Management of Forearm Fracture in Adolescence

Tania F,[1] Siswanto BA,[1] Rusdianto IA,[1] Pramantha B[2]

[1]Intern Doctor, Department of Orthopaedic Surgery, St. Carolus Hospital, Jakarta, Indonesia

[2]Orthopaedic Surgeon, St. Carolus Hospital, Jakarta, Indonesia

ABSTRACT

Forearm shaft fracture usually occurs because of indirect trauma, mainly when a child protects themself by an outstretched upper extremity during a fall. CRIF with TENS can be the treatment of choice in adolescents with simple forearm fractures, especially returning to pre-injury function and physical appearance. The patient had a history of fractures of both bones of the right forearm three months before, and the fractures were fixated using TENS. The satisfying outcomes (faster return to his initial ability to play sport, without any dysfunction, visible no big scar) were why we recommended using TENS to fixate the current fractures.

Keywords: Forearm fracture, indirect trauma, management

ABSTRAK

Fraktur tulang lengan bawah biasanya terjadi akibat trauma tak langsung, umumnya jika seseorang berusaha menahan tubuhnya saat terjatuh. Teknik CRIF dengan TENS merupakan salah satu yang terpilih untuk tata laksana fraktur lengan bawah sederhana. Pasien memiliki riwayat fraktur kedua tulang lengan kanan 3 bulan sebelumnya dan fraktur difiksasi menggunakan TENS, hasilnya memuaskan (lebih cepat kembali ke kemampuan awal untuk berolahraga, tanpa disfungsi, tidak terlihat bekas luka besar) merupakan alasan kami merekomendasikan penggunaan TENS untuk memfiksasi fraktur saat ini. **Tania F, Siswanto BA, Rusdianto IA, Pramantha B. Tata Laksana Fraktur Lengan Bawah pada Remaja – Laporan Kasus**

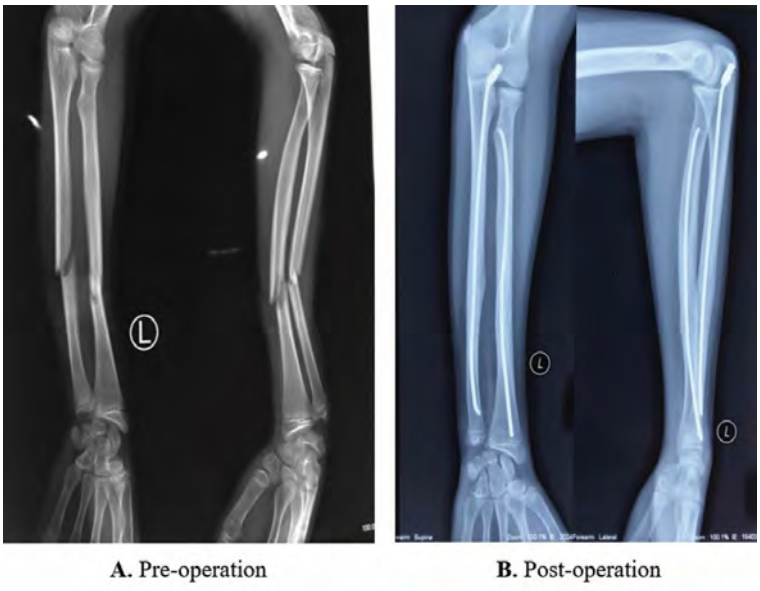
Kata kunci: Fraktur lengan bawah, tata laksana, trauma tak langsung

Introduction

Increased physical activity in adolescence is related to many cases of sports injuries. Radius and ulna fractures are the most prevalent types in children under 14 years, with an annual incidence of approximately 1.5/100 children1 and comprising up to 40% of all pediatric fractures.2 Forearm fractures comprise 25% of childhood fractures.[3]

Forearm shaft fracture usually occurs because of indirect trauma, mainly when a child protects themself by an outstretched upper extremity during a fall; high energy trauma can damage the cortical bone of the forearm. Most fracture cases in the forearm involve both radius and ulna. The type of fracture is greenstick among younger children and completed or short oblique fractures in older children.[4]

Several therapeutic options are available. Indication for operative fixation is to achieve or maintain an acceptable reduction. Titanium elastic nails (TEN) are a minimally invasive fracture treatment to achieve reduction and stabilization, especially for a child. TEN can be chosen as a surgical procedure for age 3-15-year-old; the contraindications are intraarticular fractures, complex femoral fracture in overweight (50-60 kg), and/or age (15-16 years).[5]



A. Pre-operation B. Post-operation

Picture 1. Left forearm radiograph

Alamat Korespondensi *email: fidiatania@gmail.com, belinda.siswanto@gmail.com, angga.rusdianto@hotmail.com, Bagusortho@gmail.com*

Some parents have consideration to surgical procedures for their children. They are concerned with side effects such as trauma and scar. TEN will help a child to resume their activity faster.

