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Clavicle Shaft Fracture After Surgery for Bipolar Dislocation of the Clavicle

Authors' Contribution:

Study Design A

Data Collection B

Statistical Analysis C

Data Interpretation D

Manuscript Preparation E

Literature Search F

Funds Collection G

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Conflict of interest: None declared

Patient: Female, 58-year-old
Final Diagnosis: Clavicle shaft fracture after operation of bipolar dislocation of clavicle
Symptoms: Pain
Medication: —
Clinical Procedure: —
Specialty: Surgery

Objective: Rare disease

Background: Bipolar dislocation of the clavicle is a rare disease that is often associated with some high-energy injuries. It refers to concomitant dislocation of the ipsilateral acromioclavicular joint and sternoclavicular joint. Because of its rarity, the diagnosis of bipolar dislocation of the clavicle is often difficult. Additionally, few reports are available on its treatment. Here, we describe a case of bipolar dislocation of the clavicle in which a secondary operation was needed because of a missed diagnosis. However, after surgery for bipolar dislocation of the clavicle, the clavicle shaft had a fracture that required reoperation.

Case Report: A 58-year-old woman presented at our hospital with left shoulder pain. The patient had a history of sternoclavicular joint (SCJ) reconstruction and had a plate for left SCJ dislocation inserted 1 month ago at another hospital. Plain radiography images revealed that the left acromioclavicular joint (ACJ) was dislocated. We performed ACJ reconstruction with a hook plate. However, 4 weeks after the operation, the patient fell and visited to our hospital with left shoulder pain again. Plain radiography images revealed a left clavicle shaft fracture. We removed the plates from both ends of the clavicle and performed an open reduction and internal fixation using the long clavicular plate for clavicle shaft fracture.

Conclusions: Bipolar dislocation of the clavicle is frequently missed at the first diagnostic imaging examination; therefore, careful attention is required when SCJ or ACJ dislocation is observed. This case suggested that clavicle shaft fracture can occur after reconstruction of the SCJ and ACJ for bipolar dislocation of the clavicle. We conducted a literature review of this related case, highlighting the treatment of such cases.

MeSH Keywords: Bipolar Disorder • Clavicle • Fracture Fixation

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/924889>



Background

Traumatic sternoclavicular joint (SCJ) dislocation is rare in clinical practice and it is even rarer to have acromioclavicular joint (ACJ) combine with SCJ dislocation. As early as 1831, Porral [1] first combined ACJ dislocation with SCJ dislocation, which was called bipolar dislocation of the clavicle. Beckman [2] reported a case in 1924. Because of the limited number of reported cases, the diagnosis, treatment, and prognosis of bipolar dislocation of the clavicle have not been well documented. Some authors [3,4] pointed out that surgical treatment is needed for young or middle-aged patients, and conservative treatment is given to some elderly patients or patients with low quality-of-life prospects. In this paper, we report a case of bipolar dislocation of the clavicle in which a secondary operation was needed because of missed diagnosis; the clavicle shaft later fractured and the patient had surgery again. During the 11-month follow-up, the patient's shoulder function improved considerably.

Case Report

A 58-year-old woman was injured in the left shoulder by a heavy object falling from a height. She visited a local hospital with complaints of swelling and pain in the proximal clavicle. She was diagnosed with dislocation of the left SCJ (Figure 1) and underwent plate fixation of the SCJ. After the operation, the patient complained of pain in the lateral side of the left shoulder, and there was still difficulty in lifting the shoulder. One month after the operation, there was a bulge in the left ACJ, which could touch the mass. The X-ray showed the left ACJ dislocation (type V injury, Rockwood classification) (Figure 2). For further treatment, she turned to our hospital, where she was treated with hook plating of the left ACJ and reconstruction of the coracoclavicular ligament with wire rivets. A postoperative radiography image showed that the SCJ and the ACJ were reduced (Figure 3). The patient's pain was significantly relieved.

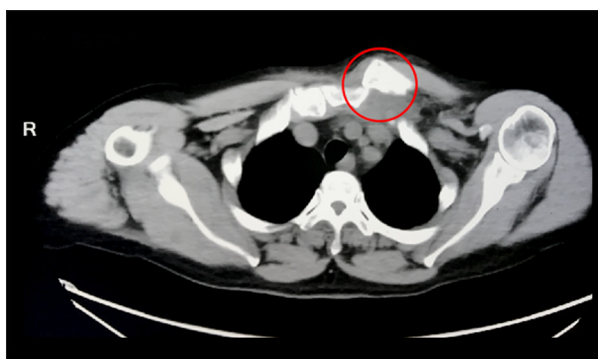


Figure 1. Axial computed tomography image at the initial injury demonstrated the left sternoclavicular dislocation (red circle).



Figure 2. Radiography image 1 month after the left sternoclavicular reconstruction revealed the left acromioclavicular dislocation (type V injury – Rockwood classification) (red circle).

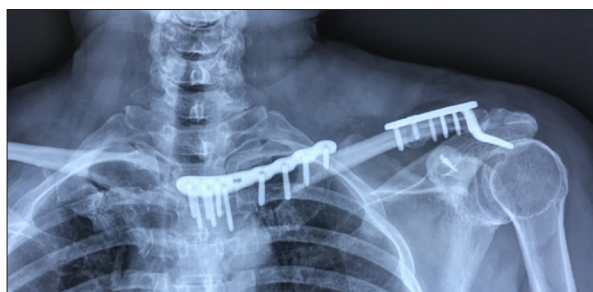


Figure 3. Postoperative radiography image indicated that the sternoclavicular joint and the acromioclavicular joint were reduced.

Four weeks after this operation, the patient fell and presented to our hospital with left shoulder pain. Plain radiography image revealed the left shaft fracture of the clavicle (Figure 4). We removed the ACJ and SCJ plates and replaced them with long clavicular plates (Figure 5). After surgery, the patient's left arm was maintained in adduction to the chest with a sling for 3 weeks. After 2 weeks, active shoulder functional exercises were performed. The upper limbs were allowed to bear weight after the X-ray showed that the fracture line had disappeared. Eleven months after surgery, her left shoulder had regained full range of movement (Figure 6A, 6B).

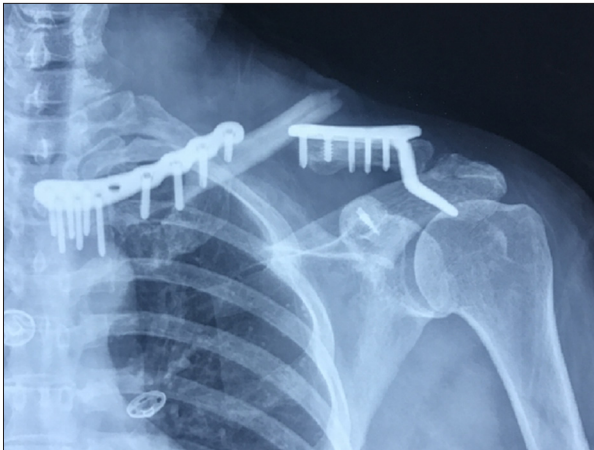


Figure 4. Plain radiography images at the second injury revealed the left clavicle shaft fracture.

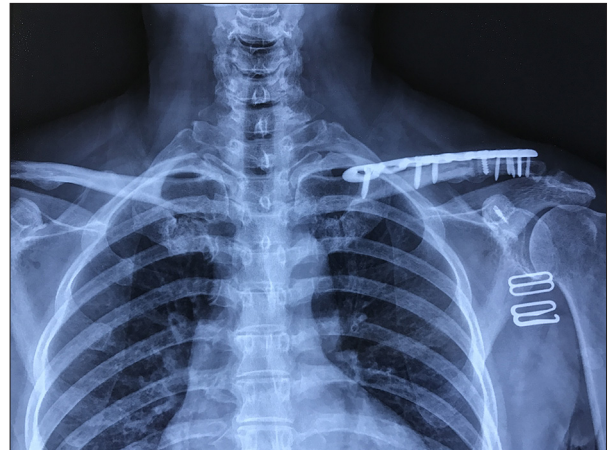


Figure 5. Postoperative radiography image of osteosynthesis for clavicle shaft fracture. We removed the plates from the ends of the clavicle and replaced them with a long clavicular plate for the clavicle shaft fracture.

