



RESEARCH ARTICLE

GLUCOCORTICOID-INDUCED SKIN ATROPHY CONSEQUENCE IN SURGERY. A DISTAL TIBIA FRACTURE CASE

Orestes Zoffoun^{1,*}, ¹Issam Boulazaib¹, Otmame Sammouni¹, SaberZari¹, Mohammed Barrached¹, Adnane Lachkar¹, Abdeljaouad Najib¹ and Hicham Yacoubi¹

¹Service de traumatologie-orthopédie, CHU Mohamed VI, Faculté de Médecine et de Pharmacie d'Oujda, Université Mohammed 1er, Oujda, Maroc Auteur correspondant : Orestes Zoffoun¹, Service de traumatologie-orthopédie, CHU Mohamed VI, Faculté de Médecine et de Pharmacie d'Oujda, Université Mohammed 1er, Oujda, Maroc

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ABSTRACT

Glucocorticoids are largely used in therapy for many diseases with a noteworthy efficacy. However, the use of glucocorticoids by a systemic or local way (topical or inhaled) is associated with numerous cutaneous side effects. Long duration of treatment and high dosage are associated with more severe side effects. Complications are related to the pharmacological properties of the molecules, especially metabolic and immunosuppressive. The mainly metabolic side effect is skin atrophy. Surgery on such skin is fastidious with complications which can be tragic. We report a case of advanced glucocorticoid-induced skin atrophy that resulted in involuntary extension of skin incision for percutaneous plate with secondary skin and covering flap necrosis. Vacuum assisted closure and spontaneous healing lead to a satisfactory result.

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INTRODUCTION

Skin bruising/thinning and sleep disturbance were the most commonly reported glucocorticoids adverse events after weight gain in a large population-based study. Though, it was really annoying in less than one third of case¹. But the quality of the skin is of paramount importance in surgery for trauma to the distal part of the tibia. Skin complications are common, but corticosteroid therapy is generally not at fault. We report a case of a patient with skin atrophy who presented intraoperative skin tears with extensive post-operative skin necrosis.

Case presentation:

A 56-year-old patient who has had rheumatoid arthritis on corticosteroid therapy for 20 years suffered a fall from height, which resulted in a closed spiral fracture of the distal ¼ of the right tibia and a fracture of the external malleolus (Figure 1A). There was no skin lesion next to the fracture site. She undergo surgery after disappearance of the edema and appearance of the wrinkle sign, eight days after trauma. She was operated under spinal anesthesia without tourniquet.

*Corresponding author: Orestes Zoffoun,

Service de Traumatologie-Orthopédie, CHU Mohamed VI, Faculté de Médecine et de Pharmacie d'Oujda, Université Mohammed 1er, Oujda, Maroc.

We performed an open osteosynthesis by plate of the external malleolus through external approach and opted for a minimally invasive plate osteosynthesis of the tibia. The bone was very osteoporotic. During subcutaneous tunneling by a soft tissue elevator advanced up the medial aspect of the tibia proximally, a skin tear induced extension of the usual incision (Figure 2), thus allowing open reduction (Figure 1B). The evolution was marked by skin necrosis (Figure 3A). The recovery was made by a distal based medial hemisoleus flap performed by the plastic surgeon. Afterward necrosis of the flap induced exposure of the plate (Figure 3B and 3C). The plate was removed and replaced by a lag screw and an external tibiofibular fixator (Figure 4). A vacuum assisted closure dressing provided bone coverage with granulation tissue with secondary spontaneous healing. The evolution was favorable with wound healing and bone union with a little varus malalignment (Figure 5).

DISCUSSION

Distal tibia fractures are difficult to treat because of the proximity of the ankle joint, its superficial nature and the difficulty in holding the reduction². Open reduction and internal fixation with different types of plate has been associated with increased rates of infection and soft tissue complications³.



Figure 1. A: Distal tibia extra-articular fracture with oblique lateral malleolus fracture B: Post-operative radiograph



Figure 5. Bone healing and skin final aspect



Figure 2 A. Skin necrosis B: Medial hemisoleus flap C: Flap necrosis and plate exposition



Figure 4. Wound healing after vacuum assisted closure

The vast majority of extra-articular fractures of the distal tibia can therefore be managed by two minimally invasive methods of fixation: intramedullary nailing and percutaneous plate⁴. Nevertheless, previous studies have reported a high incidence of complications, such as instability, mal-union and disassembly of the material with intramedullary nailing⁵. Given glucocorticoid-induced osteoporosis, we therefore opted for a percutaneous plate which offers more stability. But, skin damage remains a common complication with percutaneous plaques, which can be resolved by timely removal of the plate. This risk is increased by glucocorticoid therapy. The skin risk raises with the dose and duration of corticosteroid therapy¹.

Skin atrophy under corticosteroid therapy has four stages: in stage I, the skin is thin with abnormal visibility of the underlying vascular network, in stage II, skin tears are caused by the slightest trauma. At stage III, large superficial erosions and a delay in healing appear while at stage IV subcutaneous hemorrhages are frequent, which can lead to dissecting hematomas or even superficial necrosis⁶. The medial hemisoleus flap is a reliable flap and the first indicated in loss of substance of less than 50 cm² from the distal third of the inner side of the tibia⁷. It can be taken with a proximal or distal base. When considering use of a hemisoleus muscle flap, proximally based flaps are quite reliable, whereas distally based flaps are reliable in healthy patients. It is not recommended in patient with significant peripheral vascular disease, with those with significant diabetes and smokers in whom tip necrosis may develop because of the flap reverse flow physiology⁸. It should also not be recommended in patients on long-term corticosteroid therapy, based on our experience. For limb salvage, vacuum assisted closure can be used as last resort. It has been described for the management of difficult wounds, in particular that of elderly patients with comorbidities⁹.

Conclusion

With an equal functional result, the quality of the skin is an important factor in the choice between intramedullary nailing and percutaneous plate. Long-term corticosteroid therapy is a negative factor in favor of percutaneous plate.

Conflicts of interest: The author does not declare any conflict of interest.

Author contributions

All the authors contributed to the conduct of this work and have read and approved the final version of the manuscript.

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