ORIGINAL ARTICLE

Comparison of screw fixation and dynamic fixation in the treatment of ankle fractures with syndesmotic ruptures

Erdal Güngör,[1] Niyazi Ercan,[2] Sancar Alp Ovalı,[3] Mehmet Yağız Ayduğan,[4] Hikmet Çetin[5]

[1]Department of Orthopaedic and Traumatology, Medipol University Bahçelievler Hospital, İstanbul-*Türkiye*
[2]Department of Orthopaedic and Traumatology, Yuksek Ihtisas University Güven Hospital, Ankara-*Türkiye*
[3]Department of Orthopaedic and Traumatology, Bülent Ecevit University Zonguldak-*Türkiye*
[4]Department of Orthopaedic and Traumatology, Haymana State Hospital, Ankara-*Türkiye*
[5]Department of Orthopaedic and Traumatology, Medipol University Hospital, İstanbul-*Türkiye*

ABSTRACT

BACKGROUND: Syndesmosis injuries in ankle fractures can significantly impact patient mobility and recovery, making the choice of fixation method crucial for optimal outcomes. This study aimed to compare the quality of reduction and functional results between screw fixation and dynamic fixation in treating syndesmosis injuries in ankle fractures.

METHODS: This cohort study included 48 patients (28 males, 20 females) with an ankle fracture accompanied by syndesmosis injury. Twenty-four patients were treated with single-level TightRope fixation, while another 24 patients received single 3.5-mm cortical screw fixation. The clinical outcomes were measured using the American Orthopaedic Foot & Ankle Society (AOFAS) score, the Olerud-Molander Ankle Score (OMAS), the Visual Analog Scale (VAS) score, and the Foot and Ankle Disability Index (FADI).

RESULTS: The mean age of the patients was 37.3±15.1 years. The mean follow-up period was 27.6±13.5 months. There were no significant differences between the groups treated with syndesmotic screw or TightRope in terms of the mean postoperative one-year AOFAS score (89.0 and 86.0, respectively), OMAS (84.5 and 85.1, respectively), and FADI (85.4 and 86.8, respectively). The difference between preoperative and postoperative VAS scores was statistically significant (p=0.020). At the first-year follow-up, the median medial clear space was 4.3 mm (range: 2.1 to 5.7 mm) and 4.3 mm (range: 2.3 to 5.7 mm) in the two groups, respectively. The median tibiofibular clear space was 4.8 mm (range: 3.4 to 6.4 mm) in the screw fixation group and 5.1 mm (range: 4.0 to 6.8 mm) in the dynamic fixation group. Meanwhile, the median tibiofibular overlap was 7.8 mm (range: 4.2 to 10.4 mm) and 7.9 mm (range: 4.4 to 10.9 mm) for the screw fixation and dynamic fixation groups, respectively, one year post-surgery.

CONCLUSION: The dynamic fixation method is as functional as the screw fixation method. Early full weight-bearing and improved pain control were noted as advantages of dynamic fixation compared to screw fixation.

Keywords: Ankle; fracture; screw fixation; TightRope fixation; syndesmosis.

INTRODUCTION

Syndesmosis injury occurs in roughly 13% of patients with ankle fractures, typically resulting from external rotation and pronation injuries, and accounts for approximately 20% of ankle fractures requiring surgery.[1] Various surgical methods have been proposed for syndesmosis injury, alongside the development of numerous surgical materials to achieve ankle joint stability.[2-4] Among the many techniques that can be used for syndesmosis stabilization, the most commonly recommended is the use of metal screws. However, some questions regarding the technical aspects of the procedure, such

Cite this article as: Güngör E, Ercan N, Ovali SA, Ayduğan MY, Çetin H. Comparison of screw fixation and dynamic fixation in the treatment of ankle fractures with syndesmotic ruptures. Ulus Travma Acil Cerrahi Derg 2024;30:900-906.

