Two Level (Segmental) Tibia Fractures, Management And Complications

W Zuidema, P Breedveld

Citation

W Zuidema, P Breedveld. *Two Level (Segmental) Tibia Fractures, Management And Complications*. The Internet Journal of Orthopedic Surgery. 2006 Volume 4 Number 1.

Abstract

Seventeen segmental tibial fractures on a total of 272 tibia fractures were treated between May 1998 and December 2005. Traffic accidents were the sole cause of injury. The large majority of patients in the study group had associated chest/abdominal injury or other fractures. In 13 patients there was an open tibial fracture. Three patients required free muscle flaps to close soft tissue defects. In others, local skin closure or skin advancement techniques were used. Six patients required fasciotomie. For primary bone stabilisation intramedullary nailing or external fixation were used. Early partial weight bearing with range of motion exercises of ankle and knee joints were encouraged. Time to fracture healing was on average 10 months. Many additional surgical procedures were necessary to treat complications and reach bone healing. Even then no patient reached his or her pre-injury level of performance.

INTRODUCTION

The segmental tibia fracture is an infrequent occurring injury in our region. The facture is mostly the result of a high-energy trauma and associated with severe soft tissue damage of the lower extremity and accompanying injury[1]. The treatment of segmental tibia fractures is demanding and time consuming, in which case a choice has to be made from different stabilisation techniques, each with it's own limits and morbidity [2,3,4,5,6,7,8]. The end result is often mediocre [9,10].

METHODS

We performed a retrospective analyse of patients who were treated for a segmental tibia fracture in the period from May 1998 until December 2005 at our hospital. In this period, there where 17 segmental tibia fractures on a total of 272 tibia fractures (6.3%). The research group consisted of 15 men and 2 females. The average age was 43 year (range 25-91). The average Injury Severity Score was 18 (range 11-28). The cause of injury was in all cases a traffic accident. In 13 patients there was an open fracture, using the Gustilo and Anderson classification 4 patients had grade I, 6 grade II and 3 grade III injuries. Ten patients had also other fractures and in 7 patients there was also an accompanying injury of the chest and/or intra-abdominal. The patients with open fractures al received after local wounddebridement and irrigation of the wounds with warm saline during 5 days Augmentin® intravenously. Local wound closure or skin advancement techniques were used to close the wounds in grade I and grade II injuries. Grade III patients received a free muscle flap to close the soft tissue defects in a second procedure combined with re-inspection of the wounds.. All other patients received one gift of Augmentin® intravenously pre-operative. Primary an intramedullary osteosynthesis was in 11 patients the first performed operation and in 6 cases the first choice was external fixation with a Hoffman application. Six patients had a fasciotomy in the same procedure combined with the the application of a fasciotomy wound closing device consisting of two drains on the skin edges with can be slowly retracted without the use of anaesthetics until wound closure is achieved.

RESULTS

Fourteen patients were operated more than once, in total an extra of 42 procedures were necessary. Part of these procedures consists of replacement in 4 patients of the external fixation by an intramedullary osteosynthesis after a period of two weeks. Three patients with a primary intramedullary osteosynthesis had secondary dislocation after respectively one, two and three weeks of with one was treated by the application of a pinless fixator during 6 weeks. A second one was treated by additional Pollers screw. In the third case a LISS plate was used for extra stability. Next to that 17 operations were performed to accelerate consolidation. These consist of bone marrow grafting or

reaming the intramedullary canal. In 8 of the 17 patients there was an infection. All caused by gram positive skin bacteria. Treatment consisted of local drainage, administration of antibiotics or removal and puls lavage of the intramedullary canal with reinsertion of a new nail. All patients were allowed partial weight bearing after 3 weeks, which was increased in time if there was no pain at the level of the fractures. The time to reach full bone consolidation was at average 10 months. One patient, a elderly men with advanced arteriosclerosis had a lower leg amputation performed. After discharge from hospital, twelve patients were transferred to a rehabilitation centre, two went to a nursing home and three patients went home with adjustments. After extensive rehabilitation only 88 % of the patients was independent in basic daily activity. None of the patients reached his or her previous level of performance.

