

Pediatric Fractures Treated by Resorbable Implants



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Introduction

Biodegradable implants have seen an increase in application in pediatrics. Designed to naturally dissolve over time, they offer a promising alternative to traditional metal implants by reducing long-term complications. Initially limited to fixation of knee joint fractures—where the need for a material that could safely degrade as the bone heals was first recognized—since then, their application has expanded considerably. Today, these are effectively employed to treat fractures in the ankle and elbow joints. More recently, the use of these implants has extended to fractures in the forearm and wrist, further demonstrating their versatility and growing acceptance in pediatric orthopedics.

Purpose

The study provides a comprehensive overview of the indications for implants—from clavicle to ankle—and details the surgical techniques required for proper fixation. Illustrations are also offered for visual evidence of successful outcomes.

Case 1.



Figure 1. Nine years old girl left clavicle fracture, after open reduction and internal fixation by resorbable IM nail. One year later the fracture is completely healed, and functional and cosmetic result was perfect.

Case 4.



Figure 4. The yellow arrow shows the medial epicondyle dislocated into the joint. Intraoperative pictures present the fracture side and the fragment. Postoperative X-rays show the fracture stabilized with a resorbable implants (screw) in a good position.

Case 6.



Figure 6. Distal forearm fracture. Fully displaced (overriding) metaphyseal radius fracture associated with stable greenstick ulna metaphyseal fracture. After reduction and short intramedullary resorbable nailing fixation of the radius.

Case 8.



Figure 8. Distal tibial fracture (Tillaux fracture-red narrow shows the fracture gap). Postoperative X-rays show good articular congruency. Red ellipsis shows the resorbable screw position (shadow screw).

Conclusions

A major advantage is their ability to offer results comparable to metal counterparts. Despite being newer, resorbable implants have proven equally effective and safe over the years. Their ability to dissolve naturally renders them a viable option for pediatric patients, minimizing the need for future surgical interventions. This process reduces the risk of infections, complications of removal, or foreign material reactions. In summary, resorbable implants represent an important advancement in the treatment of childhood fractures. Their expanding range of applications, from the clavicle to the ankle, along with the positive clinical outcomes associated with their use, positions them as a highly effective and less invasive alternative to traditional metal implants in pediatric fracture management.

Case 2.



Figure 2. Displaced lateral humeral condyle fracture of the humerus. Open reduction and transient fixation by K-wires and same view of X-rays the fracture fixed by resorbable pins and PDS loop.

Case 3.



Figure 3. Dislocated lateral humeral condyle fracture treated by two resorbable screws.

Case 5.



Figure 5. Displaced capitulum fracture preop CT and 1 year later control CT showed perfect articular surface and healed fracture. The fracture was fixed by open reduction and resorbable pin fixation. The patient healed with full function.

Case 7.

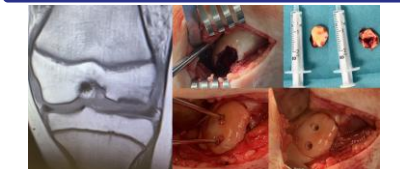


Figure 7. Femur lateral osteochondral fracture preoperative MR picture, intraoperative pictures show the defect and size of the fragment. Transient fixation by K-wire and final fixation by resorbable nails.

Case 9.



Figure 9. Avulsion of tibial tubercle, open reduction, and internal fixation by resorbable screws and PDS loop. One year after the operation the patient returned to the sport. The fracture is healed physically and radiologically too.