Case

A 12-year old boy presented to our emergency department with an acute trauma history of a fall while playing basketball. He complained of pain and deformity of the right lower arm. On examination, his vital signs were typical. Swelling and tenderness on the right lower arm were found, with no sign of any neurovascular injury (type I Gustilo-Anderson Classification). Radiological findings were completed-non displaced transverse fractures of ulna and radius. A closed reduction and internal fixation using Titanium Elastic Nails (TENS) were planned. He had an uneventful surgical history also using TENS on his left hand about three months ago for a fracture after a fall while playing skateboard.

Paracetamol 500 mg three times a day to reduce the pain and ceftriaxone 1,5 gram as a prophylactic was administered. The surgery was under general anesthesia the next day. The fracture underwent closed reduction and internal fixation (CRIF) with TENS. Radiographic evaluation revealed a solid union with good alignment of both bones. The outcome was assessed with disabilities of the Arm, Shoulder, and Hand (DASH) questionnaire[6] **(Table).**

Discussion

As fractures of the forearms are common in adolescence, finding the best and effective treatment is essential. In most diaphyseal forearm fractures in children, the treatment of choice is closed reduction and casting; surgical stabilization and fixation are occasionally required.7 TENS is safe, minimally invasive, appears to have few complications, does not interfere with growth, and is associated with short hospital stays and a rapid return to daily activity.8

The patient had a history of fractures of both bones of the right forearm three months before, and the fractures were fixated using TENS; the satisfying outcomes (faster return to his initial ability to play sport, without any dysfunction, visible no big scar) was the reason we recommended the using of TENS to fixate the current fractures.

Although the treatment of choice in most diaphyseal forearm fractures in children is with closed reduction and casting, surgical stabilization is occasionally required. It creates a point of fixation and allows the construct to act as an internal splint to achieve stability.6

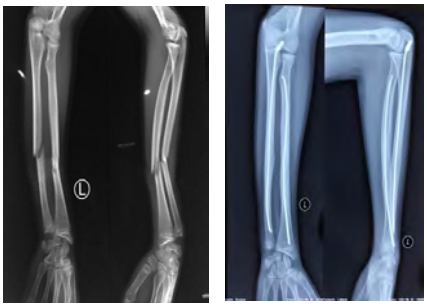
Conclusion

CRIF with TENS can be the treatment of choice in adolescents with simple forearm fractures, especially concerning returning to pre-injury function and physical appearance.

Tabel 1. Result of follow-up with DASH questionnaire

Follow-up	DASH Disability	DASH Sport Module
Pre-operation	82.76	100
Post-operation in 6 weeks	8.6	18.75
Post-operation in 8 weeks	0	0

Picture 2. Left forearm radiograph

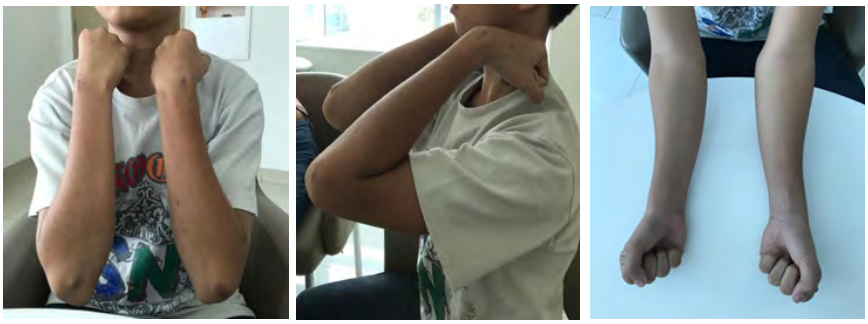


A. Pre-operation B. Post-operation

Picture 3. Right forearm radiograph

A. Pre-operation B. Post-operation C.. After 8 weeks

Picture 4. Post-operation after 8 weeks



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