Address for correspondence: Erdal Güngör
Department of Orthopaedic and Traumatology, Medipol University Bahçelievler Hospital, İstanbul, Türkiye
E-mail: egungor_49@hotmail.com

Ulus Travma Acil Cerrahi Derg 2024;30(12):900-906 DOI: 10.14744/tjtes.2024.20094
Submitted: 05.08.2024 Revised: 07.08.2024 Accepted: 26.09.2024 Published: 04.12.2024

as the optimal location for screw placement, the number of screws to be used, and the number of cortices to be crossed, have been addressed in recent guidelines.[5] Conversely, there is limited consensus on the use of bioabsorbable screws, syndesmotic staples, suturing techniques, and the timing for postoperative immobilization, weight-bearing, and screw removal.[5-7] Recent literature suggests that syndesmosis screw removal is not always necessary and should be evaluated on a case-by-case basis, considering patient-specific factors and potential complications.[8,9] Screw removal often disadvantages the patient by requiring a second surgical intervention. Patients undergoing dynamic fixation do not need a second surgery to remove the hardware, which has significant implications for reducing healthcare costs and easing the burden on surgical waiting lists. Recently, elastic fixation materials have been used as an alternative to screws. Despite concerns about its biomechanical adequacy, the technique has several advantages over rigid fixation, including early full weight-bearing, better pain control, and more dynamic and physiological properties than screw fixation.[10-15]

The present study aimed to compare the quality of reduction, evaluate the clinical outcomes of screw fixation and dynamic fixation, and determine whether dynamic fixation offers advantages over screw fixation in patients with ankle fractures accompanied by syndesmosis injury.

MATERIALS AND METHODS

This is a retrospective cohort study. In our clinic, both TightRope and screw fixation procedures are performed, and patients were randomly assigned to these groups. Patients aged 65 years and above, with multiple traumas, open fractures, a history of ankle surgery, rheumatic diseases, or pilon fractures, were excluded. The inclusion and exclusion criteria, along with the flow diagram of patient grouping, are provided in Figure 1. In the screw fixation group, there were two instances of hardware failure, necessitating secondary surgery for screw removal in five patients. The dynamic fixation group experienced only one case of infection, which was managed conservatively without the need for additional surgical procedures.

The remaining 48 patients (28 males, 20 females) with syndesmosis injuries were evaluated. Single-level dynamic fixation material (the TightRope apparatus consisting of two metal Endobuttons-one round and one oblong-and a strand of No. 5 FiberWire® continuous loop) was used in 24 patients, where the buttons created a pulley effect. A pull-through needle attached to the oblong button by two threads facilitated placement. The second group of 24 patients was treated using a single 3.5-mm cortical screw.

All patients underwent radiological and clinical assessments preoperatively, in the early postoperative period, at 4 and 8 weeks, at 3, 6, and 12 months, and then annually.

The three-sided (anteroposterior, lateral, and mortise) radiographs and computed tomography (CT) scans were analyzed for reduction and measurement of the medial and tibiofibular clear space.

