Clinical Reports

Pott's disease with unstable cervical spine, retropharyngeal cold abscess and progressive airway obstruction

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Purpose: Retropharyngeal abscess formation has the potential for acute respiratory compromise from obstruction or secondarily from rupture. The initial attempt to secure the airway is of paramount importance. We describe a patient with an unstable cervical spine secondary to Pott's disease who developed progressively obstructing retropharyngeal cold abscess.

Clinical Features: A 33-yr-old man with an unstable C-spine in halo traction presented with progressive airway obstruction secondary to retropharyngeal abscess extending from the cervical to the mid-thoracic vertebrae. After review of computerized tomography (CT) and magnetic resonance (MR) studies, preparations were made to secure the airway through fiberoptic assisted intubation. A conservative approach was chosen to secure the airway before surgical airway control as a first line approach. Following local and topical anesthesia, awake endoscopy was performed to assess the extent of obstruction and possibility of intubation without abscess rupture. A narrow tract along the lateral pharynx was identified to continue inferiorly to the epiglottis, from which point the cords were visualized. Extensive edema and abscess formation otherwise distorted the normal anatomy and prevented visualization from other directions. The airway was successfully secured without trauma with a well-lubricated 7.0 mm ID endotracheal tube.

Conclusion: This report suggests that selected cases of tense obstructing retropharyngeal abscesses can be effectively managed with fiberoptic endoscopy for assessment and subsequent intubation before requiring surgical airway control as a first line strategy.

Objectif : La formation d'un abcès rétropharyngé peut soudainement entraver la respiration, par obstruction ou par rupture. La première démarche visant à protéger les voies aériennes est primordiale. Nous décrivons le cas d'un patient à la colonne cervicale instable, secondaire au mal de Pott, qui a développé un abcès froid rétropharyngé d'obstruction progressive.

Éléments cliniques : Un homme de 33 ans, dont la colonne cervicale instable était en traction (halo), présentait une obstruction progressive des voies aériennes secondaire à un abcès rétropharyngé qui s'étendait de la colonne cervicale à médio-thoracique. Après la révision des études de tomodensitométrie et de résonance magnétique, on a assuré la perméabilité des voies aériennes par une intubation fibroscopique. Une méthode conservatrice de protection a été choisie comme première démarche avant l'intervention chirurgicale aux voies aériennes. L'endoscopie vigile a été réalisée à la suite de l'anesthésie locale et topique afin de permettre l'évaluation de l'étendue de l'obstruction et de la possibilité d'intubation sans provoquer la rupture de l'abcès. On a ainsi pu découvrir une voie étroite longeant le pharynx latéral menant vers l'épiglotte, plus inférieure, d'où on a pu visualiser les cordes vocales. L'œdème important et l'abcès déformaient, par ailleurs, l'anatomie et empêchaient la visualisation sous d'autres angles. L'intubation a été réussie sans traumatisme à l'aide d'un tube endotrachéal bien lubrifié de 7,0 mm. de DI.

Conclusion : Cet article suggère que des cas choisis d'abcès rétropharyngés obstructifs sévères peuvent être efficacement traités grâce à la fibroscopie comme stratégie de première ligne d'évaluation et d'intubation subséquente, préalables à l'intervention chirurgicale requise.

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POTT'S disease is tuberculous vertebral osteomyelitis, which represents 11% of cases diagnosed with primary extrapulmonary tuberculosis (TB).¹ Tuberculosis of the cervical spine (C-spine) is unusual and accounts for 1-3% of cases of Pott's disease.¹ During the course of such disease, instability of the C-spine is rare.²⁻⁴ However, C-spine tuberculosis is associated with neurological complications and retropharyngeal cold abscess formation in about 40% and 57% of patients respectively.^{5,6}

In the present report, we describe the presentation and management of a progressively obstructing retropharyngeal cold abscess associated with cervical Pott's disease in a patient with an unstable C-spine in halo-traction.

