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ORIGINAL RESEARCH

# Comparative clinical efficacy of absorbable screws versus metal screws for internal fixation in treating acute tibiofibular syndesmosis injury

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## Abstract

To analyze and compare the clinical efficacy of absorbable screws versus metal screws for internal fixation in treating acute tibiofibular syndesmosis injury. We conducted a retrospective analysis on the clinical data of 86 patients with acute distal tibiofibular syndesmosis injuries who underwent surgical treatment at our hospital from September 2022 to October 2023. According to the treatment methods, the patients were divided into an experimental group (absorbable screws, 43 cases) and a control group (metal screws, 43 cases). We observed and compared perioperative indicators, Berg Balance Scale (BBS) ankle joint scores, X-ray examination results, and incidence of adverse reactions between the two groups. We observed and compared perioperative indicators, BBS ankle joint scores, X-ray examination results, and the incidence of adverse reactions between the two groups. Before surgery, there was no significant difference in the tibiofibular gap and overlap width between the two groups ($p > 0.05$). After surgery, the study group had less intraoperative blood loss, lower postoperative pain scores, smaller tibiofibular gap, and lower incidence of adverse reactions. Moreover, the study group had earlier postoperative weight-bearing recovery and resumption of daily activities. Additionally, the study group showed significantly higher overlap width of the tibiofibular bones, joint stability, activity scores, walking, running, workability and imaging results scores ($p < 0.05$). Absorbable screws for internal fixation demonstrate superior clinical efficacy in treating acute tibiofibular syndesmosis injury.

## Keywords

Absorbable screws; Metal screws; Internal fixation; Acute tibiofibular syndesmosis injury

## 1. Introduction

Acute lower tibiofibular joint injury refers to damage to ligaments and other structures at the tibiofibular joint due to external forces. The tibiofibular syndesmosis is a crucial structure for ankle joint stability. Trauma such as inversion, external rotation or high-impact falls can cause this injury [1]. Patients often experience ankle pain, swelling, deformity and restricted movement. In severe cases, they may experience long-term pain, ankle joint instability and functional impairment. These issues can significantly impact patients' work, daily life and even their psychological well-being [2]. Currently, treatment methods include conservative and surgical approaches. Conservative treatment is suitable for mild injuries and stable syndesmosis separation, involving elevation, immobilization with casts or braces, and rehabilitation exercises to avoid weight-bearing until removal of external fixation, followed by gradual weight-bearing [3]. Although conservative treatment avoids surgical risks and has lower medical costs, it results in longer recovery time and may lead to chronic pain and joint instability. Surgery is essential for significant syndesmosis separation, instability, or fractures, and achieves better outcomes, especially for acute cases [4, 5].

With advancements in medical technology and biomechanical research, the medical community has gradually overcome traditional treatment limitations, placing greater emphasis on treatment efficacy and patient experience in selecting screw materials. This has led to the emergence of various innovative screw materials to meet diverse treatment needs. Metal screws are known for their high strength, effective fixation and mature technology. However, they require secondary surgery for removal and can cause metal allergies in patients, which may not contribute positively to improving their quality of life [6, 7]. Absorbable screws are generally made from polylactic acid, which is well compatible with the patient's tissues and gradually degrades in the body [8]. Their mechanical properties change in accordance with the bone healing process. They do not require additional surgery for removal,


  

which reduces patient trauma and discomfort. They also prevent complications such as foreign body reactions and screw fractures caused by metal screws in the body, significantly improving patients' quality of life. In light of this, this study will explore the efficacy of absorbable screws compared to metal screws for internal fixation in the treatment of acute distal tibiofibular syndesmosis injuries. The relevant details will now be reported.

## 2. Data and methods

### 2.1 General information

We conducted a retrospective analysis of clinical data from 86 patients who underwent surgical treatment for acute distal tibiofibular syndesmosis injuries at our hospital from September 2022 to October 2023. The patients were separated into two groups: study and control, with each group consisting of 43 cases. Fractures were caused by 51 traffic accidents, 22 crush injuries, and 13 other injuries. The Lauge-Hansen classification was 27 cases of supination-adduction, 25 cases of supination-external rotation, 22 cases of pronation-abduction and 12 cases of pronation-external rotation.