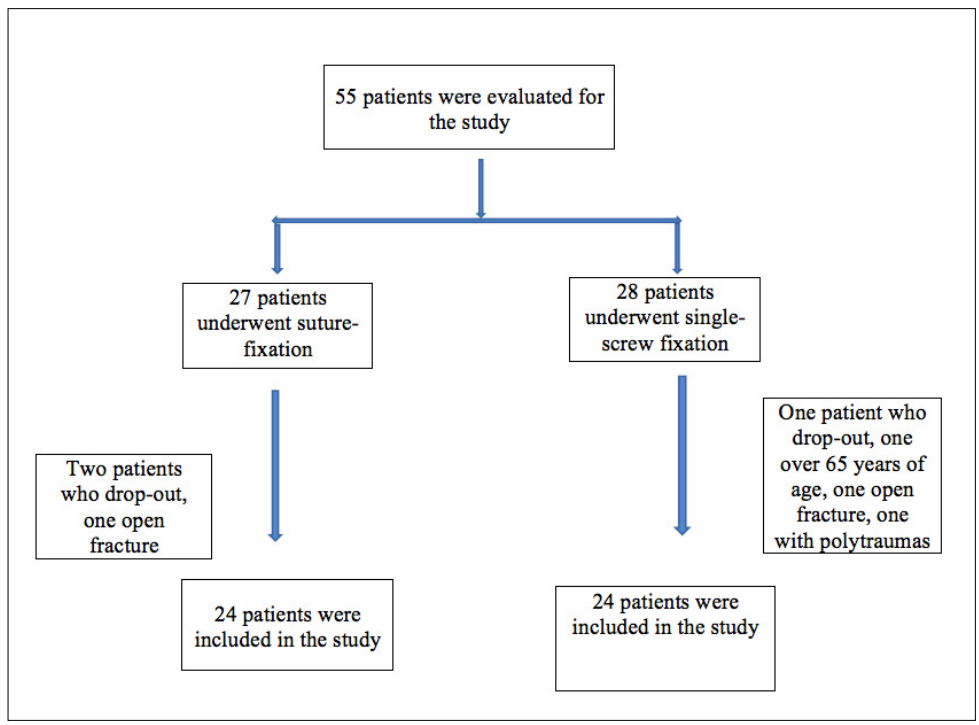

Figure 1. Flowchart of participant inclusion in the study.

The healing status was assessed and categorized as non-union, delayed union, partial union, or complete union. Syndesmosis implants were inspected and classified as intact, loose, broken, or removed. Clinical evaluations at one year postoperatively included comparisons using the American Orthopaedic Foot & Ankle Society (AOFAS) ankle-hindfoot score, the Olerud-Molander Ankle Score (OMAS),[16] and the Visual Analog Scale (VAS) for function and pain.[17] The patients were also assessed using the Foot and Ankle Disability Index (FADI) at a mean of 24 months postoperatively (range: 12 to 38 months) regarding overall satisfaction, time to full weight-bearing, time to return to normal daily activities, and any reported complications. The FADI is a site-specific, self-reported outcome measure designed to assess function after an ankle injury, including general and sports subscales.[18-21] All measurements were taken from an anteroposterior radiograph 1 cm proximal to the ankle joint.[22] The medial clear space (MCS), tibiofibular clear space (TFCS), and tibiofibular overlap (TFO) measurements were also recorded.[23] The study was approved by our hospital's ethics committee (decision no: 337, date: January 24, 2023), and informed consent was obtained from each participant.

Surgical Methods

All surgeries were conducted with the patient in the supine position under spinal anesthesia. A tourniquet was applied to the ipsilateral thigh. Open reduction and internal fixation of the fibula or tibia were performed using the AO (Arbeitsgemeinschaft für Osteosynthesefragen) technique. Intraoperative evaluation of the syndesmosis injury was conducted with the hook test under fluoroscopy, following fixation of the fibula fracture. The distal fibula was laterally pulled using a bone hook, and excessive displacement of the adjacent tibia and fibula margins indicated that syndesmotic fixation was required, according to standard indications outlined in recent guidelines.[24] After assessing the syndesmosis injury, reduction was achieved using reduction forceps. Subsequently, all four cortices were drilled from the open lateral side at a 30-degree angle in front of the image-guided coronal plane, using a 3.5-mm drill bit from the prepackaged set. If available, the drill hole was made through one of the empty plate holes. The leading needle was passed through the holes and out through the intact medial skin along with the pull-through sutures, with only the white suture under tension and the other left slack to align the oblong button with the holes. Once the leading button passed through the medial tibial cortex, confirmed by imaging, the green and white pull-through sutures were used to toggle the oblong button while applying tension to the FiberWire® from the lateral side. After both buttons were seated flush with the bone, the free ends of the FiberWire® on the lateral side were hand-tied and cut to a length of 0.5 cm.

Follow-up

The same protocol was implemented for both surgical procedures postoperatively. Short leg splints were applied to both groups, and all patients were mobilized with a walker after surgery. Splints were removed after three weeks, and patients in the dynamic fixation group were permitted partial weight-bearing. Subsequently, the same physical therapy protocol was administered to both groups by the same physical therapist starting in the third week. For patients undergoing screw fixation, the screws were removed after three months, after which they were allowed to bear full weight. In contrast, patients in the dynamic fixation group were permitted early full weight-bearing starting from the sixth week, emphasizing one of the key advantages of dynamic fixation over screw fixation.

