ORIGINAL ARTICLE

Comparison of anteroposterior and posteroanterior screw fixation techniques for posterior malleolar fractures: a retrospective and clinical study

Suat Batar, M.D.,[1] **Ali Şişman, M.D.**[2]

[1]Department of Orthopedics and Traumatology, Ümraniye Training and Research Hospital, Istanbul-*Türkiye*
[2]Department of Orthopedics and Traumatology, Adnan Menderes University Faculty of Medicine, Aydın-*Türkiye*

ABSTRACT

BACKGROUND: The posterior malleolus is an important component of the distal tibiofibular complex and plays a crucial role in maintaining ankle joint stability. This study aimed to compare the clinical and radiological outcomes of fixation with anteroposterior (AP) and posteroanterior (PA) compression screws in patients with Haraguchi Type I PMFs.

METHODS: Data from 306 patients who underwent surgery for trimalleolar fractures between January 2018 and March 2022 were retrospectively reviewed, and 60 patients meeting the criteria were included in the study. Thirty-one patients with AP screw fixation and 29 patients with PA screw fixation were compared clinically and radiologically. Radiological parameters such as fracture healing time, step-off amount, displacement amount, and development of arthritis were evaluated. Clinical outcomes including ankle joint range of motion at final follow-up, American Orthopedic Foot and Ankle Society (AOFAS) score, Visual Analog Scale (VAS), and Olerud-Molander Score were compared.

RESULTS: There were no statistically significant differences between the groups in terms of average age, gender distribution, smoking history, fracture etiology, time from injury to surgery, operation time, fracture healing time, and follow-up duration. Step-off and displacement amounts were lower in the PA screw group (P<0.001, P=0.004, respectively). When comparing the development of arthritis, according to the Kellgren-Lawrence Classification, no signs of arthritis were observed in 62.1% of the PA screw group, while this rate was 22.6% in the AP screw group. Ankle dorsiflexion, plantar flexion range of motion, AOFAS score, Olerud-Molander Score, and VAS results were statistically better in the PA screw group (P=0.002, P=0.001, P=0.002, P=0.001, P=0.002, respectively). There were no significant differences between the groups regarding complications.

CONCLUSION: Two different screw fixation techniques used in the treatment of trimalleolar fracture patients with Haraguchi Type I PMF were compared. In conclusion; percutaneous PA screw fixation is more advantageous than the AP screw fixation method because it provides less step-off in the fracture line, less arthrosis in the ankle, and better functional scores.

Keywords: Percutaneous screw fixation; posterior malleolar fractures; trimalleolar fracture.

INTRODUCTION

The posterior malleolus is an important component of the distal tibiofibular complex. It plays a crucial role in maintaining ankle joint stability, including the congruity of the distal tibiofibular syndesmosis, tension of the posteroinferior tibiofibular ligament, and stability of the distal tibiofibular syndesmosis.[1,2] Posterior malleolar fractures (PMFs) constitute approximately 7–44% of all ankle fractures.[1] Despite numerous studies, a consensus on the surgical approach for PMFs has not been reached.[1]

In recent years, the use of computed tomography (CT) in the

Cite this article as: Batar S, Şişman A. Comparison of anteroposterior and posteroanterior screw fixation techniques for posterior malleolar fractures: a retrospective and clinical study. Ulus Travma Acil Cerrahi Derg 2023;29:1376-1381.

Address for correspondence: Suat Batar, M.D.
Ümraniye Training and Research Hospital, İstanbul, Türkiye
E-mail: drsuatbatar@gmail.com

Ulus Travma Acil Cerrahi Derg 2023;29(12):1376-1381 DOI: 10.14744/tjtes.2023.66204 Submitted: 06.07.2023 Revised: 23.10.2023 Accepted: 23.11.2023

diagnosis of ankle fractures has become widespread. This has allowed for a better understanding of the location and size of fracture fragments.[3] One of the commonly used classifications for PMFs is the classification proposed by Haraguchi et al. which divides the posterior malleolus into three types based on axial CT sections.[4,5] Haraguchi Type 1 PMF is a triangular fragment type that involves the posterolateral corner of the tibial plafond. Approximately 67% of PMFs are classified as Type 1.[3-6]

Type 1 PMFs can be fixed with percutaneously placed anteroposterior (AP) screws or with screws/plates using a posterolateral approach. In AP screw fixation, the indirect reduction method relies on ligamentotaxis, and the fixation strength of AP screws may be weak.[6] On the other hand, the direct fixation method with a posterolateral approach may require more soft-tissue dissection and positional changes during surgery. Therefore, the most suitable surgical technique for Haraguchi Type 1 PMFs is a subject of questioning.[6,7]

This study aimed to compare the clinical and radiological outcomes of fixation using AP compression screws (indirect reduction) and posteroanterior (PA) compression screws (indirect reduction) in patients with Haraguchi Type 1 PMFs.

