

*Research Article***Arthroscopic Treatment of Ankle Impingement syndrome.**

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**Abstract**

Ankle impingement is defined as a painful mechanical limitation of full ankle range of motion secondary to an osseous or soft tissue abnormality<sup>1</sup>. The purpose of the study was to evaluate the functional outcome of arthroscopic treatment of ankle impingement syndromes. In this case series study, 15 patient of ankle impingement syndrome underwent arthroscopic debridement, and drilling if there was oteochondritis dissicans of the talus. Four different types of impingement lesions were found intraoperatively, Synovial hypertrophy was found in 8 cases (53.3%), fibrofatty scarred tissue was found in 4 patients (26.7%), anterior tibial spur was found in 2 cases and meniscoid lesion was found in one case (6.7%). All the patients were evaluated preoperatively and at the interval visit of 3 and 6 months postoperatively according to Meislin's criteria and ankle society (AOFAS) hind foot scale. The mean AOFAS score increased from  $56.93 \pm 9.60$  (range, 42 - 77) before surgery, to  $86.73 \pm 6.32$  (range, 73 - 97), and to  $90.60 \pm 7.48$  (range, 73 - 98) at 3 and 6 months follow-up respectively ( $p < .003$ ). Arthroscopic treatment of ankle impingement syndrome is recommended as the treatment of choice .

**Keywords:** chronic ankle pain, ankle arthroscopy, impingement syndrome.

**Introduction**

Ankle impingement is defined as a painful mechanical limitation of full ankle range of motion secondary to an osseous or soft-tissue abnormality<sup>1</sup>.

Ankle impingement syndrome be classified as either soft tissue or osseous. Soft tissue impingements occur most commonly in the anterolateral gutter, medial ankle, or syndesmotic area as a result of scarring and fibrosis associated with synovial, capsular, or ligamentous injury. Osseous impingements are a consequence of osteophyte formation, most commonly along the anterior distal tibia and talus or posteriorly as the os trigonum. These conditions are important to recognize as they may result in chronic ankle pain, especially in footballers<sup>2</sup>.

The therapy of an ankle impingement syndrome can start with conservative treatment such as the application of non-steroid drugs, some local corticoid injections, heel lifting and physiotherapy. If

there are persisting ankle troubles however surgery should be discussed. Arthroscopy had been shown to be a useful method for the diagnosis of the anterolateral impingement of the ankle, and for treatment of patients who do not respond to conservative measures<sup>3</sup>.

**Materials and Methods**

Fifteen patients with ankle impingement syndrome underwent arthroscopic debridement at Fayoum University Hospital, from March 2014 to June 2015. Patients were included in this prospective study if they met the following criteria:

- 1) History of traumatic injury to the ankle,
- 2) Persistent ankle pain after the injury that did not respond to conservative treatment for at least 3 months,
- 3) Clinically demonstrable ankle impingement syndrome. Patients with previous surgeries involving the ankle, degenerative or inflammatory arthritis, preexisting deformity, and/or mechanical instability of the ankle joint were excluded from the study.

Standard ankle radiographs and magnetic resonance images were obtained for all of the patients before arthroscopic intervention. Arthroscopy was carried out with patients under spinal anesthesia. Standard anteromedial and anterolateral portals were used. The authors performed all of the procedures. Invasive ankle distraction was not used in all cases. A sterile crepe bandage was applied to the foot to allow for intermittent distraction when needed, and for plantarflexion and dorsiflexion of the foot of the patient. Using a 2.7-mm, 30 degrees angled arthroscope, routine visualization of the ankle joint was performed. Identification of the impingement lesion and Osteochondral injury if present.

Debridement was done for the impingement lesion and drilling was done if there was Osteochondral injury.

The arthroscopic portals were sutured, and compressive crepe bandage was applied to the ankle. Ice packs were applied to the ankle region in all cases. Active range of movement exercises and weight bearing were allowed as tolerated except in cases with osteochondral injury, whose they should be commenced for 1 and half month later. After the second week, proprioceptive and peroneal muscle strengthening exercises were started. Progressive rehabilitation continued until the patient returned to his or her previous activity.

After discharge from the hospital, patients were followed up in the outpatient clinic every 2 weeks, 1 month, 3 months and 6 months. At the time of final follow-up evaluation, the clinical outcome of the ankle arthroscopy was assessed with Meislin's criteria and ankle society (AOFAS) hind foot scale<sup>94</sup>

All the data will be recorded on investigation report form. These data will be analyzed using SPSS (Statistical Package for Social Sciences) for windows release 10.0 program and we will obtain the Descriptive statistics and Analytic statistics. The results will be tabulated, graphed and discussed on the basis of current related literature. Conclusion and recommendations were driven from the discussed items.

