

## Retrograde Application of Humerus Fassier-Duval Rod in Osteogenesis Imperfecta: A New Surgical Technique

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### Background:

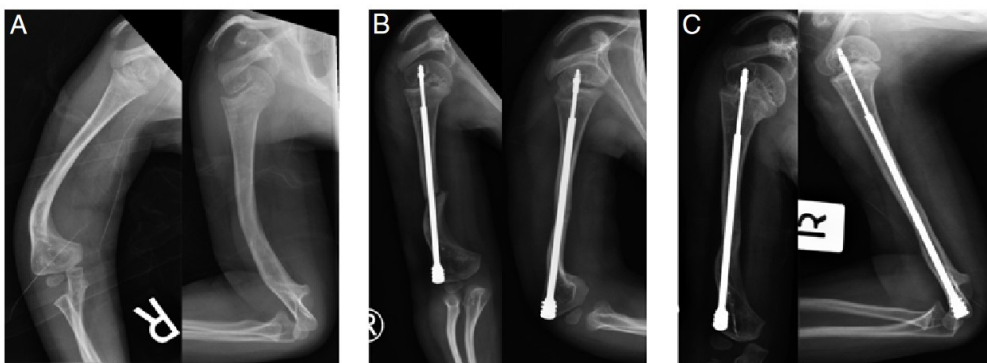
The aim of this study is to describe the technique of retrograde application of Fassier-Duval (FD) rod for the humerus in patients with osteogenesis imperfecta (OI). This technique was developed to overcome the downsides of the previously used techniques of humerus rodding.

### Methods:

The study was done at a tertiary care pediatric orthopaedic hospital from April 2014 to August 2021. Skeletally immature patients with OI who underwent retrograde FD rodding were included. This surgery was performed for humeral shaft fractures/bowing limited to the distal half of the bone to ensure appropriate stability of the fixation. Surgical technique of the procedure is described in detail.

### Results:

Six patients with OI, of which 2 (33.3%) had FD rodding bilaterally, were included. The mean age at rodding was  $7.6 \pm 3.5$  (range: 3 to 14) years. The mean duration of postoperative follow-up was  $45.5 \pm 18.0$  (range: 24 to 75) months. All patients had full healing of the fracture/osteotomy, with functional alignment of their humeri. No surgical complications were observed; however, 1 (12.5%) segment only had a traumatic humerus fracture following a fall that was associated with rod migration, occurring 60 months postoperatively. This was treated with a retrograde FD rodding again, with fracture augmentation with plate and screws.



X-rays of a 6-year-old boy with type 3 OI who underwent retrograde FD rodding of the humerus for bowing. **A**, Preoperative views of the right humerus. **B**, Two weeks following osteotomy and retrograde application of FD rod. **C**, Fifteen months following the rod application demonstrating no complication, lengthening of the rod and good bone alignment

### Conclusions:

The retrograde FD rodding technique of the humerus in OI patients is relatively simple and preserves the soft tissue surrounding the shoulder joint, with favorable outcomes. Studies with larger sample size and long-term follow-up duration are needed.