MATERIALS AND METHODS

The study initiated after obtaining ethical committee approval (Date: April 24, 2023, ID: E-54132726-000-214164054). The study was designed in accordance with the principles outlined in the 1964 Helsinki Declaration and its subsequent revisions. Informed consent was obtained from all patients. The data of 306 patients who underwent surgery for trimalleolar fractures between January 2018 and March 2022 were retrospectively reviewed. Pre-operative AP and lateral radiographs, as well as CT images, were evaluated. The lateral malleolar fracture classification was performed according to the description by Weber[8] The classification of PMFs was conducted following the criteria defined by Haraguchi et al.[5] Patients who were younger than 18 or older than 65 (n=41), those who received a different implant other than a screw for posterior malleolar fixation (n=71), those with a follow-up duration of <1 year (n=29), those with Weber Type A fractures and Haraguchi Type 2 and 3 fractures (n=61), those diagnosed with diabetes mellitus (n=16), those with open fractures (n=12), those who had previously undergone ankle surgery or had evidence of arthritis on pre-operative radiographs (n=4), and those lost to follow-up for any reason (n=12) were excluded from the study (Fig. 1).

Patients who underwent posterior malleolar fixation were divided into two groups: The AP group (n=31) and the PA group (n=29). The groups were compared in terms of radiological and clinical outcomes.

Radiologically, healing time, amount of stepping, and amount of displacement were compared. Healing was considered to have occurred when the patient reported no pain at the fracture site during follow-up and evidence of bony union was observed on direct radiographs. The amount of stepping represented the amount of displacement in the coronal plane, while displacement referred to the amount of displacement in the sagittal plane. These measurements were performed on post-operative CT scans, and a comparison was made between the groups. The development of arthritis was compared based on the radiograph obtained at the final follow-up using the Kellgren-Lawrence Classification.[9]

The surgical duration was defined as the time from anesthesia induction to skin closure, and a comparison was made between the groups. Clinical outcomes were compared based on the examination findings at the final follow-up. Clinically, the degree of dorsiflexion, plantar flexion, The American Orthopedic Foot and Ankle Score (AOFAS), Visual Analog Scale (VAS), and Olerud-Molander Score were compared.

Surgical Technique

All patients underwent surgery under general or regional anesthesia in the supine position with the use of a pneumatic thigh tourniquet. The fixation sequence for all patients was posterior malleolus, lateral malleolus, and medial malleolus. In the AP fixation group, after achieving indirect reduction with ankle dorsiflexion, a 4.0 mm partially threaded cannulated screw (Truemed®, Istanbul, Türkiye) was inserted through a guide wire placed at the most prominent part of the posterior malleolus under fluoroscopic guidance. Subsequently, a small longitudinal incision was made at the entry site of the wire in the anterior aspect, and blunt dissection was performed to reach the bone, allowing for drilling and

