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Technique of Treating Fractures in Long Bones of Lower Limb with Associated Simultaneous Loss of Limbs in the Same Injury Complicating Their Treatment.

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ABSTRACT

For effective rehabilitation of fractured limb, a functional limb is needed till the time of fracture union. If due to any reason, the limbs are lost either below the fracture site or in the contra lateral limb, then rehabilitation is a serious problem. This paper presents cases with simultaneous loss of ipsilateral and contra lateral limbs in the same accident which warranted special care to make the patients ambulate and the fractures to unite.

Keywords: Simultaneous loss, ipsilateral, contra lateral limbs, same accident, fracture treatment

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INTRODUCTION

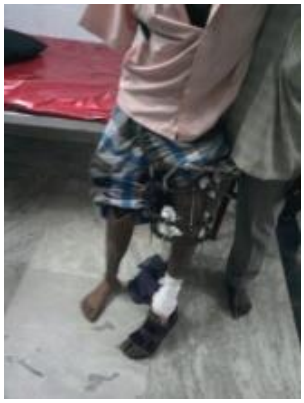
For effective rehabilitation of fractured limb a functional limb is needed till the time of fracture union. If due to any reason, the limbs are lost either below the fracture site or at the contra lateral limb, then rehabilitation is a serious problem. We present two such cases which challenged with difficult presentation in the last ten years. The papers will present methods of managing difficult fractures with simultaneous associated loss of limbs complicating their treatment. The technique of rehabilitation when there is loss of limbs complicating treatment of fractures of long bones is also described.

The first patient

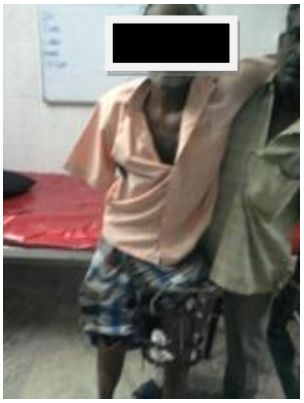
Patient was a 56 year old gentle man who fell from a train after a bout of alcohol. He had crush injuries of the right upper limb at arm level. He also had crush injuries to the right leg and right upper limb. He was taken to the hospital and after resuscitation, he had amputation of the right leg below the right knee level and at above left elbow level nearly below shoulder as a life saving measures. His general condition stabilized. When he presented to the fracture treatment three weeks later, his problems were a fractured left femur which is un-united with a deformity and with infected wound the left thigh and left leg. Even if the left distal femur fracture was treated with Ilizarov, one needs to load the right side amputated limb which is not possible due to the absence of the leg segment of the other side. This is compounded with almost entire absence of upper limb due to amputation.

Procedures for the first patient

As first measure an artificial limb was fabricated for his amputated right lower limb. His left side distal femur fracture was treated with open reduction and internal fixation and was put in Ilizarov ring fixator as seen in figures 1-3. However this person could be mobilized only with the help of an attender in the immediate post operative period. In the figures 1-3, the absence of the right upper limb and the artificial limb in right lower limb and the Ilizarov fixator in left lower limb are evident. The left lower femur fracture went on to unite and the patient is now rehabilitated with a clerical job.



Figures 1



Figures2

Figures 3

Figures 1-3.Patient standing with help of a relative, his left thigh is in an Ilizarov fixator. His right lower limb in a below knee prosthesis. He also did not have a right upper limb just below the right shoulder.

Second patient

Our second patient was a 12 year old boy who fell from a two wheeler and was ran over by a car. He had severe crush injuries to his right thigh and leg. He was taken to another hospital where he was resuscitated and had an amputation of the right leg as a life saving measure and an external fixator application for right femur shaft fracture. Later he was advised a revision at the level of the thigh fracture itself which the patient refused. He presented to our centre in this state. His problems are a fractured femur which is un-united with a deformity and with poor scar in the posterior aspect of the thigh. Even if that fracture was

treated with Ilizarov, one needs to load the limb which is not possible due to the absence of the leg segment due to amputation.

