

Ankle Arthroscopy in Post Traumatic Ankle Pain

Hassan Husien, Samir M Zahid, Hossam Elbegawi, Islam A. Abd El Fattah

Department of Orthopedic Surgery, Faculty of Medicine Benha University, Egypt.

Correspondence to: Islam A. Abd El Fattah Department of Orthopedic Surgery, Faculty of Medicine Benha University, Egypt.

Email:

islamaboelsood2020@gmail.com

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Abstract:

Background: The clinical use of ankle arthroscopy for diagnosis and treatment of foot and ankle disorders has increased over the last few decades, it may seem novel to those unfamiliar to this technique. The recent advances in the equipment as well as sound knowledge of the anatomy of the portals required for safe scope insertion have made a possible number of diagnostic and therapeutic procedures. **Aim:** to give a good, efficient and radical minimal invasive solution to the chronic post traumatic ankle pain, also we can perform an arthroscopic assisted ankle arthrodesis. **Methods:** This study was conducted on 25 patients with post traumatic ankle pain. They were being collected from the orthopedic department of Benha University and orthopedic department of Railway hospital. **Results:** Majority of cases were males by 72%, Mean \pm SD of age was 37.52 ± 11.87 and majority of cases had right side lesion by 72%. There was highly statistically significant difference between preoperative and postoperative

regarding diagnosis functional score and pain score with better score postoperative. 80% of cases had no complications, 4% had Subchondral sclerosis, 4% had RSD, and 8% had Fair mild pain and 4% mild and swelling. **Conclusion:** Arthroscopic management of post-traumatic ankle pain is indicated if the history and clinical examination are suggestive, arthroscopy proved to be effective for confirming the diagnosis and for treatment.

Keywords: ankle arthroscopy; post traumatic; ankle pain

Introduction

The clinical use of ankle arthroscopy for diagnosis and treatment of foot and ankle disorders has increased over the last few

decades, it may seem novel to those unfamiliar to this technique. The recent advances in the equipment as well as sound

knowledge of the anatomy of the portals required for safe scope insertion have made a possible number of diagnostic and therapeutic procedures (1).

Historically the first ankle arthroscopy was performed in Japan by Takagi in 1918 (2). The modern era of ankle arthroscopy started in 1972 when Watanabe described his experience in twenty eight patients and laid down the principle of small joint arthroscopy. Nowadays it is an established treatment of choice for most ankle pathologies (3).

Routinely, anteromedial and anterolateral portals are used. An additional posterolateral portal has been advocated in cases of posterior ankle pathology, but it has usually been viewed as an accessory rather than the main working portal. Arthroscopic procedures which are performed using this portal are not easy. Anterior ankle joint pathology can be treated by means of an anterior ankle arthroscopy (4).

In most cases chronic ankle pain is caused by an anterior impingement syndrome, tibiotalar anterior osteophytes, intra-articular foreign bodies, local synovitis, or osteochondral defects. The use of a 2-portal endoscopic approach to the posterior ankle with the patient in the prone position gives

excellent access for the examination and treatment of posterior ankle pathology (5).

A combined anterior arthroscopic and posterior open treatment bears the risk of posterior scar formation, scar tenderness and stiffness. Contraindications to arthroscopy include severe degenerative disease with reduced or absent joint space, Infections, severe edema and tenuous vascular status (6).

The aim of this study is to evaluate the role of ankle arthroscopy in treatment of post traumatic ankle pain. Also ankle arthroscopy gives a good means to evaluate the ankle joint in acute post traumatic ankle pain and pilon fracture prior to fixation. Lastly, we can perform an arthroscopic assisted ankle arthrodesis.

Methods:

During the period from May 2013 (when the first patient was assessed and evaluated) to August 2019 (the time of the last patient postoperative visit for final score assessment), a prospective case study of 25 patients was performed to assess the value of arthroscopic intervention to diagnose and treat patients with chronic post-traumatic ankle pain, whether the cause was soft tissue pathology like soft tissue impingement

syndromes , osteochondral pathologies like osteochondritis dissecans, bony impingement or intra-articular loose body.

