

Results of Arthroscopic Surgery in Detachable Osteochondritis Lesion of Talus Following Rotational Ankle Trauma

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Abstract

Background: Ankle sprains are amongst the most common sports injuries. Our study aimed to evaluate the results of arthroscopic surgery of detachable osteochondritis lesions in the talus (OLT) following rotational trauma in military patients referred to us.

Methods: We assessed 120 patients referred to our Hospital from June 2021 to June 2021 due to detached osteochondritis lesions in the talus of the foot. The lesion was due to rotational trauma and ankle sprain. Time to return to activity, ATFL rupture, PTFL rupture, OS trigonum, rupture of the lower desperation CFL, Loose body, and location were compared.

Results: Out of 120 patients, 107 (89.2%) were male. The mean age of the patients was 38.17±12.70 years. The mean time to return to activity was 108.07±27.87 days in women and 92.89±25.56 days in men (P = 0.066). ATFL rupture was 11 (84.6%) in women and 48 (44.9%) (P = 0.007). Lower syndesmosis was 8 (61.5%) in women and 30 (28.0%) (P = 0.014). The mean time to return to activity in patients <45 years was 87.54±23.59, and in patients >45 years was 114.51±22.81 days (P = 0.0001). There was no significant difference in the distribution of ATFL rupture, PTFL rupture.

Conclusion: The results of this study showed that the mean time to return to activity in female patients was longer than in males. Also, the return time to activity in patients less than 45 years was less than in patients over 45 years. The rupture of ATFL, and inferior Syndesmosis was higher in female than male patients.

Keywords: Arthroscopic Surgery, Detachable Osteochondritis Lesion, Talus.

Introduction

Ankle sprains are one of the most common sports injuries, and it is necessary to differentiate between sinus injuries or sprains on the upper surface of the ankle¹. The management of this lesion is different, and its recovery period is longer²⁻³. This significant difference in the prevalence and recovery period indicates the damage's variability and the injury's severity, which has led to more attention in recent years. The mechanism of this injury is mainly rotating the wrist to the outside⁴.

OLT is an acquired lesion of the subchondral bone, causing layering and dismemberment of the bone, which can be accompanied by or without involvement and instability of articular cartilage⁵. The most cause of osteochondritis lesions is repetitive microtraumas associated with vascular insufficiency. Ankle osteochondritis lesions occur mainly in the medial part of

the talus. Osteochondral lesions can occur in any joint, but the most common joints are the knee and ankle. The prevalence of osteochondral lesions is mostly in young people, especially boys⁵⁻⁷.

About half of the reported osteochondritis are not diagnosed in emergency medicine radiographs, and the patient is treated with torsion. In case of worsening symptoms, persistent effusion, dislocation 4 to 5 weeks after an ankle injury, radiographic anion, and re-examination. In the case of the knee joint, with early diagnosis and choosing appropriate treatment, restoring knee movement and improving the function of many patients is expected. However, these movement limitations are annoying and cause severe limitations in the daily and occupational activities of the patient, and in the absence of reforms at the right time, it is irreversible⁷.

In this study, we evaluate the results of arthroscopic surgery of detachable osteochondritis lesions in the talus following rotational ankle trauma in military patients referred to Baqiyatallah Hospital.

Methods

This study's population is 120 patients referred to Baqiyatallah Hospital from June 2021 to June 2021 due to detached osteochondritis lesions in the talus of the foot. The lesion was due to rotational trauma and ankle sprain, and patients are excluded from the study due to ankle fractures. Also, patients who have previously suffered from ankle fractures are excluded from the study to neutralize the distorting role of these cases.

It is important to note that patients who have suffered from rotational trauma and ankle sprains and patients are excluded after ankle fracture. Also, patients who have previously suffered ankle fractures will be excluded to neutralize the role of confounding these cases in the study. Considering the study of these patients during the mentioned years and the required items in patient records, the method of reading in this study has been used to cover patients' information.

ATFL rupture, PTFL rupture, OS trigonum, Rupture of the lower desperation sin, CFL, Loose body, and location was compared in term of gender and age (<45 years and >45 yrs). This proposal was confirmed by the Ethics Committee of Baqiyatallah University of Medical Sciences (Code: IR.BMSU.REC.1399.484).

Data were analysed by SPSS-25 software. A P-value less than 0.05 was considered statistical significance. Chi-2, Fisher exact test, T-test, and Mann Whitney were used for comparison between the two groups. Kolmogorov-Smirnov tests were used to assess the normalization.

Results

Overall, 120 patients were included, of which 107 (89.2%) were male, and 13 (10.8%) were female. The mean age of the subjects was 38.17 ± 12.70 years.

The mean time to return to activity in all subjects was 94.54 ± 26.13 days. The mean time to return to activity was 108.07 ± 27.87 in women and 92.89 ± 25.56 days in men ($P = 0.066$).

ATFL rupture was 11 (84.6%) in women and 48 (44.9%) in men and was significantly higher in women than men ($P = 0.007$). Lower syndesmosis was 8 (61.5%) in women and 30 (28.0%) in men and was significantly higher in women than men ($P = 0.014$).

The mean time to return to activity in patients under 45 years was 87.54 ± 23.59 and in patients over 45 years was 114.51 ± 22.81 days ($P = 0.0001$).

There was no significant difference in the distribution of PTFL rupture, anterior ridge syndrome, OS TRIGONUM, CFL, LOOSE BODY, and location according to the sex of the patients (Table 1).

There was no significant difference in the distribution of ATFL rupture, PTFL rupture, Anterior Ridge Syndrome, OS TRIGONUM, CFL, LOOSE BODY, and Location according to the age of patients (Table 2).

Table 1: Orthopedic findings generally and in terms of gender.

Items	Female	Male	P-value
ATFL rupture (%)	84.6%	44.9%	0.007
PTFL rupture (%)	0.0%	3.7%	0.63
Anterior Ridge Syndrome (%)	7.7%	19.6%	0.265
OS trigonum(%)	7.7%	6.5%	0.612
Rupture of the lower desperation sin (%)	61.5%	28.0%	0.014
CFL(%)	0.0%	15.9%	0.122
Loose body(%)	15.4%	17.8%	0.594
Location (%)			0.737
Medial	84.6%	89.7%	
Latral	15.4%	7.5%	
Center	0.0%	0.9%	
Medial and Latral	0.0%	1.9%	

Table 2: Orthopedic findings by age level.

Items	>45	<45	P-value
ATFL rupture (%)	54.8%	47.2%	0.463
PTFL rupture (%)	3.2%	3.4%	0.726
Anterior Ridge Syndrome (%)	32.3%	13.5%	0.265
OS trigonum(%)	6.5%	6.7%	0.660
Rupture of the lower desperation sin (%)	25.8%	33.7%	0.415
CFL(%)	6.5%	16.9%	0.126
Loose body(%)	12.9%	19.1%	0.314
Location (%)			
Medial	90.3%	88.8%	0.767
Lateral	6.5%	9.0%	
Center	0.0%	1.1%	
Medial and Lateral	3.2%	1.1%	

Discussion

Ankle torsion is one of the most common exercise injuries. It is necessary to differentiate the damage of the descent or the torsion at the upper surface of the ankle. The evaluation and treatment of this lesion are different, and its recovery is longer¹. Studies reported the twist of the descent between one and eleven percent of wrist injuries². A person's return to sports activities is reported between 14 and 157 days. This significant difference in the prevalence and recovery period indicates the damage's variability and the injury's severity, which has led to more attention in recent years³.

OLT is an acquired Subchondral lesion that causes bone laying and separation that can be accompanied by or without accompanying articular cartilage.

The ankle osteochitis lesion happens typically in the medial of the talus⁴. The osteochondral lesion can occur in any detail, but the most common joints are the knees and ankles. The prevalence of osteochondral lesions is mostly in young people, especially boys⁵.

The etiological factors of osteochondral lesions is unclear, but the trauma has been examined as a potential factor¹⁻³. CT and MRI may allow early detection and provide more accuracy in the lesion stage. Ankle torsion is one of the most common exercise injuries, and it is necessary to differentiate the damage of the descent or the torsion at the upper surface of the ankle. The feet of the evaluation and treatment of this lesion is different, and its recovery is longer¹.

Detachable osteochondritis is an unknown cause of the Subchondral bone that causes the layering and separation of the bone that can be accompanied by or without accompanying the articular cartilage. The cause

of the osteocytes lesion continues to be the place of discussion, but the most common cause is repetitive microtraumas dependent on vascular failure that causes progressive pain generally in the knee and ankle. The ankle osteitis lesion occurs typically in the medial section of the Talus³. One study showed that 30 and 40 percent of patients with chronic osteochondral lesions reported trauma⁸.

In the present study, ATFL rupture was significantly higher in women. The lower descendants' rupture was 61.5 % in women and 28.0 % in men, higher in women than in men. In the distribution of PTFL rupture, there was no significant difference in the gender of the anterior, OS trigonum, CFL, loose body, and location. The average return to activity in patients was less than 45 years older than 45 years old. There was no significant difference in the distribution of ATFL rupture, PTFE rupture, anterior ridge syndrome, OS trigonum, CFL, loose body, and location, depending on the age of the patients.

Sarcon et al. reported that returned to sports activities between 14 and 157 days. This significant difference in the prevalence and recovery period indicates that the degree of damage and the injury's severity has led to more attention in recent years. The mechanism of this damage is mainly wrist rotation³. In the study of Wright et al. on five hockey players with ankle torsion, the return period of these patients was very variable, and the average recovery of these patients was reported as 45 days⁹. In the present study, the average return time to activity in women was higher than in men. One of the reasons for the difference in our results and previous studies can be the difference in the population under study. Also, contrary to the results of the present study,

several studies showed no significant relationship between gender and treatment results¹⁰⁻¹³.