Case Report

A previously healthy 33-yr-old man presented to hospital immediately upon returning from a three-month trip in Southern Asia. His chief complaints were of neck pain, fever and weight loss. Neurological examination revealed no neurological deficits. However, he gave a history suggestive of exposure to TB and typhoid fever during his trip. Initial C-spine radiographs demonstrated near destruction of C₁₋₂ vertebral bodies with anterior subluxation of C₂ and a large prespinal soft tissue swelling (Figure 1). He was then placed in halo-traction and transferred to our institution.

Following transfer, magnetic resonance imaging (MR) studies demonstrated destruction of C₂, with the formation of a prespinal abscess extending from the C₂ body superiorly to the clivus and inferiorly to below the level of C₆. The precervical abscess collection considerably decreased the space between the posterior wall of the pharynx and the soft palate and the epiglottis, particularly in the midline (Figure 2). Over about six to eight hours after admission to the neurosurgical intensive care unit (NICU), the patient developed progressive dysphagia, hoarseness of voice and stridor, particularly during brief periods of sleep. Because of the progression of symptoms and signs of respiratory distress a decision was taken to secure the airway urgently and to evacuate the retropharyngeal abscess.

In the operating room the patient was alert and stridorous with an oxygen saturation of 95% while breathing 4 l·min⁻¹ oxygen flow via nasal prongs. His respiratory rate was 26 bpm, blood pressure 145/90 mm Hg, heart rate 130 bpm and body temperature 38°C. The airway was well topicalized without sedation using atomized lidocaine 4%, lidocaine spray 10%, cotton pledgets soaked with lidocaine 4% and bilateral glossopharyngeal nerve blocks. Glossopharyngeal nerve block was achieved by injecting 4 ml lidocaine

FIGURE 1 A lateral C-spine plain X-ray photograph showing a collapse fracture and subluxation of C₂ (arrow). Note the extensive prespinal soft tissue mass protruding anteriorly (A).

1% through a 22-gauge short-beveled 1.5-inch needle inserted intraorally at the caudad portion of the posterior tonsillar pillar. The posterior tonsillar pillar was identified by widely opening the mouth following topical anesthesia of the tongue and depressing the tongue using a #3 Macintosh laryngoscope blade. The needle was then inserted submucosally and careful aspiration for blood was performed before local anesthetic injection.⁷ The advantage of glossopharyngeal nerve block is to reduce the gag reflex that results from pressure on the posterior third of the tongue during awake intubation, even after adequate topical mucosal anesthesia has been obtained.

After topicalization and nerve blockade, reassessment of the patient showed that the degree of respiratory obstruction was unchanged and his oxygen saturation was stable at 95%. Accordingly, we decided to explore the oropharynx and visualize the vocal cords with the fibroscope. The endoscope was introduced orally while his tongue was protruded anteriorly and held by an assistant. Upon reaching the posterior pharynx, profound glottic edema obscured the normal airway anatomy. A channel along the left postero-lateral pharynx was seen and continued below the epiglottis to the level of the vocal cords, which were well visualized.

FIGURE 2 A midline MR study showing destruction of C₂ (right arrow) and a large prespinal mass pushing the posterior pharyngeal wall anteriorly (left arrow). The retropharyngeal mass minimized the space between the soft palate superiorly and the epiglottis inferiorly.

At this point, the patient became restless and complained of difficulty breathing and his oxygen saturation decreased to 90%. The endoscope was immediately withdrawn and the tongue was freed and retracted in the oral cavity. The patient had instantaneous relief and the oxygen saturation returned to 96%. Based on the MR findings, we realized that protrusion of the tongue had obscured the tiny space between the posterior pharyngeal wall and the soft palate leading to almost complete supraglottic obstruction. Another attempt was made with the endoscope without tongue protrusion. Using the information obtained from the first attempt, the distal end of the endoscope was manipulated through the cords until the tracheal rings and the carina were visible. A well-lubricated 7.0 ID endotracheal tube (ETT) was carefully passed over the bronchoscope

which was kept at the side of the pharynx to avoid rupturing the abscess. After confirmation of ETT placement, brief neurological examination revealed no new deficits. General anesthesia was then induced with propofol and maintained by a combination of fentanyl, isoflurane and rocuronium. Surgical exploration of the abscess through a right anterior neck incision expelled approximately 100 ml of purulent material which was later shown to contain mycobacterium tuberculosis. The patient was returned to the NICU and the trachea was extubated uneventfully after ten days when the pharyngeal edema subsided. Following prolonged quadruple antibiotic therapy, the patient subsequently underwent posterior occipital-cervical fusion and had a complete recovery from his illness.

