CASE REPORT

An unusual cause of recurrent laryngospasm: A case report

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ABSTRACT

Introduction: Laryngospasm is a partial or complete closure of the vocal cords, causing stridor and then complete airway obstruction. We present an unusual case of recurrent laryngospasm following cervical spine trauma.

Case report: A 41-year-old pedestrian was hit by a car sustaining several spine fractures including a comminuted fracture of C1. These were initially unrecognised, and his cervical spine was not immobilised. During this time the patient experienced three episodes of laryngospasm requiring intubation. On day 11 his fractures were identified, and a Philadelphia collar was placed. He made a full recovery without any neurological sequelae.

Discussion: Laryngospasm is a recognised complication of anaesthesia and intubation. This case illustrates that this life-threatening complication can also follow cervical fractures, and reinforces the need for prompt and careful review of imaging to identify such fractures in trauma patients, especially those with stridor.

African relevance

• Trauma (i.e. road traffic accidents) is fairly common in Africa.
• Trauma-related injury patterns (i.e. spine fractures) is a fairly commonly associated.
• Financial and other delays to diagnosis and admission remains a challenge.

Introduction

Laryngospasm is a partial or complete closure of the vocal cords, causing initial stridor and then complete airway obstruction. It is a recognised complication of anaesthesia and intubation [1]. Stridor due to vocal cord paralysis can also complicate cervical spine surgery [2]. We present an unusual case of recurrent laryngospasm following cervical spine trauma.

Case report

A 41-year-old male pedestrian was hit by a car, and initially assessed at a district hospital. His neck was immobilised, and several hours later he was transferred to the University Teaching Hospital of Kigali’s emergency centre (EC) at 22h00. Initial vital signs revealed a mild tachycardia (HR 108) and tachypnoea (RR 21), BP 105/59, GCS 15, pain score 7/10. EFAST (Extended Focused Assessment with Sonography in Trauma) performed by the duty general practitioner (GP), was reported as negative. Further imaging was requested and the following day chest X-ray, pelvic X-ray, and computed tomography (CT) of the head and neck were performed. There was no formal report and the duty GP did not note any significant findings on the print-out, which provided only lateral images (Fig. 1). The cervical collar was removed. On day three, a repeat EFAST demonstrated small bilateral haemothoraces. CT chest was requested but not done, due to the patient’s inability to pay. Vital signs were stable, and there was no sign of limb injury or neurological deficit.

At 06h50 on day four, the patient became severely breathless, desaturating to 62% oxygen. The duty GP diagnosed bronchospasm and following unsuccessful treatment with bronchodilators, decided to intubate the patient. After intubation, lung function was normal, with no wheeze, and the patient was extubated. A few hours later, a similar episode occurred, with stridor and desaturation but no wheeze. A diagnosis of laryngospasm was made by the EC resident, and the patient was re-intubated successfully. Again, following intubation lung function was normal.

The following day, the patient received a tracheostomy and CT chest was performed with imaging up to C3. This showed a T3 burst fracture...
with extension into the spinal canal, spinous process fractures of T1-T3, and transverse process fractures of T1–T2 (Fig. 2). Undisplaced bilateral medial clavicle fractures, and fractures of the manubrium sterni and right first three ribs posteriorly were also identified. No pneumothorax was seen, and small haemothoraces persisted. None of these had been recognised on the initial chest X-ray. He was reviewed by the acute surgical and neurosurgical teams and accepted for admission for conservative management.

The patient continued to do well, with no focal neurological deficit, and on day 11 his initial CT scan was formally reported. Bilateral LeFort type 2 fractures were noted, together with comminuted burst fracture of C1 (Fig. 3). He was placed in a Philadelphia collar and transferred to the ward. He was discharged on day 23 to remain in the collar for two months. He subsequently made a full recovery.

Discussion

This case highlights several issues for quality improvement. Initial imaging was not reported formally for several days and our own interpretation of the imaging relied on inadequate lateral views. Although not recognised at the time, in retrospect it was noted that the initial CT did show slight widening of the predental space. As a result, a patient with a comminuted C1 fracture was intubated three times without neck protection. Fortunately, the patient never developed any evidence of spinal cord injury.

Readers might also be surprised at the length of time it took before the patient was accepted for admission by the inpatient surgical teams, resulting in an 11-day stay in the EC. This is not unusual in our department. In our setting, patients pay in advance for investigations, and family members can take significant time to find the money. Although CT is available in the teaching hospital, radiologist support is limited and formal reporting can be delayed for several days. Both these factors delay diagnosis and disposition decisions by in-patient teams. Furthermore, lack of availability of beds is also compounded by resource-limitations: patients are not allowed to leave the hospital until...
they have paid for their hospital stay.

However, the main point of interest is the recurrent laryngospasm. On each of three occasions, the patient developed sudden stridor and life-threatening desaturation that could not be corrected without emergency intubation. Our case also demonstrates the need to distinguish the stridor of laryngospasm from the wheeze of bronchospasm. Laryngeal stridor does not respond to bronchodilators.

Much has been written about the aetiology of laryngospasm following intubation for anaesthesia [1]. However, this patient’s first episode was prior to any intubation and subsequent episodes were delayed after extubation by hours to days making this mechanism unlikely.

Stridor due to vocal cord paralysis has been described following cervical spine surgery for fracture repair related to recurrent laryngeal nerve damage during surgery [2]. In addition, Eissa et al. reviewed 343 patients with C1 and C2 fractures and found 17 (4.9%) with upper airway compromise. The precise aetiology of the airway compromise was not investigated in detail however retropharyngeal hematoma was implicated [3,4]. While direct airway obstruction from a retropharyngeal haematoma would not explain the intermittent and reversible nature of upper airway obstruction in our case, it is conceivable that swelling might exert pressure on the laryngeal nerve, also possibly related to head position in a patient without cervical spine immobilization, leading to intermittent laryngospasm.

To our knowledge, this is the first description of recurrent laryngospasm attributed to a high cervical spine fracture, and serves as a warning not just of this potential life-threatening complication of these fractures, but also the need for prompt and careful review of appropriate imaging to identify such fractures in trauma patients, especially those with stridor.

Conflicts of interest

The authors have no conflicts to declare.

Dissemination of results

This case report was discussed with EC staff in our hospital as an opportunity to learn from our experience both for quality improvement measures and for clinical interest.

Authors’ contributions

All authors were involved in the management of the case, and collectively decided to write it up as a case report. All authors substantially contributed to the drafting of the manuscript. VN obtained consent and collected relevant case notes and reports. NP-R and GC performed literature reviews. All authors were involved in revising the paper and approved the submitted version.

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