

# Monorail External Fixator: An Ideal Construct For Long Segment Bone Regeneration?

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## INTRODUCTION

Long segment femoral bone loss remains a challenging entity for Orthopaedic surgeons everywhere. Whilst there have been various management options detailed in literature, there has not been a gold standard defined and each option carries its own pros and cons. We report a case of traumatic long segment femoral bone loss which we successfully addressed using a monolateral external fixator (monorail).

## REPORT

A 15-year old boy with no known underlying medical illness presented to us following a head-on collision (he was on a motorcycle) with an oncoming car. He sustained an open right comminuted midshaft femur fracture as well as an open left supracondylar femur fracture. After initial debridement, there was a 13.5cm bone defect which we chose to address with a monolateral external fixator.

Post-operatively, we encountered multiple issues such as unintentional patient non-compliance in adjustment of the monorail fixator, non-union of transport segment at the docking site and fracture of the osteotomy site post-monorail removal. These highlight the magnitude of the challenge faced in trying to regenerate a long segment of bone. Despite these, we successfully managed to achieve femoral union and returned him to full ambulation.

## CONCLUSION

Whilst we considered using Masquelet's induced membrane technique, the anticipated donor-site morbidity of the iliac crests for graft harvesting and the extra cost to procure the demineralized bone matrix (DBM) would be too burdensome for the patient.

With good surgical technique and patient selection, the monorail external fixator is an ideal treatment option providing just the right balance of construct stability and patient comfort when addressing cases of long segment bone defects.

## REFERENCES

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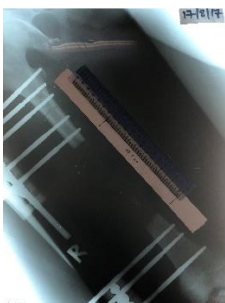


Fig. 1.  
Bone gap of 13.5cm  
post-debridement



Fig. 2.  
Union of regenerate  
at docking site