Discussion

Strategies for airway management in patients with retropharyngeal masses in the presence of respiratory compromise remain unclear. Successful airway management in this setting has been advocated through direct laryngoscopy, fiberoptic endoscopy and obtaining a surgical airway as first line approaches.^{8,9} Interestingly, blind nasal intubation has also been proposed particularly in cases of retropharyngeal hematoma.¹⁰

In the present report, the patient presented not only with an obstructing retropharyngeal mass but also with an unstable C-spine stabilized by axial traction. Such a combination adds to the difficulty in securing an already compromised airway. We elected to undertake a conservative approach for endotracheal tube placement, i.e. fiberoptic intubation. We did not attempt to visualize the vocal cords by direct laryngoscopy because of our reluctance to pass the tip of the laryngoscope blindly into an area of a tense abscess in an individual with an already compromised airway with virtually no movement of the C-spine. Blind nasotracheal intubation was not tried because of the danger of rupturing the abscess. In addition, the surgeons did not recommend preoperative aspiration of the abscess. Therefore, two alternatives were considered to be appropriate choices for endotracheal tube placement; tracheotomy under local anesthesia and fiberoptic intubation. As the patient was not acutely or progressively hypoxic, sufficient time was available to assess the airway before committing to surgical intervention. Acknowledging the potential for failure to intubate or for abscess rupture, preparations were made for establishing an emergency surgical airway by experienced surgical staff. Had the abscess ruptured, positioning of the patient in the Trendelenberg position and suctioning would have been performed simultaneously with instituting a surgical airway. In a drastic situation, personnel were available to remove the

halo and apply midline axial stabilization to facilitate rigid bronchoscopy or surgical tracheotomy.

In conclusion, this case report demonstrates the use of fiberoptic intubation in preventing and managing respiratory compromise in selected cases of obstructing retropharyngeal masses. Nonetheless, every precaution should be available for the potential need to establish a surgical airway.

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References

- 1 Janssens J-P, De Haller R. Spinal tuberculosis in a developed country. *Clin Orthop* 1991; 257: 67-75.
- 2 Fageeh NA, Lamothe A. Tuberculosis of the retropharyngeal space. *J Otolaryngol* 1998; 27: 43-5.
- 3 Neumann JL, Schlueter DP. Retropharyngeal abscess as the presenting feature of tuberculosis of the cervical spine. *Am Rev Resp Dis* 1974; 110: 508-11.
- 4 Al Soub H. Retropharyngeal abscess associated with tuberculosis of the cervical spine. *Tubercle Lung Dis* 1996; 77: 563-5.
- 5 Al Arabi KM, Al Sebai MW. Bifacetal dislocation following tuberculosis of the cervical spine. *Tubercle* 1991; 72: 294-8.
- 6 Thomas MD, Tierney PA, Samuel D, Patel KS. Tuberculosis: an unusual cause of dysphagia. *Otolaryngol Head Neck Surg* 1995; 113: 644-50.
- 7 Brown DL. Glossopharyngeal block. In: Brown DL (Ed.). *Atlas of Regional Anesthesia*. Philadelphia: WB Saunders Company, 1992: 186-92.
- 8 Riaz J. The difficult pediatric airway. In: Benumoff JL (Ed.). *Airway Management: Principles and Practice*. St. Louis: Mosby-Year Book, 1996: 611-2.
- 9 Williams SR. Airway management for a retropharyngeal hematoma (Editorial). *J Emerg Med* 1995; 13: 243-4.
- 10 Mitchell RO, Heniford BT. Traumatic retropharyngeal hematoma- a cause of acute airway obstruction. *J Emerg Med* 1995; 13: 165-7.