

TREATMENT OF NEGLEGTED STERNOCLAVICULAR (SC) DISLOCATION WITH CANNULATED SCREW AND CERCLAGE WIRE OSTEOSYNTHESIS

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Abstrak. Dilaporkan sebuah kasus seorang laki-laki 18 tahun, mengalami kecelakaan lalu lintas terjatuh dari tabrakan sepeda motor 6 bulan sebelum datang berobat ke poliklinik Orthopaedi RSUZA Banda Aceh, pasien mengeluh nyeri bahu kiri. Dari pemeriksaan fisik didapatkan pada inspeksi terlihat hilangnya kontur normal pada sisi kiri sternum dan ada tonjolan ujung bagian dalam tulang klavikula kiri. Pemeriksaan sistem vaskular dan saraf tungkai atas kiri dalam batas normal. Pada pemeriksaan ronsen dada posisi postero-anterior didapatkan dislokasi Sternoklavikula kiri dengan pergeseran sekitar 5 cm. Kami lakukan operasi elektif, reduksi terbuka dengan immobilisasi dan fusi menggunakan cannulated screw dan kawat cerclage. Didapatkan hasil operasi yang memuaskan baik dari aspek anatomis dan fungsinya pada evaluasi 1 tahun. (JKS 2014; 2: 98-102)

Kata kunci : Dislokasi sternoclavicular tipe anterior, kasus lama/terlantar, cannulated screw/cerclage

Abstract. Reported a 18-year-old man road motor cycle accident. He presented to the polyclinic orthopaedic department at dr. Zainoel Abidin General hospital with left shoulder pain. He was diagnosed with a left anterior SC dislocation neglected. On physical examination, the patient loss of the normal anatomical contour with prominent of the left medial clavicle into the superior mediastinum was noted. A vascular examination was normal, with intact radial, ulnar, median, and axillary nerve sensation and function. Review of the chest postero anterior view revealed a dislocation of the medial clavicle with displacement of the medial clavicular fragment anterior to the manubrium. We treated with open reduction and internal fixation using cannulated screwing and cerclage osteosynthesis with favourable outcome up to one year follow up. (JKS 2014; 2: 98-102)

Key words : Anterior sternoclavicular dislocation, neglected, cannulated screwing and cerclage osteosynthesis

Introduction

Sternoclavicular (SC) dislocations are uncommon injuries, representing approximately 3% of all major insults to the shoulder girdle.¹ Anterior sternoclavicular dislocations outnumber posterior dislocations by a ratio of 20:1, due in part to the greater strength of the posterior sternoclavicular ligament over its anterior counterpart.² In fact, posterior sternoclavicular dislocations are so rare that approximately 100 cases have been reported in the literature since first being described in 1824 by Sir Astley Cooper.³ Despite the relative infrequency of posterior sternoclavicular dislocations,¹ early diagnosis and treatment are crucial

because of the potential of damage to the great vessels, trachea, and esophagus in the superior mediastinum caused by the posteriorly displaced clavicular head.

The sternoclavicular (SC) joint is the pivot on which the shoulder girdle moves on the trunk. Dislocation of this joint most often results from a fall onto the shoulder. This joint is a diarthrodial joint, permitting rotary movement of the clavicle. Internal rotation of the arm is associated with the maximum degree of rotation of the clavicle so that the bone protrudes anteriorly. A sharp, forward thrust of the shoulder girdle, as in the motion of throwing, depends on the integrity of this joint. Elevation of the arm above 110 degrees is associated with clavicular rotation.³

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In an anterior dislocation, severe pain and tenderness are present over the SC joint. Any movement of the shoulder causes increased pain. Pain is increased when the patient is supine, and the individual prefers to be in the sitting position, supporting the arm on the injured side. The anteriorly displaced medial end of the clavicle is generally quite visible. The inner end of the clavicle is most commonly dislocated anteriorly and lies in front of the manubrium. The capsule may be torn and interposed to prevent reduction.^{3,4}

Reduction, if possible, is effected by abducting the arm and pulling the shoulder girdle backward, at the same time manipulating the clavicle backward into the sternal facet. The patient is kept flat on his back with a sandbag placed over the clavicle. His or her arms are held at the side, and only minimal movement of the hands is permitted. It is extremely difficult to maintain this position for the 3 weeks necessary for capsule healing. Instability of the joint and redislocation are frequent occurrences.⁴

Surprisingly, many persistent dislocations permit rotation of the clavicle and excellent function. Occasionally, the displaced bone becomes firmly bound down with adhesions. Movement of the shoulder is painful and restricted, particularly internal rotation and abduction above 110 degrees⁵.

Surgery is indicated for pain, restricted motion at the shoulder, deformity, and as an emergency in posterior dislocations with compression of the great vessels. One may reduce the dislocation and provide stability by a sling between the clavicle and the first rib or by tenodesis, using the subclavius tendon. If the dislocation is old and degeneration of the joint is probable, resection of the inner end of the clavicle should be done. This is compatible with excellent function.⁶

The diagnosis of a posterior SC dislocation often is difficult and generally requires a high index of suspicion based on the patient's history and physical examination. Patients with a posterior SC dislocation usually have a history of trauma to either the sternum or scapulothoracic area and may complain of dyspnea, dysphagia, dysphonia, or pain over the clavicular head. A thorough physical examination also may reveal a slight depression of the clavicular head into the superior mediastinum, although swelling over the area can make detection of such a defect virtually impossible.

Patients also may have signs and symptoms of thoracic outlet syndrome, such as an edematous upper extremity, or evidence of brachial plexus palsy. Presenting symptoms can be altered by changes in arm positioning, particularly in chronic dislocations. Evaluation with anteroposterior radiographs is difficult because of the superimposed ribs and lungs.⁴ Computed tomography (CT) is required for appropriate evaluation of the injury pattern. Because the medial clavicle is the last bone to fuse (at approximately age 25 years), injury patterns can change depending on patient age, with CT used to distinguish dislocations from medial epiphyseal fractures.

