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RESULTS OF TITANIUM ELASTIC NAILING IN MIDSHAFT RADIUS-ULNA FRACTURES IN ADULTS

Orthopaedics

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ABSTRACT

Aims and objectives : To study the functional outcome of TENS in midshaft radius-ulna fracture.
Introduction : The biomechanical principal of the TEN is based on the symmetrical bracing action of elastic nails inserted into the metaphysis, which bears against the inner bone at three points . This method has the benefits of early immediate stability to the involved bone segment, which permits early mobilization and returns to the normal activities of the patients, with very low complication rate
Materials and methods: A retrospective study of 27 adult patients with closed and open grade 1 midshaft radius-ulna fracture carried out at our institute between 2016-2019 treated with TENS and observed for a period of minimum 18 months.
Conclusion : It can be concluded that TENS nailing in mid-shaft radius-ulna fractures in adults is an acceptable modality of treatment for midshaft radius-ulna fractures in adults.

KEYWORDS

Midshaft , radius-ulna , adult , TENS

INTRODUCTION

Diaphyseal forearm fractures are considered intra-articular fractures. Anatomic reduction with plates and screw fixation serves as the gold standard as it is important to restore rotational stability and preserve double bone length [1, 2].However, extensive surgical exposure and periosteal stripping during open reduction surgery may increase the risks of neurovascular injuries, soft tissue injuries, intraoperative fractures, muscle swelling, and even postoperative compartment syndrome [3–5]. To avoid iatrogenic injuries, non-locked intramedullary nailing treatment for forearm fractures has been previously reported [5].

The biomechanical principal of the TEN is based on the symmetrical bracing action of elastic nails inserted into the metaphysis, which bears against the inner bone at three points [9]. This method has the benefits of early immediate stability to the involved bone segment, which permits early mobilization and returns to the normal activities of the patients, with very low complication rate [10].TENs lack axial and rotational stability but they are relatively stable with secondary bone healing. There are few reports evaluating the use of elastic stable intramedullary nails in adult proximal radial fractures [11, 12]. The proximal radius is surrounded by abundant forearm muscle, especially the supinator and pronator teres, and the posterior interosseous nerve (PIN) also crosses the proximal radius. The intramedullary nail method has advantages such as closed application, less soft tissue injury, avoidance of nerve injury, and cosmetic benefits. In particular, the application of the TEN for adult proximal radial shaft fractures has not been extensively investigated.

The underlying hypothesis of this study was that limited surgical dissection to treat adult proximal radial shaft fractures can avoid neuromuscular injury, reduce blood loss, enhance fracture healing, and yield better cosmetic results compared with the standard procedure of open reduction with plate and screw fixation. Toward this end, this study evaluated the functional outcomes and efficiency of TENS in the surgical treatment of adult proximal radial shaft fractures.

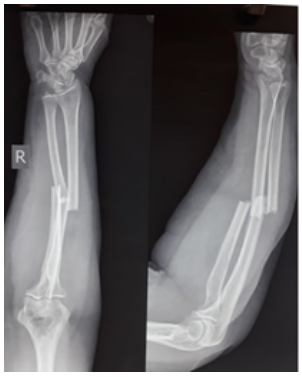
MATERIALS AND METHODS

This is a retrospective study of 27 patients between the age of 20 to 70 years carried out at our institute between june 2016 to august 2019. All patients having closed and open grade-1 fractures of mid-shaft radius-ulna without any neurovascular deficit were included in the study. All other patients were excluded .

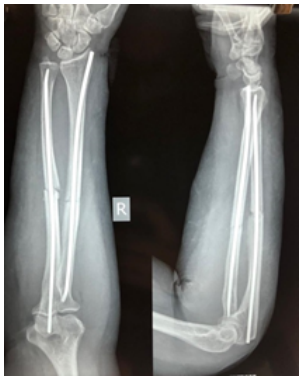
Pre-operative radiographs , routine blood investigations and medical and anaesthetic fitness was obtained before the surgery. All patients were given general anaesthesia or block as per the requirement.

Surgical technique:Patients were taken on a simple table in supine position. A small incisionof 0.5 cm was made at the tip of the olecranon . Entry for the ulnar nail taken at the tip of the olecranon using entry awl after confirming with the help of intra-operative fluoroscopy. TENS nail of appropriate diameter was selected and inserted after manipulation and closed reduction of the fracture under fluoroscopy. Then for the radius fracture , a small incision of 0.5 cm was made at the radial styloid and entry taken at the tip of the radial styloid using entry awl sparing the tendons of the first dorsal compartment of the forearm. TENS nail of appropriate size selected and inserted after manipulation and closed reduction of the radius fracture. If required a second nail is also used by taking an entry from the lister's tubercle for additional stability.Reduction was confirmed under the fluoroscope. Excess nails were cut and surgical wound was closed using ethilon 2-0.

Post-operative care: An above elbow slab was given to all the patients for a period of 4 weeks. Suture removal was done at 12-15 days after surgery. Elbow mobilisation was started at 6 weeks for almost all the patients.



Pre-operative radiograph



Post-operative radiograph

DISCUSSION AND RESULTS

Out of 27 patients 24 patients had excellent outcome according to the DASH score. 2 patients had good outcome and 1 patient had poor outcome due to delayed union. Radiological union was seen at 3 months in 24 patients , at 5 months in 2 patients and at 1 year in 1 patient. There was no non-union in any patient at 18 months follow-up. Full range of motion at the elbow and wrist joint was achieved in all the patients at 3 months follow-up.

CONCLUSION

It can be concluded that TENS nailing in mid-shaft radius-ulna fractures in adults is an acceptable modality of treatment in midshaft radius ulna fractures in adults as it is a relatively simple procedure with minimum or no soft tissue damage ,preservation of fracture haematoma causing rapid union and reduced blood loss during the surgery.

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