patients increased significantly postoperatively ($p < .001$ for both. Also, although the mean score of the nonobese patients (BMI 18.5 to 24.9 kg/m^2) was

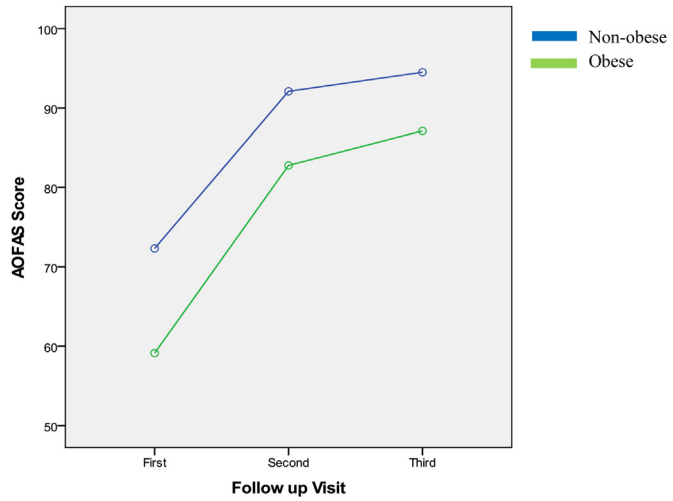

Fig. In the assessment of the functional outcome according to the American Orthopaedic Foot and Ankle Society score, the nonobese patients had a higher score than the obese patients; however, this difference was not statistically significant (repeated measures analysis of variance, $p = .162$).