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BONE GRAFTING USING AN  
ALUMINUM FOIL TEMPLATE

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## *In Search of Answers*

HANDS ACROSS  
THE ATLANTIC

CURRENT MANAGEMENT OF SCAPHOID NON-  
UNION BASED ON THE BIOMECHANICAL STUDY

UPCOMING EVENTS

# Bone Grafting using an Aluminum Foil Template

## TIPS AND PEARLS OF WISDOM



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### Introduction

Bone grafting is a common surgical procedure for the treatment of bone defects and deformities. Cortico-cancellous bone graft can be used as an "onlay", "inlay" or "peg"<sup>1</sup>. Bone graft size and shape should be equal to size and shape of the bone defect for stability and contact with the bone fragments. Very often bone defects have complex geometric shapes such as a non-symmetrical cylinder, cone or cube. Therefore it could be difficult to prepare the bone graft equal to the exact shape and size of the defect. To optimize this stage of the operation, Toh (2007) suggested a template of the bone defect made from a silicon block<sup>2</sup>. This "trial spacer" helped to prepare the optimal bone graft as a copy of the bone defect for the treatment of a scaphoid nonunion. Pulgar et al (2017) used a template of the bone defect made from bone cement for the treatment of the defect of a talus<sup>3</sup>.

In our practice we shape a template from sterile aluminum foil. Aluminum foil is cheaper and more affordable in comparison with silicone or bone cement. Template fabrication from aluminum foil is simple and convenient and this process requires only little time.

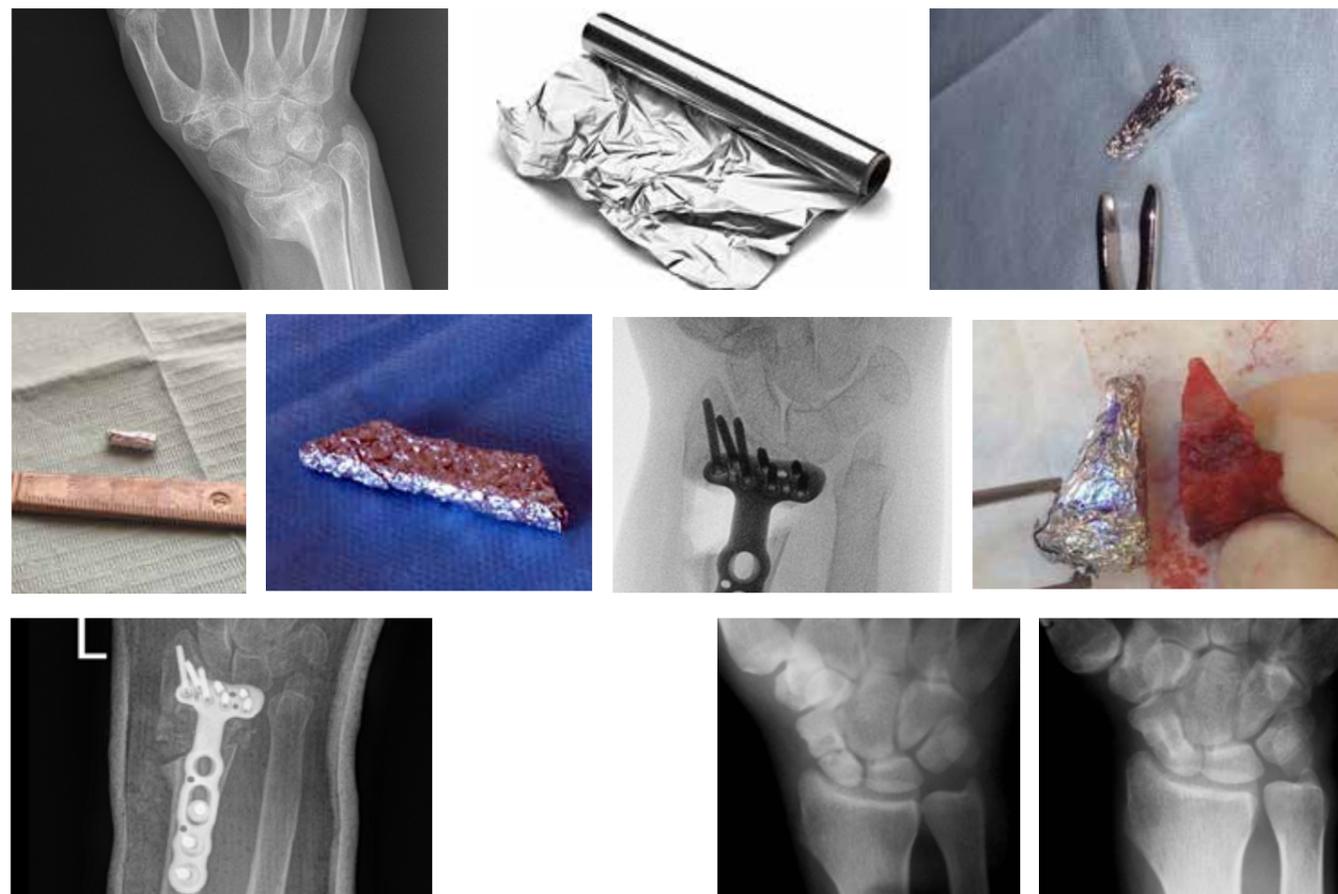
### Material and methods

After exposing the area of malunion (nonunion), correction of the deformity and fixation of the bone fragments, the surgeon measures the size and shape of the bone defect. He then prepares a template according to the size and form of the bone defect. The template is formed from sterile aluminum foil. The surgeon manipulates the piece of foil like a piece of plasticine and molds the template. The foil template is fitted to the defect to achieve close contact with the bone. The ready-made template is removed from the wound. The surgeon then uses the template to draw an outline of the future bone graft on the donor site with a surgical marker. The bone graft is taken equal to, or a little bit larger than the template. The bone graft is

then compared with the template and shaped with a bone forceps/nibbler as necessary. The prepared graft is then inserted tightly into the bone defect.

The proposed method was applied in the treatment of 45 patients aged from 14 to 53 years old with defects and/or deformities of the bones and joints of the upper extremity: fingers (5), metacarpal (4), wrist (23), forearm (11), distal humerus (1), and glenoid (1).

This proposed method for bone grafting has important advantages. The aluminum foil is readily available and cheap and sterilization is standard. The template fabrication process is quick and simple. The template can be made smaller (with scissors) or larger (add to the piece of foil) if needed. Once prepared, the template is durable and keeps its shape. There were no complications connected with the use of the template from sterile aluminum foil.



### REFERENCES:

1. Crenshaw AH. Surgical techniques. In: Crenshaw AH. (Ed.) Campbell's Operative Orthopaedics. St. Louis, Mosby Company, 1987, Vol.1:3-22.
2. Toh S. Fractures of the Scaphoid. In: Ring D.C., Cohen M.S. (Ed.) Fractures of the Hand and Wrist. New York, NY: Informa Healthcare, 2007:115-136.
3. Pulgar J, Escudero M, Carcuro G et al. Cement Casting to Optimize Reconstruction of Chronic Osteochondral Lesions of the Talus. Foot and Ankle Specialist. 2017; 10: 333-336.