

Bipolar Clavicular Dislocation

A Case Report and Literature Review

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ABSTRACT : Bipolar dislocation of the clavicle is a very unusual injury. There have been only ten reported cases since the review by Beckman in 1924. This present study addresses a further case of this rare injury and the results of our management, including a review of the previous literature.

Simultaneous dislocation of both ends of the clavicle is uncommon and unusual. It has been documented as panclavicular dislocation¹, floating clavicle², complete dislocation of the clavicle³ and bipolar dislocation.^{4,5} This injury was first described by Porralin 1831, the sixteenth case and literature review was reported by Beckman in 1924³. Apparently, only ten additional cases have been reported since then^{1,2,4-6} (Table I) and the injury has never been classified. Currently, there is no standard treatment. The methods of management included conservative measures (rest followed by motion, closed reduction) and operative surgery⁶.

The present report describe a case of simultaneous dislocation of both ends of the clavicle and reviewed the ten cases that had been reported since Beckman.

CASE REPORT

A 31-year-old man was driving a motorcycle while following a van which was slowing down and turning left to park. He suddenly turned the handle to change the direction away from the van. This caused a swaying of the motorcycle and part of it hit the side of the van. He was catapulted and landed on the ground, first with the anterior aspect of the right shoulder, and then with the head and trunk. He was unconscious for one hour during transportation to Srinagarind Hospital Khon Kaen, Thailand.

Clinical examination showed abrasions and painful swelling over the right acromioclavicular joint, sternoclavicular joint and supraclavicular area. The patient's neurovascular status was intact. Radiographic examination demonstrated dislocation of the medial end of the clavicle and grade III separation of the acromioclavicular joint (Fig. 1). The medial end of the clavicle was found to be dislocated anteriorly. There

was also fracture of the right first rib. Considering the patient's age and level of activity, and the instability of the clavicle, open reduction and internal fixation of the acromioclavicular joint with closed reduction of the sternoclavicular joint, under general anesthesia, were elected. At operation, the acromioclavicular joint was found to be dislocated posteriorly into the trapezius muscle, a type IV dislocation according to Rockwood.⁷ The joint was debrided, the meniscus, which was noted to be torn and frayed, was removed; and the dislocation was reduced. Fixation was accomplished with two smooth Kirschner wires through the distal part of the acromion and clavicle in a manner similar to the modified technique of Phemister⁷ combined with temporary internal stabilization of the end of the clavicle with a coracoclavicular lag-screw (Fig 2). The torn coracoacromial and coracoclavicular ligaments were sutured. Good stability of the clavicle was obtained after closed reduction of the medial end of the clavicle. Stability at the sternoclavicular joint was increased by initial stabilization of the acromioclavicular joint. The shoulder was immobilized by a stockinette velpeau strap for two weeks, after which the patient began active range-of-motion exercises, limited to

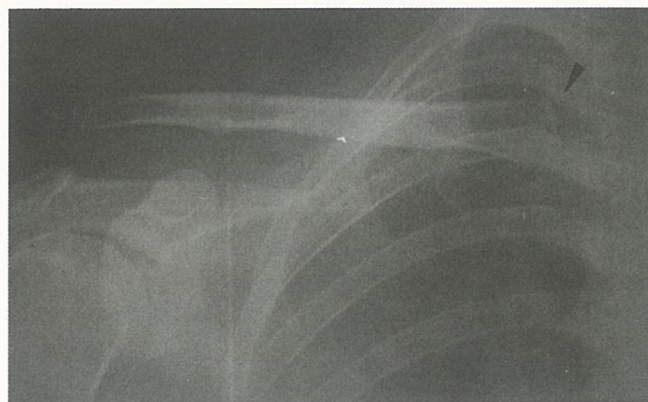


Fig 1. Anteroposterior radiograph of the injured right clavicle shows anterior dislocation of the sternoclavicular joint (arrow) and dislocation of the acromioclavicular joint.

