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Tibial Fractures with Occult Posterior Ankle Fractures: Incidence and Predictive Factors

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Abstract

Background: There aren't many studies on the risk factors for tibial fractures with concealed posterior ankle fractures.

Objective: To research the prevalence and risk factors for tibial fractures in the presence of hidden posterior ankle fractures.

Methods: Patients with tibial fractures who were admitted to our hospital between January 2016 and May 2021 were prospectively chosen. General clinical information, X-ray images, CT images, and other imaging data were collected, and the patients were then divided into two groups based on the presence or absence of posterior malleolus fractures: the posterior malleolus fracture group and the nonposterior malleolus fracture group.

Results: Among the 186 patients with tibial fractures, CT revealed that 25 (13.44%) patients had concealed posterior ankle fractures. Gender, age, and the sites of the tibial fracture did not significantly differ between the two groups (P > 0.05). The types, locations, and lengths of patients with tibial fractures but no posterior malleolus fractures showed statistical differences. The difference in +e length between the tibia fracture group and the tibia with posterior ankle fracture group was statistically significant (P 0.05). The AUC of the length of the tibial fracture with concealed posterior ankle fracture was 0.599, according to the +e ROC curve. The best cut point for the prediction of tibial fracture with concealed posterior ankle fracture, according to the +e YD index, was over 13.18%. In comparison to tibial fracture length, the sensitivity and specificity of spiral tibial fracture and distal third tibial fracture for prediction were significantly higher at 88.00% and 63.35%, 92.00%, and 58.39%, respectively (P 0.05).

Conclusion: Occult posterior ankle fractures are more common in patients with tibial fractures. With occult posterior ankle fractures, spiral and distal third tibial fractures have a greater predictive value for tibial fractures and can aid in early clinical identification for more accurate and suitable treatment.

Keywords: Tibial fractures; Posterior ankle fractures; Posterior malleolus

Introduction

In clinical practice, tibial fractures and malleolus fractures are frequent. Tibia fractures typically manifest as spiral fractures of the bottom third segment, and tibial fracture is a prevalent type of fracture in clinics. Tibia fractures usually co-occur with concealed posterior ankle fractures, which have a major impact on the patient's ability to use their lower limbs. Tibial fractures combined with hidden posterior ankle fractures typically call for posterior ankle fracture repair during the course of treatment. Clinical diagnoses of concealed posterior ankle fractures and tibial fractures are commonly missed. As a result, the real incidence of clinical tibial fractures with concealed posterior ankle fractures is substantially lower. The patient's prognosis has been demonstrated to be impacted by missed diagnoses because improper treatment of ankle fracture components during recovery might result in additional displacement and eventual ankle incoordination. In order to improve the prognosis of patients with tibial fracture combined with occult posterior ankle fracture, it is crucial to effectively master the epidemiological status of tibial fracture combined with occult posterior ankle fracture and effectively identify the high-risk population of tibial fracture combined with occult posterior ankle fracture by mastering the high-risk factors [1].

Materials and Methods

Data collection

Retrospective analysis is done on patients who had tibial fractures in our institution between January 2016 and May 2021. The following are the +e inclusion criteria: All patients had tibial fractures, which were their first diagnosis; they also all had X-rays and CT scans; and they all had ipsilateral ankle CT scans [2].

Exclusion criteria

lacking clinical data and lacking a CT scan; (2) fractures that primarily affect the knee joint (tibial plateau fractures); (3) single, double, and three-toe ankle fractures that primarily affect the ankle joint; (4) fractures in patients over the age of 65; (5) congenital dysplasia, neuromuscular diseases, infections, etc. (6) Bone tumours and other conditions that may alter the normal structure of the skeletal and muscular systems; (7) comminuted tibial shaft fractures; and (8) fractures of the ipsilateral ankles without radiography or CT scans (except the complete length of the tibia and fibula). 186 patients were enrolled, with 51 women (27.342%) and 135 men (72.58%) [3].

Methods

Following admission, all patients had X-rays taken, and depending

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on the type of fracture, intramedullary nail fixation was administered. To check for ankle fractures, all patients underwent CT or MRI scans at the ankle joint. Both the tibial fracture and general clinical information were noted. Three orthopedic doctors reviewed and decided on all the information collectively [4].

Observation

Both the tibial fracture and general clinical information were noted. (1) +e length of tibial frac- tures: the pro-portion of the tibia length occupied by the calculator and the X-ray and CT images are used to determine the tibia fracture length. (2) Tibial fracture type: based on imaging pictures, the fracture is transverse, oblique, or spiral, and at least two fracture types are noted as complex [5].