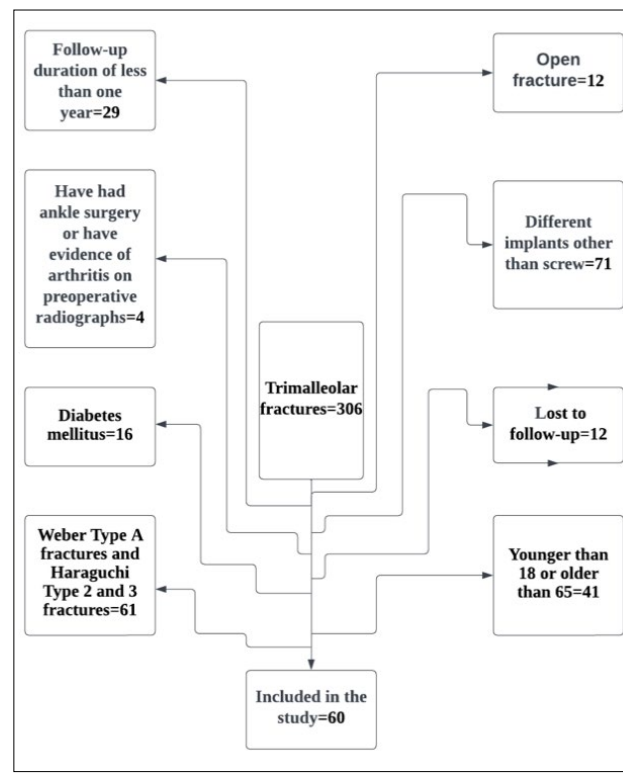

Figure 1. Flow diagram of patient selection.

Figure 2. Pre-operative and post-operative anteroposterior radiograph **(a,b,e, and f)** and computed tomography **(c,d,g, and h)** images of the patient with anterioposterior screw fixation.

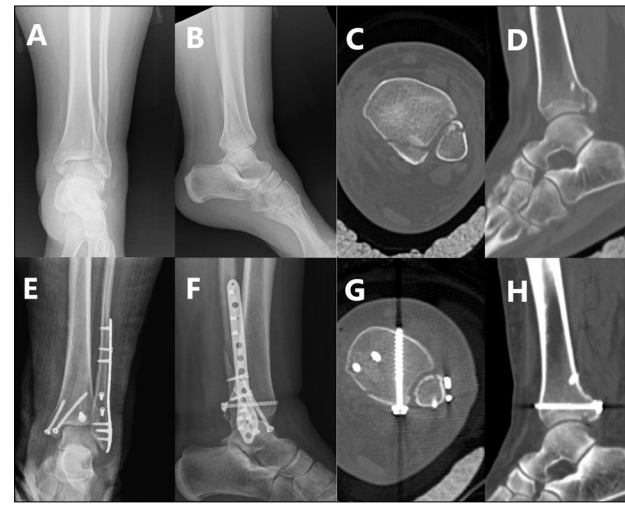

Figure 3. Pre-operative and post-operative anteroposterior radiograph **(a,b,e, and f)** and computed tomography **(c,d,g, and h)** images of the patient with posterior-anterior screw fixation.

screw placement (Fig. 2).

In the PA fixation group, a routine longitudinal incision was made from the lateral aspect for the lateral malleolus plate fixation. Then, blunt dissection was performed posterior to the peroneal tendons to palpate the posterior malleolus with a finger. At this stage, direct reduction was achieved either by dorsiflexing the ankle for ligamentotaxis or using a blunt dissector under fluoroscopy control. Once reduction was deemed satisfactory, a guide wire was again inserted from anterior to posterior, and confirmation was made by palpating the location where the wire emerged as the most prominent part of the malleolus. Then, a washer was passed through the guide wire with the help of a mosquito clamp, and the wire was brought out from the lateral aspect of the Achilles tendon through a stab incision. A drill sleeve was percutaneously inserted at the exit point of the wire, and drilling was performed from posterior to anterior, followed by the placement of a 4.0 mm partially threaded cannulated screw for compression across the fracture line (Fig. 3).

Following posterior malleolus fixation, an anatomical distal fibula plate (Truemed®, Istanbul, Türkiye) was used for lateral malleolus fixation, and a 4.0 mm cannulated screw from the same manufacturer was used for fixation of medial malleolus fractures.

All patients were placed in a short leg cast for 2 weeks postoperatively, during which weight-bearing was not allowed. Active and passive ankle exercises were initiated after cast removal in the 2nd week. Partial weight-bearing with bilateral support was permitted at the 4th-week follow-up. Full weight-bearing and mobilization were allowed after 6 weeks.

RESULTS

Sixty cases that met the inclusion criteria were included in the study. The AP group consisted of 31 patients, while the PA group consisted of 29 patients. The mean age was 40.7±14.6 years in the AP group and 41.7±14.6 years in the PA group (P>0.05).

There were no significant differences between the groups in terms of gender, smoking status, fracture etiology, and wait for surgery time (P>0.05) (Table 1). The surgery time, healing time, and follow-up time were similar between the groups (P>0.05, P=0.555, respectively).