Choi et al. (2012) showed that age did not affect treatment results¹⁴. But a recent study showed that aging had a significant statistical relationship with the increase in return to work. The average return to activity in patients less than 45 years was less than in patients more than 45 years. On the other hand, several studies showed the relationship between age and treatment outcome¹⁰⁻¹³. However, it is assumed that younger patients are more susceptible to exercise than older patients, which in turn causes younger patients to have more likely to have osteochondral lesions, one of the most common causes. The elderly had also reported less of a trauma history¹⁴.

Kumai et al.¹² reported good results in 72 % of patients using arthroscopic debris and drilling¹⁰. Also, in the study of Pritsch et al., 73 % of patients reported acceptable results¹⁵. Becher et al. reported good to excellent results in 83 % of patients who used arthroscopic debris and microscopic¹⁰. In the study of Ferkel et al., 50 patients with chronic osteochondral lesions were treated by arthroscopy. In 72 % of patients, there were excellent/good results, 20 % fair results, and 8 % poor results. There was no significant relationship between simple radiography, computer tumor, or MRI stage and clinical results. However, there was a relationship between the arthroscopic stage and the clinical outcome⁸.

Chuckpaiwong et al. (2008) examined the effect of micro-fracture size for osteochondral ankle lesions (talus) on the outcome. However, there was no relationship between age, gender, sports profession, lesion location, or lesion location results. They showed age, higher BMI and the duration of symptoms hurt the consequence¹¹. Also, Becher and Thermann (2005) and Robinson colleagues (2003) found no relationship between age, BMI, duration of symptoms, and consequences^{10,12}.

Schimmer et al., in 52.8 % of cases, osteochondritis of the talus was observed in the interior and 41.7 % in the lateral talus¹⁶. In the present study, 89.2 % were in the medial section, 10.3 % in the line, 0.8 % in the center, and 1.7 % in the medial and lateral sites.

In a study conducted on 1344 ankles, Hopkinson et al. found that ankle screws were the most common cause of Osteochondritis, and only nine patients had long-term complications. The disease included movement

constraints, joint arthritis, and joint instability¹⁷. Nielson et al. reported ankle radiation does not help the physician in diagnosis and is merely based on the patient's complaint and clinical suspicion of the surgeon and symptoms of the patient¹⁸. Thomas et al. found that if there were osteochondral defects in the ankle joint, it was best not to use arthroscopy and internal or external osteotomy¹⁹. On 27 traumatic patients, Schuman et al. concluded that if the symptoms and problems were stable, the best treatment and return to the patient's life was arthroscopic surgery²⁰.

Schuman (2002) examined 38 patients treated with arthroscopic curettage and drilling due to osteochondral defects. Surgical treatment indications were sustained symptoms after conservative treatment for at least six months. A total of 22 primary surgical treatments (primary group) and 16 previous surgical patients had failed (revised group). The average follow-up was 4.8 years (2 to 11). Good or excellent results were evaluated in 86 % in the initial group and 75 % in the revised group. After ten years, radiological degenerative changes were observed in an ankle in the appeal group. They reported that curettage and arthroscopic drill are recommended for initial treatment and revision of osteochondral talus defects²⁰.

Choi et al. (2020) stated that arthroscopic microscopy showed good performance results and improved quality of life by maintaining satisfactory results in the average follow-up of 6.7 years. Therefore, arthroscopic microscopic microscopy appears as a first-line treatment for OLT in mid-term tracking²¹. It should be noted that about half of the reports of Osteochondritis Dissecans were not diagnosed in emergency medicine radiographs, and the patient is treated with torsion. If symptoms exacerbate, persistent hypertension, or dislocation after 4 to 5 weeks after an ankle injury, indicates radiography and re-examination⁶. The osteochondritis lesion is used as an accepted indicator for surgery, and this surgical intervention aims to prevent degenerative disease. Recent advances in the field of diagnostic arthroscopy in the ankle have led to the creation of newer techniques that have enhanced patient management following a surgical procedure²².

Conclusion

The results of this study showed that the mean time to return to activity in female patients was longer than in

males. Also, the return time to activity in patients less than 45 years was less than in patients more than 45 years. The rupture of ATFL, and inferior Syndesmosis was higher in female than male patients.

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Authors' contributions

Concept and design: Alireza Rahimnia, Mohammad Kazem Emami Meybody, Hesam Bour Bour.

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Conflict of interest

There is not conflict of interest.

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Ethical consideration

This proposal was confirmed by the Ethics Committee of Baqiyatallah University of Medical Sciences (Code: IR.BMSU.REC.1399.484).

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