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SUBSPECIALTY PROCEDURES

ELASTIC INTRAMEDULLARY NAILING OF PEDIATRIC BOTH-BONE FOREARM FRACTURES

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Investigation performed at Rady Children's Hospital, San Diego, California

Published outcomes of this procedure can be found at: *J Pediatr Orthop.* 2013 Sep;33(6):598-607; *J Bone Joint Surg Br.* 2011 Feb;93(2):262-5; and *J Pediatr Orthop.* Jul-Aug 1998; 18(4):457-61.

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Abstract

Background: Elastic intramedullary nailing of both-bone pediatric forearm fractures is used to treat unstable fractures that fail conservative management with closed reduction and casting, open injuries, or injuries with neurovascular compromise.

Description: Small incisions are used to enter the medullary canal of the distal end of the radius and proximal part of the ulna, avoiding injury to the adjacent physis. The elastic nail is advanced to the fracture site under fluoroscopic guidance. The fracture is reduced with traction and manipulation, and the nail is passed across the fracture site to stabilize the forearm.

Alternatives: Closed reduction and casting is the mainstay of treatment in most pediatric forearm fractures. If conservative treatment fails, these fractures can be surgically managed with elastic intramedullary nails or with plate and screw fixation.

Rationale: Elastic intramedullary nailing of pediatric forearm fractures provides a minimally invasive alternative to treat unstable fractures that fail closed reduction and casting. It has been shown to be a reliable method of achieving anatomic union with excellent function of the injured upper extremity in most patients with very few complications related to the surgery¹⁻³.

Expected Outcomes: We advise patients that in >90% of children treated with this technique, we achieve anatomic union with excellent wrist and elbow function. Usually, the nails can be removed 6 to 12 months after the procedure. Complications related to infection, nonunion, malunion, compartment syndrome, and neurovascular compromise are rare¹⁻³.

Important Tips:

- Position the patient and fluoroscopy machine to allow easy access to the elbow and wrist throughout the procedure.
- Use a sharp-pointed awl to access the medullary canal without injuring the adjacent physes of the distal end of the radius or proximal part of the ulna.

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- Contour the radial implant to allow easy passage and to establish the anatomic radial bow.
- Traction and direct manual pressure can be used to reduce the fractured fragments to allow passage of the implants across the fracture site.
- A small open reduction of the fracture site should be performed after ≥ 3 failed attempts at obtaining a closed reduction.
- The nails should be cut so that they can be buried subcutaneously but easily accessed for later removal without injuring the adjacent physes.

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