An important complication of upper cervical spine fracture: a case report

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SUMMARY

A case report is presented of a patient who sustained a high cervical spine fracture, the possible mechanisms of injury and details of the fracture are discussed. The patient developed bilateral vagal nerve palsies 48 h after the accident. This complication was only recognized after dysphagia and an aspiration pneumonia developed. The complication of aspiration pneumonia was preventable. Meticulous and repeated examination of the cranial nerve function in this type of injury is recommended. Normal feeding should commence only when the cranial nerve function has been shown to be normal after repeated examination.

INTRODUCTION

A case of a cervical spine injury is reported with fractures involving C1 and C2 which presented recently. Several unusual features of this injury are discussed. Neurological assessment in such patients often includes detailed examination of spinal cord and peripheral nerve function below the level of the injury and scant attention is paid to neurological function above the level of the injury.

CASE REPORT

A 60-year-old man was seen in the accident & emergency (A&E) department having fallen 8 feet from a ladder in his garden. There was no loss of consciousness and he reported that his shoulders hit the ground first. For several seconds immediately

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after the fall he had no feeling in his arms but he was able to get to his feet and walk into the house to call an ambulance. The ambulance crew attending applied a stiff cervical collar and transported him lying flat on a scoop stretcher.

On arrival at the hospital his only complaint was of severe neck pain. He had abrasions over his right shoulder. Neurological examination revealed slight weakness in the triceps and biceps of both arms (MRC Grade 4) with blunting of the reflexes throughout all four limbs. There was no sensory deficit.

Plain radiographs of the cervical spine were performed (Fig. 1) and initially these were thought to be normal. He was admitted in view of the rather worrying history and clinical findings and nursed supine with a stiff cervical collar. A CT scan of his upper cervical spine was performed on the second day of admission. It showed the fracture of C1 extending obliquely through the right lateral mass to the left posterior arch (not shown) and a fracture of C2 which passed transversely through the posterior part of the body of the vertebra (Fig. 2). In retrospect the C1 and C2 fractures could be seen on the initial plain radiographs.

Also on the second day after admission whilst lying flat the patient was allowed to eat and drink. He developed dysphagia and aspirated. This resulted in a severe bronchopneumonia requiring supplementary oxygen, intensive physiotherapy and intravenous antibiotics before recovering. On examination, he had bilateral vagal nerve palsies with partial injury to the glossopharyngeal nerves on both sides and complete loss of function of his soft palate. Prior to this, no cranial nerve examination had been documented, though there had been repeated detailed examination of the peripheral nervous system.

The patient required feeding via a nasogastric tube for several weeks. Flexion and extension views of his neck (Fig. 3) were performed 7 days after the incident.

Fig. 1. Initial plain lateral X-ray of neck.

Fig. 2. CT Scan showing fracture passing through the body of C2.

Fig. 3. Flexion views clearly demonstrating the fracture (note the feeding tube).

when his condition had improved sufficiently for him to be moved. These showed the neck to be unstable in the flexed position, but reduced in neutral. On this basis, he was treated conservatively in a Doll collar and union had occurred by 12 weeks. Normal power returned to his arms and at 3 months his dysphagia had almost completely resolved and he was eating normally.

DISCUSSION

The term 'Hangman's fracture' is used to describe bilateral avulsion fractures through the pars interarticularis of C2 separating the neural arch from the axis

body without injury to the odontoid peg and forward subluxation of C2 on C3 (Schneider *et al.* 1965). As can be seen in Fig. 2 the fracture involves the body of C2 rather than the pedicles and consequently is similar to the case described by Marotta *et al.* (1990). Associated posterior C1 arch fractures have previously been described by Levine & Edwards (1986). Most authors postulate the mechanism of injury in such cases as being hyperextension (Harris *et al.* 1986). In this case the patient clearly described falling backwards, striking the ground with his shoulder therefore sustaining a flexion injury.

The delayed onset of neurological symptoms has been described previously by Lyness & Simone (1978). The cause of cranial nerve damage is thought to be ischaemia secondary to vertebral artery occlusion. The sequelae range from asymptomatic in unilateral injuries to Wallenberg's syndrome and various cranial nerve palsies and fatal brain stem injury. The 'Hangman's fracture' can also cause dysphagia and visual disturbance in non-fatal cases (Schneider *et al.* 1965). In this case there was a high index of suspicion that there had been a significant injury to the cervical spine despite the plain radiographs being initially thought to be normal and the patient was treated from the outset with cervical spine immobilization. There was a delay in the identification of the cranial nerve lesions and the patient was allowed to eat and drink whilst lying flat before repeated examination of the cranial nerves had excluded an injury.

CONCLUSION

It is necessary to be aware of the possibility of delayed neurological deficit in spinal trauma, in particular, delayed cranial nerve deficit in cases of high cervical spine injury. Only then can appropriate action be taken to prevent the potentially lethal complication of aspiration pneumonia. It is recommended that these patients are observed very closely and that meticulous examination of both the cranial and peripheral nerves are made repeatedly. Normal feeding should only be commenced when the function of the cranial nerves has been shown to be normal throughout the period when deterioration is possible.

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