

Bilateral Posterior Sternoclavicular Dislocations

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Abbreviations: CT, computed tomography

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Abstract

We present the case of a professional horse jockey with chronic, bilateral, posterior sternoclavicular dislocations. Traumatic dislocation of the sternoclavicular is a relatively rare but potentially devastating injury. Posterior sternoclavicular dislocations occur less frequently than anterior dislocations and require careful and complete evaluation because of the potential for serious complications including respiratory distress, brachial plexus injury, and vascular injury. Our patient was treated with excision of the medial end of the clavicle on her symptomatic side.

Introduction

Traumatic posterior sternoclavicular dislocation and posterior physeal fracture-dislocation of medial clavicle are the least common types of injury to the sternoclavicular joint [1]. The relative rarity of these injuries is due to: (1) the anatomy of the joint and (2) the mechanism of injury. The ligamentous supporting structures of the sternoclavicular joint impart a tremendous amount of stability to the joint and include the intra-articular disk ligament, costoclavicular ligament, interclavicular ligament, and capsular ligament. The posterior capsular ligaments are substantially stronger than the other sternoclavicular ligaments [1, 2]. Large direct or indirect forces need to be applied to the shoulder in order for a sternoclavicular dislocation to occur.

Case Report

A professional horse jockey presented to our clinic six months after she had been involved in a severe racing accident. The horse that she was riding rolled over her three times and another horse and jockey trampled over her shortly thereafter (Figure 1). She sustained multiple rib fractures, a

pneumothorax, bilateral posterior sternoclavicular dislocations, and a left shoulder injury. She returned to racing shortly after she recovered from the rib fractures and pneumothorax.

When she first presented to us, she complained of facial flushing, shortness of breath, difficulty swallowing, and hoarseness when she extended her left arm behind her body. She had intermittent paresthesias in her digits that were most pronounced with extension of her arm. Additionally, she had difficulty sleeping on her left shoulder and noted pain with attempted overhead motion.

On physical examination she had 170 degrees of forward elevation bilaterally, 60 degrees of external rotation bilaterally, and internal rotation to L5 on the left and to T10 on the right. Rotator cuff strength was excellent. Radial pulses were 2+ and both motor and sensation to light touch were intact for the axillary, median, radial, and ulnar nerves. Extension of her left arm behind the plane of her body produced a raspy change in her voice. There was no gross motion at either sternoclavicular joint.

Radiographs including serendipity view (40-degree cephalic tilt) and Computed Tomography Angiography (CTA) confirmed bilateral posterior sternoclavicular dislocations. The left clavicle was more severely displaced than the right (Figures 2,3,4). Slight decreased caliber of the left subclavian vein was noted in comparison to the contralateral side and a small anterior/superior mediastinal hematoma was present. Magnetic Resonance Imaging (MRI) revealed a full thickness tear of the left rotator cuff.

A discussion was undertaken with the patient regarding the potential risks and benefits of surgical intervention. Because of her persistent symptoms and demanding occupation, a decision was made to proceed with surgery. She was placed in the semi-beach chair position and the entire thorax was prepped. With the assistance of a vascular surgeon, a curvilinear incision was made over the left sternoclavicular joint. The medial end of the clavicle was exposed in a subperiosteal fashion and was then divided medial to the costoclavicular ligament (rhomboid ligament) with an oscillating saw. All medial soft tissue attachments were sharply dissected and the medial end of the clavicle was delivered from the wound (Figures 5,6). The periosteum and deep fascia were robustly repaired. An open rotator cuff repair was performed in routine fashion on the left side. Her symptoms of hoarseness, dyspnea, and dysphagia largely resolved six weeks following the operation. She continued to have facial flushing with forward bending and is currently considering resection of the medial end of the clavicle on the contralateral side in effort to eliminate this symptom. It is our hope that she will ultimately have a full recovery and be able to return to professional horse racing



Figure 1. [Video clip of crash](#) (QuickTime 13.4 MB).



Figure 2. Professional horse jockey with chronic bilateral posterior sternoclavicular dislocations. Serendipity view (AP 40 degree cephalic tilt) shows bilateral sternoclavicular dislocations



Figure 3. Professional horse jockey with chronic bilateral posterior sternoclavicular dislocations. (A) Axial CT at the level of the sternoclavicular joints shows bilateral sternoclavicular dislocations. (B) CT 3D reconstruction surface-rendered shows bilateral sternoclavicular dislocations with more pronounced displacement on the left.