Twenty five cases were reviewed in these hospitals. All were reviewed in Faculty of medicine Benha University hospital Egypt, and Railway hospital Egypt.

All patients who were included in these study had complained from post- traumatic ankle pain with or without swelling, limitation of movement or and locking. They did not respond to conservative treatment, including rest, anti-inflammatory medications, ankle orthotics, shoe wear modification, physiotherapy or immobilization.

Inclusion criteria:

- 1- Patient aged 18-65 years.
- 2- Patients with chronic post traumatic Ankle pain

All patients who were included in these study had complained from post- traumatic ankle pain with or without swelling, limitation of movement or and locking. They did not respond to conservative treatment, including rest, anti-inflammatory medications, ankle orthotics, shoe wear modification, physiotherapy or immobilization.

Exclusion criteria:1- Patient aged outside the included age group; 2- Patients suffering from pain caused by any other cause rather than trauma, such as pain due to systemic disease like rheumatoid disease, pain due to primary osteoarthritis; 3-Patients with severe degenerative disease with reduced or absent joint space, infections, severe edema, diabetic, neurologic and tenuous vascular status.

All patients were subjected to full history taking, full clinical examination including pain assessment and scaling, Karlsson and Peterson scoring system his scoring scale is based on eight different items (Table 1), according to the physician's and the patient's own evaluation. These items are a subjective evaluation of functional stability, pain, swelling and stiffness. Tasks of daily life, such as running and stair climbing, working ability, as well as sports activity and leisure activities are evaluated. Subjective or functional stability is given the score, 25 points. In this study as all patients have no instability so every patient in this study was given a score of 25 in this parameter (stability). Absence of pain is given a score of 20 points. Swelling is given a score, 10 points. Stiffness is given a lower score than swelling, 5 points, as most patients feel that stiffness gives rise to less

residual disability than swelling. Activities such as running and stair climbing are given a score of 10 points each. Such tasks are a good assessment of ankle joint function for most individuals in normal daily living, work and leisure activities. Overall assessment of work, sports activities and leisure time activities is given a score of 15 points in combination. The last item, i.e. the

need for wearing an ankle support is given a score of only 5 points, as only few patients are forced to use ankle supports.

Imaging and radiological evaluation by plain x ray, Ct and MRI were performed to all patients. After reaching final diagnosis by thorough arthroscopic examination, surgical managements were done according to classification of cases into four groups:

The Karlsson and Peterson Scoring System for Ankle function

	Degree	Score
Pain	None	20
	During exercise	15
	Walking on uneven surface	10
	Walking on even surface	5
	Constant	0
Swelling	None	10
	After exercise	5
	Constant	0
Instability	None	25
	1-2 / year (during exercise)	20
	1-2 / month (during exercise)	15
	Walking on uneven ground	10
	Walking on even ground	5
	Constant (severe) using ankle support	0
Stiffness	None	5
	Moderate (morning, after exercise)	2
	Marked (constant, severe)	0
Stair climbing	No problems	10
	Impaired (instability)	5
	Impossible	0

Running	No problems	10
	Impaired	5
	Impossible	0
Work activities	Same as pre-injury	15
	Same work, less sports, normal leisure activities	10
	Lighter work, no sports, normal leisure activities	5
	Severe impaired work capacity, decreased leisure activities	0
Support	None	5
	Ankle support during exercise	2
	Ankle support during daily activities	0

1-Group A: Group A which includes the patients with isolated soft tissue impingement as the main pathology; they were thirteen cases (52% of all cases); six cases of anterolateral impingement, one case of antero-medial impingement, six case of whole anterior aspect of the joint impingement. For this group arthroscopic debridement of the hypertrophied inflamed synovium and fibrotic impinging tissue lesions; using small diameter shaver, through the antero-medial or anterolateral portals was done.

