

## Bone Voyage! : Application of Masquelet Technique in the Management of Open Fracture Tibia to Bridge Bone Defects

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### INTRODUCTION:

This case report details the application of the Masquelet technique in the surgical management of a Gustilo-Anderson type IIIA open fracture in a 22-year-old male's right tibia, in a district hospital setting.

### REPORT:

The patient, involved in a motor vehicle accident, suffered an open fracture of the right tibia and fibula with a 4cm bone defect in the tibia. In a two-stage process, thorough debridement and internal fixation were performed. The fibula was initially reduced and plated to maintain limb length. The Masquelet technique followed, inserting a polymethyl methacrylate (PMMA) spacer into the tibia to create a biological chamber and bridge the defect, secured with an anterolateral locking plate. This staged approach aimed at ensuring stability and preparing for the induced membrane, facilitating subsequent autologous bone grafting in the second stage.

Post-surgery, the patient had a closely monitored latency period in preparation for the second stage. Radiographic assessments showed early signs of bone consolidation, prompting the planned second stage with PMMA spacer removal and autologous bone graft insertion. This approach ensures stability and prepares the biological environment for successful bone regeneration. The patient's progress in the latency period signals positive early signs of bone consolidation, highlighting the technique's potential in addressing challenges.



FIGURE 1: Bone defect of right tibia before and after PMMA spacer insertion



FIGURE 2: Postoperative Xrays

### CONCLUSION:

The Masquelet technique excels at preserving limb length in fractures with significant bone defects, proving to be adaptable for district settings with resource constraints even without intraoperative imaging. The upcoming second stage is expected to clarify the technique's effectiveness in fostering successful bone regeneration in complex cases.

### REFERENCES:

1. Sun SH, Tsai WW, Shiu SI, Chen CH. Induced membrane technique for large bone defects: A systematic review and individual participant data meta-analysis. *Medicine (Baltimore)*. 2022 Jun 24;101(25):e29292. doi: 10.1097/MD.00000000000029292. PMID: 35758359; PMCID: PMC9276340.
2. Watson JT, Anders M, Moed BR. Management strategies for bone loss in tibial shaft fractures. *Clin Orthop Relat Res*. 1995 Jun;(315):138-52. PMID: 7634662.