



# Maisonneuve Variant Lesion with Proximal Tibiofibular Dislocation\*

## *Lesão variante de Maisonneuve com luxação tibiofibular proximal*

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### Abstract

Maisonneuve lesion is a rare entity, accounting for 7% of all ankle fractures. One of its variants includes a proximal tibiofibular dislocation, which is an even more unusual injury. This article reports the case of a 34-year-old male patient admitted to the emergency room with left lower limb edema after a sports trauma. A knee X-ray revealed an anterolateral subluxation of the proximal tibiofibular joint, with no signs of fracture. After limb evaluation, the diagnosis of Maisonneuve variant lesion with proximal tibiofibular dislocation was confirmed. The authors describe this case, addressing the clinical, radiological and surgical features of such variant.

### Keywords

- ▶ ankle injuries
- ▶ joint dislocations
- ▶ surgical procedures, operative

### Resumo

A lesão de Maisonneuve é uma entidade rara, correspondendo a 7% das fraturas de tornozelo. Uma de suas variantes inclui a lesão da sindesmose tibiofibular distal com luxação tibiofibular proximal, que é uma lesão ainda mais incomum. Este artigo apresenta o caso de um paciente de 34 anos admitido na emergência de traumatologia de um hospital terciário com dor e edema no membro inferior esquerdo, após trauma esportivo. A radiografia do joelho evidenciou luxação anterolateral da articulação tibiofibular proximal com subluxação lateral do tornozelo, sem sinais de fratura. Após avaliação tomográfica do membro, confirmou-se o diagnóstico de uma lesão variante de Maisonneuve com luxação tibiofibular proximal. Os autores descrevem o caso, abordando os aspectos clínicos, radiográficos e cirúrgicos desta variante.

### Palavras-chave

- ▶ traumatismos do tornozelo
- ▶ luxações articulares
- ▶ procedimentos cirúrgicos operatórios

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## Introduction

Ankle joint injuries associated with sports are often diagnosed in trauma centers, especially in the age group ranging from 15 to 35 years-old.<sup>1</sup> The prevalence of trauma-related fractures in this area, such as medial and lateral malleoli fractures, is higher.<sup>2</sup> As such, the concurrent disjunction of the proximal tibiofibular joint and the distal syndesmosis in the absence of tibial or fibular fracture is uncommon.<sup>2</sup>

Maisonneuve lesion, first described in 1840 by the surgeon Jules Germain François Maisonneuve, accounts for 7% of all ankle fractures.<sup>3</sup> The trauma mechanism involves an external rotation associated with ankle pronation, resulting in an injury of the distal tibiofibular ligament, syndesmosis complex, and proximal fibular fracture. In one variant, there is concomitant dislocation of the proximal tibiofibular joint and distal ankle syndesmosis in the absence of a proximal fibular fracture.<sup>3</sup>

Only four cases of this rare lesion have been reported up to this year.<sup>4</sup> This paper aims to present an original case of a patient with a Maisonneuve variant lesion, that is, tibiofibular syndesmosis injury, and proximal tibiofibular luxation.

## Case report

A 34-year-old patient was admitted to the emergency room after a left lower limb trauma during a football match. In addition to severe pain in his left ankle and knee, the patient was unable to walk. Clinical examination revealed edema in the left lateral malleolus region and the lateral aspect of the left knee. No neurological or vascular changes were observed.

Radiographs revealed lateral left ankle subluxation and medial clear space enlargement associated with proximal



**Fig. 1** Anteroposterior radiographs of the ankle (A) and the leg (B) showing ankle syndesmosis disjunction and proximal tibiofibular subluxation, respectively.

tibiofibular joint anterolateral luxation (→**Fig. 1**), with no evidence of fracture. A computed tomography scan of the knee joint confirmed the presence of Maisonneuve variant lesion with anterolateral luxation of the proximal tibiofibular joint (→**Fig. 2**).

The patient underwent surgical anatomical reduction under spinal anesthesia. The curvilinear lateral access to the knee was used, starting at the lateral femoral condyle, toward the anterior border of the proximal fibular portion. The common fibular nerve was identified and carefully retracted. The tibiofibular joint was identified, and, after hematoma drainage, reduction and fixation were performed. The ankle injury was percutaneously treated, taking care to maintain the divergence between screws. In this approach, two 3.5 mm Orthosir (Medtronic®, Dublin, Irlanda) titanium cortical screws were used in the ankle and one Orthosir titanium cortical screw was placed in the proximal tibiofibular joint after anatomical reduction under direct visualization (→**Fig. 3**). Anatomical reduction and perfect stability were obtained, preserving the ankle and knee functional arc of motion, as well as their proper alignment and rotation.

Active and passive knee and ankle mobilization started immediately after surgery. In addition, loading was immediately allowed with the use of an axillary crutch for partial support. Isometric thigh and leg strengthening exercises were started at the same time. Total load was allowed within a month. The patient returned to work in two months and resumed sports activities in 3 months. After 6 months of follow-up, he had total knee flexion, dorsiflexion and plantar flexion, with no limitations (→**Fig. 4**).

## Discussion

The stability of the proximal tibiofibular joint depends on the bony and muscle-ligamentous components. Despite the fragility of this complex, the fibular head displacement is very rare, and it is little described in the literature. There are four



**Fig. 2** Axial computed tomography scan of the proximal tibiofibular joint (A) showing an anterolateral proximal tibiofibular subluxation. Posterior view of computed tomography scan with 3D reconstruction of knee (B) showing the proximal tibiofibular anterolateral subluxation.



**Fig. 3** Anteroposterior (A) and lateral (B) radiograph of the leg and anteroposterior (C) and lateral (D) radiograph of the ankle after surgery.



**Fig. 4** Knee and ankle total arcs of motion (A); Total dorsiflexion (B); Total plantar flexion (C).

possibilities for this displacement: anterolateral (more frequent), posteromedial, superior and atraumatic subluxation.<sup>5</sup>

The distal tibiofibular syndesmosis is an injury frequently seen in the emergency room due to ankle torsional trauma. However, the isolated lesion of the ligament complex without fibular fracture is rare.<sup>3</sup>

Thus, Maisonneuve variant lesion with proximal tibiofibular luxation is a rare disorder that requires a careful diagnostic approach. A search in the BIREME, PUBMED and LILACS databases in January 2018 retrieved with only 4 cases of Maisonneuve variant lesion.<sup>2,4,6,7</sup> Its incidence varied in high and low-energy traumas, but all patients were surgically treated with good functional results and complete restoration of the limb's range of motion.

In this case report, the patient was treated with direct surgical reduction for proximal tibiofibular luxation and

percutaneous ankle reduction and fixation. We also report the need to immediately allow active and passive movement in addition to partial load support to obtain good functional results in these patients' rehabilitation.

#### Conflicts of interest

The authors declare that there are no conflicts of interest.

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