2-Group B: Group B that included patients who had anterolateral soft tissue impingement and small osteochondral lesion of their tibial plafonds they were two patients (8%) of all cases; arthroscopic shaving was done for the soft tissues and debridement of their osteochondral lesions.

3-Group C: Group C included the patient with Osteochondritis Dissecans of talus, four cases (16%) of all cases; the four patients all were supero-medial lesions of the talar dome, the for cases were diagnosed before surgery, intraoperative once the lesion was identified, a careful evaluation was performed using multiple portal visualization to determine the arthroscopic stage and appropriate treatment. All the four lesions were loose and had a thick, fibrous membrane surrounding it, they were removed and the base drilled directly through the corresponding portal using a sleeve to protect the soft tissues, they were anterior enough so the foot was positioned in maximum planter-flexion and the lesions were drilled directly.

4-Group D: Group D included the patients with anterior bony impingement and

osteoarthritic changes; three patients (12%) with anterior bony impingement and one case (4%) with osteoarthritic changes; debridement of friable chondral lesions or fibrillations, drilling of ulcers and removal of the osteophytes, bony protrusions and loose bodies with burr and grasper under arthroscopic vision and intra-operative image intensifier assessment to ensure adequacy of debridement.

All patients were followed up beginning with two week interval for the first six weeks postoperatively in outpatient clinics and then monthly for six months. The patients were assessed at each visit using the scale of pain (7). Health care professionals typically measure pain on a scale of 0-10, with 0 being no pain and 10 being the worst pain imaginable.

Results:

The majority of cases were males by 72%, Mean \pm SD of age was 37.52 ± 11.87 and

majority of cases had right side lesion by 72%. Demographic data shown in Table 1.

This table shows distribution of the studied cases according to functional score, revealing that there was highly statistically significant difference between preoperative and postoperative regarding functional and pain score with better postoperative functional and pain score. Table 2 and fig.1

In this study, 80% of cases had no complications, 4% had Subchondral sclerosis, 4% had RSD, and 8% had Fair mild pain and 4% mild pain and swelling. Fig. 2. In addition, all patients had preoperative below knee Cast, physical therapy and NSAID, and 100% of complicated cases had post-operative X-Ray and MRI.

In this study, majority of cases 40% had Anterolateral pain, 16% were diffuse ante-post, 12% were Anterior medial and only 32% had diffuse ante pathology. Table 3

Table (1):Distribution of the studied cases according to demographic data (n = 25)

	No.	%
Sex		
Male	18	72.0
Female	7	28.0
Age (years)		
Min. – Max.	5.0 –59.0	
Mean \pm SD.	37.52 \pm 11.87	
Median (IQR)	38.0 (28.0 –46.0)	
Side		
Right	18	72.0

Left 7 28.0

Table (2): Distribution of the studied cases according to diagnostic score (n = 25)

Diagnosis Score	Preoperative		Postoperative		MH p
	No.	%	No.	%	
No pain	0	0.0	21	84.0	
Mild pain	0	0.0	4	16.0	
Discomforting - moderate pain	12	48.0	0	0.0	<0.001*
Distressing - severe pain	12	48.0	0	0.0	
Intense - very severe pain	1	4.0	0	0.0	

MH: Marginal Homogeneity Test; p: p value for comparing between the studied groups; *: Statistically significant at $p \leq 0.05$.