Procedures for the second patient

As first measure an artificial limb was fabricated for his right below knee stump. For the femur fracture by a postero-lateral approach, the femur fracture was opened and freshened and reduced and fixed with a custom made nail. It was stabilized with a four level construct with an Italian femoral arch and three rings. The patient was given an artificial limb and was made to walk one week post operatively. He was followed up every month and at six months after the procedure his femur fracture was found united and the fixator was removed. The united fracture and the radiological status of the stump are also seen figure 4 and 5. The patient is seen with his stump in figures 6 and 7 and artificial limb fitted in figure 8. It is ten years since the surgery and the patient is now working as an accountant in a surgical company. This case is presented to give a scope for these patients where the knee can be retained to maintain proprioception.

Figure 4: The femur fracture of the second patient seen healed with a custom made intramedullary nail

Figure 5: Radiograph of the below knee stump of the second patient is seen. The lower end of the custom made intramedullary nail is also seen

Figure 6: The below knee stump is seen with patient extending the knee

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Figure 7: The below knee stump of the second patient is seen with patient flexing the hip with extended knee

Figure 8: The second patient is seen standing without any support. The Ilizarov apparatus is already removed from his right thigh. His right lower limb is in a below knee prosthesis.

Table 1: The details of the two cases is summarised

S.no	Limbs lost	Fractured bone	Managemement of limb loss	Management of the fracture
1	Right upper limb just below the shoulder and Right lower limb below the right knee.	Left distal femur	Above knee prosthesis for the right lower limb opposite limb to the fracture	Ilizarov ring application
2	Right leg below the knee	Ununited fracture in the thigh aspect with below knee stump	managed and rehabilitated with above knee prosthesis for the right lower limb same side limb as the fracture	Ilizarov ring application

DISCUSSION

The details of the two cases is breifly tabulated in table 1.Whenever it is posiible the below knee stump should be preserved whatever its length it may be or however raw it may look . This is because at present time the prosthesis are not end bearing and such raw areas can be covered with skin grafts or free flaps. Some times the stump can also be lenghtened with Ilizarov apparatus. Thus if one consider amputating at the knee joint level, preserving it with even the smallest below knee stump can both enhance the control of the knee joint and also increase the proprioception of the knee joint position , resulting in less use of energy during gait [1,2]. There have been works analyzing fractures happening long after the amputation. These papers have analyzed the method of instructing the (already) amputees to avoid factures. Study of patients who sustained a fracture of the amputation stump was done in Mayo clinic. 15 fractures were in femur or hip, and only one involved the tibia and fibula. . The study found that five fractures could have been prevented if the patient was properly advised as to the use of the prosthesis and if the prosthesis was conveniently fitted. Seven fractures were from the elderly patients falling. All fractures united. Four of nine stumps which were managed with internal fixation had complications requiring more operations. The fractures

that were treated conservatively promptly united [3]. In both of our cases we did operation but did not use any internal fixation devices. We allowed early weight bearing with Ilizarov in both our cases. A study found that at least 3% of lower-extremity amputees have fractures. In 23 already above-knee and below-knee amputees there were distal femur fractures and hip fractures. 25% of these fractures were initially missed. The fractures of femur were treated conservatively and the hip fractures were operated. In limbs of poor vascularity , rehabilitation was difficult. At least 50% of the patient s who were able to walk inside the house was rendered wheel chair born life after this injury [4]. We presented tight situations for a surgeon where the fractures need to be treated inspite of the absence of part of same side or opposite side limbs. Two cases of ununited femur fractures with same side and opposite side below knee stumps are presented as to how they were managed and rehabilitated. The first case was relatively difficult to manage as there was no right upper limb.

CONCLUSION

Proper timely fabrication of artificial limb even before definitive fracture fixation is a must to reduce the time required for rehabilitation. Preserving knee joint in the amputated limb must be the aim in such cases.

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