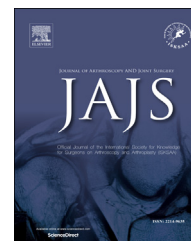


Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

[www.elsevier.com/locate/jajs](http://www.elsevier.com/locate/jajs)

## Original Article

# Titanium elastic nail fixation for clavicular fractures in adults



B. Suresha, Shekhar Srivastav\*, Ambuj Sud, Harjoban Singh, Shekhar Agarwal

DITO, Sant Parmanand Hospital, 18 Shamnath Marg, Delhi 110054, India

## A B S T R A C T

## Keywords:

Clavicle fracture  
Midshaft fractures  
Displaced fracture  
Titanium elastic nail

**Objectives:** Clavicular fractures account for 2% of all fractures, and more than 80% involve the middle third of the clavicle. Various modalities of treatments have been explained for the same in literature, including nonoperative and operative. Plate fixation has been associated with many complications, whereas nonoperative associated with delayed union, nonunion and mal union.

We report case series treated with Titanium elastic nail to fix the displaced mid-clavicular fractures without comminution.

**Materials and methods:** 20 patients with midclavicular fractures without comminution were included for the study. All were male patient with a mean age of 32.05 years (range 24–40 years). The mean course of the disease was 4 days. Patients were followed up at an interval of 2, 6, 12 weeks till fracture union and Constant Score was used to assess the disability of the upper arm. Fracture reduction and healing were followed up by X-rays to analyze internal fixation with the titanium elastic technique.

**Results:** All patients were followed up till the fracture union with mean of 4.5 months. The mean bone union time was 12.45 weeks (11–14 weeks). The Constant Score of 94.61 was attained at the latest follow-up. None of the patients had any complications. The anatomical reduction, functional recovery and appearance were satisfactory in all patients.

**Conclusion:** The treatment of adult midclavicular fractures with Titanium elastic nail provides adequate fixation, faster recovery with early return to normal function.

Copyright © 2013, International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty. Published by Reed Elsevier India Pvt. Ltd. All rights reserved.

## 1. Introduction

The clavicle provides the junction between the chest and the upper limb, so it plays an important role in the whole function of the shoulder girdle. Morphologically, the clavicle normally presents a characteristic S-like shape resulting from the

junction of two opposite curves at the level of the midshaft. The bone is thinner and consequently weaker at this junction, which is why most fractures occur at this level (Tables 1 and 2).<sup>1</sup>

Fractures of the clavicle are common, and account for 2–15% of all adult fractures and 33–45% of all injuries involving the shoulder girdle. The midshaft is the most frequently affected site, encompassing 69–82% of all clavicle

\* Corresponding author.

E-mail address: [drssrivastav@hotmail.com](mailto:drssrivastav@hotmail.com) (S. Srivastav).

**Table 1 – Demographic and clinical characteristics of patients treated with Titanium elastic nail.**

Characteristics	No.
Mean age	32.05 years
Sex	
Male	20
Female	0
Clavicle	
Right	13
Left	7
Cause of injury	
Road traffic accident	12
Fall	8
Classification	Allman – Group 1
Reduction techniques	
Closed reduction	12
Open reduction	8

fractures, and most fractures that occur in the midshaft are displaced.<sup>1</sup>

In young adults, these fractures are usually related to sports or vehicle accidents, whereas in children and elderly, they are usually related to falls.<sup>2</sup> In general, clavicle fractures are treated conservatively and have a variable outcome. Hill et al and Robinson et al reported that nonoperative treatment of midclavicular fractures leads to subjectively, clinically, and radiographically unsatisfactory results in 10–30% of patients. Hill et al showed that displacement of more than 20 mm resulted in 15% nonunion and 18% of the patients had thoracic outlet syndrome following union.<sup>3</sup> Hence, more recently, there has been a trend toward surgical fixation. The gold standard for the surgical treatment has been open reduction and plate fixation through a large incision.<sup>4</sup> However, surgical procedures using plate fixation have shown major complications such as hematoma, infections, implant failures and nonunion.<sup>5</sup>

Intramedullary fixation has emerged as a promising alternative to traditional open reduction and internal plate fixation.<sup>6</sup> Advantages of this minimally invasive treatment option include maintaining the fracture hematoma and keeping the periosteum intact, which positively influences bone formation and improves cosmetics owing to the small incisions used.

Recently, Jubel et al<sup>7</sup> introduced a new intramedullary nailing technique in which a single Titanium elastic nail is inserted in an antegrade manner from the sternal end of the clavicle to fix those fractures. He reported fewer complications and a higher rate of fracture healing than those previously reported with the use of rigid intramedullary implants.

The aim of this study was to report the results of treating displaced midshaft clavicle fractures with Titanium elastic nail in adults.

**Table 2 – Clinical outcomes of patients treated with Titanium elastic nail.**

Outcome	Mean
Duration of follow-up in months	4.5 months
Healing time in weeks	12.45 weeks
Final Constant Score	94.61
Complications	Nil

## 2. Material and methods

A retrospective review of 20 patients who underwent surgery for displaced midshaft clavicle fractures and treated with Titanium elastic nail were carried out. The patients' data were obtained from the patients' case notes, radiographs, and clinic letters.

We used the Allman classification for clavicular fractures.

### 2.1. Inclusion criteria

- Age group of 20–50 years
- Diaphyseal midshaft, non-comminuted displaced clavicle fractures
- Fractures with imminent skin perforation
- Fracture with less than 1 week old.

### 2.2. Exclusion criteria

- Patients with proximal or distal fractures
- Presence of associated injury – Floating shoulder
- Pathological fractures
- Open fractures
- Brachial plexus injury
- Comminuted fractures.

All the patients were followed up at an interval of 2, 6, 12 weeks till fracture union and all were subjected for both clinical and radiological evaluation of fracture union at regular follow-up. We used the Constant Score for functional outcome at latest follow-up.

## 3. Surgical techniques

After general anaesthesia, patients were placed on radiolucent table in beach-chair position with folded towel under the affected shoulder and injured extremity prepared and draped from midline to upper arm. All patients received single dose of intravenous antibiotic as prophylactic dose. The image intensifier and monitor are placed on the opposite side of the operating table.

A horizontal skin incision (Fig. 4.) of 1–1.5 cm was made 1 cm lateral to the sternoclavicular joint and incision was deepened till bone to separate subcutaneous fat, platysma and pectoral fascia. The entry point was made with bone awl or drill bit and Titanium elastic nail of appropriate size (usually 2.5–3 mm) was mounted on Jacob's chuck and inserted into the medullary canal from the sternal end (Fig. 1). Attempt was made to close reduce the fracture with reduction performed percutaneously by means of towel clip (Fig. 2). If closed reduction failed, then a separate horizontal incision was given at fracture site to ease the reduction. Thus the nail was passed from sternal end across the fracture site till 1 cm from lateral end of clavicle under the fluoroscopic control (Fig. 3). The nail was cut flush to the entry point in order to minimize soft tissue irritation.

All patients were put in arm pouch post-operatively with early gentle mobilization when pain allows. The arm pouch

Download English Version:

<https://daneshyari.com/en/article/3245143>

Download Persian Version:

<https://daneshyari.com/article/3245143>

[Daneshyari.com](https://daneshyari.com)