Table (3): Distribution of the studied cases according to site (n = 25)

Site	No.	%
Anterior medial	3	12.0
Diffuse ante	8	32.0
Anterolateral	10	40.0
Diffuse ante-post	4	16.0

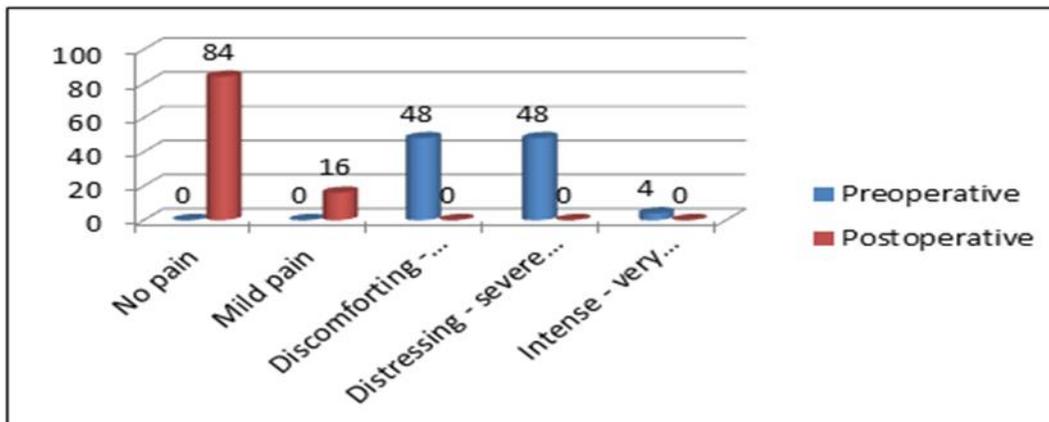


Fig 1: Bar charts showing distribution of cases according to diagnosis score.

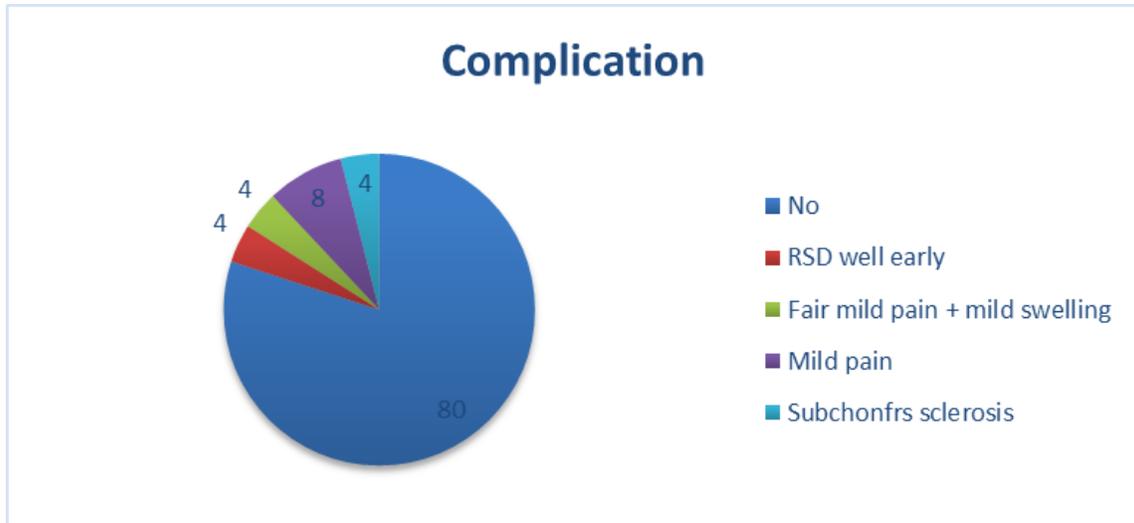


Fig 2: pie diagram showing distribution of cases according to complications.

Discussion

The findings of the present study revealed that majority of cases were males by 72%, Mean \pm SD of age was 37.52 ± 11.87 and majority of cases had right side lesion by 72%. Similar to our results, in a study done in 2018, revealed that twenty-one cases had right side affection while six cases had left side affection. The mean age was 29.5 years (Range: 17 - 49).

Four cases were females while 23 cases were males (8).

The present study assessed diagnosis score among studied cases, revealing that there was highly statistically significant difference between preoperative and postoperative regarding diagnosis score with better diagnosis postoperative.

