

Image Diagnosis: A 16 Year Old with Chest Pain after Blunt Trauma

Minh Van Le, MD; Clifford Swap, MD

Perm J 2013 Fall;17(4):e147-e148

<http://dx.doi.org/10.7812/TPP/12-136>

Case Study

A 16-year-old male developed chest pain immediately after he was tackled in a football game one hour before he presented to the Emergency Department. Examination of the chest wall revealed tenderness to palpation of the right proximal clavicle with a depression of the clavicular head (Figure 1). The patient had equal distal pulses and was neurovascularly intact with no airway compromise. Right clavicle series radiographs were obtained (Figure 2).

A diagnosis of posterior sternoclavicular dislocation was suspected and confirmed by computed tomography scan (Figure 3). The underlying great vessels, esophagus, and airway were not compromised. The orthopedic service was consulted and subsequently performed an open reduction internal fixation as definitive management. The patient did not sustain damage to the underlying superior mediastinal structures and had an uneventful postoperative course.

Discussion

Sternoclavicular dislocations are rare, accounting for only 3% of all shoulder girdle injuries. Posterior sternoclavicular dislocations are more rare than anterior sternoclavicular dislocations, accounting for only 5% of all sternoclavicular injuries.¹ Early diagnosis and treatment are imperative given the potential for life-threatening injuries. Underlying structures that can be



Figure 2. Plain film (anterior-posterior view) of the right clavicle and shoulder. Arrow indicates inferior and medially displaced right clavicular head.

injured include the great vessels, trachea, brachial plexus, and esophagus. Impingement on these structures can result in signs and symptoms such as dyspnea, dysphagia, and dysphonia.¹ A high index of suspicion is necessary because physical examination and plain radiographs may have limited findings. Bedside ultrasound has been used to diagnose a posterior sternoclavicular dislocation but is unable to assess the integrity of the underlying superior mediastinal structures.² Computed tomography is the imaging modality of choice to define the injury pattern and evaluate for potential damage to the underlying superior mediastinal structures. Closed reduction should be attempted in the setting of a patient with acute compromise of underlying structures while awaiting consultation. The orthopedic service is the preferred consultative service. Cardiothoracic and vascular services are alternative services that can aid in definitive management given the nature of the injury and underlying structures. Emergent closed reduction at bedside is indicated when there is clinical compromise of underlying structures. An abduction long axis traction method is commonly used. The abduction traction method of reduction is performed by placing the patient in the supine position with the dislocated shoulder near the edge of the table. Thereafter, sandbags or towels are propped 3 inches

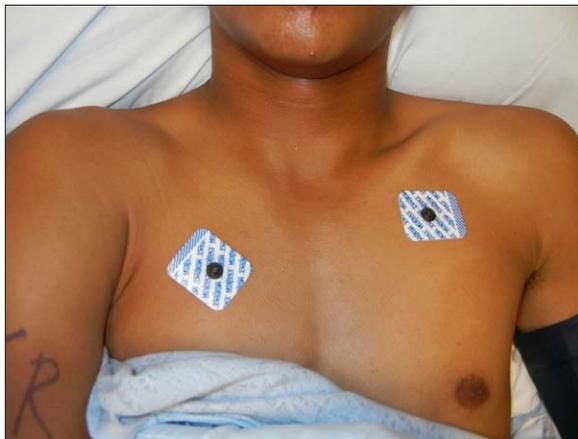


Figure 1. Clinical photograph demonstrating lack of right clavicle prominence.

to 4 inches thick between the shoulders. Lateral traction is applied to the abducted arm, which is then gradually brought back into extension. If unsuccessful, the affected medial clavicle can be prepped and draped in a sterile fashion and a sterile towel clip can be used to facilitate the reduction by encircling the medial clavicle and applying lateral and anterior traction.³ Closed reduction in the operating room with cardiothoracic surgeon consultation is the preferred reduction method because of risk of resultant vascular or tracheal injuries.⁴ Open reduction internal fixation may be necessary for definitive management in either the unstable posterior sternoclavicular joint or if underlying superior mediastinal structures are compromised.⁵ ❖

References

1. Shuler FD, Pappas N. Treatment of posterior sternoclavicular dislocation with locking plate osteosynthesis. *Orthopedics* 2008 Mar;31(3):273. DOI: <http://dx.doi.org/10.3928/01477447-20080301-35>
2. Fenig M, Lowman R, Thompson BP, Shayne PH. Fatal posterior sternoclavicular joint dislocation due to occult trauma. *Am J Emerg Med*. 2010 Mar;28(3):385.e5-8. DOI: <http://dx.doi.org/10.1016/j.ajem.2009.05.011>
3. Groh GI, Wirth MA, Rockwood CA Jr. Treatment of traumatic posterior sternoclavicular dislocations. *J Shoulder Elbow Surg* 2011 Jan;20(1):107-13. DOI: <http://dx.doi.org/10.1016/j.jse.2010.03.009>
4. Buckley BJ, Hayden SR. Posterior sternoclavicular dislocation. *J Emerg Med* 2008 Apr;34(3):331-2. DOI: <http://dx.doi.org/10.1016/j.jemermed.2007.03.052>
5. Sahin MS, Ergun T, Cakmak G, Akyuz M. Posterior sternoclavicular joint dislocation with first rib fracture and ipsilateral vocal cord palsy. *J Emerg Med* 2012 May;42(5):e121-3. DOI: <http://dx.doi.org/10.1016/j.jemermed.2010.06.026>

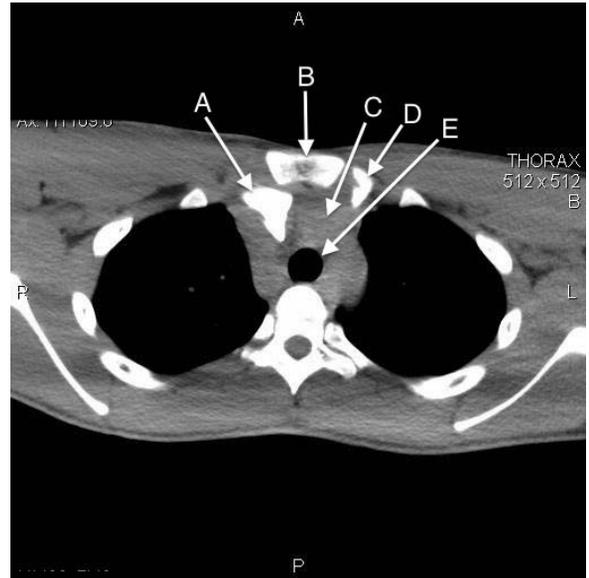


Figure 3. Noncontrast chest computed tomography scan: A) posterior dislocation right clavicular head, B) sternum, C) mediastinal vessels, D) left clavicular head, E) trachea.