



Below Knee Amputation of Gustilo Type 3C Open Tibial Fracture: A Case Report

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Abstract

Background: High-energy open tibial fractures are challenging to treat. The incidence of open tibial fracture, as a part of isolated injury or polytrauma, is rising due to an increase in motor vehicle accidents. The extensive damage seen in types 3C may be a veritable challenge, even for surgeons with greater experience.

Case Presentation: We describe a case of gustilo type 3C open tibial fracture in a male following a traffic road accident. The patient was treated with below-knee amputation because of the severity of the wound.

Conclusions: Severe open leg trauma with Gustilo 3C fracture entails a risk of serious functional and also psychological sequelae, and obliges the surgeon to make the difficult choice. Amputation must not be considered as a failure, but a deliberate choice due to the functional impact of complications that occur after limb-salvage.

Keywords: Amputation, gustilo type 3C, open tibial fracture, case report

Introduction

High-energy open tibial fractures are challenging to treat. The incidence of open tibial fracture, as a part of isolated injury or polytrauma, is rising due to an increase in motor vehicle accidents. The prevalence of tibial shaft fractures is estimated at 67%¹. Gustilo-Anderson type 3 open tibial fractures are commonly accompanied by serious complications such as amputation, infection, nonunion, malunion, and soft tissue losses. The extensive damage seen in types 3C may be a veritable challenge, even for surgeons with greater experience². We reported a case of a 55-year-old man with Gustilo type 3C open tibial fracture.

Case Presentation

A 55-year-old man was involved in a traffic accident between a car and a motorcycle. He is a car passenger. The accident occurred when the car he was riding grazed a motorbike and crashed into a bridge. He was taken to the emergency room at Wiradadi Husada Bayumas Hospital. The patient

came conscious and sick. The blood pressure was 100/80 mmHg with 102 pulse per minutes. Physical examination found no head, thoracic, abdominal and pelvic trauma. He had an open wound on the left leg with extensive tissue damage, active bleeding, and cold feet. Initial assessment actions were carried out in administering oxygen, installing a 2-line infusion, controlling bleeding by placing a tourniquet and arterial ligation, administering 1 gram of tranexamic acid, analgesics, antibiotics injection and placing splints on the feet. The patient underwent a radiographic examination in the form of anterior-posterior tibia, and the results showed missing tibia and fibula bones in the 1/3 middle to proximal aspect. The patient was diagnosed early with an open fracture of the left tibia (Gustilo type 3C). The surgical amputation was carried out for these patients with a previously given explanation to the patient and family. The antibiotic given before surgery is 2 grams of Ceftriaxone. Under general anaesthesia, the patient lies in a supine position. Debridement was carried out

using normal saline, hydrogen peroxide, and betadine solutions. An evaluation was carried out during operation for bone loss of the tibia and fibula; no popliteal artery pulsation was seen, and an amputation was carried out below the knee. Then install drainage and close the wound. Antibiotics were continued for the next 2 days during the hospital stay and given oral antibiotics on discharge from the hospital.

Discussion

Tibial fractures are seen in approximately 15% of all adult fractures. It is frequently caused by direct or indirect traumas due to slimness of cutaneous and subcutaneous tissues of the anterior tibial shaft. Previous studies have shown that compound fractures are estimated by 23.5% of all tibial shaft fractures^{3,4}. Gustilo-Anderson type 3 open fractures remain to be one of the important orthopedic surgery problems because of neurovascular damages, high amputation rate, and vast soft tissue injuries resulting in treatment challenges and complications⁵. Historically, open type 3C tibial fractures have been treated with primary amputation, with studies reporting up to 78% amputation rates. When an open fracture is complicated with vascular injury requiring reconstruction, the management is challenging and the demands are even higher⁶.

Surgical strategy should be tailored to lesion severity. In the most severe types (Gustilo 3B and 3C), two attitudes are possible: the team must choose, often with great difficulty, between salvage, which is often heavy and complex, and first-line amputation. Amputation is often felt to be synonymous with failure, which tends to lead to an excess of indications for maximalist reconstruction, involving multiple medical and surgical techniques⁷. When managing a patient with severe limb trauma, the decision for primary amputation should be weighed against the impact of limb salvage and reconstruction. Indications for primary amputation may include damage control (amputation as the only means of haemorrhage control and resuscitation) and limb ischaemia (eg: an avascular limb with a warm ischaemic time exceeding 4 hour). The presenting injury is not as well-defined, the factors to be taken into consideration extend beyond anatomical and functional variables, and patient factors should also be considered⁸.

It is essential to preserve the knee during an amputation as the amputation level is directly related to energy consumption and quality of life. Transtibial amputees had better survival than transfemoral amputees: 72% of below-knee amputees are able to walk at least 500 meters versus 58% of above-knee amputees; the latter group is also less likely to wear their prosthetic leg than transtibial amputees^{9,10}. Study reported that the amputation group showed better functional results (walk-ing distance, use of canes, standing, and resumption of driving and sport), but did not return to work more easily than the conservative treatment group. Lower-limb amputation is a real solution in emergency, with shorter hospital stay (fewer readmissions, less rehabilitation and fewer revision surgeries) and advantages for the patient in function and quality of life¹¹.

Conclusion

Severe open leg trauma with Gustilo 3C fracture entails a risk of serious functional and also psychological sequelae, and obliges the surgeon to make the difficult choice between salvage, which can be long and complex, with uncertain outcome, but does preserve the patient's body-image, and amputation, a radical act which obliges the patient to integrate a major physical modification. Amputation must not be considered as a failure, but a deliberate choice due to the functional impact of complications that occur after limb-salvage.

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Figure 1: Gustilo type 3C (anterior view); left open tibial fracture with a wide and contaminated soft tissues defect



Figure 2: Gustilo type 3C left open tibial fracture (lateral view)



Figure 3: Anterior X-Ray View



Figure 4: Post operative below knee amputation