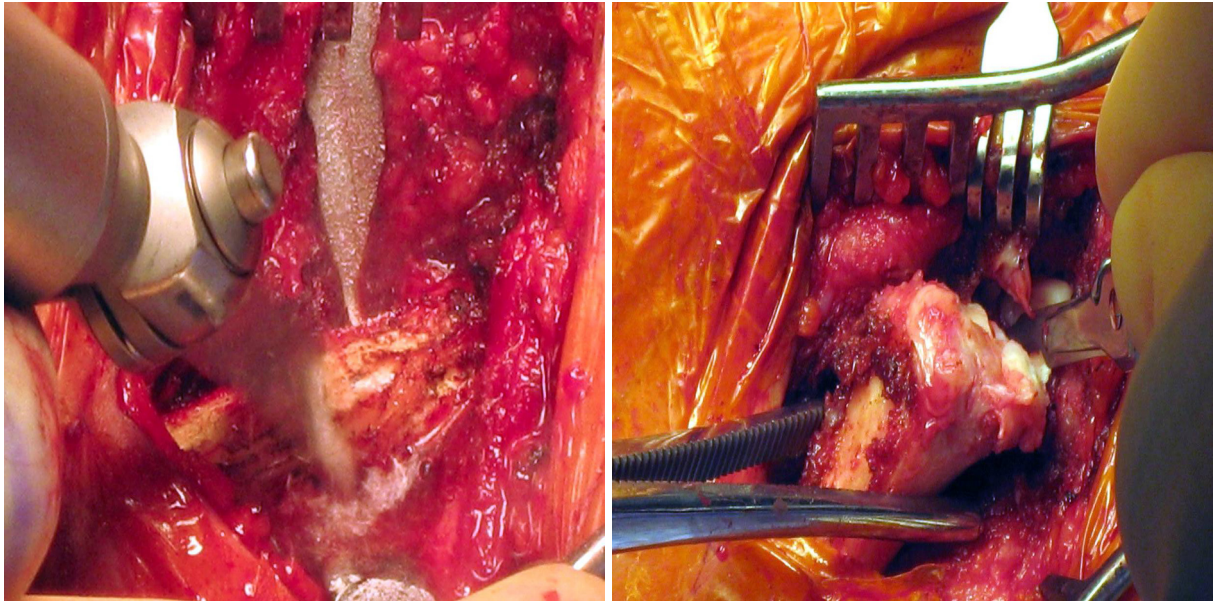


Figure 4. Professional horse jockey with chronic bilateral posterior sternoclavicular dislocations. (A) Intraoperative photograph shows oscillating saw resecting medial end of left clavicle. (B) Intraoperative photograph following removal of medial end of left clavicle.

Discussion

Routine chest radiographs can occasionally suggest a sternoclavicular joint dislocation. The serendipity view (40-degree cephalic tilt) can confirm the direction of displacement [1, 3]. Computed Tomography offers the additional benefit of defining the proximity of the clavicle to nearby neurovascular structures. Further, CT can detect subtle sublaxations, differentiate pure dislocations

from physal injuries, and allow for comparison with the contralateral side [1-7]. CT angiogram proved valuable in this case because it confirmed that the major vascular structures were uninjured and revealed that the medial clavicle was in close proximity to her trachea, offering an explanation for some of her symptoms.

Posterior sternoclavicular dislocations necessitate careful evaluation because of the potentially devastating injuries associated with them. Many complications have been reported in the literature related to retrosternal dislocation of the medial end of the clavicle including: subclavian compression and laceration, pneumothorax, esophageal rupture, myocardial conduction abnormalities, brachial plexopathy, tracheal tear, and late thoracic outlet syndrome [1, 3, 5-8]. Prompt closed reduction is recommended if the patient presents within 7 to 10 days following injury [1].

Open reduction should be considered if an attempt at closed reduction fails in the acute setting or if the patient presents in a delayed fashion. Various authors have recommended reconstruction with suture, fascia lata, autograft or allograft tendon, internal fixation or myotendonous transfer [1, 3, 7-12]. Other authors have favored resection of the medial end of the clavicle without reconstruction of the joint. It is recommended that the costoclavicular ligament be preserved if this option is undertaken [12]. An anatomic study by Bisson revealed that 1.0 cm of the medial clavicle could be resected in males and 0.9 cm in females with minimal disruption of the costoclavicular ligament [13]. We prefer resection without reconstruction as it removes the offending bone and eliminates the potential for future complications related to hardware.

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