Statistical Method

Measurement data was expressed as (x s), comparisons between groups were made using independent sample t-tests, count data was expressed as (n%), and differences between groups were analyzed using the 2 test. Statistical analysis was carried out using SPSS 25.0 version statistical software. In order to investigate the factors that may affect a fractured bone combined with an occult postcomplication fracture, multivariable logistic regression analysis was used. We also used the Receiver Operator Characteristic (ROC) curve to assess the performance of the prediction, calculate the Area under the Curve (AUC), and compare the results [6, 7].

Discussion

It has been discovered that tibial shaft fractures and posterior malleolus fractures frequently occur concurrently in clinical practice. The prevalence of these combined injuries can reach 39%–49%. Identification of posterior ankle injuries has been demonstrated to be crucial for accurate preoperative planning and suitable postoperative physical treatment. Neglecting posterior ankle fractures during tibial fracture therapy may cause iatrogenic displacement. Preventing posterior ankle fractures during intra-medullary nailing or postoperative additional displacement due to inadequate protection can be accomplished by early detection of individuals with tibial fractures in conjunction with occult posterior ankle fractures [8]. However, tibial fractures and posterior ankle fractures are frequently overlooked during clinical diagnosis and therapy. The majority of ankle fractures are hidden fractures, making it challenging to detect them on an X-ray. Since the ankle joint is typically not visible on the initial X-ray film and most doctors only look for obvious displacement of tibial shaft fractures, ankle fractures are frequently missed. Finding good predictors for posterior malleolus fractures will therefore assist patients receive more successful surgical treatment and enhance their prognosis, in line with the characteristics of tibial fractures [9, 10].

Conclusion

In conclusion, concealed posterior ankle fractures are more common in patients with tibial fractures. Spiral tibial fractures and distal third tibial fractures have a high predictive value for occult posterior ankle fractures, which can aid in clinically identifying patients with tibial fractures and occult posterior ankle fractures as early as possible and then administering more precise and effective treatment.

References

1. Hendrickx LAM, Cain ME, Sierevelt IN (2019) Incidence, predictors, and fracture mapping of (occult) posteriormalleolar fractures associated with tibial shaft fractures. J Orthop Trauma 33: e452-e458. Cataldi C, Bacci N, Colasanti GB (2020) Posterior tibial tendon rupture associated with anterolateral distal tibial and medial malleolar fracture and a novel pattern of tibiofibular sinjury: a case report and review of the literature, 5e. J Foot Ankle Surg 59: 1066-107.
2. Yuan Q, Guo Z, Wang X (2020) Concurrent ipsilateral Tillaux fracture and medial malleolar fracture in adolescents: management and outcome. J Orthop Surg Res 15: 423.
3. Meijer DT, Gevers Deynoot BDJ, Stufkens SA (2019) What factors are associated with outcomes scores after surgical treatment of ankle fractures with a posterior malleolar f. Clin Orthop Relat Res 477: 863-869.
4. Kempegowda H, Maniar HH, Richard R (2016) Posterior malleolar fractures associated with tibial shaft fractures and sequence of fixation. J Orthop Trauma. 30: 568-571.
5. Huang Z, Liu Y, Xie W, Li X, Qin X, et al. (2018) Pre-operative radiographic findings predicting concomitant posterior malleolar fractures in tibial shaft fractures: a comparative retrospective study. BMC Musculoskeletal Disorders 19: 86.
6. Wang Z, Chen W, Zhu Y (2021) Incidence and missed diagnosis risk of occult posterior malleolar fractures associated with the tibial shaft fractures: a systematic review. J Orthop Surg Res 16: 355.
7. Wang C, X. Fan (2019) Effect of semi-extension intramedullary nail and hollow screw fixation in the treatment of inferior 1/3 tibial spiral fracture with posterior malleolus fracture. Anhui Medicine 40: 1380-1383.
8. Kellam PJ, Haller JM, Rothberg DL, Higgins T F, Marchand LS (2019) Posterior malleolar fracture morphology in tibial shaft versus rotational ankle fractures: the significance of the computed tomography scan. J Orthop Trauma 33: e459-e465.
9. Huang Z, Liu Y, Xie W, Li X, Qin X, et al. (2018) Pre-operative radiographic findings predicting concomitant posterior malleolar fractures in tibial shaft fractures: a comparative retrospective study. BMC Musculoskelet Disord 19: 86.