The amount of stepping and displacement was lower in the PA group (P<0.001, P=0.004, respectively). When comparing the development of arthritis, according to the Kellgren-Lawrence classification, no evidence of arthritis was found in 62.1% of the PA group, while this rate was 22.6% in the AP group. The most severe grade of arthritis detected in both groups was Stage 3, with a rate of 3.4% in the PA group and 16.1% in the AP group. Dorsiflexion and plantarflexion degrees were higher in the PA group (P=0.002, P=0.001, respectively). The AOFAS and Olerud-Molander scores were higher in the PA group (P=0.002, P=0.001, respectively). The VAS score was higher in the AP group (P=0.002). There were no significant differences between the groups in terms of complications (Table 2).

DISCUSSION

Our study demonstrates that functional and radiological outcomes are better in patients treated with PA fixation compared to AP fixation, with fewer cases of ankle arthritis development and improved ankle mobility. However, there were no significant differences between the two treatment groups in terms of surgery time, healing time, and complications.

The posterior malleolus plays an important role in ankle stability and load distribution. Identification of the fracture fragment at the posterior malleolus can be done directly or indirectly depending on the type of ankle fracture and may help determine the appropriate approach. In the study of Yu et al.,[6] screw fixation methods were compared in Haraguchi

Table 1. Patient demographics

	AP-Group (n=31)	PA-Group (n=29)	P-value
Mean Age (years)	40.7±14.6	41.7±14.6	P>0.05
Gender (%)			
Male	18 (58)	18 (62)	P>0.05
Female	13 (42)	11(38)	
Time to surgery (day)	3.3±2.2	4.0±2.8	P>0.05
Smoker (n, %)	15 (48.4)	13 (44.8)	P>0.05
Fracture Aetiology (n, %)			
Sprain	10 (32.3)	12 (41.4)	P>0.05
Simple Fall(low energy)	16 (51.6)	15 (51.7)	
Fall From Height	1 (3.2)	0	
Traffic Accident	4 (12.9)	2 (6.9)	

AP: Anterior-posterior; PA: Posterior-anterior; P: One-way ANOVA.

type I fractures. As a result, similar to this study, it was determined that PA screw fixation is more advantageous than AP screw fixation in terms of the development of post-operative arthritis and less amount of step-off.[6]

The posterolateral approach allows for direct reduction and fixation of the posterior malleolus and distal fibula through the same incision. Depending on the size of the fracture fragment, fixation can be performed with screws or plates.[6] In some cases, the patient's position may not be suitable for the posterolateral approach, especially in patients with multiple fractures. In addition, infection and wound problems can occur due to the incision.[6,10,11]

The indirect screw fixation with an AP approach is a commonly used technique for the fixation of the posterior malleolus. It is particularly suitable for Haraguchi Type I fractures. [6] However, along with its frequent use, this technique has some disadvantages, such as the possibility of step-off or gap formation due to indirect reduction. In addition, sometimes the threads of lag screws may not pass through the fracture line, resulting in insufficient compression.[6,12,13]

Our study has shown that PMFs of Haraguchi Type I can be safely treated with percutaneous screw fixation without extensive dissection. The use of a PA screw fixation with a lateral approach allows for better reduction compared to an AP screw. Post-operative CT images revealed a significant difference in terms of displacement and step-off in favor of PA screw fixation. During surgery, the posterior malleolar fragment could be palpated with the fingertip. The reduction of the fragment was achieved by ankle dorsiflexion during screw insertion. In cases where this was not sufficient, reduction was performed using a blunt dissector.

During percutaneous fixation of the posterior malleolus, there are anatomical structures at risk. Cadaver studies have shown significant proximity of the guide Kirschner wire, placed from the Volkmann tubercle, to the sural nerve, increasing the risk of injury.[14] Although the Flexor Hallucis Longus (FHL) tendon was pierced by the guide wire in 40% of cases, the screw easily passed through the muscle bundle.[14] The Achilles tendon is also at risk. Sural nerve injury can lead to foot paresthesia, dysesthesia, and painful neuroma development.[15] Both percutaneous screw fixation and direct posterolateral approaches have been reported to carry the risk of nerve injury or irritation.[14,16] To protect the sural nerve, Achilles tendon, vascular structures, and FHL, it is recommended to place a tissue-protective sheath around the guide wire and perform drilling through a small incision.[14]

In our study, the supine position of the patient provides advantages in terms of anesthesia complications and intervention for associated fractures. The ability to palpate the fingertip at the point where the guide Kirschner wire exits posteriorly and visualize the exit point on the skin helps prevent damage to anatomical structures and improves understanding of the guide wire placement. We did not observe any nerve or tendon injuries in any of the cases where we performed PA screw fixation.

