MEDIAL SCAPULAR WINGING ASSOCIATED WITH RIB FRACTURES AND PLATING CORRECTED WITH PECTORALIS MAJOR TRANSFER

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ABSTRACT

INTRODUCTION: Rib plating is becoming increasingly common as a method for stabilizing a flail chest resulting from multiple rib fractures. Recent guidelines recommend surgical stabilization of a flail chest based on consistent evidence of its efficacy and lack of major safety concerns. But complications of this procedure can occur and are wide ranging.

PRESENTATION OF CASE: We report an interesting case of a 58-year-old male patient who worked as a long-distance truck driver and had a flail chest from multiple bilateral rib fractures that occurred when his vehicle was blown over in a wind storm. He underwent open reduction with internal fixation (ORIF) of the bilateral rib fractures and they successfully healed. However, he had permanent long thoracic nerve injury on the side with the most severe trauma. This resulted in symptomatic scapular winging that impeded him from long-distance truck driving. The scapular winging was surgically corrected nearly two years later with a pectoralis major transfer augmented with fascia lata graft. The patient had an excellent final result.

DISCUSSION: We report this case to alert surgeons who perform rib fracture ORIF that long thoracic nerve injury is a potential iatrogenic complication of that procedure or might be a result of the chest wall trauma.

CONCLUSION: Although the specific cause of the long thoracic nerve injury could not be determined in our patient, it was associated with chest wall trauma in the setting of rib fracture ORIF. The scapular winging was surgically corrected with a pectoralis major transfer.

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1. Introduction

Rib plating is becoming increasingly common as a method for stabilizing a flail chest resulting from multiple rib fractures. Studies have shown that when patients undergo open reduction with internal fixation (ORIF) of rib fractures they require shorter periods of ventilator support, which in turn reduces morbidity and mortality associated with mechanical ventilation, and reduces risk of contracting infections or sepsis.1,4 Complications of this procedure include fracture nonunion, infection (including osteomyelitis), pneumothorax, hardware prominence, failure or loss of fixation, and post-operative chest wall “stiffness”, “rigidity”, or pain necessitating plate removal.1–6 We report an interesting case of a patient that underwent ORIF for bilateral rib fractures that successfully healed, but was complicated by permanent long thoracic nerve injury that resulted in scapular winging. The scapular winging was surgically corrected with a pectoralis major transfer and the patient had an excellent result.

2. Informed consent

The patient was informed and consented that data concerning the case would be submitted for publication.

3. Presentation of case

The patient is a 58 year-old, right-hand-dominant male who was in a work-related motor vehicle accident in February 2011. He
4. Discussion

We could not locate a case report of the association of the long thoracic nerve injury with rib fracture plating. It could not be determined if the nerve injury in our patient was an iatrogenic complication occurring during the surgical procedure or was caused by the rib fractures. Support for the possibility that our patient’s long thoracic nerve injury was caused by the trauma include the greater severity of the injuries on the involved side, including the clavicle fracture and the greater number of fractured ribs. Additional, through less direct, support for the possibility that the trauma caused our patient’s long thoracic nerve injury is suggested by Gozna and Harris.11 Three of their 14 patients with scapular winging due to trauma also suffered from fractures on the ipsilateral side (one with fracture of the scapula, one with fracture of the humerus, and one with fracture of the clavicle). Long thoracic nerve injury is also a known complication of chest wall trauma without any fractures12,13 and also with rib fractures.14,15 The patient described by Rasyid et al.14 had scapular winging with an ipsilateral mid-shaft clavicle fracture and flail chest. The scapular winging in their patient improved “immediately after” surgical fixation (ORIF) of the clavicle fracture. This contrasts with our patient who had persistent scapular winging despite healing of his ipsilateral mid-shaft clavicle fracture.

In contrast to these prior studies, to our knowledge, long thoracic nerve injury has not been described as the direct result of rib fracture ORIF. One reason for reporting this case is to alert surgeons who perform rib fracture ORIF that long thoracic nerve injury is a potential complication of that procedure or might result from more direct injury from the chest wall trauma. In either case the winging would most likely not be recognized pre-operatively because of the recumbency of these patients. But patients that are able to receive informed consent could be informed that long thoracic nerve might be present prior to rib fracture ORIF. Another important aspect of our patient’s post-operative course was that our patient was in physical therapy for 12 weeks, which is double that recommended by Perlmutter and Leffert.10 The increased duration of physical therapy likely reflects the relatively advanced age of our patient (58 years old) when compared to other patients (124 cases with average age 33 years old) who have had this.
procedure for post-traumatic winging and have been reported in the literature.10,16–28

5. Conclusion

Whether caused by chest wall trauma or rib fracture ORIF, long thoracic nerve injury with resulting scapular winging can be surgically corrected with a pectoralis major transfer augmented with fascia lata graft.

Conflict of interest

None declared.

Funding

None.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

Each of the five authors participated in each of the following capacities: study design, data collections, data analysis and writing.

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