Open Femur Fracture With Severe Bone Loss: Weight-Bearing In 3-Months

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INTRODUCTION:
Femoral fractures with severe bone loss is challenging to treat. Described methods include Ilizarov bone transport and Masquelet technique.

CASE REPORT:
A 31-year-old female presented after road traffic accident. She sustained open fracture right distal femur with intraarticular extension, with 7cm bone loss (AO33-C3). She also had comminuted fractures over her left distal humerus, distal radius, distal femur and right tibia shaft.

1-week post debridement and distal femur screw fixation, we decided on internal fixation with right femur locking plate augmented with bone graft. Defect was filled with synthetic bone granules and synthetic bone blocks mixed with reaming material collected from interlocking nail of the ipsilateral tibia.

3-months post injury, she was able to full weight bear and achieve 0-90 knee motion. Subsequent radiographs also showed good uptake with consolidation.

DISCUSSION:
Treatment of traumatic bone loss include acute shortening and internal fixation. It allows bony contact between fracture ends which reduces risk of delayed or non-union, thus the need for secondary procedures. However, acute shortening of 5cm or more may lead to neurovascular compromise1.

Options to fill bone gap include autologous bone graft from iliac crest, free vascularized fibula graft, allograft and use of synthetic bone substitutes. Metaphyseal defects can be fixed to original length initially, however, those with more than 6cm bone loss required secondary grafting2. We decided to augment our fixation with synthetic bone substitutes and autologous reaming material from ILN tibia procedure.

Masquelet technique is a 2-stage procedure which begins with filling fracture gap with bone cement. 6-weeks later, induced membrane would form around the cement spacer. Cement is then replaced with cancellous graft. Successful bone regeneration of up to 25cm was reported1. The main drawback in this case would be a need for secondary surgery in future. Ilizarov bone transport remains well-established for large bone defects. However, circular external fixators around bilateral thighs lead to increased morbidity.

REFERENCES: