



Posterior dislocation of the sternoclavicular joint in a young rugby player

Fouad Ahmed CHAUDHRY¹, Vijay V. KILLAMPALLI¹, Majid CHOWDHRY¹,
Peter HOLLAND², Richard W. C. KNEBEL¹

¹Department of Trauma & Orthopaedic Surgery, Alexandra Hospital, Redditch, UK;

²Department of Radiology, Alexandra Hospital, Redditch, UK

Posterior dislocation of the sternoclavicular joint is a well-reported condition, but can be overlooked as it is difficult to diagnose. We present the case of a 17-year-old male rugby player in which the diagnosis was not recognised at his initial presentation.

Key words: Posterior dislocation; sternoclavicular joint.

The sternoclavicular joint (SCJ) is a diarthrodial joint, representing the only true articulation between the upper extremity and the axial skeleton. Injuries to this joint are rare, accounting for only 3% of dislocations around the shoulder girdle and are mainly anterior dislocations.^[1] The brachial plexus and major vascular structures are closely related to the medial end of the clavicle. Posterior dislocations of the SCJ have the potential to compress or damage these vital structures sometimes with a fatal outcome. It is therefore important to diagnose such injuries accurately and manage them appropriately. We present the case of a 17-year-old rugby player with a posterior dislocation of the SCJ, which was not recognised at his initial presentation.

Case report

A seventeen-year-old rugby player was “dump tackled” and landed on his right shoulder. He experienced severe pain in his right shoulder and was unable to continue with the game. He presented to the Accident & Emergency (A&E) department with pain and discomfort in the right shoulder and

reduced range of movement. Examination revealed swelling and bruising over the acromioclavicular region with no deformity. He had painful restriction of movement in the shoulder and arm, but no distal neurovascular deficits. This was considered to be largely due to the swelling in the acromioclavicular joint (ACJ) region and the SCJ depression was misinterpreted as ACJ swelling. As a result, no specific attention was given to the SCJ during the examination.

Anteroposterior (AP) radiographs of the shoulder and both AJCs were obtained. The radiographs revealed no bony injuries or dislocations. The patient was given a broad-arm sling for comfort and support.

The patient was reviewed in the fracture clinic the following morning. The clinical features remained unchanged from the previous day. On examination, there was an obvious depression on the right SCJ, giving rise to the suspicion of posterior SCJ dislocation. Radiographs of the SCJs failed to confirm the diagnosis. An urgent CT scan of both SCJs showed the posterior right SCJ dislocation and

was complemented with a contrast-enhanced CT to clarify the vascular anatomy. The scans showed that the medial end of the right clavicle was displaced posteriorly into the superior mediastinum and lay between the right brachiocephalic vein and the brachiocephalic artery. No fracture of the clavicle or sternum was found. There was no evidence of vascular injury, mediastinal hematoma or compression (Figs. 1 and 2).

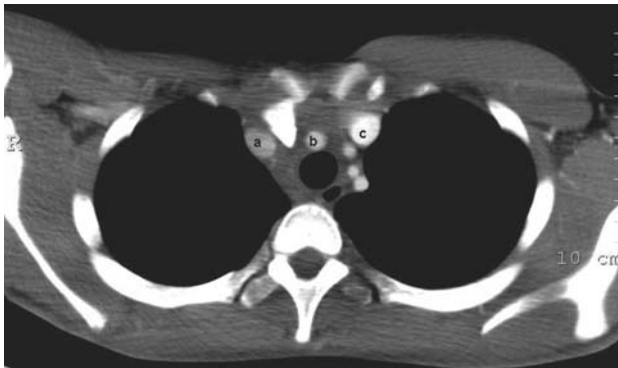


Fig 1. Plain CT scan of the SCJs, confirming the posterior dislocation of the right SCJ and its relationship to the major blood vessels. (a) Right brachiocephalic vein, (b) brachiocephalic artery, (c) left brachiocephalic vein.



Fig 2. Three-dimensional surface reconstruction CT scan of the SCJs, confirming the posterior dislocation of the right SCJ and its relationship to the major blood vessels. (a) Right brachiocephalic vein, (b) brachiocephalic artery, (c) left brachiocephalic vein. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

After obtaining informed consent, the patient was taken to the operating theatre for reduction under gen-

eral anaesthesia. Reduction was easily achieved with a combined manoeuvre of sustained longitudinal traction of the right arm, along with ninety degrees of abduction and fifteen degrees of extension of the shoulder. A bolster was placed between the shoulder blades to assist in the reduction, whilst counter-traction was applied by the assistant from the opposite side of the trunk. The reduction was found to be stable and stability was confirmed with the image intensifier using oblique views of the SCJ. The following day, the patient had a repeat CT scan to confirm the reduction of the SCJ and the normal anatomy of the vascular structures adjacent to the SCJ.

