

Bone Graft Placement by Modified Plastic Syringe

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Abstract

Several fracture patterns with resulting bony defects require augmentation with bone graft or other orthobiologics. Accurate placement of graft may be difficult when the area to be augmented is not readily accessible. In such a case, a quickly modified 3-mL plastic syringe may be a useful and efficient delivery method for accurate placement and impacting of the graft.

Intraoperative placement of bone graft material can often be inefficient. Prepackaged graft fragments or corticocancellous graft harvested with an acetabular reamer can be difficult to handle and accurately place during a procedure. One example of this is placement of graft material by corticotomy during tibial plateau fracture treatment. To address this particular circumstance, we describe a simple modification of a 3-mL plastic syringe that allows the surgeon to deliver particulate graft material efficiently.

TECHNIQUE

During fixation of some tibial plateau fractures, the surgeon must make a cortical window through which a bone tamp can be used to elevate the depressed articular surface. Once the articular surface is raised, the void can be filled and packed with bone graft material. This is usually done by placing the graft through the cortical window and using a tamp to direct and impact the graft into the location of interest.

In our modification of this technique, the distal end of a sterile 3-mL syringe is removed with a bone or rib cutter. A triangular section with its apex toward the plunger is removed from the syringe shaft. A longitudinal cut is made from this apex to the midshaft area of the syringe (Figure 1). This modification makes the shaft into an effective scoop

into which graft material can be quickly loaded (Figure 2). The longitudinal split allows for the shaft to expand with larger morsels of graft. Some larger pieces may require further morselization. Of note, the construct must be cleaned of debris to prevent the plastic from being pushed into the graft site. Once the syringe is loaded, it can be introduced into the area to be grafted through the cortical window created (Figure 3). Its placement can be accurately guided by fluoroscopy, which shows the graft packed into the syringe as well as the radiopaque syringe plunger. The plunger may then be pressed, extruding the graft material into the defect (Figures 4A, 4B).

We routinely used this graft introduction technique in the treatment of tibial plateau fractures requiring corticotomy and grafting. A similar tech-



A

Figure 1. Distal portion of syringe was cut, triangular defect was made in shaft, and longitudinal split was created along shaft.



B

Figure 2. Syringe can be quickly loaded with graft material.



Figure 3. Introduction of syringe through cortical window on anterior lateral proximal tibia.

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Figure 4. (A) Articular surface elevation by bone tamp. (B) Graft introduction by syringe as seen under fluoroscopy. Syringe contents are visible, making accurate placement possible. Residual articular collapse can be corrected by bone tamp or by mallet blows on plunger.

nique, minus use of a longitudinal splint in the syringe itself, has been described.¹ The advantages of this technique include the accurate placement of the graft itself and intraoperative time savings. We believe that it is an efficient method for accurately handling and introducing the graft material.

AUTHORS' DISCLOSURE STATEMENT

The authors report no actual or potential conflict of interest in relation to this article.

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