Figure 1

Figure 1: Study group

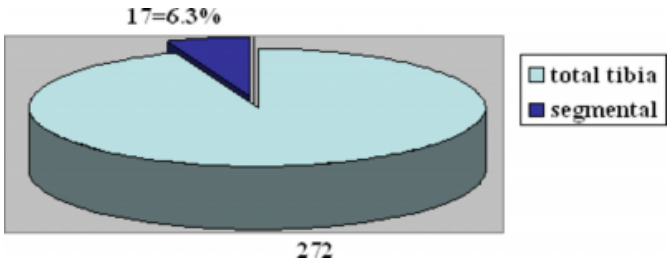

Figure 2

Figure 2: Patients

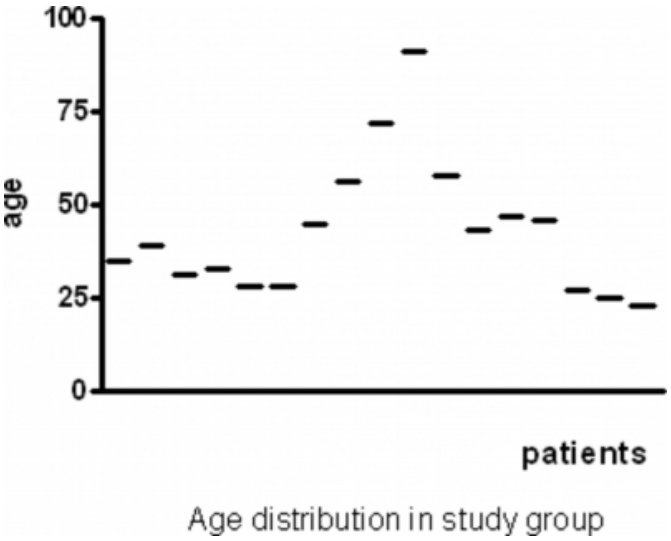

Figure 3

Figure 3: AO classification

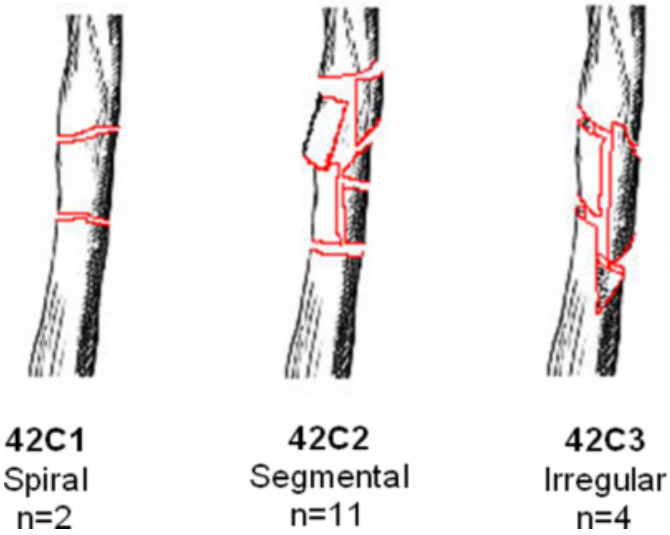

Figure 4

Figure 4: segmental tibial fracture with intramedullary nail and additional pinless fixator

CONCLUSION

The segmental tibia fracture only involves a small group of patients with tibial fractures. This fracture is often accompanied by severe related injuries and demands of patients and surgeon a prolonged treatment with an uncertain

functional outcome.

CORRESPONDENCE TO

W.P.Zuidema MD Department of Trauma-surgery Academic Hospital Maastricht P. Debyelaan 25 6202 AZ Maastricht The Netherlands wzu@surgery.azm.nl

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Author Information

W. P. Zuidema, M.D.
Surgeon, Department of Trauma-surgery, Academic Hospital Maastricht

P. H. Breedveld, M.D.
Trauma-surgeon and staff member Intensive Care, Department of Trauma-surgery, Academic Hospital Maastricht