



Superior sternoclavicular dislocation: A case report



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ARTICLE INFO

Article history:

Received 23 February 2017

Received in revised form

14 September 2017

Accepted 16 September 2017

Available online 23 September 2017

Keywords:

Superior sternoclavicular dislocation

Case report

Functional treatment

ABSTRACT

INTRODUCTION: Sternoclavicular dislocations are difficult to diagnose and often missed.

Anterior dislocations are more common than posterior dislocations and typically have a low risk of complications.

PRESENTATION OF CASE: We report the third case of post-traumatic superior sternoclavicular dislocation, which was successfully treated by functional treatment.

DISCUSSION: The sternoclavicular joint is a diarthrodial joint with three degrees of freedom that is relatively immobile and incongruent.

The treatment strategy for these injuries is based on two criteria: the possibility of vascular, nerve or tracheal compression such as in posterior dislocations, which is a surgical indication because of potential risk to life and function; the second indication is to improve esthetics, which is especially a concern with anterior dislocations.

CONCLUSION: Superior sternoclavicular dislocation is a rare condition, with only three published cases up to now. Functional treatment can be used without complications.

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1. Introduction

Sternoclavicular dislocations are difficult to diagnose and often missed. These rare injuries make up about 1% of all dislocations [1]. Anterior dislocations are 4–20 times more common than posterior dislocations and typically have a low risk of complications [1]. Posterior dislocations are less common but associated with a risk of vascular and nerve-related complications [1]. The treatment for anterior and posterior dislocations is well established [2,4].

We report the third case of post-traumatic superior sternoclavicular dislocation in line with the SCARE criteria [5].

2. Case report

During a low-speed motor vehicle accident, the 46-year-old woman was thrown against the car door when the vehicle hit a tree head-on. She had no medical or surgical past history. This resulted in direct trauma to her left shoulder. She initially did not seek medical treatment because she was not in pain.

However, the next day, pain and deformity in the left sternoclavicular joint led the patient to see her family doctor, who referred her to the emergency room. On clinical examination, the patient had pain over the entire left upper limb with complete functional disability, and a visible deformity of the left sternoclavicular joint.

She had no neurological deficits and the peripheral pulses were present. There were no esophageal or tracheal manifestations.

The shoulder x-ray showed a superior dislocation. A CT scan with contrast confirmed the diagnosis of pure sternoclavicular dislocation, with no anterior or posterior component (Fig. 1, Fig. 2, Fig. 3). There was no compression of nerves or vascular structures.

After discussion with the patient, who was not bothered by the appearance of the injury, and given the absence of neurovascular complications, we decided to use a functional treatment in which the injured arm was immobilized in a sling, along with rest and a 1-month course of analgesics. At the follow-up visit 2 weeks later, she had regained full range of motion of her upper limb. The sternoclavicular deformity was still visible but did not bother the patient.

At the 18-month follow-up, the patient was asymptomatic despite the clinically apparent superior sternoclavicular dislocation, and was satisfied by the treatment.

3. Discussion

The sternoclavicular joint is a diarthrodial joint with three degrees of freedom that is relatively immobile and incongruent. It is the only articulation between the upper limb and trunk [2].

Ligaments are primarily responsible for stabilizing the joint. The largest one is the costoclavicular ligament, which averages 1.3 cm long and 1.9 cm wide. The other structures are the interclavicular ligament, anterior and posterior capsules, and meniscus [3].

The strength of the costoclavicular ligament likely explains the low rate of superior dislocations and as a consequence, the rar-

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Table 1
Published cases of superior sternoclavicular dislocation.

Author (year)	Injury mechanism	Treatment	Results
Little (2008) [3]	Motor vehicle accident	Functional treatment with rest	Healed; esthetic sequelae only
Maseda (2009) [6]	Sports injury (fall directly on shoulder after being tackled)	Functional treatment with early return to sports	Healed; esthetic sequelae only
Menez (this article)	Motor vehicle accident (direct trauma to shoulder)	Functional treatment with activities restarted as pain allows	Healed; esthetic sequelae only



Fig. 1. Axial CT slice showing no anterior or posterior displacement.