### 2.2 Inclusion and exclusion criteria

#### 2.2.1 Inclusion criteria

① Meet the Clinical Consensus on Acute Isolated Tibiofibular Syndesmosis Injury (2015 edition) [8] diagnostic criteria and be diagnosed with an acute tibiofibular syndesmosis injury.

② Imaging shows tibiofibular syndesmosis separation, tibiofibular syndesmosis ligament injury or rupture.

③ First-time treatment.

④ Signed informed consent.

#### 2.2.2 Exclusion criteria

① Significant dysfunction of important organs such as kidneys, liver or lungs.

② Mental disorders.

③ Complicated with ankle joint inflammation.

④ Pregnant or lactating women.

⑤ Patients with severe osteoporosis and vascular peripheral diseases.

### 2.3 Methods

(1) Emergency surgical treatment was performed. Both groups of patients underwent emergency surgery within 2 days. (2) Local anesthesia was administered. Patients were positioned laterally or seated. A spinal needle was inserted into the epidural space, followed by placement of an epidural catheter and injection of local anesthetics. Gelatin sponge was used for hemostasis at the bleeding site. (3) Determination of surgical positions: on the lateral side of the ankle, the incision was made along the posterior edge of the fibula, extending anteriorly in an arc; on the medial side of the ankle, a posterior arc-shaped incision was made, preserving the medial malleolus and the fracture site. All patients were followed up for six months.

The control group underwent internal fixation using metal screws, specifically titanium alloy fully threaded cortical bone screws. Among them, 25 patients received 3.5 mm diameter screws and 18 patients received 4.5 mm diameter screws. During fixation, accurate placement and relative stability were ensured, with real-time monitoring of angles and depth.

The study group underwent internal fixation using absorbable screws, made of polylactic acid fully threaded absorbable screws. Among them, 28 patients had normal bone density and received 4.5 mm diameter absorbable screws; 15 patients had osteoporosis and received 3.5 mm diameter absorbable screws. During fixation, excessive force was avoided, and the position and fixation effect of the absorbable screws were confirmed after insertion.

### 2.4 Observational indicators

All patients were followed up for 12 to 16 months, with an average of 14.3 months.

(1) Perioperative Indicators

The duration of the procedure, the amount of bleeding that occurred during the procedure, the time it took to fix the lower tibiofibular joint in the two patient groups, and the variations in the time it took to resume weight-bearing and daily activities during the postoperative rehabilitation training were all monitored and compared.

(2) Score of the BBS ankle scoring system

The patients' postoperative ankle function was assessed using the Berg Balance Scale, which has a maximum score of 100 and focuses primarily on postoperative pain, ankle stability, walking and running capacity, working ability, ankle mobility, and imaging results. Scores range from 0 to 100, with higher scores indicating better function.

(3) Results of the X-ray examination

The two patient groups' X-ray results were examined. To ascertain the fracture recovery, the tibiofibular overlap width and gap variations were evaluated.

(4) Incidence of adverse reactions

The follow-up data of the two patient groups with regard to ankle swelling, screw breakage, poor healing and decreased mobility were compared.

### 2.5 Statistical analysis

SPSS 24.0 statistical software (International Business Machines, Armonk, NY, USA) was used to analyze the data. The *t*-test was used for quantitative data, and the chi-square test was used for categorical data. A significance level of $p < 0.05$ was considered statistically significant.

## 3. Results

### 3.1 Comparison of general information between the two groups

Table 1 shows that there was no significant difference between the two groups' general information ($p > 0.05$).

**TABLE 1. Comparison of general information of the two groups.**

| Grouping | Number of cases | Gender (type) | | Average age ($\bar{x} \pm s$, yr) | BMI ($\bar{x} \pm s$) |
|---|---|---|---|---|---|
| | | Male | Female | | |
| Study group | 43 | 22 | 21 | 32.47 ± 3.46 | 22.53 ± 2.41 |
| Control group | 43 | 23 | 20 | 33.15 ± 3.12 | 23.18 ± 2.19 |
| $t/\chi^2$ value | —— | 0.047 | | 0.949 | 1.326 |
| $p$ value | —— | 0.829 | | 0.345 | 0.188 |

*BMI: Body mass index.*

### 3.2 Comparison of perioperative indicators between the two groups

Following surgery, the study group experienced less intraoperative bleeding than the control group. The lower tibial fibula joint fixation, postoperative weight-bearing recuperation and daily activities were all completed earlier than in the control group. Table 2 shows that all of the differences were significant ($p < 0.05$).