Despite advances in diagnostic imaging, diagnostic arthroscopy still remains the gold standard for diagnosis and assessment of ankle pathology and posttraumatic pain (9). The arthroscopic findings in the current study were consistent with that reported in the literature (10).

The outcome of the current study was satisfactory in most cases; with disappearance or improvement of the complaints, improved function and improved ankle scores. This was comparable to the reported literature, The rate of excellent to good results after arthroscopic treatment of ALSTAI (anterolateral soft tissue ankle impingement) varied from 75% to 96.7% in the published literature (11). After arthroscopic treatment of 41 patients with

posttraumatic ankle pain, it was reported that (12), 21 patients as excellent, 16 as good, 2 as fine, and 2 as weak according to the Meislin criteria (13). In the series of Devgan et al, (14), the mean VAS score decreased 7.93 preoperatively to 2.57 finally, and the mean pain score ankle hind foot scale improved from 50.5 preoperatively to 85.71 finally.

The current study assessed the complications among the participants and revealed that 80% of cases had no complications, 4% had subchondral sclerosis, 4% had RSD (reflex sympathetic dystrophy), and 8% had fair mild pain and 4% mild pain + mild swelling.

Similar to our results, the study done in 2018, (8) found that there were no major postoperative complications in any patient. The reported complications were minor and few. Two cases had temporary paresthesia of the dorsum of the foot secondary to neuropraxia of the superficial peroneal nerve. Two patients showed signs of periportal superficial infection that resolved with antibiotics and local care.

In the systematic review done in 2015 (15) that assessed arthroscopic treatment for anterior ankle Impingement, 20 studies were evaluated based on patient satisfaction rates, complication rates, and clinical outcome measures to provide an overview. Complications were recorded in all but 2

studies, resulting in a summed complication rate of 5.1%, 1.2% of which were considered major complications and the remaining 3.9% were minor complications. The most commonly reported complications were mild nerve symptoms (n 27¼), superficial infection (n 4¼), and deep infection (n 4¼)

Postoperative assessment focuses on functional score and patient satisfaction as regarding pain free feeling. Two to five days following ankle arthroscopy, the patient can remove the posterior splint and begin passive range of motion exercises. This early range of motion will help the new fibrocartilage to better contour to the joint as it is deposited and will prevent stiffness of the joint, the patient should then wear a partial weight bearing cast for four to six weeks to allow the cartilage to repair and fill in with fibrocartilage. After six weeks, the patient should begin physical therapy to regain range of motion. Patients should postpone all impact activities for 12 weeks; typically, NSAIDs provide satisfactory analgesia following ankle arthroscopy. It is also important to inform the patient that for many months after the procedure, considerable edema may be present at the level of the ankle (16).

In the present study, we assessed patient's management and found that all patients had preoperative below knee cast , physical

therapy and NSAID, and 100% of cases had postoperative X-Ray and MRI. One can access the ankle joint from the anterior or posterior aspect of the joint. There are three chief incision locations or portals that are in use most often in ankle arthroscopy. Surgeons can strategically place these portals to gain access to the ankle joint with instrumentation while minimizing the risk of damage to anatomical structures around the ankle, especially nerves and blood vessels (15).

Additionally, the current study assessed the studied cases according to site of pathology, showing that majority of cases 40% had Anterolateral pathology, 16% were diffuse ante and post, 12% were Anteromedial and only 32% had diffuse ante pathology. In agreement with our study, it was found that the ankle was approached through standard anteromedial and anterolateral portals, taking care to protect the neurovascular structures (8).

Conclusion

Arthroscopic management of post-traumatic ankle pain was indicated if the history and clinical examination are conclusive, arthroscopy proved to be effective for confirming the diagnosis and for treatment. The outcome was satisfactory in most cases, with marked improvement of pain and

function. The procedure proved to be safe, with minimal morbidity and few complications.

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