Biomechanical studies on implants used in PMFs have shown that PA compression screws generate higher biomechanical strength, provide lower deformation forces, and carry a lower risk of fixation failure compared to AP lag screws.[17] Proper fixation is crucial for ankle joint congruity and syndesmotic stability in patients with PMFs. Inadequate fixation can lead to malreduction and the development of post-traumatic osteoarthritis. In addition, early initiation of joint motion exercises helps prevent joint stiffness and preserves muscle strength, enabling early return to daily activities. Therefore, it is important for the fixation material used during fracture healing not to cause reduction loss.[17] Biomechanical studies have shown that PA compression screw fixation provides greater resistance to loading, less displacement, and a lower risk of

fixation failure.[17] In our study, consistent with Mansur et al.'s study,[17,18] the amount of stepping and displacement was lower in the PA group. When comparing X-rays at the final follow-up according to the Kellgren-Lawrence Classification, less arthritis development was observed in the PA group. Dorsiflexion and plantarflexion degrees, as well as AOFAS and Olerud-Molander scores, were better in the PA group. Although direct posterolateral plating is biomechanically stronger in most studies, it poses disadvantages in terms of soft-tissue dissection, patient positioning, and wound-related issues.[19-22] In our study, applying fixation with PA screws compared to AP screws was more advantageous due to the supine position of the patient and the absence of additional soft tissue morbidity. Percutaneous fixation prevents extensive dissection required for open reduction, leading to less pain and faster recovery. It also reduces the higher complication rates associated with open reduction (such as wound healing problems, infection, and neurovascular injury) and decreases hospital stay.[6,7] However, PA percutaneous screw fixation carries a risk of damage to the neurovascular bundle (including the sural nerve) and FHL, and the quality of reduction is potentially lower than that achieved with an open approach.[14,23]

Our study had several limitations. First, it was a retrospective study. The post-operative follow-up period was approximately 25 months in both groups, which was relatively short to demonstrate long-term differences that could develop between the groups. In addition, while the number of cases in the groups was sufficient to reveal statistical differences, a larger series could enhance the power of the study.

CONCLUSION

In this study, two different screw fixation techniques used for the treatment of Haraguchi type I PMFs in patients with trimalleolar fractures were compared. Using our surgical technique, we achieved better outcomes with lower rates of post-operative arthritis in patients who received percutaneous PA screw fixation compared to those in the percutaneous AP screw fixation group. While the standard approach for Haraguchi Type I PMFs worldwide is the posterolateral approach, which allows direct visualization of the fracture fragment, percutaneous PA screw fixation can be considered a suitable and reliable alternative technique.

Ethics Committee Approval: This study was approved by the Ümraniye Training and Research Hospital, Istanbul, Türkiye Ethics Committee (Date: 24.04.2023, Decision No: 143).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: S.B.; Design: A.Ş.; Supervision: S.B., A.Ş.; Resource: S.B., A.Ş.; Materials: S.B.; Data collection and/or processing: S.B.; Analysis and/or interpretation: A.Ş.; Literature search: S.B., A.Ş.; Writing: S.B., A.Ş.; Critical review: S.B., A.Ş.

Conflict of Interest: None declared.

Financial Disclosure: The author declared that this study has received no financial support.