### 3.3 Comparison of BBS ankle scoring system scores between the two groups

After surgery, the postoperative pain score of the study group was lower than that of the control group. The study group also had higher scores for ankle joint stability, range of motion, walking, running, working ability, and overall impact, with all differences being significant ($p < 0.05$) as seen in Table 3.

### 3.4 Comparison of X-ray Examination results between the two groups

Before surgery, there was no significant difference in the tibiofibular gap and overlap width between the two groups ($p > 0.05$). After surgery, the study group showed a smaller tibiofibular gap and a larger overlap width, with significant differences ($p < 0.05$) as shown in Table 4.

### 3.5 Comparison of the incidence of adverse reactions between the two groups

After surgery, the incidence of adverse reactions was lower in the study group, and the differences were all significant ($p < 0.05$) as seen in Table 5.

## 4. Discussion

Acute distal tibiofibular syndesmosis injury refers to acute damage to the connecting structure between the distal tibia and fibula. It is typically caused by significant force to the ankle, such as twisting injuries, falls from height or car accidents. Common symptoms include pain, swelling, tenderness at the injury site, and restricted ankle joint movement [9]. If not treated promptly or improperly, it may lead to complications such as ankle instability, post-traumatic arthritis, affecting ankle joint function. Currently, treatment options for syndesmosis injury include conservative methods (such as immobilization) and surgical treatments (such as screw fixation). The former approach is gentler, reducing surgical risks and easing financial burdens on patients, but it may result in inadequate joint recovery, lingering chronic pain and joint instability [10]. The latter approach allows direct reduction and repair of the syndesmosis by using screws for internal fixation, effectively restoring stability of the distal tibiofibular joint. Active rehabilitation training should be promoted following surgery, with a focus on active flexion and extension exercises for the toes and ankle joints to enhance blood circulation and prevent muscle atrophy. For individuals with acute syndesmosis damage [11], this approach can quickly ease symptoms, limit sequelae and restore functional mobility. To enhance surgical efficacy and improve patient quality of life, the medical community has experimented with different screw materials. They do not require additional surgery for removal, which reduces patient trauma and discomfort. Metal screws are commonly used internal fixation devices [12], typically made of titanium alloy. They offer advantages such as good stability, high effectiveness and wide applicability in treating acute syndesmosis injuries. However, they are prone to causing metal allergies and screw loosening, often necessitating revision surgery, which can increase negative patient experiences.

Absorbable screws are typically made of polylactic acid. Their advantage lies in not requiring secondary surgery for removal, thereby reducing the pain and burden of additional surgery for patients. Moreover, they gradually degrade and absorb in the body, significantly enhancing patients' subjective experience. Active rehabilitation training should be promoted following surgery, with a focus on active flexion and extension exercises for the toes and ankle joints to enhance blood circulation and prevent muscle atrophy. Regular follow-up examinations should be conducted to assess the range of motion of the ankle joint, swelling, muscle strength in the lower limbs, and to understand the progress of recovery [13].

In this study, the research group had significantly lower blood loss, shorter durations for surgery, distal tibiofibular syndesmosis fixation, postoperative weight-bearing recovery, and daily activities ($p < 0.05$). This suggests that absorbable screw fixation can improve perioperative outcomes for patients [14]. The reasons may include the simplicity of absorbable screw insertion, resulting in minimal trauma to surrounding tissues and thus less blood loss. Additionally, it avoids the trauma associated with secondary screw removal [15], thereby reducing recovery and daily activity times. Absorbable screws can be metabolized and absorbed by the patient's body, reducing foreign body irritation and promoting overall recovery.

In the comparison of BBS ankle joint scores, the research group had lower postoperative pain scores and higher scores for joint stability, range of motion, walking, running, work capacity and imaging results [16], with all differences be-

**TABLE 2. Comparison of perioperative conditions between the two groups ($\bar{x} \pm s$).**

| Group | Number of cases | Time of surgery (min) | Intraoperative blood loss (mL) | Joint fixation time of the lower tibial fibula (min) | Postoperative weight-bearing recovery (wk) | Time to return to daily activities (h) |
|---|---|---|---|---|---|---|
| Study group | 43 | 97.31 ± 9.87 | 57.31 ± 5.87 | 7.24 ± 0.75 | 6.37 ± 0.64 | 8.16 ± 0.82 |
| Control group | 43 | 125.37 ± 12.67 | 63.17 ± 6.22 | 9.88 ± 0.98 | 11.28 ± 1.13 | 13.57 ± 1.41 |
| *t* value | —— | 11.461 | 4.502 | 14.073 | 25.159 | 21.816 |
| *p* value | —— | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

