

Pure Talocrural Dislocation without Associated Malleolar Fracture

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Abstract

Pure talocrural dislocation is an uncommon injury of the ankle. Malleolar fracture is usually associated. We report two cases of pure talocrural dislocation, to describe its therapeutic and prognostic clinical aspects through a review of the literature.

Keywords

Talocrural, Pure Dislocation, Closed Reduction

1. Introduction

Pure talocrural dislocation is the dislocation of the ankle. The talocalcaneal block is expelled out of the mortise which is intact both with regard to malleoli and syndesmosis [1].

It is a simple dislocation compared to subtalar dislocation, which is a double dislocation, and enucleation of the talus which is a triple dislocation.

This is a very rare lesion that occurs in a context of violent trauma. Historically, the first case was published in 1912 by Auvray [2]. It is an emergency whose management, apart from complications (cutaneous opening, vascular and nerve lesions), is most often orthopedic: reduction under general anesthesia followed by a restraint by plaster cast.

Pure talocrural dislocation can compromise the functional development of the ankle due to late complications such as stiffness of the ankle, osteoarthritis or necrosis of the talus.

The goal of this work was to report two cases of pure talocrural dislocation, to describe its therapeutic and prognostic clinical aspects through a review of the literature.

2. Our Observations

Observation 1:

Mr. H. S. D. 32 years old, with no significant pathological history, has been received at H1 from a sports-related life-style accident (football). He would have done a faux pas with the foot in inversion. Physical examination at admission noted deformity and swelling of the left ankle without cutaneous opening or vasculoneural involvement.

The palpation and the mobilization of the ankle caused a sharp pain. The X-ray of the ankle showed pure posterior talocrural dislocation without associated bone lesion (**Figure 1**).

The reduction was carried out in an emergency by maneuvering a boot jack. The control X-ray confirmed the reduction of dislocation (**Figure 2**).



Figure 1. X-rays of the ankle showing pure posterior Talocrural dislocation ((a) face; (b) profile).

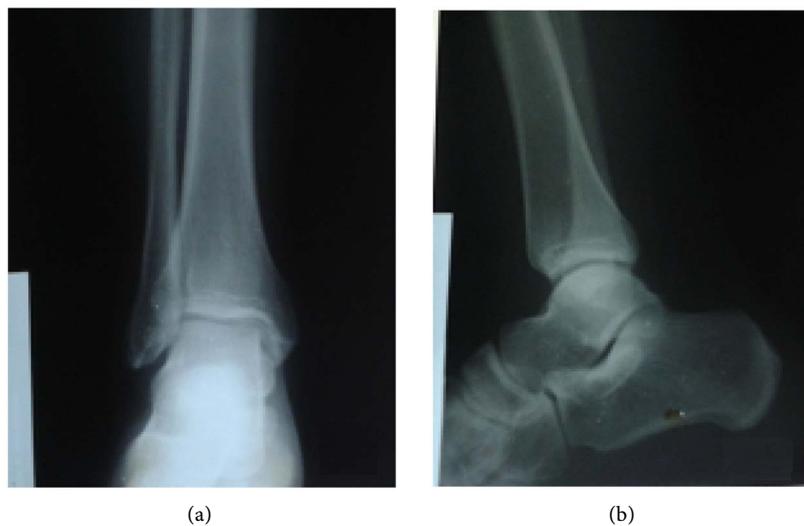


Figure 2. Post reduction control X-ray ((a) face; (b) profile).

The arterial duplex scan of the limb was normal. The restraint has been ensured by a plastered boot for 6 weeks. Rehabilitation of the ankle has been started as soon as the cast was removed.

After 2 years of hindsight, the patient had no pain, and he had resumed his sporting and professional activities. The functional results (**Figure 3**), judged on the Gay and Evrard score (**Table 1**), were excellent with a score of 15 points. The X-rays of the ankle were normal.



Figure 3. Pictures showing normal mobility of the ankle in hindsight of 2 years.

Table 1. Score of gay and Evrard.

Criteria of Gay and Evrard		
	Subjective Criteria	Points
Pain	Absence of pain	3
	Pain on uneven ground	2
	Function pain limiting activity	1
	Pain preventing any activity	0
Instability	Absence of instability	3
	Instability on rough ground	2
	Awkward and insecurity Instability	1
	Instability requiring a stick	0
Mobility	Objective Criteria	
	Normal mobility	3
	Mobility equal to or greater than 50% of normal	2
	Mobility less than 50% of normal	1
Edema and trophic disorders	Ankylosis or foot deflection	0
	Absence of edema	3
	Mild or intermittent edema	2
	Important edema to fatigue	1
Professional activity	Important and permanent edema	0
	Identical activity or profession	3
	Retained profession with adjustment of the position	2
	Change of profession or activity	1
	Impossible professional activity	0

- Disappearance of tibiotalar spacing and decrease in height of external malleolus (a);
- Displacement of the talo-calcaneo-pedal block behind the tibia (b);
- The malleoluses are intact on both pictures.

Observation 2:

Mr. B. M. S., 29 years old, with no pathological history reported, was received at H1 from a home-related accident; he would have done a faux pas when coming down the stairs with foot in inversion. Physical examination at admission noted edema and deformity of the left ankle. The palpation of the ankle was painful. There was no cutaneous opening or vasculoneural lesion.