Presentation of the statistical outcomes and tables will be performed using the "Microsoft Word XP" program.

Written consent was taken from every case sharing in the study. Patients were informed in detail about steps and aims of each procedure and test performed in the study. Patients were informed about any abnormal results of procedures and tests performed and were instructed and treated accordingly. The patient had the right to withdraw from the study at any time with neither jeopardizing the right of the patient to be treated nor affecting the relationship between the patient and the care provider. Confidentiality of all data and test results of all the study population.

## Results

There were 9 male patients (60%) and 6 female patient (40%). The age of the patients ranged from 20 years to 49 years with an average age of 34.6 years at the date of performance of the surgery. 11 patients (73.3%) were complaining of RT sided ankle pain and 4 patients (26.7%) were complaining of LT sided ankle pain. thirteen patients (86.7 %) sustained sprain ankle and two cases (13.3%) sustained fracture ankle (fig.28). Number of previous sprain was one in 9 cases (60%) and more than one in 6 cases (40 5%).

Symptoms were persistent for three to six months in four patients (26.7%), from six o twelve months in nine patients (60%) and two patients (13.3%) having symptoms persisting for more than one year. Pain was anterolateral in 8 cases (53.3 %), anterior in 3 cases (20 %), anteromedial in 2 cases (13.3%), and diffuse in 2 cases (13.3%). Dorsiflexion is limited in 5 cases (33.3%)

X ray examination revealed that 10 cases (66.7%) were normal, 3 cases (20%) showed osteolytic lesion in the talar dome and 2 cases (13.3%) showed anterior bony spurs. MRI showed minimal effusion in ten cases (66.7%), OCD in the talar dome in three cases (20%) and anterior bony impingement in two cases (13.3%).

Synovial hypertrophy was found in 8 cases

(53.3%), fibrofatty scarred tissue was found in 4 patients (26.7%), anterior tibial spur was found in 2 cases and meniscoid lesion was found in one case (6.7%) (table 1).

According to Meisilin criteria at 3 months, five cases (33.3%) were excellent, six cases (40%) were good, three cases (20%) were fair and one case (6.7%) was poor. At 6 months; six cases (40%) were excellent, six cases (40%) were good, two cases were fair and one case (6.7%) remained poor (fig. 36), as one case improved from good to excellent, another case improved from fair to good (fig 1).

The mean AOFAS score increased from  $56.93 \pm 9.60$  (range, 42- 77) before surgery, to  $86.73 \pm 6.32$  (range, 73 - 97), and to  $90.60 \pm 7.48$  (range, 73 - 98) at 3 and 6 months follow-up, respectively ( $p < .003$ ). Out of the 15 patients included in the study, 14 (93.3%) had a poor score ( $< 70$ ) before surgery, while no patients had such a score postoperatively. Excellent score was observed for 3 patients (20.0%) at 3 months postoperatively, and for 7 patients (46.7%) at 6 months postoperatively.

There is obvious difference between the score pre and post operatively with P value  $< 0.0001$  which means highly significant value (fig. 2) (fig. 3).

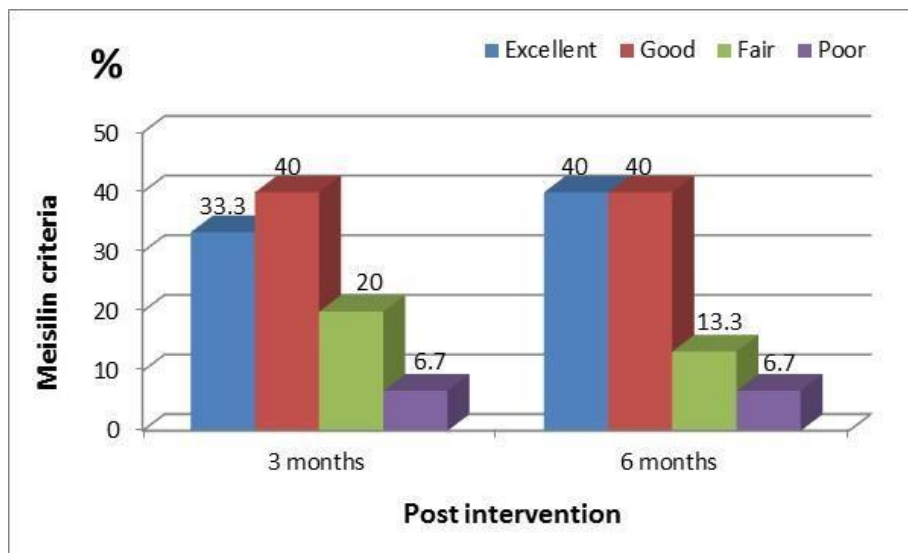


Fig. (1): Distribution of study patients regarding Meisilin criteria.