REFERENCES

1. Wang Z, Sun J, Yan J, Gao P, Zhang H, Yang Y, et al. Comparison of the efficacy of posterior-anterior screws, anterior-posterior screws and a posterior-anterior plate in the fixation of posterior malleolar fractures with a fragment size of ≥ 15 and ≤ 15. BMC Musculoskelet Disord 2020;21:570. [CrossRef]
2. Irwin TA, Lien J, Kadakia AR. Posterior malleolus fracture. J Am Acad Orthop Surg 2013;21:32–40. [CrossRef]
3. Odak S, Ahluwalia R, Unnikrishnan P, Hennessy M, Platt S. Management of posterior malleolar fractures: A systematic review. J Foot Ankle Surg 2016;55:140–5. [CrossRef]
4. Miller MA, McDonald TC, Graves ML, Spitler CA, Russell GV, Jones LC, et al. Stability of the syndesmosis after posterior malleolar fracture fixation. Foot Ankle Int 2018;39:99–104. [CrossRef]
5. Haraguchi N, Haruyama H, Toga H, Kato F. Pathoanatomy of posterior malleolar fractures of the ankle. J Bone Joint Surg Am 2006;88:1085–92.
6. Yu T, Ying J, Liu J, Huang D, Yan H, Xiao B, et al. Percutaneous posteroanterior screw fixation for Haraguchi type 1 posterior malleolar fracture in tri-malleolar fracture: Operative technique and randomized clinical results. J Orthop Surg (Hong Kong) 2021;29:2309499021997996. [CrossRef]
7. Anwar A, Zhang Z, Lv D, Lv G, Zhao Z, Wang Y, et al. Biomechanical efficacy of AP, PA lag screws and posterior plating for fixation of posterior malleolar fractures: A three dimensional finite element study. BMC Musculoskelet Disord 2018;19:73. [CrossRef]
8. Weber BG. Die Verletzungen des oberen Sprunggelenkes. Bern: Verlag Hans Huber; 1977. p. 51–63.
9. Kellgren JH, Lawrence JS. Radiological assessment of osteo-arthrosis. Ann Rheum Dis 1957;16:494–502. [CrossRef]
10. Zhong S, Shen L, Zhao JG, Chen J, Xie JF, Shi Q, et al. "A to p" screw versus posterolateral plate for posterior malleolus fixation in trimalleolar ankle fractures. J Orthop Trauma 2015;29:151–6. [CrossRef]
11. Gupta S, Virk JS, Malhotra A, Garg SK. Fragment-specific fixation of trimalleolar fractures utilizing the posterolateral approach: A preliminary experience. J Orthop Surg (Hong Kong) 2019;27:2309499019842289.
12. Tuček M, Rammelt S, Kostlivý K, Bartoníček J. CT controlled results of direct reduction and fixation of posterior malleolus in ankle fractures. Eur J Trauma Emerg Surg 2020;47:913–20. [CrossRef]
13. Drijfhout van Hooff CC, Verhage SM, Hoogendoorn JM. Influence of fragment size and postoperative joint congruency on long-term outcome of posterior malleolar fractures. Foot Ankle Int 2015;36:673–8. [CrossRef]
14. Czerwonka N, Momenzadeh K, Stenquist DS, O'Donnell S, Kwon JY, Nazarian A, et al. Anatomic structures at risk during posterior to anterior percutaneous screw fixation of posterior malleolar fractures: A cadaveric study. Foot Ankle Spec 2022;15:50–8. [CrossRef]
15. Patel A, Charles L, Ritchie J. A complication of posterior malleolar fracture fixation. J Foot Ankle Surg 2016;55:383–6. [CrossRef]
16. Mason LW, Marlow WJ, Widnall J, Molloy AP. Pathoanatomy and associated injuries of posterior malleolus fracture of the ankle. Foot Ankle Int 2017;38:1229–35. [CrossRef]
17. Strenge KB, Idusuyi OB. Technique tip: Percutaneus screw fixation of posterior malleolar fractures. Foot Ankle Int 2006;27:650–2. [CrossRef]
18. Mansur H, Lucas PP, Vitorino RC, Barin FR, Freitas A, Battaglion LR, et al. Biomechanical comparison of four different posterior malleolus fixation techniques: A finite element analysis. Foot Ankle Surg 2022;28:570–7. [CrossRef]
19. van den Bekerom MP, Haverkamp D, Kloen P. Biomechanical and clinical evaluation of posterior malleolar fractures. A systematic review of the literature. J Trauma 2009;66:279–84. [CrossRef]
20. Weigelt L, Hasler J, Flury A, Dimitriou D, Helmy N. Clinical and radio-

logical mid- to long-term results after direct fixation of posterior malleolar fractures through a posterolateral approach. Arch Orthop Trauma Surg 2020;140:1641–7. [CrossRef]