Most posterior SC dislocations can be treated effectively with closed reduction and 6 to 8 weeks of immobilization.^{2,5} Instability presenting as recurrent or chronic dislocation is addressed with open treatment. Precisely which technique should be used to achieve stable internal fixation is controversial, but ligament repair with reconstruction appears to be the most widely accepted.^{6,7,8} Surgical fixation with Kirschner wires is not recommended and has been associated with fatal hardware migration.⁹ Medial clavicle resection also has been reported as a treatment option.^{10,12,13} These soft-tissue stabilization procedures all require a

prolonged course of immobilization. Clinical presentation more simple detection in anterior sternoclavicular dislocation than posterior one.

This article presents one case of anterior SC dislocation treated with open reduction and internal fixation using cannulated screwing and cerclage osteosynthesis.

Case report

In December 2011, a 18-year-old man road motor cycle accident. He presented to the out clinic orthopaedic department at dr. Zainoel Abidin General hospital with left shoulder pain. He was diagnosed with a

left anterior SC dislocation neglected. On physical examination, the patient had no dyspnea, dysphonia, or dysphagia. Loss of the normal anatomical contour with prominent of the left medial clavicle into the superior mediastinum was noted. A vascular examination was normal, with intact radial, ulnar, median, and axillary nerve sensation and function. Review of the chest postero anterior view revealed a dislocation of the medial clavicle with displacement of the medial clavicular fragment anterior to the manubrium (Figure 1 and 2).



Figure 1 and 2 Clinical photograph shows the wider displace of the left sternoclavicle and prominent of medial tip of left clavicle.

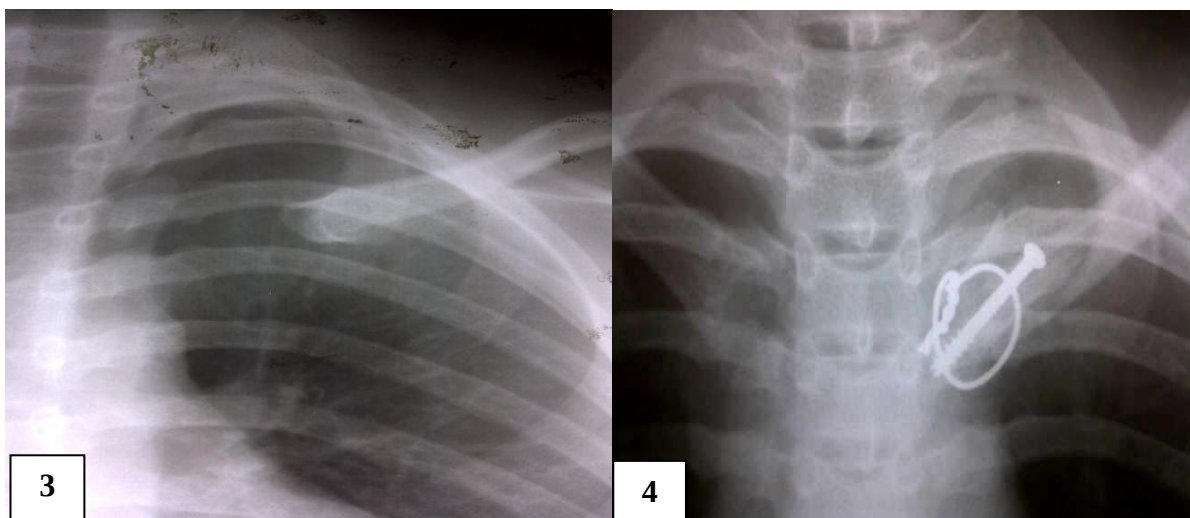


Figure 3 pre operative postero-anterior (PA) view of SC dislocation, figure 4 post operative PA view

After treatment options were discussed with the patient, open reduction and internal fixation of the dislocation was performed using cannulated screw and cerclage wire osteosynthesis. Intraoperatively, no damage to the mediastinal structures was noted. Anatomic reduction was stabilized to increase the construct strength and resist rotational forces. Range-of-motion testing in the arm revealed no interfragmentary movement and stable anatomic reduction. Postoperative radiographs demonstrated anatomic reduction with no evidence of pneumothorax. Postoperatively, the patient had no complaints and continued to routine activities. He returned to full left upper extremity at 3 weeks and was even able to resume riding motorbike one week post operation at that time. He underwent physical therapy and has regained full function.

Discussion

Dislocations of the SC joint are rare yet potentially life-threatening injuries because of the proximity of the SC joint to anatomic structures in the superior mediastinum. Physical examination can yield limited findings, and a high index of suspicion is warranted for this injury pattern, especially with impingement signs and symptoms such as dyspnea, dysphagia, dysphonia, brachial plexus injury, and vascular alterations.

Diagnosis anterior SC dislocations with plain radiographs no difficult because of superficial bone between sternal and clavicle structures; therefore, CT is the diagnostic modality of choice.^{4,11,14} Computed tomography defines the injury pattern and differentiates dislocations from medial clavicle physeal separations. It is particularly important to make such a distinction in individuals <25 years.

After diagnosis of anterior SC dislocation neglected, open reduction should be attempted as elective surgery. Most

minimal displace acute SC dislocations can be treated with closed reduction and 6 to 8 weeks of immobilization in a figure-of-8 bandage, but for neglected case we should performed open reduction and internal fixation. This patient we treated with open reduction and internal fixation using cannulated screwing and cerclage osteosynthesis with favourable outcome up to one year follow up.

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