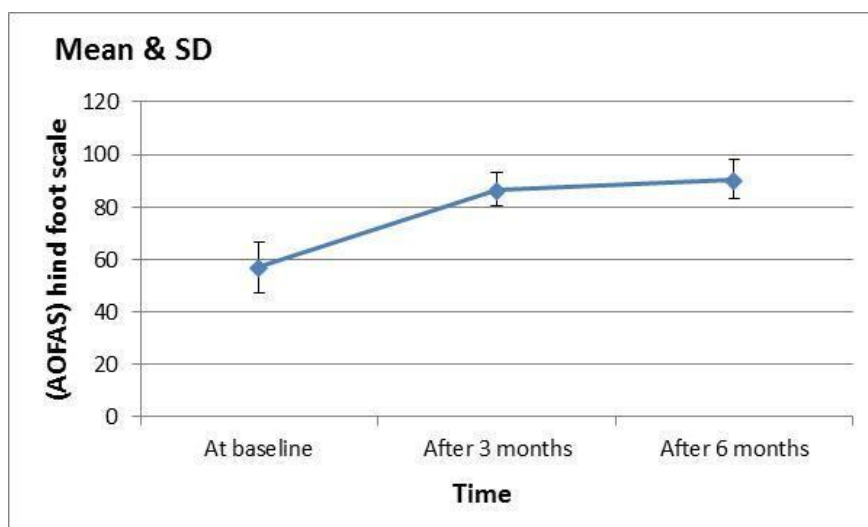


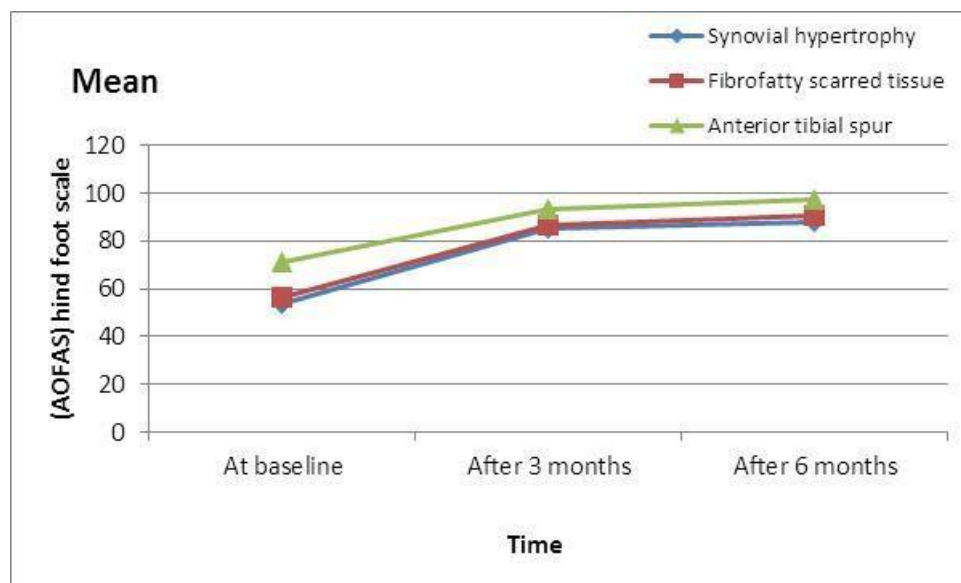
Fig. (2): (AOFAS) hind foot scale among the study participants.

**Table 1:** (AOFAS) hind foot scale among different lesions of impingement at different intervals of follow up.

Time	Synovial hypertrophy	Fibrofatty scarred tissue	Anterior tibial spur
	Mean ± SD		
At baseline	54.00 ± 9.83	56.13 ± 7.51	71.00 ± 8.49
After 3 months	85.00 ± 9.01	86.63 ± 4.87	93.00 ± 5.66
After 6 months	88.00 ± 10.89	90.88 ± 6.24	97.50 ± 0.71
P-value baseline/3m	0.002*	<0.0001**	0.272
P-value baseline/6m	0.001*	<0.0001**	0.130
P-value 3m/6m	0.182	0.043*	0.500

\* Significant

\*\* Highly significant



**Fig. (3):** (AOFAS) hind foot scale among different lesions of impingement at different intervals of follow up.



**Fig. (4): anterior tibial spur**



**Fig. (5): Arthroscopy showing meniscoid lesion**

### **Discussion**

In agreement with Bassett et al.,<sup>4</sup> the present study showed that history and physical examination were effective in determining the type of impingement, while Radiographs and magnetic resonance scans were not useful as physical examination; their role was to exclude the presence of

other pathological conditions causing anterolateral joint pain .

