CLINICAL CASE

POSTERIOR STERNOCLAVICULAR DISLOCATION WITH MEDIASTINAL OCCUPANCY: A CHALLENGING DIAGNOSIS AFTER CHEST TRAUMA

LUXACIÓN ESTERNOCLAVICULAR POSTERIOR CON OCUPACIÓN MEDIASTINAL: UN DIAGNÓSTICO DESAFIANTE TRAS EL TRAUMA DE TORAX

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ABSTRACT: Sternoclavicular dislocations are a rare but important condition that can occur after direct or indirect trauma. Most cases involve anterior dislocations, which are less serious than posterior dislocations, the latter representing a significant risk due to their proximity to vital vascular and nervous structures. The diagnosis is based on clinical findings and confirmation by radiological images. Evaluation includes a detailed history, physical examination, and imaging studies such as contrast-enhanced CT scan. Treatment varies from conservative methods to surgical interventions, depending on the severity of the injury and the presence of complications. We present a case of posterior sternoclavicular dislocation with mediastinal involvement successfully treated surgically, highlighting the importance of an accurate diagnosis and timely management to avoid long-term complications.

Keywords: Sternoclavicular Joint, Reduction, Mediastinum

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RESUMEN: Las luxaciones esternoclaviculares son una condición poco común pero importante que puede presentarse tras traumatismos directos o indirectos. La mayoría de los casos involucran luxaciones anteriores, menos graves que las posteriores, estas últimas representando un riesgo significativo debido a su proximidad a estructuras vasculares y nerviosas vitales. El diagnóstico se basa en hallazgos clínicos y confirmación mediante imágenes radiológicas. La evaluación incluye anamnesis detallada, examen físico y estudios por imágenes como tomografía computarizada con contraste. El tratamiento varía desde métodos conservadores hasta intervenciones quirúrgicas, dependiendo de la gravedad de la lesión y la presencia de complicaciones. Presentamos un caso de luxación esternoclavicular posterior con compromiso mediastinal tratado quirúrgicamente con éxito, resaltando la importancia de un diagnóstico preciso y un manejo oportuno para evitar complicaciones a largo plazo.

Palabras claves: Luxación Esternoclavicular, Reducción, Mediastino

INTRODUCTION

Sternoclavicular dislocations are uncommon (3%) and typically occur between the second and fourth decades of life. They are mainly caused by direct trauma to the joint or lateral indirect trauma to the ipsilateral shoulder. Most are anterior dislocations, more frequent and less severe than posterior ones. The latter are more dangerous and can result from high-energy direct or indirect impacts. Diagnosis is based on edema, hematomas, tenderness to palpation, and posture changes indicating clinical suspicion, along with diagnostic imaging for confirmation. In anterior dislocations, the clavicle protrudes forward, while in posterior ones, there's intense pain and depression in the clavicle. Complications may include breathing difficulty, swallowing problems, venous congestion, and, in severe cases, pneumothorax and shock. (Sernandez & Riehl, 2019), (Ingoe et al., 2023)

Traumatic posterior sternoclavicular joint dislocation is a rare but serious injury due to its proximity to major intrathoracic blood vessels, posing risks of pneumothorax, subclavian artery or vein injury, esophagus, trachea, or brachial plexus. Symptoms in most patients include shoulder pain or clavicular pain with reduced active range of motion, with chest pain being uncommon. Anterior dislocations form a painful prominence protruding at the sternoclavicular joint, while in posterior dislocations, a depression in the upper chest may be described. In severe cases of posterior dislocations, venous compression could lead to peripheral edema of the affected limb, and patients with arterial involvement may exhibit symptoms of distal ischemia. Posterior presentations can go unnoticed, with diagnoses established days or months later due to persistent pain, radiculopathy, respiratory problems, or even dysphagia. (Carius et al., 2021)

Clinical assessment involves proper history taking of the trauma mechanism, followed by examination of the injured limb, which may appear shortened, with the arm adducted and the elbow flexed to avoid pain upon abduction, while being supported by the contralateral arm. Additionally, patients may adopt anti-pain postures, such as resting with the neck flexed towards the ipsilateral side of the dislocation. The sternoclavicular joint is evaluated with the patient in the supine

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position, noting the absence or presence of severe joint deformity, protrusion in anterior dislocation, and depression in posterior dislocation, respectively. Other signs to assess include those suggesting neurovascular compromise, such as thoracic outlet syndrome through checking distal pulses, capillary refill, edema, hypotension, skin color, and sensation (presence of paresthesia or decreased sensitivity). Audible hoarseness or stridor may occur in extreme cases of tracheal impingement, while hypoxemia, tachypnea, and tachycardia are present with pneumothorax or hemothorax. (Carius et al., 2021).

