A case of Horner’s syndrome due to first rib fracture is reported. A 73-year-old male patient experienced initial onset partial ptosis and miosis of the upper eyelid following a motor vehicle collision. Initial evaluation in an emergency department and follow-up by his primary care physician failed to identify the condition. Careful assessment and review of the patient’s symptoms, signs and images revealed an underlying, uncommon and important neurologic case presentation.

Background
The diagnosis of Horner’s syndrome requires careful consideration [1]. Congenital, acquired, traumatic, compressive, invasive and iatrogenic etiologies are well reported in the literature [2–7]. The incidence of fracture of first rib fracture is uncommon and varied in its causation [8–10]. This paper describes a case of a 73-year-old gentleman who experienced a first rib fracture and Horner’s syndrome, due to a motor vehicle collision.

Case Presentation
A 73-year-old man presented to our chiropractic office eight-weeks following a vehicular collision. While driving, he suffered a head on collision with an oncoming vehicle. He was expedited via ambulance to a local hospital where evaluation and extensive imaging was performed. The attending emergency medical physician advised that he suffered rib fractures and he was subsequently released from the hospital to seek follow-up care with his primary care physician (PCP). He received pain medication from his PCP and was advised to rest.

The patient’s wife reported that while visiting him at the hospital immediately following his car accident, she noted asymmetry and partial drooping of his right eyelid. The patient and his wife indicated that none of the previous attending physicians assessed or mentioned this condition.

The patient sought care in our chiropractic office eight-weeks following the wreck. His past medical history was negative for any medical, neurologic or ophthalmologic disorders. The patient’s vital signs were normal. He was alert and oriented. Initial visual inspection revealed miosis and partial ptosis of the right eye. His right eye was not responsive to direct or consensual light. Cardinal fields of gaze were normal. The patient denied alteration of facial sensation or hemi-facial anhidrosis of the affected side.

The remainder of the neurologic evaluation was negative. Auscultation of the carotid and subclavian arteries revealed no bruits. Physical examination revealed decreased and painful cervical and lumbar active end ranges of motion. Palpation revealed tenderness of the first rib at the apex of the right lung. The patient reported localized discomfort at C6/7 upon cervical compression, Spurlings and Valsalva maneuver. No radiating pain was elicited. No other abnormalities were identified during physical examination.

Imaging
The following comprehensive imaging was performed upon initial evaluation at the hospital and read by different attending radiologists. All imaging reports and images performed following the vehicular collision were obtained from the hospital. A review of the radiology reports and careful over-read of all images was conducted in our office by the author:

1. **Non-contrast CT of the cervical spine.**

   - [Link](http://www.chiromt.com/content/21/1/22/figure/F1)
   - This coronal view reveals a displaced fracture of the proximal right first rib (white arrow).

2. **Non-contrast CT of the cervical spine.**

   - [Link](http://www.chiromt.com/content/21/1/22/figure/F2)
   - Sagittal image (A) reveals an anteriorly displaced fracture of the right first rib (white arrow). For comparison, image (B) reveals a normal left first rib.
Horner’s syndrome is present in up to 53% of internal carotid artery dissections [12]. Most patients experience neck, facial and head pain ipsilateral to the lesion because of ischemia or stretching of the trigeminal pain fibers surrounding the carotid arteries [13]. Ophthalmic manifestations have been reported to occur in up to 62% of patients with internal carotid artery dissection [13].

Due to the trauma sustained by the patient, persistent neck pain, the identified first rib fracture, persistent miosis and eyelid ptosis and concern for a traumatic arterial dissection, the patient was referred for brain MRI and magnetic resonance angiography (MRA) examinations of the cervical and brain vessels [5,12,13]. He was also referred to a local neuro-ophthalmologist for assessment and follow-up.

The MRI and MRA studies were negative and the patient was provided a diagnosis of Horner’s syndrome due to first rib fracture. No specific treatment was rendered. Over the period of one year, the patient recovered fully.

Discussion

The differential diagnosis of Horner’s syndrome can be challenging due to possible disruption of sympathetic fibers of first, second or third order neurons [4,5]. As noted in this case, careful historic examination, imaging and integrative assessment can provide an accurate diagnosis.

Our patient suffered a second-order neuron lesion. Disruption and edema at the fracture site likely produced an oculo-sympathetic deficit due to the proximity of the Stellate ganglion to the proximal first rib fracture site. All of the advanced imaging studies performed visualized the fractured first rib. However, attending radiologists failed to note the fracture in two imaging reports. It is important to recognize the fallibility and inherent difficulty of identifying rib fractures via imaging modalities. Cho et al. report that missed rib fractures are not uncommon [11].

Despite the obvious visual cue of a drooping eyelid, the patient’s attending medical providers did not properly assess this condition. This is critical as the patient could have suffered an arterial dissection that may have been undetected and untreated for that time period [12,13]. Such an error could have been catastrophic to this patient and his family.

Had the patient suffered an undiagnosed post-traumatic arterial dissection and received chiropractic care, it is plausible that a chiropractor could have been wrongly implicated for a pre-existing injury.
Conclusions
In this case, the first rib fracture due to motor vehicle collision produced Horner’s syndrome. While uncommon, Horner’s syndrome is a condition that can be difficult to assess and bears due attentiveness and diagnostic consideration. Attending chiropractic physicians should not rely solely upon the opinions and decisions of other physicians when assessing such cases. Such cases require careful assessment to delineate pre-existing causes that may precipitate Horner’s syndrome.

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References

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