In our study, According to Meisilin criteria<sup>5</sup>. The final results revealed 6 cases (40%) were excellent, 6 cases (40%) were good, 2 cases (13.3) were fair and one case (6.7%) was poor.

In a study by El-Sayed<sup>6</sup>, conducted upon 20 patients assessment according to Meisilin criteria were excellent in 11 patients (55%), good in 6 patients (30%), fair in 2 patients (10%), and poor in 1 patient (5%).

The rate of excellent to good results as regards Meisilin criteria after arthroscopic treatment of anterolateral soft tissue impingement of the ankle varied from 75% to 96.7% in the published literature. The patients described in this prospective study demonstrated a comparable high percentage of excellent and good results (80%).

The AOFAS<sup>7</sup> used scoring system in our study includes main indexes such as pain, patient ambulatory function, and ankle joint movement limitations. It involves up to 100 scores for each patient and is classified as excellent (90 to 100), good (80 to 89), fine (70 to 79), and poor (<70).

In our study, the mean AOFAS score increased from  $56.93 \pm 9.60$  before surgery to  $86.73 \pm 6.32$  and  $90.60 \pm 7.48$  (range 73 to 98) at 3 and 6 months follow-up, respectively ( $p < .003$ ).

In a study by Mohsen Mardani et al.,<sup>8</sup> the mean AOFAS score was  $59.21 \pm 10.25$  before surgery, which increased to  $83.56 \pm 7.87$  and  $88.13 \pm 7.68$  at 3 and 6 months postoperatively.

Hassan<sup>3</sup> reported an AOFAS mean score of 34 before surgery and 89 postoperatively after arthroscopic treatment of 23 patients with soft tissue impingement lesions with good to excellent results 91%

In our study, with good to excellent results 92.7%. This is high percentage comparable to the literature.

**In conclusion,** Arthroscopic debridement is an effective procedure in the treatment of ankle impingement. There is marked improvement of pain and function in the patients after arthroscopic debridement.

This procedure proved to be safe and effective, with minimal morbidity and few complications. The most important factors negatively affecting the final outcomes are associated chondral lesions of the talus, associated syndesmotic lesions, and a new inversion injury to the ankle after the arthroscopic procedure.

## References

1. Morgan CD. Gross and arthroscopic anatomy of the ankle. Operative Arthroscopy. 2<sup>nd</sup> ed. Lippincott-Raven, Philadelphia 1996; 1101-1117.
2. Sanders T, Rathur S. Impingement Syndromes of the Ankle. Magnetic Resonance Imaging Clinics of North America 2008; 16(1):29-38.
3. Hassan, A: Treatment of anterolateral impingements of the ankle joint by arthroscopy. Knee Surgery, Sports Traumatology, Arthroscopy 2007; 15: 1150-1154.
4. Bassett FH III, Gates HS, Billys JB et al., Talar impingement by the anteroinferior tibiofibular ligament: A cause of chronic pain in the ankle after inversion sprain. J Bone Joint Surg Am 1990; 72(1):55-59.
5. Meislin, R, Rose, D, Parisien, J Springer, S: Arthroscopic treatment of synovial impingement of the ankle. The American Journal of Sports Medicine 1993; 21:186-189.
6. Moustafa El-Sayed, A: Arthroscopic Treatment of Anterolateral Impingement of the Ankle. The Journal of Foot and Ankle Surgery 2010; 49:219-223.
7. Rodrigues RC, Masiero D, Mizusaki JM, Imoto AM, Peccin MS, Cohen M et al., Translation, cultural adaptation and validity of the american orthopaedic foot and ankle society (AOFAS) ankle-hindfoot scale. Acta Ortop Bras. [serial on the Internet]. 2008; 16(2): 107-111
8. Mardani-Kivi, Arthroscopic Treatment of Patients with Anterolateral Impingement of the Ankle with and without Chondral Lesions. The Journal of Foot and Ankle Surgery. 2013; 52:188-191.