Statistics

The normality assumption of the variables was tested using the Kolmogorov-Smirnov and Shapiro-Wilk tests. In the normality tests of the scales, skewness and kurtosis coefficients were also examined. Descriptive statistics of the variables are presented as median (min-max), and frequencies as n (%). For the univariate analysis of the variables, the Mann-Whitney U test and Wilcoxon signed-rank tests were used based on the type of variable and the assumptions' availability. Statistical analyses were performed using IBM SPSS version 28.0 software for Windows (IBM Corp., Armonk, NY, USA). Additionally, a post hoc power analysis was conducted to determine the statistical power of the study. The effect size (Cohen's d) was calculated based on the differences in primary outcome measures, resulting in an effect size of 1.0. With a total sample size of 48 (24 patients in each group), an alpha level of 0.05, and a desired power of 0.80, the power analysis confirmed that the study was adequately powered to detect significant differences between the two groups.

RESULTS

A total of 48 patients (28 males, 20 females) participated in the study, with 24 treated with screw fixation and 24 with dynamic fixation. The mean age of the patients was 37.3±15.1 years, and the average follow-up period was 27.6±13.5 months. Clinically, there were no statistically significant differences between the screw fixation and dynamic fixation groups in terms of AOFAS ankle-hindfoot scores (89.0 and 86.0, respectively), OMAS scores (84.5 and 85.1, respectively), and FADI scores (85.4 and 86.8, respectively) at one year postoperatively ($p>0.05$). However, the postoperative VAS score was notably lower in the dynamic fixation group (1.0) compared to the screw fixation group (2.0), indicating better pain control ($p=0.020$). According to the Weber classification, for Weber B fractures, the screw fixation group had seven patients (range: 1-10), while the dynamic fixation group had five patients (range: 2-8) ($p=0.500$). For Weber C fractures, the screw fixation group had 15 patients (range: 8-20), and the dynamic fixation group had 17 patients (range: 10-22) ($p=0.450$). For cases involving only soft tissue, both groups had two patients; the screw fixation group had a range of 0-3, and the dynamic fixation group had a range of 1-4 ($p=0.700$) (Table 1).

Table 1. Evaluation of the clinical outcomes

	Screw Fixation Group (n=24)	Dynamic Fixation Group (n=24)	p*
Follow-up (months)	26.5 (7.0-49.0)	27.0 (8.0-50.0)	0.685
AOFAS Ankle-Hindfoot Score (12th month)	89.0 (73.0-94.0)	86.0 (73.0-96.0)	0.722
OMAS (12th month)	84.5 (70.0-95.0)	85.1 (75.0-90.0)	0.746
VAS Score (12th month)	2.0 (1.0-3.0)	1.0 (0.0-3.0)	0.020
FADI (12th month)	85.4 (70.0-94.0)	86.8 (78.0-98.0)	0.140
Classification			
Weber B	7	5	0.500
Weber C	15	17	0.450
Soft Tissue Only	2	2	0.700

AOFAS: American Orthopaedic Foot & Ankle Society; FADI: Foot and Ankle Disability Index; OMAS: Olerud-Molander Ankle Score; VAS: Visual Analog Scale.
*Mann-Whitney U test. Data are presented as median (min-max).

Table 2. Intergroup evaluation and comparison of the preoperative and postoperative radiographic measurements

	Screw Fixation (n=24)	Dynamic Fixation (n=24)	p*
Medial Clear Space			
Preoperative	7.9 (4.6-13.5)	7.7 (4.5-13.6)	0.197
Postoperative	4.3 (2.1-5.7)	4.3 (2.3-5.7)	0.057
Tibiofibular Clear Space			
Preoperative	7.2 (6.6-6.9)	7.3 (6.5-8.0)	0.878
Postoperative	4.8 (3.4-6.4)	5.1 (4.0-6.8)	0.101
Tibiofibular Overlap			
Preoperative	4.9 (3.8-5.3)	4.9 (4.0-5.2)	0.425
Postoperative	7.8 (4.2-10.4)	7.9 (4.4-10.9)	0.155

*Mann-Whitney U test. Data are presented as median (min-max).