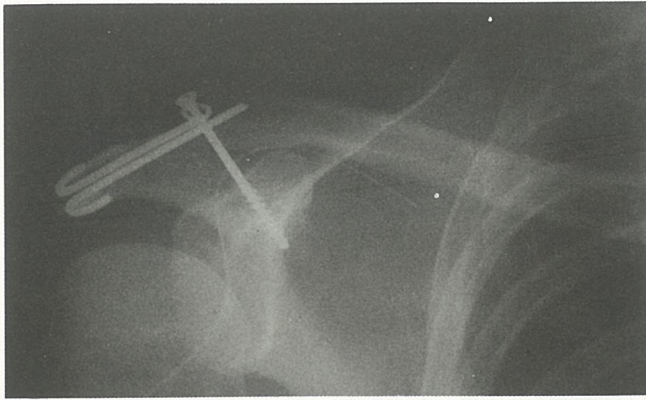


Fig 2. Postoperative radiograph showing the reconstructed acromioclavicular joint with temporary fixation by two Kirschner wires and coracoclavicular lag-screw in place.

below the horizontal plane for four weeks. The internal fixations were removed after eight weeks. Four months after surgery, both injured joints were stable and there was no recurrent dislocation, popping or stiffness. The patient had no complaints of pain or subjective difference in strength between the normal and the injured shoulder. Normal range of motion was regained at three months post operatively.

DISCUSSION

Of the sixteen cases that were reviewed by Beckman, two had severe posterior dislocations of the acromioclavicular joint and three were associated with fracture of the first rib. Fifteen patients were treated conservatively. There were good results in ten cases but completely normal in only six. Of the ten cases that have been reported more recently (Table I), the displacement of the clavicle at the sternoclavicular end was anterior in nine and was not described in one case. At the acromioclavicular joint, the dislocation was posteriorly in

eight, was described as the clavicle overriding the acromion in one case and was not described in one case. In four patients the dislocation was left unreduced at both ends, two regained normal shoulder function and two had symptoms with poor cosmetic results. The acromioclavicular joint underwent open reduction in one case and was reconstructed in four cases, all of which achieved normal shoulder function.

According to Sanders⁶, when both ends of a clavicle are dislocated, the acromioclavicular joint should be managed as if it is an isolated injury, and the sternoclavicular joint should be disregarded. If the patient continues to have symptoms, the joint can be reconstructed by modified method of Weaver and Dunn⁸, which include resection of the distal end of the clavicle and transfer of the acromial attachment of the coracoclavicular ligament to the medullary canal in the remaining segment of clavicle as a substitution for coracoclavicular ligaments. In our case. We also found that the sternoclavicular joint could be simply reduced during the open reduction of the acromioclavicular joint. The reduction became more stable after the acromioclavicular joint was completely stabilized. The shoulder was able to have early mobilization and there was no recurrent dislocation and good cosmetic result of the sterno clavicular joint.

In summary, dislocation of both ends of the clavicle are usually a combination of anterior dislocation of the sternoclavicular joint and posterior dislocation of the acromioclavicular joint⁶. The injury to the sternoclavicular joint may be left untreated, even if it is unstable. This does not pertain to the injury to the acromioclavicular joint, which may be easily overlooked on routine anteroposterior radiographs because the only indication of an abnormality may be slight widening of the joint. Injuries to the acromioclavicular joint can be managed conservatively, especially in patients who do not engage in hard labor or sports activities. The stabilization of the acromioclavicular joint in an acute case can enable the patient to exercise shoulder motion earlier with good results at the sternoclavicular joint.

Table I. Details of ten previously reported cases of bipolar clavicular dislocation.

	Case	Sex	Age	Injury	Dislocation		Duration of	Treatment	Result
					SCJ	ACJ	Injury to Treatment		
Gearen & Petty 1982	1	M	27	BA	Anterior	?	1 day	closed reduction spica cast	Good function Prominence of medial end
Jain, 1984	2	M	77	HA	?	?	-	No reduction Arm sling	Good function
Cook et al. 1987	3	M	60	VA	Anterior	Posterior	-	No reduction ROM exercise	Good function prominence medial end.
Echo et al. 1988	4	M	20	BA	Anterior	Posterior	2 days	ORIF of ACJ c2K wires. Closed reduction SCJ	Good function small prominence of medial of clavicle
Sander et al. 1990 (6 cases)	5	M	26	MA	Anterior	Posterior	18 Mo.	ACJ reconstr.	Good function
	6	M	35	VA	Anterior	Posterior	13 Mo.	ACJ reconstr.	Good function
	7	F	21	VA	Anterior	Posterior	-	No reduction.	Symptomatic
	8	M	20	MA	Anterior	Posterior	3 Mo.	ACJ reconstr.	Good function
	9	F	67	VA	Anterior	Posterior	-	No reduction.	Symptomatic prominence medial end of clavicle
	10	M	41	Direct blow	Anterior	Posterior	12 Mo.	ACJ reconstr.	Good function

BA = Bicycle accident

VA = Motor vehicle accident

ROM = Range of motion

SCJ = Sternoclavicular joint

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