Initial imaging diagnosis includes chest and shoulder radiographs, although both have limited utility in identifying these injuries due to overlapping structures, with numerous cases of falsely negative images. The gold standard is contrast-enhanced computed tomography (CECT) to visualize vascular structures. CECT images, including both clavicles and acromioclavicular joints, allow evaluation of subtle rotation, translation, and displacement shortening. Axial images provide the best visualization of posterior displacement and proximity to the underlying major vessels. (Carius et al., 2021)

Anterior dislocation can be effectively treated in the emergency department with appropriate analgesia, sedation, and traction methods. Those not reducible may be placed in a sling and discharged with urgent orthopedic follow-up, while posterior dislocations may require reduction attempts in the emergency department if there are compromises to the airway, hemodynamics, or vasculature, becoming an emergency requiring orthopedic evaluation with additional consultation from cardiothoracic or vascular surgery for possible surgical intervention if there are findings of compromised airways, hemodynamics, or vasculature. (Carius et al., 2021), (Escobar et al., 2016).

Reduction involves a traction-abduction method, applying traction to the affected upper limb while maintaining a 90-degree extension and abduction position, exerting pressure on the posterior aspect of the clavicle, or by clavicle traction using a towel clamp and simultaneously on the affected limb. Reduction within the first 24 hours is preferred, as after this, the complexity of the procedure and associated risks increase. (Carius et al., 2021), (Morell & Thyagarajan, 2016)

If closed reduction is not possible or there's continuous symptomatic instability, surgical management should be pursued. Several surgical techniques have been described in the literature, with no evidence that one method is superior to another. A clinical case of posterior sternoclavicular dislocation requiring surgical management by the thoracic surgery service is presented next. (Pimenta et al., 2013)

CLINICAL CASE

We present the case of a 35-year-old woman with no significant medical history who suffered thoracic and right shoulder trauma after falling from a moving bicycle. Despite no relevant medical history, she developed acute symptoms, including severe stabbing pain in the right hemithorax, dyspnea, and loss of strength in the affected limb. Symptoms worsened with palpation of the sternum, accompanied by a sensation of deformity.

Initially, she received conservative analgesic management at a primary care center, but due to persistent deformity and

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pain, she was referred to a tertiary center for further evaluation.

The patient was evaluated by the orthopedic service, who performed a chest X-ray, which did not reveal obvious fractures. However, persistent deformity led to a request for contrast-enhanced chest computed tomography (Figures 1 and 2). Radiological evaluation revealed severe dislocation of the clavicle proximal to the sternum, with displacement into the mediastinum. Based on these findings, the patient was referred to the thoracic surgery service for specialized management.

During a subsequent assessment, the patient was found to have pain and functional limitation in any range of motion of the right upper limb. Despite the absence of neurological or vascular findings, the presence of sternoclavicular dislocation was confirmed through detailed physical examination and diagnostic imaging (Figure 3). Cardiopulmonary examination revealed no additional anomalies.

Given the severity of the injury and the persistence of symptoms, it was decided to proceed with surgical management of the sternoclavicular dislocation.
Successful open reduction and internal fixation were performed, followed by the implementation of a comprehensive rehabilitation plan to restore function of the affected limb, which is ongoing.
Currently, nearly three months post-surgical procedure and still in rehabilitation, the patient reports improvement in symptoms with persistent pain during some activities of daily living; however, she performs her professional duties normally.