Table 3. Intragroup evaluation and comparison of the preoperative and postoperative radiographic measurements

	Preoperative (mm)	Postoperative (mm)	p*
Screw Fixation (n=24)			
Medial Clear Space	7.9 (4.6-13.5)	4.3 (2.1-5.7)	<0.001
Tibiofibular Clear Space	7.2 (6.6-6.9)	4.8 (3.4-6.4)	<0.001
Tibiofibular Overlap	4.9 (3.8-5.3)	7.8 (4.2-10.4)	<0.001
Dynamic Fixation (n=24)			
Medial Clear Space	7.7 (4.5-13.6)	4.3 (2.3-5.7)	<0.001
Tibiofibular Clear Space	7.3 (6.5-8.0)	5.1 (4.0-6.8)	<0.001
Tibiofibular Overlap	4.9 (4.0-5.2)	7.9 (4.4-10.9)	<0.001

*Wilcoxon signed-rank test. Data are presented as median (min-max).

Radiographic outcomes revealed no significant differences between the two groups. The mean postoperative medial clear space was 4.3 mm in both groups, the tibiofibular clear space was 4.8 mm in the screw fixation group and 5.1 mm in the dynamic fixation group, and the tibiofibular overlap was 7.8 mm in the screw group and 7.9 mm in the dynamic group, with all parameters showing no statistically significant differences ($p>0.05$) (Table 2).

Both groups showed statistically significant improvements in radiological parameters such as MCS, TFCS, and TFO before and after surgery. These improvements were similar across both groups, indicating that both fixation methods were effective in achieving good radiographic outcomes (Table 3).

DISCUSSION

In our study, postoperative clinical and radiological outcomes were compared between patients with syndesmosis injury who underwent screw fixation and dynamic fixation. The results showed similar clinical outcomes between screw fixation and elastic dynamic fixation in terms of AOFAS, OMAS, and FADI scores. However, the dynamic fixation group demonstrated better pain control and avoided the need for secondary surgery.

The long-term results were similar, but the elastic dynamic fixation method had fewer complications and allowed for earlier full weight-bearing, as supported by previous studies.[25,26] On the other hand, Cottom et al. reported no difference between screw and dynamic fixation at six months.[13] In another study, Laflamme et al.[27] conducted a randomized controlled trial comparing percutaneous screw fixation and dynamic fixation and found no difference in AOFAS ankle-hindfoot scores between the two groups postoperatively. The authors noted that OMAS was slightly improved in the dynamic fixation group at the 3rd, 6th, and 12th months, but this difference averaged only six points on a 100-point scale. The overall clinical outcome was found to be excellent in both groups. The results of our study were similar to those of previous studies.

Some authors have reported no difference in functional outcomes between the two treatment modalities using the AOFAS ankle-hindfoot score.[10,13-15,26,28,29] Coetzee and Ebeling[11] reported that the dynamic fixation group had a higher AOFAS ankle-hindfoot score than the screw fixation group after a three-year follow-up period. Kim et al.[29] found the mean AOFAS ankle-hindfoot score to be 86.6 points in the screw fixation group and 88.1 points in the dynamic fixation group one year postoperatively. However, the researchers reported no statistically significant differences in radiological findings between the screw and dynamic fixation groups one year after surgery. In the current study, the TFCS was 4.8 mm in the screw fixation group and 5.1 mm in the dynamic fixation group one year after surgery, while the TFO was 7.8 mm in the screw fixation group and 7.9 mm in the dynamic fixation group. The corresponding MCS value was 4.3 mm for both groups. Clinically, the median AOFAS ankle-hindfoot score was 89.0 in the screw fixation group and 86.0 in the dynamic fixation group one year postoperatively.

Kocadal et al.[28] reported that restoring fibular rotation after syndesmotic injuries via screw fixation can be problematic and that the syndesmotic space can be better maintained with the dynamic fixation technique. Sanders et al.[30] obtained similar functional results using two tricortical syndesmosis position screws or a single flexible TightRope. However, the rate of malreduction and reoperation was higher in the third postoperative month with screw fixation. In our study, similar reduction quality was found in both groups.

The limitations of our study include its retrospective design and the exclusion of physical parameters such as gait analysis. Additionally, radiological parameters were not compared with the contralateral side, and routine CT scans to verify the accuracy of postoperative reduction were not performed. The study design did not allow for the assessment of malreduction and functional outcomes. Future research should include larger sample sizes, longer follow-up periods, and more comprehensive assessments.