Fig. 2. Three-dimensional CT reconstruction showing a superior sternoclavicular dislocation.



Fig. 3. Frontal CT scan slice showing pure superior sternoclavicular dislocation on the left side.

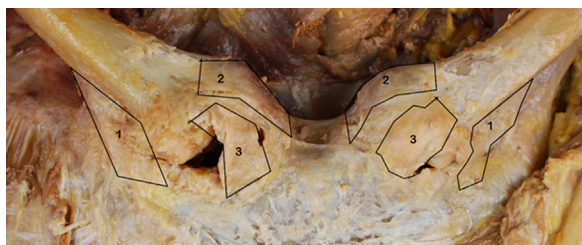


Fig. 4. Dissection of the sternoclavicular joint in a cadaver showing the various ligaments around the joint (1: costoclavicular ligament, 2: superior sternoclavicular ligament, 3: anterior sternoclavicular ligament). The costoclavicular ligament is noticeably sturdier than the other ligaments.

ity of pure superior sternoclavicular dislocations. To demonstrate this more concretely, we dissected a cadaver specimen and found that the costoclavicular ligament was more solid than the other ligaments around that joint (Fig. 4). In addition, the joint can be displaced superiorly only when the costoclavicular ligament is cut



Fig. 5. Superior sternoclavicular subluxation occurs when the costoclavicular ligament is cut (1); the superior sternoclavicular ligament (2) takes up the load and prevents a complete dislocation.

(Fig. 5). The largest displacement occurs when the superior sternoclavicular ligament is also cut (Fig. 6).

This leads us to surmise that this type of dislocation can occur only in one very specific case: when the compressive forces received by the sternoclavicular joint place only the costoclavicular and superior sternoclavicular ligaments under tension and when the exerted force is large enough to tear them. In most cases, either the anterior or posterior sternoclavicular ligament tears first since these forces are not perfectly aligned, which leaves the stronger costoclavicular ligament intact.

Lastly, this rare injury mechanism is even rarer in younger patients, in whom epiphyseal separation is more common since the middle part of the clavicle does not ossify until later [1].

The treatment strategy for these injuries is based on two criteria: the possibility of vascular, nerve or tracheal compression such as in posterior dislocations, which is a surgical indication because of potential risk to life and function; the second indication is to improve esthetics, which is especially a concern with anterior dislocations.

For this reason, given the atypical dislocation reported here, the main objectives were to ensure that no critical structures were being compressed, as shown on a CT scan, and that the patient was not uncomfortable with the appearance. We decided to use a func-



Fig. 6. Superior sternoclavicular dislocation after both the superior sternoclavicular and costoclavicular ligaments are cut (1). The posterior sternoclavicular ligament was left intact (2) to show that it does not directly counter superior displacement of the joint.

tional treatment, as in the other two published cases [3,6], which consisted of immobilization and analgesics for 1 month.

Table 1 provides further information about published cases of superior sternoclavicular dislocation, such as the mechanism of injury, treatment and long-term results.

4. Conclusion

Superior sternoclavicular dislocation is a rare condition, with only three published cases up to now. Due to the absence of vascular or nerve-related risk, and the absence of functional repercussion after healing, a functional treatment can be used without complications. The esthetic deformation would remain the only sequelae.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Conflicts of interest

The authors declare to have no conflicts of Interest.

Funding

The authors declare to have no source of funding.

Ethical approval

Ethical approval was not required for this study.

Consent

An oral and a written informed consent was obtained from the patient for publication of this case report and accompanying images.

Author contribution

Clement Menez: data collection, writing the paper
 Sebastien El Rifai: data collection
 Gregoire Faivre: data collection
 François Loisel: cadaver dissection
 Laurent Obert: supervisor

Guarantor

The Guarantor is Mr Clement Menez.

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