21. Stringfellow TD, Walters ST, Nash W, Ahluwalia R, Posterior Malleolus Study Group. Management of posterior malleolus fractures: A multicentre cohort study in the United Kingdom. Foot Ankle Surg 2021;27:629–35. [CrossRef]
22. Kang C, Hwang DS, Lee JK, Won Y, Song JH, Lee GS. Screw fixation of the posterior malleolus fragment in ankle fracture. Foot Ankle Int 2019;40:1288–94. [CrossRef]
23. O'Connor T, Mueller B, Ly T, Jacobson A, Nelson E, Cole P. "A top" screw versus posterolateral plate for posterior malleolus fixation in trimalleolar ankle fractures. J Orthop Trauma 2015;29:151–6. [CrossRef]

ORİJİNAL ÇALIŞMA - *ÖZ*

Posterior malleolar kırıklarda anteroposterior ve posteroanterior vida tespit tekniklerinin karşılaştırılması: Retrospektif bir klinik çalışma

Dr. Suat Batar,[1] Dr. Ali Şişman[2]

[1]Ümraniye Eğitim ve Araştırma Hastanesi, Ortopedi ve Travmatoloji Kliniği, İstanbul, Türkiye
[2]Adnan Menderes Üniversitesi Tıp Fakültesi, Ortopedi ve Travmatoloji Ana Bilim Dalı, Aydın, Türkiye

AMAÇ: Posterior malleol distal tibiofibular kompleksin önemli bir parçasıdır. Ayak bileği ekleminin stabilitesinin korunmasında çok önemli rolü vardır. Bu çalışmada, Haraguchi Tip 1 posterior malleol kırığı olan hastalarda, anteroposterior (AP) ve posteroranterior (PA) kompresyon vidası ile fiksasyonun klinik ve radyolojik sonuçları karşılaştırıldı.

GEREÇ VE YÖNTEM: Ocak 2018- Mart 2022 tarihleri arasında trimalleoler kırık tanısı ile opere edilen 306 olgunun verileri retrospektif olarak incelendi ve kriterleri karşılayan 60 hasta çalışmaya dahil edildi. AP vida uygulanan 31 hasta ve PA vida uygulanan 29 hasta klinik ve radyolojik olarak karşılaştırıldı. Radyolojik olarak; kırık iyileşme süresi, basamaklanma miktarı, deplasman miktarı ve artroz gelişimi karşılaştırıldı.. Klinik olarak ise; son kontroldeki ayak bileği eklem hareket açıklığı, Amerikan Ortopedik Ayak-Ayak Bileği Derneği Skoru (AOFAS), Görsel Analog Skala (VAS) ve Olerud-Molander Skoru sonuçları karşılaştırıldı.

BULGULAR: Hastaların yaş ortalaması, cinsiyet dağılımı, sigara kullanımı, kırık etyolojisi, yaralanmadan ameliyata kadar beklenen süre, ameliyat süresi, kırık iyileşme süresi ve takip süresi açısından gruplar arasında istatistiksel olarak anlamlı fark görülmedi. Basamaklanma ve deplasman miktarı PA vida grubunda daha düşüktü (sırasıyla, p<0.001, p=0.004). Artroz gelişimi karşılaştırıldığında Kellgren-Lawrence Sınıflamasına göre PA vida grubunun %62.1'inde artroz bulgusu görülmezken, AP vida grubunda bu oran %22.6 idi. Ayak bileği dorsifleksiyon ve plantar fleksiyon hareket açıklığı, AOFAS skoru, Olerud-Molander Skoru ve VAS sonuçlarının PA vida grubunda istatistiksel olarak daha iyi olduğu tespit edildi (sırasıyla, p=0.002, p=0.001, p=0.002, p=0.001, p=0.002). Komplikasyonlar açısından gruplar arasında anlamlı fark tespit edilmedi.

SONUÇ: Haraguchi tip 1 posterior malleol kırığı olan trimalleoler kırıklı hastaların tedavisinde kullanılan iki farklı vida fiksasyon tekniği karşılaştırıldı. Sonuç olarak, perkütan PA vida fiksasyonu kırık hattında daha az deplasman ve basamaklanma sağlaması, ayak bileğinde daha az artroz geliştirmesi ve daha iyi fonksiyonel skorlara sahip olması nedeni ile AP vida fiksasyon yöntemine göre daha avantajlıdır.

Anahtar sözcükler: Posterior malleol kırıkları; perkütan vida tespiti; trimalleoler kırık.

Ulus Travma Acil Cerrahi Derg 2023;29(12):1376-1381 DOI: 10.14744/tjtes.2023.66204