CONCLUSION

Both dynamic fixation and screw fixation are effective in treating ankle fractures with syndesmotic injury. Elastic dynamic fixation offers advantages such as avoiding secondary surgery, allowing early full weight-bearing, and providing better pain control, making it a viable alternative to traditional screw fixation.

Ethics Committee Approval: This study was approved by the Batman Trainig and Research Hospital Ethics Committee (Decision No: 337).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: E.G., N.E.; Design: E.G., S.A.O.; Supervision: E.G., N.E.; Resource: E.G., N.E., M.Y.A., H.Ç.; Materials: E.G., N.E., M.Y.A., H.Ç.; Data collection and/or processing: E.G., H.Ç.; Analysis and/or interpretation: E.G., S.A.O.; Literature search: C.E.G., M.Y.A., H.Ç.; Writing: E.G.; Critical reviews: E.G., N.E.

Conflict of Interest: None declared.

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

REFERENCES

1. Dattani R, Patnaik S, Kantak A, Srikanth B, Selvan TP. Injuries to the tibiofibular syndesmosis. J Bone Joint Surg Br 2008;90:405–10. [CrossRef]
2. Hovis WD, Kaiser BW, Watson JT, Bucholz RW. Treatment of syndesmotic disruptions of the ankle with bioabsorbable screw fixation. J Bone Joint Surg Am 2002;84:26–31. [CrossRef]

