

# Medial clavicle physeal disruption with posterior displacement - Case report

Nilesh Darawade<sup>1</sup>, Yogesh Gaikwad<sup>1</sup>, Darshan Sonawane<sup>1</sup>, Madhav Khadilkar<sup>1</sup>

## Abstract:

*In first 2 decades of life sternoclavicular injuries occur commonly through physis as medial clavicular physis closes last in the body till age of 25th year<sup>3</sup>. This is a rare scenario and we report a case of post-traumatic medial clavicular physeal injury with posterior displacement in 14 years old boy. Closed reduction was unsuccessful and open reduction showed Salter Harris type II fracture through the medial physis of clavicle. This was reduced and fixed using transosseous non-absorbable sutures through the metaphysis. Patient was fine with good range of shoulder movement at follow up.*

**Key words:** Medial clavicle physis, Salter Harris fracture, posterior dislocation.

## Introduction

Sternoclavicular dislocations are uncommon injuries, accounting for approximately 3% of all shoulder girdle injuries [1]. In Sternoclavicular dislocations anterior dislocation is much more common than posterior dislocation, with data varying from 5% [2] to 27% [3] prevalence of posterior dislocation. In first 2 decades of life sternoclavicular injuries occur commonly through physis as medial clavicular physis closes last in the body till age of 25th year [3]. We report a case of post-traumatic medial clavicular physeal injury with posterior displacement in 14 years old boy.

## Case Report

14 years old boy presented to outpatient clinic with 2 days old history of fall with left sternoclavicular region pain and discomfort while deep breathing. Patient gave history of fall while running, although the mechanism of injury could not be elicited by patient precisely. Initially he experienced only pain and difficulty in movement of left shoulder, however on next day he started experiencing discomfort on deep breathing. On examination left clavicle medial end was less prominent than right side (Fig 1c); tenderness was present in left sternoclavicular region with restricted motion of left shoulder. Pulsations in both upper limbs were equal and there was no pallor, edema or paresthesias in left upper extremity. A radiograph of sternoclavicular joints was not conclusive. Patient was

admitted and underwent a computed tomography and magnetic resonance imaging scan of left sternoclavicular region. Both confirmed left sternoclavicular posterior dislocation with impingement of left carotid artery seen in MRI scan (Fig 1b). Closed reduction under anesthesia was unsuccessful; hence an open reduction was performed. Intraoperatively there was a fracture through medial physis of clavicle (Salter Harris I) which was reduced (Fig 1c) and a transosseous nonabsorbable suture taken in anterior part of physis to metaphysis. Reduction was found to be stable. Postoperatively patient was kept in figure of eight strapping for 4 weeks. Patient reported postoperative relief of symptoms and shoulder range of motion improved gradually.

## Discussion

Sternoclavicular joint is only true articulation between shoulder girdle and axial skeleton. It is likely most frequently moved joint of long bones of the body as any movement of upper extremity is transferred to this joint<sup>3</sup>. Although bony ends at articulation are not completely congruous the joint rarely dislocates due to strong capsuloligamentous stability of which posterior sternoclavicular joint capsule is of most importance. Amongst dislocations of this joint anterior dislocation is much more common than posterior. Posterior dislocation although less frequent has been associated with severe complications [4,5,6,7].

Epiphysis at the medial end of clavicle is last of the long bones in body to ossify and last to close around 23rd to 25th year. Due to strong capsuloligamentous attachment to epiphysis, growth plate is more susceptible to mechanical failure in sternoclavicular injury than actual articulation<sup>8</sup>.

Literature advocates closed reduction of posterior sternoclavicular dislocations in acute settings with Abduction Traction or Adduction Traction techniques<sup>3</sup>. A strong case has been made for

<sup>1</sup>Dept. of Orthopaedics,

S.K.N. Medical College, Pune, Maharashtra, India.

### Address of Correspondence

Dr. Nilesh Darwade

Department of Orthopaedics S.K.N. Medical College, Pune.

Maharashtra, India.

E-Mail: drnilesh1@gmail.com



Figure 1:  
 (a) Clinically the medial end of left clavicle was less prominent than right due to posterior dislocation / (b) MRI showing left sternoclavicular posterior dislocation with impingement of left carotid artery (c) Intraoperative photograph showing fracture through medial physis of clavicle (Salter Harris I).

nonoperative approach in young adults as most of them have physeal injuries which have potential to remodel with growth [3,8]. However there have been reports of delayed complications of conservatively managed injuries.

Emms et al described a case of subclavian vein obstruction diagnosed 2 years after medial clavicular physeal injury which required first rib excision<sup>6</sup>. Mirza et al reported case of posterior sternoclavicular dislocation in 19 years old patient who complained of difficulty in taking deep breaths several hours later than injury<sup>9</sup>. Although patient had no vasculogenic symptoms in upper extremity, CT imaging demonstrated complete obstruction of brachiocephalic vein and impingement of the aorta. This patient was managed with open reduction and nonabsorbable bone suture to stabilize the joint.

Although physeal injuries of medial clavicle with posterior displacement can be managed nonoperatively with or without closed reduction we believe each case to be evaluated independently as delayed complications of unreduced physeal injuries have been documented. The data to make a generalized protocol is inadequate as posterior dislocation of sternoclavicular joint is a rare injury. Although open reduction is fraught with possible complications in this dangerous anatomical area; dissection close to bone can minimize the risk. We agree with literature that any attempt at fixation is too dangerous. A bony suture can be safely utilized to augment stability especially when dealing with physeal separations. However the mechanical strength provided will need to be evaluated for this modality.

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