CASE REPORT

Double trouble!!! An unusual presentation of cervical cord herniation and medial end clavicle non-union in a single patient

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SUMMARY

Non-union of medial end clavicle is rare. Though traditionally they have been treated with conservative methods, surgery at initial presentation should be considered in these patients since conservative treatment can lead to non-union. Herniation of spinal cord, though rare, is seen in the thoracic region but can also occur in the cervical region post-traumatically as seen in our patient.

BACKGROUND

Spinal cord herniation (SCH) is not often encountered in daily practice.^{1,2} It refers to the herniation of the spinal cord through a ventral dural defect, typically in the mid-thoracic spinal column² and is a rarely reported clinical entity that may be classified on the basis of aetiology—spontaneously, post-traumatically or iatrogenically.³ Since its first report in 1974, approximately 180 cases of SCH have been reported in the literature⁴ with majority of them being located in the thoracic region. Few cases of SCH in the cervical region have been reported, but all of them are iatrogenic in aetiology^{5–7} with no case of post-traumatic aetiology being documented until. The shoulder is a closed chain mechanism and constitutes the combined function of four joints: the sternoclavicular, the acromioclavicular, the scapulothoracic and the glenohumeral joint. Two of the four joints are articulations of the clavicle; therefore, clavicle malunion affects the whole shoulder girdle.⁸

CASE PRESENTATION

A 25-year-old man, farmer by occupation, presented to us with complaints of severe pain in the right shoulder, loss of movement of the neck to the right side along with loss of range of movements of the right upper limb with loss of sensation on the lateral aspect of the arm from shoulder to the hand. He gave a h/o Road Traffic Accident (RTA) 7 months back and was treated by a primary care physician. An X-ray of the right shoulder was advised then for his complaints of right shoulder pain, which revealed a fracture clavicle of the medial end. He was given a clavicular brace and analgesics. No further work-up was done previously. His symptoms had worsened over the period of time for which he did not seek any medical attention. Now, he presented to us with the current symptoms.

Figure 1 Radiograph of right shoulder anteroposterior view showing non-united displaced fracture medial end of right clavicle (arrow).

INVESTIGATIONS

A thorough clinical examination of the right upper limb aroused a suspicion of brachial plexus injury for which an MRI of brachial plexus was done. X-ray of the right shoulder revealed an atrophic non-union of the medial end of the clavicle (figure 1). MRI revealed a focal dural defect with right ventrolateral cord herniation at C6–C7 level (figure 2), cervical spinal cord hernia with widening of thecal sac space (figure 3), hyperintense

Figure 2 MRI axial fat saturated T2-weighted image—focal dural defect with right ventrolateral cord herniation at C6–C7 level (arrow).

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Figure 3 Zoomed image showing cervical spinal cord hernia with widening of thecal sac space (arrow).

signal intensity between the level of cord and scaleneus medius suggestive of brachial plexus injury, and atrophy with fatty replacement of supraspinatus, infraspinatus, deltoid and pectoralis (figure 4). Altered hyperintense signal intensity and atrophy is noted in the scaleneus medius muscle suggestive of brachial plexus injury (figure 5). Presence of hyperintense signal intensity between the level of cord and scaleneus medius confirmed the diagnosis of brachial plexus injury thereby explaining the atrophy of supraspinatus (C5–C6), infraspinatus (C5–C6) and sternal head of pectoralis (C7–T1). There was more to the injury than just the cord herniation at C6–C7.

OUTCOME AND FOLLOW-UP

Surgery planned in the form of (1) reduction of the SCH with dural defect repair for the SCH and (2) open reduction internal fixation with autogenous bone grafting for the clavicle non-union.

DISCUSSION

Fractures to the medial end of the clavicle are uncommon, representing only 2% to 4% of all clavicle fractures with a non-union rate of only 1%.⁹ Although rare, such injuries deserve rapid diagnosis and effective treatment to avoid future complications. They are often associated with polytrauma and therefore have a high associated mortality. Traditionally, the

Figure 4 MRI axial T1-weighted image—atrophy with fatty replacement of infraspinatus (purple arrow), supraspinatus (blue arrow), deltoid (green arrow) and pectoralis (red arrow) muscles is seen.

Figure 5 MRI oblique coronal T2-weighted image—altered hyperintense signal intensity and atrophy is noted in the scaleneus medius muscle suggestive of brachial plexus injury (arrow).

treatment of medial clavicle fractures has been non-operative,¹⁰ but newer published reports suggest that surgical treatment should be considered for displaced medial clavicle fractures to prevent non-union and functional complaints.^{11 12} SCH is an unusual and possibly under-recognised condition that is being diagnosed more frequently with the widespread use of MRI.² Based on MRI findings, SCH has been classified into three types according to the severity of herniation and displacement: type K (kink), showing an obvious spinal cord kink towards the ventral region; type D (discontinuous), in which the spinal cord completely disappears at a herniated site; and type P (protrusion), in which the subarachnoid space of the anterior spinal cord disappears with almost no kink.¹³ The main goal of surgical treatment for SCH is to release the herniated spinal cord and reposition the cord to a normal anatomical position and thereby stop clinical deterioration.¹⁴ The most common method is to obliterate the dural defect with a dural patch to minimise spinal cord manipulation.¹⁵

Learning points

- Fractures of the medial clavicle demonstrate only a 1% non-union rate.
- Traditionally, the treatment of medial clavicle fractures has been non-operative, but newer published reports suggest that surgical treatment should be considered for displaced medial clavicle fractures to prevent non-union and functional complaints as conservative treatment led to non-union in our patient.
- Spinal cord herniation is an unusual and possibly under-recognised condition that is being diagnosed more frequently with the widespread use of MRI.
- Though current literature suggests that spinal cord herniations seen in the cervical region are iatrogenic in aetiology, they can also occur post-trauma.

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