

Complex upper cervical spine injury associated with vertebral artery injury and sensory deficit: A case report.

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Citation

B L. N, N Motsitsi. *Complex upper cervical spine injury associated with vertebral artery injury and sensory deficit: A case report.* The Internet Journal of Orthopedic Surgery. 2009 Volume 16 Number 1.

Abstract

Introduction. Multiple levels cervical spine injuries constitute less than half of all cervical spine injuries. They occur following severe trauma. There is a high risk of associated cranio-cervical vascular injury. **Case presentation.** We present a young adult patient who sustained complex multiple contiguous upper cervical spine (C2-C3) fractures associated with asymptomatic vertebral artery thrombosis and sensory deficits involving C2 – C4 dermatomes. She underwent successful anterior cervical arthrodesis. She was followed up for fifteen months. Clinically she showed improvement, but the neck disability index was 46% at the last visit. **Conclusion.** Complex cervical spine injury may have significant morbidity despite successful surgical intervention

INTRODUCTION

Multi-level cervical spine injuries are not uncommon: they occur in 43% of all cervical spine injuries [1]. They are commonly due to high-energy trauma: motor vehicle accidents, falls from heights and diving into shallow waters. They commonly involve the lower cervical spine and the cervico-thoracic junction [2]. High-energy neck injuries must always raise suspicion of associated blunt arterial injury, particularly in high-risk injuries: multilevel cervical spine fractures, fractures of the facets or fractures of the transverse processes above C6 [3].

We report on a case of multiple contiguous fractures of the upper cervical spine associated with vertebral artery injury plus sensory deficits. We detail the management strategy and the outcome fifteen months following treatment.

CASE PRESENTATION

A 25 year-old female was involved in a car accident two years ago. The car in which she was traveling was hit from behind. She sustained neck injury. She arrived in a clinically stable condition, she was tender in the upper cervical spine (C2 –C3), she had decreased sensation (light touch and pin prick) at the level of C2 - C4 dermatomes, especially on the right side. There were no any other neurological findings.

X-rays showed a large teardrop fracture of the axis (C2). Computed tomography scan (CT SCAN) showed teardrop fracture of the axis and a burst fracture of C3 associated with a 'hemi-vertebral fracture' plus fracture of the right

transverse process. CT SCAN Angiography was done to exclude vertebral artery injury. There was thrombosis involving the right vertebral artery (figure 1).

Figure 1

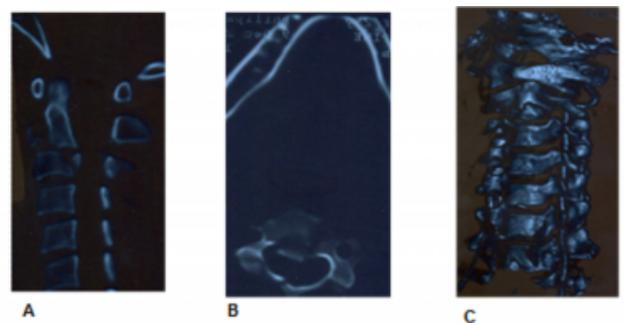


Figure 1. Axial CT SCAN shows teardrop fracture of the axis and burst fracture of C3 (A). Transverse CT section shows 'hemi-vertebral' fracture of C3 plus fracture of transverse foramen (B). 3D-reconstruction of CT angiography shows complete blockage of the right vertebral artery blood flow (C).

She was commenced on Aspirin therapy for three months. Neck injury was managed surgically: C3 corpectomy, tricortical iliac grafting and anterior cervical plating was done. The operation was uneventful. Follow-up was done for fifteen months. She was still complaining of mild neck pain, slightly restricted neck movements. Sensory deficits in the C2-C4 dermatomes was still present. The neck disability index was 46% which indicated moderate disability. Flexion-extension views of the neck did not reveal any implant complications or pseudo-arthrosis. CT SCAN showed solid fusion (figure 2)

Figure 2

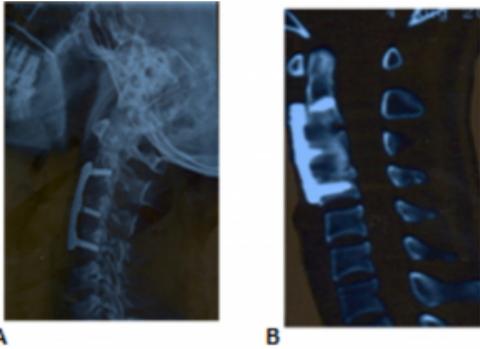


Figure 2. X-ray done fifteen months following surgery shows no implant complication (A). CT axial cut confirmed solid arthrodesis. .

Follow-up angiography done three months after the injury revealed recanalization of the vertebral artery. There was no pseudo aneurysm or fistula.

DISCUSSION.

Complex cervical spine injuries have a significant morbidity. The management of these injuries is also challenging. Surgical intervention has a reasonable outcome. This patient had significant neck disability more than one year following successful surgical intervention. Neurological improvement was insignificant. Vertebral artery outcome was good: there were no complications (neurological or vascular) related to the thrombotic episode.

Traumatic vertebral artery injury among patients with blunt neck trauma is estimated at 0.2% - 0.77% [4]. Vertebral occlusion occurs in 27% of cases compared to non-occlusive injuries which occur in 33% of cases [3]. Many such injuries remain undiagnosed [5]. Blunt vertebral artery injury has been considered an uncommon event of relative insignificance [6]. Vertebral artery injury can have devastating consequences [7].

Vertebral artery injury has a 5% mortality and 8% severe neurological complication [7]. Pre-emptive treatment may be reasonable considering the devastating potential for vertebral artery injury [8,9] The choice of treatment is very controversial: others advocate anticoagulation while others advocate anti-platelet therapy like aspirin.

Teardrop fractures of the axis is commonly caused by hyperextension injury of the neck. They are extremely rare.

They account for 1% of all cervical spine injuries [10] They are caused by a direct blow to the head in the majority of cases. They are considered stable injuries. Conservative treatment usually leads to good outcome. Burst fractures of the cervical spine are unstable. Surgical treatment gives a better outcome compared to conservative treatment. Corpectomy plus anterior cervical plating and bone grafting provide good stability comparable to other modalities of treatment.

CONCLUSION

Complex contiguous upper cervical spine injuries can be managed surgically with the reasonable expectation of good outcome. Neck disability can persist for over a year following surgery.

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