3. Thornes B, Walsh A, Hislop M, Murray P, O'Brien M. Suture-endobutton fixation of ankle tibio-fibular diastasis: a cadaver study. Foot Ankle Int 2003;24:142–6. [CrossRef]
4. Zalavras C, Thordarson D. Ankle syndesmotic injury. J Am Acad Orthop Surg 2007;15:330–9. [CrossRef]
5. van Dijk CN, Longo UG, Loppini M, Florio P, Maltese L, Ciuffreda M, et al. Classification and diagnosis of acute isolated syndesmotic injuries: ESSKA-AFAS consensus and guidelines. Knee Surg Sports Traumatol Arthrosc 2016;24:1200–16. [CrossRef]
6. Wilson FC. Fractures of the ankle: pathogenesis and treatment. J South Orthop Assoc 2000;9:105–15. [CrossRef]
7. Mast JW, Teipner WA. A reproducible approach to the internal fixation of adult ankle fractures: rationale, technique, and early results. Orthop Clin North Am 1980;11:661–79. [CrossRef]
8. TeachMe Orthopedics. Ankle Fractures - Syndesmosis Disruption. Available from: https://teachmesurgery.com/orthopaedic/ankle-and-foot/ankle-fracture/. Accessed Oct 23, 2024.
9. Sanders D, Schneider P, Taylor M, Tieszer C, Lawendy AR; Canadian Orthopaedic Trauma Society;. Improved reduction of the tibiofibular syndesmosis with tightrope compared with screw fixation: results of a randomized controlled study. J Orthop Trauma 2019;33:531–7. [CrossRef]
10. Manjoo A, Sanders DW, Tieszer C, MacLeod MD. Functional and radiographic results of patients with syndesmotic screw fixation: implications for screw removal. J Orthop Trauma 2010;24:2–6. [CrossRef]
11. Coetzee JK, Ebeling PB. Treatment of syndesmoses disruptions: a prospective, randomized study comparing conventional screw fixation vs TightRope fiber wire fixation–medium term results. SA Orthop J 2009; Autumn;32–7. [CrossRef]
12. Klitzman R, Zhao H, Zhang LQ, Strohmeyer G, Vora A. Suture-button versus screw fixation of the syndesmosis: a biomechanical analysis. Foot Ankle Int 2010;31:69–75. [CrossRef]
13. Cottom JM, Hyer CF, Philbin TM, Berlet GC. Treatment of syndesmotic disruptions with the Arthrex Tightrope: a report of 25 cases. Foot Ankle Int 2008;29:773–80. [CrossRef]
14. Cottom JM, Hyer CF, Philbin TM, Berlet GC. Transosseous fixation of the distal tibiofibular syndesmosis: comparison of an interosseous suture and endobutton to traditional screw fixation in 50 cases. J Foot Ankle Surg 2009;48:620–30. [CrossRef]
15. Naqvi GA, Shafqat A, Awan N. Tightrope fixation of ankle syndesmosis injuries: clinical outcome, complications and technique modification. Injury 2012;43:838–42. [CrossRef]
16. Thornes B, Shannon F, Guiney AM, Hession P, Masterson E. Suture-button syndesmosis fixation: accelerated rehabilitation and improved outcomes. Clin Orthop Relat Res 2005;(431):207–12. [CrossRef]
17. Olerud C, Molander H. A scoring scale for symptom evaluation after ankle fracture. Arch Orthop Trauma Surg 1984;103:190–4. [CrossRef]
18. Chapman CR, Casey KL, Dubner R, Foley KM, Gracely RH, Reading AE. Pain measurement: an overview. Pain 1985;22:1–31. [CrossRef]
19. Hale S, Hertel J. Reliability and sensitivity of the foot and ankle disability index in subjects with chronic ankle instability. J Athl Train 2005;40:35–40. [CrossRef]
20. Eechaute C, Vaes P, Van Aerschot L, Asman S, Duquet W. The clinimetric qualities of patient-assessed instruments for measuring chronic ankle instability: a systematic review. BMC Musculoskelet Disord 2007;8:6. [CrossRef]
21. Carcia CR. Validity of the foot and ankle ability measure in athletes with chronic ankle instability. J Athl Train 2008;43:179–83. [CrossRef]
22. Martin RL, Irrgang JJ. A survey of self-reported outcome instruments for the foot and ankle. J Orthop Sports Phys Ther 2007;37:72–84. [CrossRef]
23. Weening B, Bhandari M. Predictors of functional outcome following transsyndesmotic screw fixation of ankle fractures. J Orthop Trauma 2005;19:102–8. [CrossRef]
24. Hallbauer J, Schenk P, Herrmann L, Ullrich BW, Biedermann U, Wildemann B, et al. Objective assessment of syndesmosis stability using the hook test. J Clin Med 2023;12:4580. [CrossRef]
25. Naqvi GA, Cunningham P, Lynch B, Galvin R, Awan N. Fixation of ankle syndesmotic injuries: comparison of TightRope fixation and syndesmotic screw fixation for accuracy of syndesmotic reduction. Am J Sports Med 2012;40:2828–35. [CrossRef]
26. Seyhan M, Donmez F, Mahirogullari M, Cakmak S, Mutlu S, Guler O. Comparison of screw fixation with elastic fixation methods in the treatment of syndesmosis injuries in ankle fractures. Injury 2015;46:S19–S23. [CrossRef]
27. Laflamme M, Belzile EL, Bédard L, Van Den Bekerom MP, Glazebrook M, Pelet S. A prospective randomized multicenter trial comparing clinical outcomes of patients treated surgically with a static or dynamic implant for acute ankle syndesmosis rupture. J Orthop Trauma 2015;29:216–23. [CrossRef]
28. Kocadal O, Yucel M, Pepe M, Aksahin E, Aktekin CN. Evaluation of reduction accuracy of suture-button and screw fixation techniques for syndesmotic injuries. Foot Ankle Int 2016;37:1317–25. [CrossRef]
29. Kim JH, Gwak HC, Lee CR, Choo HJ, Kim JG, Kim DY. A Comparison of screw fixation and suture-button fixation in a syndesmosis injury in an ankle fracture. J Foot Ankle Surg 2016;55:985–90. [CrossRef]
30. Sanders D, Schneider P, Taylor M, Tieszer C, Lawendy AR; Canadian Orthopaedic Trauma Society;. Improved reduction of the tibiofibular syndesmosis with tightrope compared with screw fixation: results of a randomized controlled study. J Orthop Trauma 2019;33:531–7. [CrossRef]

ORİJİNAL ÇALIŞMA - *ÖZ*

Syndesmotic yaralanmalı ayak bileği kırıklarının tedavisinde vida fiksasyonu ile dinamik fiksasyonun karşılaştırılması