**TABLE 3. Comparison of BBS scores between the two groups ($\bar{x} \pm s$, scores).**

| Group | Number of cases | Postoperative pain | Ankle joint stability | Walking ability | Running ability | Working ability | Ankle joint range motion | Imaging results |
|---|---|---|---|---|---|---|---|---|
| Study group | 43 | 9.25 ± 0.92 | 16.38 ± 1.71 | 14.39 ± 1.44 | 9.88 ± 0.93 | 10.27 ± 1.05 | 10.25 ± 1.03 | 25.87 ± 2.66 |
| Control group | 43 | 12.38 ± 1.27 | 13.75 ± 1.40 | 11.29 ± 1.08 | 7.48 ± 0.77 | 8.91 ± 0.88 | 9.17 ± 0.89 | 21.73 ± 2.21 |
| *t* value | —— | 12.873 | 7.633 | 11.030 | 12.587 | 6.370 | 6.370 | 7.681 |
| *p* value | —— | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

**TABLE 4. Comparison of radiographic findings between the two groups ($\bar{x} \pm s$, mm).**

| Indicators | Study group (n = 43) | Control group (n = 43) | *t* value | *p* value |
|---|---|---|---|---|
| Tibiofibular gap | | | | |
| Before treatment | 8.35 ± 0.84 | 8.27 ± 0.91 | 0.372 | 0.711 |
| After treatment | 4.03 ± 0.53 | 4.61 ± 0.51 | 5.211 | <0.001 |
| *t* value | 31.526 | 20.970 | | |
| *p* value | <0.001 | <0.001 | | |
| Tibiofibular overlap width | | | | |
| Before treatment | 2.47 ± 0.54 | 2.45 ± 0.52 | 0.260 | 0.795 |
| After treatment | 9.75 ± 0.96 | 9.07 ± 0.93 | 3.312 | 0.001 |
| *t* value | 43.933 | 39.517 | | |
| *p* value | <0.001 | <0.001 | | |

**TABLE 5. Comparison of adverse events (n, %).**

| Group | Number of cases | Foreign body reaction | Activity disorder | Swollen ankle joint | Ectopic Osteoarthritis | Total incidence |
|---|---|---|---|---|---|---|
| Study group | 43 | 0 (0.00) | 0 (0.00) | 1 (2.33) | 0 (0.00) | 1 (2.33) |
| Control group | 43 | 1 (2.33) | 1 (2.33) | 3 (6.98) | 2 (4.65) | 7 (16.28) |
| $\chi^2$ value | —— | | —— | | | 4.962 |
| *p* value | —— | | —— | | | 0.026 |

ing statistically significant ($p < 0.05$). This suggests that absorbable screws are more beneficial for ankle joint injury recovery [17]. The reasons may include the ability of absorbable screws to reduce metal irritation, thereby avoiding allergic reactions and reducing pain. They can help maintain the normal anatomical relationship of the distal tibiofibular syndesmosis, restrict abnormal movements and continue to provide support to surrounding tissues during the degradation process, thereby enhancing joint stability [18]. A stable joint structure can improve mobility, walking, running and work capacity. According to related studies, absorbable screws do not show foreign body shadows on imaging after degradation, and they can promote the restoration of the distal tibiofibular syndesmosis to its normal position, appearing as normal anatomical structure on imaging. In the comparison of X-ray examination results, the research group had smaller tibiofibular clear space and larger tibiofibular overlap width, with all differences being statistically significant ($p < 0.05$).