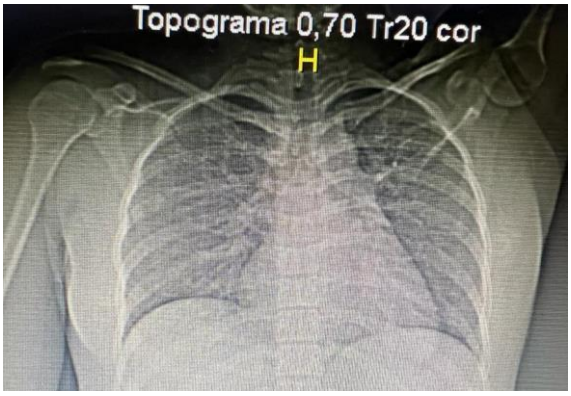

Figure 1. Preview of the chest computed tomography

Figure 3. Depression of the medial edge of the right clavicle with physical deformity

THERAPEUTIC MANAGEMENT

After a thorough evaluation by the anesthesiology department, the patient was classified as ASA II and underwent surgery with an estimated surgical time of 1 hour and 30 minutes. This was performed through a right thoracic sternoclavicular incision (Figure 4), following the anatomical planes until reaching the chest wall. During exploration, a total dislocation of the right sternoclavicular joint was identified, accompanied by mediastinal pleural thickening and an associated hematoma. Meticulous reduction of the dislocation was performed, followed by mediastinal pleurectomies to address pleural thickening and release pressure in the

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mediastinum. Subsequently, stabilization of the right sternoclavicular junction was carried out using osteosynthesis material, consisting of 3x3 DCP plates, number 2 holes, and 2.4 x 10 mm screws (4 in total), as well as 10 mm LOCK screws (8 in total). Once hemostasis was confirmed, a local anesthetic block was performed, and closure by planes was carried out, successfully completing the surgical procedure without complications (Figure 4).

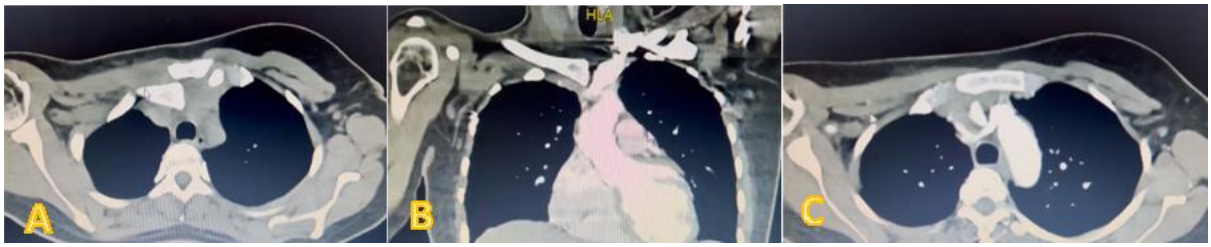

Figure 2. Chest computed tomography with transverse (A) and coronal (B) sections showing incongruence of the right sternoclavicular joint, with the clavicle displaced posteriorly towards the mediastinum. (C) Mediastinal collection associated with right sternoclavicular dislocation.

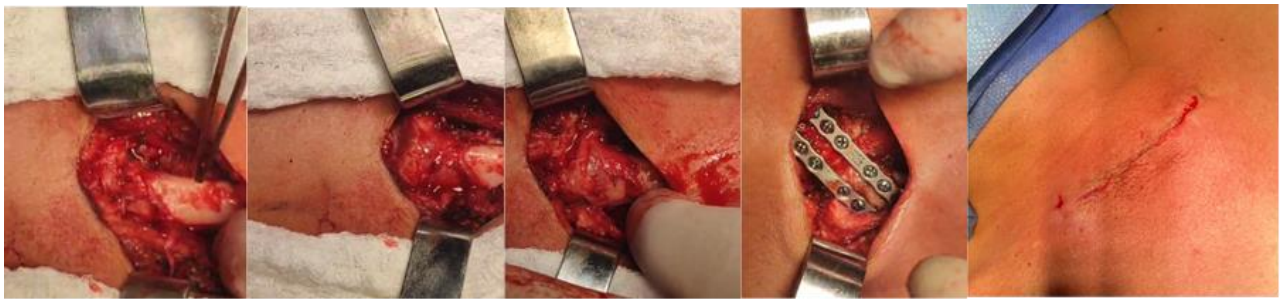

Figure 4. Intraoperative images showing the process of stabilization and open reduction of the sternoclavicular dislocation with placement of osteosynthesis material and closure by planes.

CONCLUSIONS

This case highlights the importance of maintaining a high index of suspicion for uncommon injuries such as sternoclavicular dislocation, especially in patients presenting with palpable deformity, pain, and functional limitation following thoracic trauma, even when initial imaging does not demonstrate fractures. Careful clinical evaluation, use of radiological imaging, accurate diagnosis, and early management are crucial to prevent long-term complications and optimize clinical outcomes in such conditions.

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