

# Correlation of the degree of clavicle shortening after non-surgical treatment of midshaft fractures with upper limb function

**Submission date**

16/04/2014

**Recruitment status**

No longer recruiting

Prospectively registered

Protocol

**Registration date**

12/05/2014

**Overall study status**

Completed

Statistical analysis plan

Results

**Last Edited**

05/02/2016

**Condition category**

Injury, Occupational Diseases, Poisoning

Individual participant data

## Plain English summary of protocol

### Background and study aims

Fractures of the clavicle (broken collarbone) are very common. They represent approximately 2.6% of all skeletal injuries (fracture of the middle third of the clavicle responsible for 80% to 85% of all clavicle fractures). Very often this type of fracture is associated with some deviation caused by muscle insertions. Nonsurgical treatment of clavicle fractures with a figure-of-eight bandage or sling has been used for years with excellent results and low complication rates. However, some recent studies have questioned these results especially in cases of fracture with some bone displacement and shortening. Shortening of the clavicle is linked to decreased strength and range of motion. Some studies have demonstrated a relationship between shortening and loss of strength and worse functional outcomes and recommend surgical treatment in case where shortening is greater than 2 cms. Other studies report good functional outcome and low complication rates in patients that have undergone conservative treatment (figure-of-eight bandage or sling) even when the clavicle is shortened.

It is not clear whether clavicle shortening affects upper limb function. The aim of this study is to assess the relationship between shortening of the clavicle after conservative treatment with figure-of-eight bandage and upper limb function by observing a number of patients.

### Who can participate?

Patients aged 18 and over, with a fracture of the middle third of the clavicle.

### What does the study involve?

We looked at 59 patients with clavicle fractures (recruited sequentially) from the Discipline of Hand and Upper Limb Surgery at São Paulo Federal University (UNIFESP). All patients were treated with a non-surgical standard care figure-of-eight bandage for a minimum of six weeks until clinical and radiological healing of the fracture was observed. In the first evaluation, the length of both clavicles was measured on a single anteroposterior radiograph. The degree of shortening was calculated as the difference between the lengths of the two clavicles. During treatment with a figure-of-eight bandage, the function of the affected upper limb was released as tolerated. Each patient underwent rehabilitation from the sixth week onward, and the rehabilitation was similar to that for any patient undergoing physiotherapeutic rehabilitation,

with exercises to increase range of motion and passive, active, and progressive strength. Participants answered 30 questions concerning the level of difficulty in completing everyday tasks, and pain during and after the treatment.

What are the possible benefits and risks of participating?

All patients receive standard care. There is no benefit in participating. Risks are related to the treatment and the type of fracture such as non-union (fracture area has not healed), malunion (fracture heals out of position it was set) in and cosmetic deformity in the shoulder by the consolidation.

Where is the study run from?

Discipline of Hand and Upper Limb Surgery at São Paulo Federal University (UNIFESP).

When is the study starting and how long is it expected to run for?

January 2010 to June 2012

Who is funding the study?

UNIFESP (São Paulo Federal University), Brazil

Who is the main contact?

Dr Gustavo Santiago de Lima Figueiredo

## Contact information

**Type(s)**

Scientific

**Contact name**

Dr Gustavo Figueiredo

**Contact details**

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Brazil

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## Additional identifiers

## Study information

**Scientific Title**

Correlation of the degree of clavicle shortening after non-surgical treatment of midshaft fractures with upper limb function: a prospective cohort single-centre study

**Study objectives**

We developed this study to assess the relationship between shortening of the clavicle after conservative treatment with figure-of-eight bandage and upper limb function, hypothesising that there is no relationship between shortening and functional deficit.

**Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

CEP UNIFESP - Plataforma Brasil (Center for Ethics in Research of the Federal University of São Paulo - Brazil platform), 08/02/2013, approval number 192248, protocol number 11376613.2.0000.5505.

### **Primary study design**

Observational

### **Study design**

Prospective cohort single-centre study

### **Study type(s)**

Treatment

### **Health condition(s) or problem(s) studied**

Clavicle fracture

### **Interventions**

At the time of diagnosis all patients were treated with a non-surgically standard care figure-of-eight bandage (a type of immobilization to this kind of fracture), for a minimum of 6 weeks until clinical and radiological healing of the fracture was observed. During treatment with a figure-of-eight bandage, the function of the affected upper limb was released as tolerated. Each patient underwent rehabilitation from the sixth week onward, and the rehabilitation was similar for all with physiotherapeutic rehabilitation, starting with exercises to increase range of motion and passive, active and progressive strength gain.

### **Intervention Type**

Other

### **Phase**

Not Applicable

### **Primary outcome(s)**

The primary clinical outcome was measured using the Disability of Arm, Hand and Shoulder (DASH) score revalidated for Portuguese language, consisting of 30 questions concerning the level of difficulty in completing everyday tasks, and the visual analogue scale (VAS), score (0 = no pain, 10 = unbearable pain), both applied in the 6 weeks and 1 year consultations, and compared to the clavicle shortening in the first evaluation (the length of both clavicles was measured on a single anteroposterior radiograph from the centre of the sternoclavicular joint to the centre of the acromioclavicular joint; the degree of shortening was calculated as the difference between the lengths of the two clavicles)

### **Key secondary outcome(s)**

As secondary outcomes we examined the association of the objective variables age, sex (male /female), and affected limb (right/left) with the dichotomous, subjective variables of occupation, cause of trauma (high/low energy), aesthetic satisfaction (satisfied/not satisfied), and occurrence of complications (type of complication and frequency)

### **Completion date**

01/05/2012

## Eligibility

### Key inclusion criteria

Patients aged 18 and older diagnosed with a fracture of the middle third of the clavicle

### Participant type(s)

Patient

### Healthy volunteers allowed

No

### Age group

Adult

### Lower age limit

18 Years

### Sex

All

### Key exclusion criteria

1. Neurological and vascular deficits
2. Open fractures
3. Associated fracture in the upper limb
4. Bilateral fractures
5. Clavicle fractures with bone contact
6. Passage of more than 14 days since fracture
7. Previous surgery
8. Chronic disease in the affected limb

### Date of first enrolment

20/01/2010

### Date of final enrolment

01/05/2012

## Locations

### Countries of recruitment

Brazil

### Study participating centre

Avenida Doutor Altino Arantes n. 895

São Paulo

Brazil

04042-034

# Sponsor information

## Organisation

São Paulo Federal University (Brazil)

## ROR

<https://ror.org/02k5swt12>

# Funder(s)

## Funder type

University/education

## Funder Name

São Paulo Federal University (Brazil)

# Results and Publications

## Individual participant data (IPD) sharing plan

## IPD sharing plan summary

Not provided at time of registration

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	results	17/06/2015		Yes	No