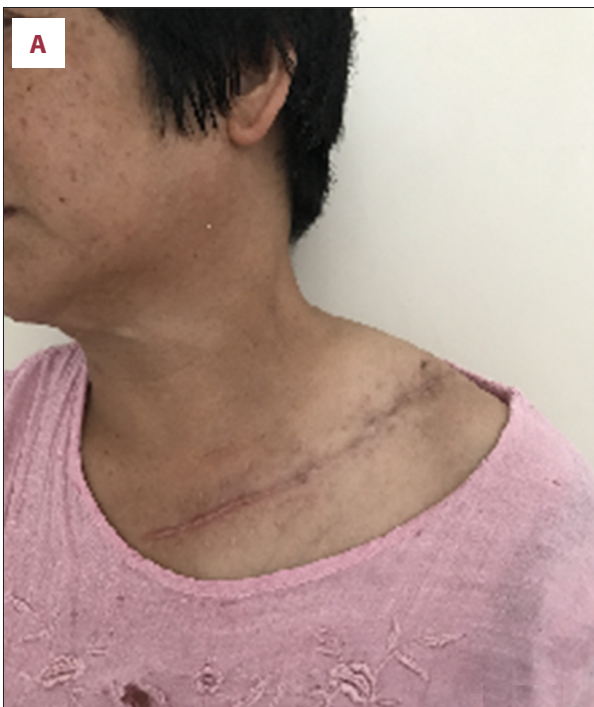


Figure 6. (A, B) The left shoulder regained full range of movement.

Discussion

Bipolar dislocation of the clavicle is infrequent, and there has been no definitive incidence of these injuries reported in the literature. Because of its rarity, the diagnosis of bipolar dislocation of the clavicle is often difficult. Therefore, it is easily missed or delayed in diagnosis, especially by junior doctors. Many authors reported that SCJ dislocation is frequently missed at the first diagnostic imaging examination [5,6]. To avoid missing diagnosis, careful attention is required when

SCJ or ACJ dislocation is observed. At present, computed tomography is thought to be the most valuable tool for the early diagnosis of bipolar dislocation [7,8].

In this case, the diagnosis was initially missed. The patient came to our hospital to ask for help. Given the level of her functional requirement, we felt that operative treatment was appropriate. Four weeks after this operation, the left clavicle shaft fractured because of an accidental fall. For the cause of this fracture, we consider that because the 2 ends of the clavicle

are fixed with steel plates instead of elastically, the mechanical conduction caused the stress between the 2 plates to be concentrated and the fracture occurred with slight force. This situation is clinically challenging. A review of the existing literature showed no related reports. We considered that 4 weeks would have been sufficient for minimal recovery of ligaments. We therefore performed surgery on this patient again. During the 11 months of follow-up, the patient recovered most of her shoulder function.

Conclusions

Bipolar dislocation of the clavicle is frequently missed at the first diagnostic imaging examination; therefore, careful attention is required when SCJ or ACJ dislocation is observed. In

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addition, this case suggested that clavicle shaft fracture can occur after the reconstruction of SCJ and ACJ for bipolar dislocation of the clavicle. When this happens, we remove the ACJ and SCJ plates and replace them with long clavicular plates. There are no published reports on removing the dislocation treatment plate. Long-term results are still uncertain and further follow-up of this patient is required.

Acknowledgments

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Conflict of interest

None