

## High Velocity Injury And Fracture Of Previously Reconstructed Limb Salvage Tumor Surgery – Options Of Surgical Treatment

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### INTRODUCTION:

The advancement of chemotherapy, surgical technique and implant design have improved survival of bone cancer patients while retaining good limb functions. We report four cases of fractures of the previously reconstructed limb salvage tumour surgery following high velocity motorcycle accidents (MVA).

### CASE SERIES:

All the fractures involving lower limbs in 3 patients, and upper limb in 1 patient were caused by MVA. 1<sup>st</sup> patient had previous proximal tibia osteosarcoma. He sustained an open fracture of tibia which caused bending of the endoprosthesis stem. He was initially treated with debridement. The comminuted distal tibial fracture was replaced with allograft to allow fitting of a new distal stem.

2<sup>nd</sup> patient with previous proximal humerus Giant Cell Tumour had replacement surgery with endoprosthesis. He sustained comminuted humerus fracture over the stem, which caused implant instability. The construct was revised with a longer implant body segment and a new stem.

3<sup>rd</sup> patient was another proximal tibia osteosarcoma survivor who underwent proximal tibia endoprosthesis but complicated with delayed infection. The implant was removed and he was planned for two-staged endoprosthesis revision. However, an accident caused femur fracture around the proximal part of the temporary bone cement spacer. He was then treated with removal of the spacer and a knee fusion surgery using vascularized fibula graft.

4<sup>th</sup> patient, a case of distal tibia osteosarcoma was initially managed with allograft-vascularized fibula composite ankle fusion. Following an accident, the distal tibia reconstruction was fractured. He was managed with an angular-stable plate fixation.



### DISCUSSIONS:

Bone fracture around a well-fitted massive endoprosthesis might cause severe bony comminution. It is difficult to achieve osteosynthesis in this area. Therefore, the comminuted bones are removed and a new segment of longer implant is used as described in the 2<sup>nd</sup> case. Allograft had been used in the 1<sup>st</sup> case to increase the length of intramedullary canal as the remaining bone was not adequate for the stem. Definitive surgical management was delayed for 3 weeks in the case of open fracture to minimize the risk of infection.

Management of the 3<sup>rd</sup> patient posed another challenge as he already had implant-related infection, a previous proximal tibia resection and a distal femur fracture. Extended revision of distal femur and proximal tibia contributed to difficult soft tissue control for the patient and always complicated with poor outcome. As such, we opted for knee fusion surgery. Reconstruction with vascularized fibular graft has an advantage of biological healing in combating the infection, as well as providing stable limb for ambulation.

4<sup>th</sup> patient had a fracture of his allograft-fibula composite reconstruction, which was a biological construct and had a potential for osteosynthesis. We used Locking Compression Plate (LCP) through minimally invasive surgery to minimize the soft tissue stripping over the flap while maintaining vascularity for better healing.