Infected Nonunion of the Forearm: The Masquelet Technique
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**Purpose:** Infected nonunion of the forearm bones is a challenge for the orthopaedic surgeon on several fronts. The forearm itself is unique as the difficulties include the relationship between restoration of shaft length with the anatomy and long-term functional outcome of adjacent joints, as well as the risk of elbow and wrist stiffness related to prolonged immobilization. The problem of infection is complex due to the presence of bone necrosis, segmental bone loss, sinus tract formation, fracture instability, and scar adhesion of the soft tissues. Several methods have been used for the management of the infected nonunion of forearm bones. However, the results tend to be unsatisfactory due to the aforementioned factors.

**Methods:** We used the 2-stage induced membrane technique devised by Alain Masquelet for the management of nonunion. It involves a staged procedure in which a temporary skeletal stabilization is paired with implantation of an antibiotic spacer and left in place for 6 to 8 weeks, during which time a “pseudomembrane” forms around the cement spacer. During the second stage of the procedure, the pseudomembrane is incised, the antibiotic spacer removed, and bone graft is placed. This technique was used for 12 infected forearm nonunions where the defects postdebridement ranged from 3.5 to 7 cm. The preferred type of fixation in most cases of pseudoarthrosis is the external fixator. However, this type of fixation does not always provide rigid enough fixation throughout the process of healing, and fixation of the radius proximally is an issue as the posterior interosseous nerve is likely to get damaged. Therefore we used a plate to stabilize the defect.

**Results:** All 12 bones united uneventfully. The bones united in a period ranging from 6 to 12 months with a mean of 7.8 months. Although a plate was used to stabilize the fracture, the results were uniformly good without any persistent and recurrent infection at the time of final follow-up. This technique addressed several of the challenges pertinent to the forearm nonunion simultaneously and results are uniformly predictable.

**Conclusion:** Infected nonunion of the forearm bones is a difficult problem and the treatment options continue to evolve. The Masquelet procedure is an effective procedure for such situations. Traditional bone graft techniques are limited by uncontrollable graft resorption, even when the recipient site is well vascularized. It is proposed that this membrane prevents graft resorption and improves vascularity and corticalization. On the basis of our findings, we would suggest that it should be the frontline procedure for the management of infected nonunion of the forearm bones.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.