Erdal Güngör,[1] Niyazı Ercan,[2] Sancar Alp Ovalı,[3] Mehmet Yağız Ayduğan,[4] Hikmet Çetin[5]

[1]Medipol Üniversitesi Bahçelievler Hastanesi Ortopedi ve Travmatoloji Anabilim Dalı, İstanbul, Türkiye
[2]Yüksek İhtisas Üniversitesi Güven Hastanesi Ortopedi ve Travmatoloji Kliniği, Ankara, Türkiye
[3]Bülent Ecevit Üniversitesi Ortopedi ve Travmatoloji Anabilim Dalı, Zonguldak, Türkiye
[4]Haymana Devlet Hastanesi Ortopedi ve Travmatoloji Kliniği, Ankara, Türkiye
[5]Medipol Üniversite Hastanesi Ortopedi ve Travmatoloji Anabilim Dalı, İstanbul, Türkiye

AMAÇ: Syndesmosis yaralanmaları ayak bileği kırıklarında, hastanın hareketliliği ve iyileşmesi üzerinde önemli bir etki yaratabilir. Bu çalışmanın amacı, ayak bileği kırıklarında syndesmosis yaralanmalarının tedavisinde vida fiksasyonu ile dinamik fiksasyon arasındaki redüksiyon kalitesi ve fonksiyonel sonuçları karşılaştırmaktır.

GEREÇ VE YÖNTEM: Bu çalışma ayak bileği kırığı ile birlikte syndesmosis yaralanması olan 48 hastanın (28 erkek, 20 kadın) kohort çalışmasıdır. Yirmi dört hasta tek seviyeli TightRope fiksasyonu ile tedavi edilirken, diğer yirmi dört hasta tek 3.5 mm kortikal vida fiksasyonu ile tedavi edildi. Klinik sonuçlar Amerikan Ortopedik Ayak ve Ayak Bileği Derneği (AOFAS) skoru, Olerud-Molander Ayak Bileği Skoru (OMAS), görsel analog skala (VAS) skoru ve Ayak ve Ayak Bileği Engellilik İndeksi (FADI) kullanılarak ölçüldü.

BULGULAR: Hastaların ortalama yaşı 37.3∓15.1 yıl idi. Ortalama takip süresi 27.6∓13.5 ay idi. Vida fiksasyonu veya TightRope ile tedavi edilen gruplar arasında ortalama postoperatif bir yıllık AOFAS skoru (sırasıyla, 89.0 ve 86.0), OMAS (sırasıyla, 84.5 ve 85.1) ve FADI (sırasıyla, 85.4 ve 86.8) açısından anlamlı fark yoktu. Preoperatif ve postoperatif VAS skorları arasındaki fark istatistiksel olarak anlamlıydı (p=0.020). Birinci yıl takipte, ortalama medial aralık vidalı grupta 4.3 mm (aralık: 2.1 ile 5.7 mm) ve dinamik fiksasyon grubunda 4.3 mm (aralık: 2.3 ile 5.7 mm) idi. Ortalama tibiofibular aralık vida fiksasyon grubunda 4.8 mm (aralık: 3.4 ile 6.4 mm) ve dinamik fiksasyon grubunda 5.1 mm (aralık: 4.0 ile 6.8 mm) idi. Bu arada, ortalama tibiofibular örtüşme vidalı fiksasyon ve dinamik fiksasyon gruplarında sırasıyla 7.8 mm (aralık: 4.2 ile 10.4 mm) ve 7.9 mm (aralık: 4.4 ile 10.9 mm) idi.

SONUÇ: Dinamik fiksasyon yöntemi, vida fiksasyon yöntemi kadar fonksiyoneldir. Dinamik fiksasyonun vida fiksasyonuna göre erken dönemde tam yük taşıma ve iyi ağrı kontrolü gibi avantajları not edilmiştir.

Anahtar sözcükler: Ayak bileği; kırık; syndesmosis; tightrope fiksasyonu; vida fiksasyonu.

Ulus Travma Acil Cerrahi Derg 2024;30(12):900-906 DOI: 10.14744/tjtes.2024.20094