The X-ray of the ankle showed posterior pure tibiotalar dislocation with talonavicular sprain (**Figure 4**).

The orthopedic reduction was performed as an emergency, confirmed by an ankle control X-ray (**Figure 5**).

The restraint has been ensured by a plastered boot for 6 weeks followed by reeducation of the ankle. The patient had resumed his activities. He had no pain or limitation of ankle mobility (**Figure 6**). The functional results were considered very good according to the score of Gay and Evrard modified by Elisé (score = 15), in hindsight of 2 years.

The X-rays of the ankle (face and profile) did not show calcification with regard to ligaments or osteoarthritis.

- Disappearance of joint space;
- Displacement of the talo-calcaneo-pedal block behind the tibia;
- Removal of the talonavicular ligament;
- Two malleoli are intact.

The result was as the following:



Figure 4. Ankle X-ray showing posterior pure tibiotalar dislocation with talonavicular sprain ((a) face; (b) profile).



Figure 5. Post reduction control X-ray ((a) face; (b) profile).



Figure 6. Pictures showing normal mobility of the ankle in hindsight of 2 years.

- bad (score ≤ 4);
- passable (score between 5 and 9);
- good (score between 10 and 14) ;
- and excellent (score = 15).

3. Comments

• Epidemiology

We have only found two cases over a period of 15 years.

Pure talocrural dislocation is exceptional [3] [4]. The first case documented by X-ray was described in 1913 by Peraire [1]. The work reported in the literature on this lesion is few [5]. Until 1995, only 73 cases were reported [6]. Most studies are based on clinical facts that rarely exceed 2 cases.

Only two series of more than 10 cases [1] [7] have been reported.

The scarcity of this lesion is due to the mechanical stability of the tibiofibular mortise and the resistance of the collateral ligaments, which are as strong as the malleolus, hence the high frequency of the fractures [8].

• Mechanisms and circumstances of occurrence

For the cases of our two patients, these were respectively real-life accidents of

sports-related and home-related. Talocrural dislocation without associated fracture always occurs in a context of violent trauma [1] [5]. Two-wheeled crashes are the main cause [5] [8] [9] [10], followed by real-life sports-related accidents (football, basketball, volleyball) [4] [10] [11] [12] and falls.

We had two posterior dislocations. In both cases, the mechanism was a mis-step associated with inversion of the foot.

According to Fernandes [13], the mechanism of the lesion usually consists of a high energy trauma, which produces sufficient anteroposterior force applied to the foot in maximal plantar flexion resulting in a posterior dislocation of the ankle. The Plantar flexion was considered to be the unstable position of the talocrural joint because the narrow part of the body of the talus lies in the mortise, allowing dislocation.

Fahey and Murphy [5] classified this lesion into five types according to the direction of dislocation: anterior, posterior, medial, lateral and superior. They add the combined forms. The posteromedial variety is the most common [1] [6] [14] [15] [16].

No risk factors were found in any of our patients. Predisposing factors for pure talocrural dislocation are ligament laxity, shortness of the medial malleolus [1] [9] [17] [18], lack of talus cover, history of sprained ankle, and weakness of the peroneal muscles.

- Immediate complications and associated lesions

None early complications have been observed with our patients.

In the literature, cutaneous opening is frequent. It would be of the order of 50% [1] [2] [6]. The other lesions observed are ligamentous [6] [19], vascular [1] [6] [17] [20] [21] [22], nervous [1] [7] [12] and musculo-tendinous [1] [17] [21] [23] [24].

Lower tibiofibular ligaments are intact in posterior dislocations [18] [20].

- Treatment

The management of pure talocrural dislocation should not be delayed because it is an extreme emergency. Closed dislocations must be treated orthopedically. The reduction is done by maneuvering a boot jack in the posterior varieties, under general anesthesia, knee flexed to release the triceps sural muscle [10] [12]. Most authors recommend emergency reduction followed by plaster cast restraint whether the dislocation is open or closed [7] [25]. Orthopaedic reduction was performed without anaesthesia in both our patients. Indeed our working conditions in our hospitals in sub-Saharan Africa do not often allow us to have a fast general anaesthesia in our patients.

This immobilization must last 6 to 8 weeks [1] [15] [16]. Open dislocations require trimming with drainage, and repair of capsular, neurovascular and musculotendinous lesions. The repair of collateral ligaments is controversial. Finkmeier [26] recommends ligament repair only in case of instability. Other authors advocate their repair in open dislocations [1] [6] [20].

- Prognosis

The functional results were excellent for both of our patients in hindsight of 2

years. Elisé [1] had had satisfactory results (6 very good, 5 good and 1 bad) in 11 cases in hindsight of 11 years. Its complications were stiffness, paresthesia and trophic disorders.

Other late complications are reported in the literature such as ankle osteoarthritis [6], avascular necrosis of the talus [7] and residual ligament laxity [18].

4. Conclusion

The talocrural dislocation without malleolar fracture is an exceptional lesion. It occurs in a context of high energy trauma. Its treatment is most often orthopedic with excellent functional results.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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