Discussion

Sternoclavicular joint dislocation is an uncommon condition and accounts for only 3% of shoulder girdle injuries. Posterior dislocations are relatively less frequent than anterior dislocations, with an incidence rate varying between 5% and 27%.^[1]

The injury is generally caused by direct trauma to the clavicle or indirect trauma through lateral compression to the shoulders. The first rib may occasionally be involved.^[2] Road traffic accidents and athletic injuries are the most common causes of an SCJ dislocation. Atraumatic dislocations are very rare.

Posterior displacement of the medial end of the clavicle is potentially extremely hazardous to the mediastinal structures, such as the trachea, oesophagus, brachial plexus, lungs and major vessels. A posterior sternoclavicular dislocation may cause serious complications, such as the compression and tearing of the adjacent neural and vascular structures, including the aorta and the thoracic duct, as well as the trachea, larynx and oesophagus.^[3]

Plain radiographs of the SCJs are both difficult to obtain and interpret. There are a number of superimposed bony structures that limit the view; thus, fractures and dislocations can be easily overlooked. A "serendipity X-ray" reveals SCJ dislocations easily and without time loss. This X-ray reveals not only the existence of dislocation but also its direction and is more informative than a standard AP SCJ X-ray. Alternatively, CT scanning can be used to overcome the difficulties encountered by plain radiographs.^[4] CT scan not only shows the dislocation but also its relationship to the mediastinal structures, which is why it was the imaging modality of choice for the authors of this paper.

It is important that this injury is not triaged in the emergency department as a minor injury, which can lead to improper or delayed treatment. The cardinal symptom is severe pain when moving the shoulder or arm without any local tenderness around the shoulder itself. Specific attention needs to be given to difficulties in breathing and/or swallowing or hoarseness in the voice. Patients presenting with an SCJ dislocation have difficulties in lying flat at examination, as this can compress the mediastinal structures. A full examination of the shoulder, including the clavicle and the SCJ, needs to be performed. As plain radiographs often do not reveal the diagnosis, CT scan is indicated for definitive diagnosis.^[3] When vascular injury is suspected, intravenous contrast may be used to enhance the CT interpretation. Angiography has also been employed both pre- and post-reduction, though it is only useful for selected cases, due to its invasive nature.^[5]

Reduction is advised in all cases, as soon as possible, to avoid major complications, such as vascular or tracheal compromise. It should ideally be achieved by a closed method as in this case. Sometimes, additional grasping with a sterile towel clamp around the medial end of the clavicle is necessary. After the joint has been reduced, the patient should wear a well-padded figure-of-eight bandage for 3 to 4 weeks to allow healing of the soft tissue structures and ligaments. After this period, the initiation of a gradually increasing exercise programme is recommended.

If the closed reduction is unsuccessful, either due to the delay in presentation or the interposition of soft tissue structures, open reduction may be required. Either the open reduction or excision of the medial clavicle is reserved for failed attempts at closed reduction and for patients with secondary serious internal complications.^[3] Finally, it is impor-

tant to assess the stability of the joint as recurrent dislocations may have severe complications, such as late and significant vascular problems, including thrombosis and swelling of the arm, dyspnoea and respiratory problems, as well as neurological symptoms, such as thoracic outlet syndrome.

Posterior dislocation of the SCJ is an unusual condition which can have severe complications if the diagnosis is not readily obtained. The treating clinician should have a high index of suspicion when dealing with these injuries, whether resulting from a direct or an indirect trauma to the shoulder girdle. The appropriate investigations in the form of an early CT scan should be requested and treatment should not be delayed. Failing this, at the very least "serendipity X-rays" should be ordered instead of plain radiographs. The importance of a complete and thorough physical examination cannot be over emphasized, as SCJ dislocations can lead to major mediastinal complications.

Conflicts of Interest: No conflicts declared.

References

1. Buchholz RW, Heckman JD, Court-Brown CM, Tornetta P. Rockwood and Green's fractures in adults. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2006. p. 1365-97.
2. Hidalgo Ovejero AM, García Mata S, Sanchez Villares JJ, Martínez de Morentin J, Martínez Grande M. Posterior sternoclavicular dislocation. Report of two cases. *Acta Orthop Belg* 2003;69:188-92.
3. Pearson MR, Leonard RB. Posterior sternoclavicular dislocation: a case report. *J Emerg Med* 1994;12:783-7.
4. Destouet JM, Gilula LA, Murphy WA, Sagel SS. Computed tomography of the sternoclavicular joint and sternum. *Radiology* 1981;138:123-8.
5. Mirza AH, Alam K, Ali A. Posterior sternoclavicular dislocation in a rugby player as a cause of silent vascular compromise: a case report. *Br J Sports Med* 2005;39:e28.