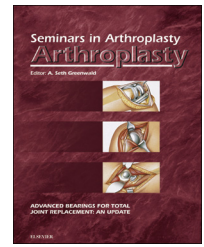


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# Femoral impaction grafting

Ashton H. Goldman, MD and Rafael J. Sierra, MD\*

Department of Orthopedic Surgery, Mayo Clinic, 200 First St SW, Rochester, MN 55905

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## ABSTRACT

Femoral impaction grafting is a utilitarian technique for femoral defects. With modern implants, its role may be limited to Paprosky 3B and 4 type femoral deficiencies, especially in the younger patient. With appropriate technique, mid- and long-term results have proven this technique to be globally reliable. Periprosthetic fracture is not uncommon with this technique; however, strategies to mitigate the risk have been developed. A thorough understanding of the history, technique, results and complications of this technique is essential for the revision hip surgeon in order to obtain successful results in the most complex femoral reconstruction cases.

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## 1. Introduction

The goals of femoral reconstruction in revision total hip arthroplasty (THA) are not only to create a durable long-term reconstruction with a stable implant, but if possible, preserve and/or restore bone stock. Different techniques have been used to restore bone stock at the time of revision THA. Allograft prosthetic composites have been shown at midterm to provide adequate fixation and stability. More recently, the use of modern tapered modular stems has been associated with proximal bony reconstitution as long as the soft tissues around the proximal implant remain vascular. Finally, the technique of impaction grafting has been shown to be viable option providing a durable reconstruction and preservation of proximal bone stock with reported both mid-term and long-term excellent results [1–9]. Over time, improvements have been made in the technique which limit complications and improve outcomes. Understanding the indications, technique, and complications will allow a surgeon to effectively employ this procedure for some of their most challenging revision cases.

### 1.1. Indications

The technique of impaction grafting involves the tight packing of multiple sizes of cancellous bone chips into a closed femoral canal or a canal that can be reconstructed and closed.

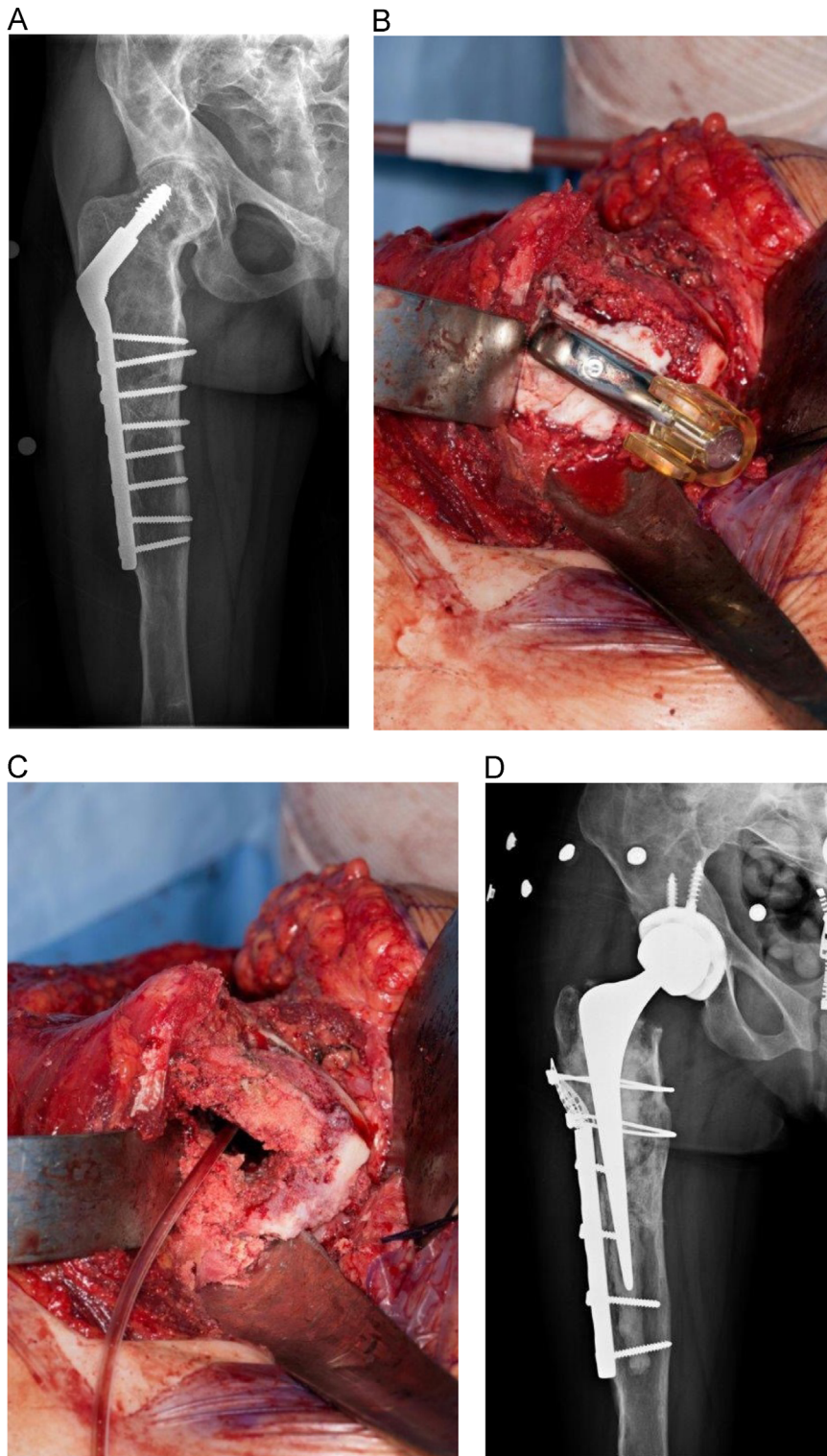
Progressive impaction occurs over time implants in order to recreate a host bone bed in which a stable prosthesis can be cemented into place. Today, the most common indication is for the Paprosky 3B femurs in young patients where proximal restoration of bone is desired or if distal fixation is not ideal or 4 type femurs where there is a lack of proximal bone stock and there is compromise of the isthmus. Other special cases may also prove this technique to be inviting. Patients with fibrous dysplasia of their proximal femurs where distal fixation is compromised may be candidates as well. The newly packed cancellous bone can create a new endosteal bed for cementing (Fig. 1). Furthermore, an ectatic proximal femur over a well fixed distal cement plug is another scenario consider impaction grafting. This allows the surgeon to perform the reconstruction without removing the distal cement to get in a longer diaphyseal engaging stem. Other case examples follow similar principles that challenge whether jeopardizing the host bone to remove distal diaphyseal blockades to uncemented fixation is necessary, if a portion of the diaphysis and metaphysis is appropriate for impaction grafting.

## 2. Technique

Templating is important in order to select the correct size that bypasses the bony deficiency for the planned femoral

\* Corresponding author.

E-mail address: [sierra.rafael@mayo.edu](mailto:sierra.rafael@mayo.edu) (R.J. Sierra)



**Figure 1 – A 27 year female with fibrous dysplasia of the proximal femur. (A) Shows preoperative radiographs and previous hardware. (B) Shows the bone preparation following impaction grafting with an newly created cancellous endosteal template for the cemented femoral stem. (C) Shows the cemented femoral stem in place. (D) Post operative radiographs following impaction grafting.**

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