The Masquelet technique is employed to treat large bone defects left by trauma or infection. It involves two stages: 1. Compressed soft tissue ischemia is revascularized and the defect is filled with a foreign bone (bone cement or PMMA), inducing the formation of a membrane around the foreign object. 2. After 6 weeks, the PMMA is removed, taking care not to disrupt the membrane, as it will be left behind to provide a growth factor environment for the bone graft, whether it is autograft, autogenous or synthetic. The membrane is then reconstructed for the remaining 4 months with ambulation allowed soon after its removal.

The ulcer site was edematous, erythematous, and probed to bone (Image 1). Cultures of the ulcer on the dorsum of this right IPJ. Patient presented with a strong desire to keep this toe, and after an extensive discussion on the morbidity of digital amputation, the patient expressed a desire to proceed with the Masquelet technique to avoid post-surgical demands.

Procedure 1: Procedure began with resection of infected bones from patient's right hallucal proximal phalanx. Significant purulent exudate formed on the operation site. The defect was filled with a spacer consisting of antibiotic-impregnated bone cement, and a mini-external fixator external fixator was applied for stability (Image 4). Patient was placed on subcutaneous antibiotics and instructed to stay non-weight-bearing post-operatively.

Following the operation, the patient was seen weekly for ulcer debridement and monitoring of the surgical site. Throughout this time, the ulcer and surgical site showed good healing and no signs of infection.

Procedure 2: Six weeks after initial application, the bone spacer was removed and replaced with tibial bone graft. The mini-external fixator bar was removed and sent for pathology, while the two pins at the 1st metatarsal head and the two pins at the distal phalanx were left in place. The spacer was removed and sent for pathology leaving a 1 cm gap between the proximal and distal portions of the right hallucal phalanx (Image 6).

The gap was irrigated with sterile saline and filled with tibial cortical bone graft and synthetic bone substitute. A new external fixator mini-rail was reconnected to the existing wires at the distal phalanx and first metatarsal head to apply appropriate compression. A half pin was placed in the bone graft to aid stability.

Subcutaneous soft tissue membrane was reapproximated with absorbable suture and distalphalangeal joint was closed with silk. Patient was instructed to remain non-weight-bearing post-operatively.

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