The absorbable screw internal fixation procedure shows better fixation effectiveness [19]. This is possibly due to effective correction of tibiofibular separation, maintaining good vertical alignment between the tibia and fibula, thereby enhancing stability and load-bearing capacity of the syndesmosis, facilitating better strength endurance and activity during subsequent rehabilitation. In terms of comparison of adverse reaction rates, the study group had a significantly lower incidence [20] ($p < 0.05$), indicating higher safety and reliability of absorbable screw internal fixation. The rationale could be that absorbable screws lessen long-term discomfort and interference with surrounding tissues, minimizing foreign body reactions [21], thus creating a more favorable environment for healing. They also avoid the impact on joint activity caused by secondary surgery and do not restrict the range of motion due to long-term presence. By enhancing biocompatibility, they reduce foreign body reactions and inflammatory stimuli. Their relatively stable structure can promote blood circulation, reduce swelling, and alleviate the incidence of foreign body arthritis [22]. The use of absorbable screws for internal fixation shows higher safety and reliability. This is likely because absorbable screws reduce long-term irritation and interference with surrounding tissues, creating a more favorable microenvironment for healing. They also eliminate the need for secondary surgeries affecting joint movement and don't restrict the range of motion due to their long-term presence. Additionally, they reduce foreign body reactions and inflammation, promote blood circulation and eliminate issues of metal fatigue and breakage.

However, the study has some limitations: (1) Limited sample size of 86 patients, which may affect the generalizability and statistical robustness. (2) Short follow-up period, focusing mainly on perioperative and early postoperative recovery without long-term data on functional recovery, recurrence, or long-term complications. (3) Lack of multicenter research, limiting external validity and applicability to other settings. Future research should address these issues by increasing sample sizes, extending follow-up periods, and conducting multicenter studies to better assess the efficacy of absorbable screws in treating acute distal tibiofibular joint injuries.

## 5. Conclusions

In summary, absorbable screw fixation in treating acute distal tibiofibular joint injuries demonstrates higher compatibility, stability, safety and degradability, offering better clinical outcomes.

## AVAILABILITY OF DATA AND MATERIALS

The authors declare that all data supporting the findings of this study are available within the paper and any raw data can be obtained from the corresponding author upon request.

## AUTHOR CONTRIBUTIONS

SKW—designed the study and carried them out; prepared the manuscript for publication and reviewed the draft of the manuscript. SKW, SP, JTW, JWL, RKZ, XSC—supervised the data collection. SKW, SP, JTW, JWL—analyzed the data. SKW, SP—interpreted the data. All authors have read and approved the manuscript.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was obtained from the Ethics Committee of Affiliated Hospital of Guangdong Medical University (Approval no. 2021-016). Written informed consent was obtained from a legally authorized representative for anonymized patient information to be published in this article.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## REFERENCES

[1] Liu Z, Gao W, Zhang X, Wang W, Tan M, Qiu E, *et al*. The distance between the anterior and posterior edges of the fibula at a lateral internal rotation of 15° is associated with postoperative malreduction in patients with an ankle joint fracture combined with a lower tibiofibular syndesmosis injury. Advances in Clinical and Experimental Medicine. 2024; 33: 343–350.

[2] Medina McKeon JM, Hoch MC. The ankle-joint complex: a kinesiologic approach to lateral ankle sprains. Journal of Athletic Training. 2019; 54: 589–602.

[3] Zhao J, Zhang Y, Xia Y, Wang X, Xu S, Xie Y. Application of an arched, Ni-Ti shape-memory connector in repairing distal tibiofibular syndesmosis ligament injury. BMC Musculoskeletal Disorders. 2022; 23: 476.

[4] Bui GA, Huang JI. Intramedullary screw fixation of metacarpal and phalangeal fractures. Hand Clinics. 2023; 39: 475–488.

[5] McClure TT, Taylor BC, Huber G, Glazier M, Myers DM, DeGenova DT. Intramedullary screw fixation versus traditional plating for distal fibula fractures. The Journal of Foot and Ankle Surgery. 2023; 62: 355–359.

[6] Debieux P, Franciozi CE, Lenza M, Tamaoki MJ, Magnussen RA, Faloppa F, *et al*. Bioabsorbable versus metallic interference screws for graft fixation in anterior cruciate ligament reconstruction. Cochrane Database of Systematic Reviews. 2016; 7: CD009772.

[7] Labrador J, Carrera I, Holdsworth A. Extended computed tomography scale images provide a detailed assessment of metal screws and are superior to standard computed tomography scale images and digital radiography at detecting experimentally induced screw fractures *in vitro*. Veterinary and Comparative Orthopaedics and Traumatology. 2022; 35: 230–238.

[8] Zhu N, Zhong Q, Zhan J, Zhang S, Liu W, Yao Y, *et al*. A new type of elastic fixation, using an encircling and binding technique, for tibiofibular syndesmosis stabilization: comparison to traditional cortical

screw fixation. Journal of Orthopaedic Surgery and Research. 2023; 18: 269.

[9] Olory BCR, Marín Fermín T, Papakostas E, Al-Khelaifi K, Zikria BA, D'Hooghe P. Simultaneous single-graft tibiofibular syndesmosis and deltoid ligament reconstruction in chronic instability: technical tip. Foot & Ankle International. 2023; 44: 790–795.

[10] Pechlivani C, Grammatikopoulou D, Antonoglou G, Pelopidas T, Varvarousis DN, Vrettakos A. Lateral ankle instability after rotational injury: a case report. Journal of Orthopaedic Case Reports. 2023; 13: 137–141.

[11] Yüce A, Misir A, Yerli M, Bayraktar TO, Tekin AÇ, Dedeoğlu SS, *et al*. Syndesmosis injuries in lateral malleolar fractures accompanied by a posterior malleolar fracture: a nonfixed posterior fracture fragment may not affect postoperative tibiofibular joint malreduction rates. Journal of the American Podiatric Medical Association. 2023; 113: 21–105.

[12] Zhu HB, Zhang YT, Lyu H, Ren FC, Zhou CH, Ying YF. Comparative study of minimally invasive titanium elastic nail and steel plate on the treatment of fracture of tibiofibular fracture in adults. Zhongguo Gu Shang. 2024; 37: 352–357. (In Chinese)

[13] Yüce A, Yerli M, Imren Y, Dedeoglu SS, Cabuk H, Gurbuz H. Distal tibiofibular malreduction in ankle fractures received fibula plate and syndesmotic screw fixation. Journal of the American Podiatric Medical Association. 2023; 113: 21–167.

[14] Chen B, Wang Z, Chen Z, Qu X, Fang X, Wang X, *et al*. Retracted: Comparison of two surgical approaches to supination-external rotation-type ankle fractures. Journal of Healthcare Engineering. 2023; 2023: 9840241.

[15] Zhang L, Xiong JX, Zhou X, Xiong LJ, Yu L. Biomechanical comparison of screw, tightrope and novel double endobutton in the treatment of tibiofibular syndesmotic injuries. Injury. 2021; 52: 2813–2819.

[16] Privalov M, Swartman B, Beisemann N, Barbari JE, Franke J, Grützner PA, *et al*. Influence of unstable ankle fracture (type Weber C), osteosynthesis and syndesmotic transfixation on position of fibula in tibiofibular notch: a cadaveric study. European Journal of Trauma and Emergency Surgery. 2022; 48: 1445–1452.

[17] Yuan X, Zhang B, Hu J, Lu B. Comparison of short-term effectiveness of metal screws and absorbable screws in repair of distal tibiofibular syndesmosis. Chinese Journal of Reparative and Reconstructive Surgery. 2022; 36: 989–994. (In Chinese)

[18] Zhang L, Wang R, Yang S, Jiang S, You G, Shi H, *et al*. Anterior talofibular ligament repair in combination with anterior tibiofibular ligament distal fascicle transfer for the treatment of chronic lateral ankle instability: a finite element analysis. The Journal of Foot and Ankle Surgery. 2024; 63: 435–442.

[19] Shao J, Kong DC, Zheng XH, Chen TN, Yang TY. Postoperative complications of concomitant fat embolism syndrome, pulmonary embolism and tympanic membrane perforation after tibiofibular fracture: a case report. World Journal of Clinical Cases. 2021; 9: 476–481.

[20] Yaradılmış YU, Polat Y, Uslu MB, Ateş A, Demirkale İ, Altay M. The evaluation of radiological measurements used in diagnosis and treatment of syndesmosis injury: a regional study in Turkey. Joint Diseases and Related Surgery. 2020; 31: 123–129.

[21] Yuce A, Dedeoglu SS, Imren Y, Yerli M, Gurbuz H. Two-stage surgical procedure in intra-articular distal tibiofibular fractures with soft tissue injury: in which stage should the fibular plate be applied at initial surgery? Malaysian Orthopaedic Journal. 2020; 14: 90–97.

[22] Zhao Y, Zhu Z, Lu M, Chang J, Zheng S, Kent Kwoh C, *et al*. Irregular types of proximal tibiofibular joint increase the risk of total knee replacement: data from the osteoarthritis initiative. Journal of Orthopaedic Research. 2022; 40: 1787–1793.

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