

## CASE REPORT

### ***Ochrobactrum anthropi* induced retropharyngeal abscess with mediastinal extension complicating airway obstruction: a case report**

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#### Abstract

Retropharyngeal abscess with involvement of mediastinal abscess represents an uncommon complication of upper respiratory tract infections. We report a case presenting with a large retropharyngeal abscess with airway obstruction as the primary presenting symptom. Contrast-enhanced CT showed a large retropharyngeal abscess in the neck with extension to the upper and posterior mediastinal spaces. The abscess was surgically excised with 200 cc pus drained from the neck and mediastinal regions. We describe this case to assist physicians in making the difficult diagnosis when confronting a patient with airway obstruction, as early recognition of retropharyngeal abscess permits emergent airway management.

#### Introduction

Retropharyngeal abscess is an uncommon but potentially life-threatening infection in the neck. It is most commonly seen in infants and young children, with 75–80% of patients younger than 5 years and 16% younger than 1 year.<sup>1–3</sup> It may result in local and systematic complications, leading to significant morbidity and mortality due to sepsis, mediastinitis, airway obstruction, internal jugular vein thrombosis and carotid artery aneurysm.<sup>2,3</sup> The presenting features of the retropharyngeal abscess are highly variable, therefore, this presents difficulties and challenges for emergency physicians, paediatricians and otolaryngologists to make a timely diagnosis based on symptoms alone.<sup>3</sup>

The most common presenting symptoms of retropharyngeal abscess are reported to be fever and neck

pain, followed by dysphagia, palpable mass and sore throat.<sup>3</sup> Airway symptoms due to airway obstruction are unusual manifestations of retropharyngeal abscess, but occurrence of these symptoms requires the patients to be admitted to the paediatric intensive care unit (ICU) and intubation. Thus, early diagnosis and appropriate surgical management will reduce the potential morbidity from the retropharyngeal abscess and neck infections.

In this report, we describe a case whose initial presentation was related to airway obstruction. A retropharyngeal mass with extension to the mediastinal space was identified by a neck and chest computed tomography (CT) scan. There was a delay in diagnosis for the patient described in the case report, thus, the rare presentation of airway obstruction in paediatric patients serves as a reminder of including retropharyngeal abscess in the differential diagnosis.

## Case Report

Permission was granted to use the de-identified patient information and images.

A 15-year-old Saudi Arabian male patient presented to the emergency department with a history of vomiting, headache and hemoptysis for 3 days, followed by shortness of breath. He had no past medical illness. The patient was referred from a secondary care hospital to a tertiary care hospital which has the ICU facility. The patient was intubated in the tertiary care hospital due to decreased oxygen saturation (SpO<sub>2</sub>) level. An initial diagnosis of meningitis and acute respiratory distress syndrome was made based on clinical examination.

On physical examination, the patient was intubated having SpO<sub>2</sub> 100%, with a temperature of 37.2°C, heart rate of 132 bpm and blood pressure of 135/95 mmHg. Chest examination revealed crepitus at both upper regions of the chest on auscultation, with more on the left side. Examination on abdominal and cardiovascular systems did not reveal any clinical abnormality.

Laboratory findings of blood count were not significant. Neck and chest contrast-enhanced CT revealed a large pre-vertebral collection of abscess in the retropharyngeal space (Fig. 1), extending inferiorly towards the superior mediastinum and a direct extension into the posterior mediastinum (Fig. 2). The abscess showed low attenuation density with peripheral rim enhancement filling both sides of retropharyngeal space. The collection of abscess that extended from opposite to C3 vertebral body up to T5 was measured around 19 × 6.5 × 2.4 cm<sup>3</sup> in craniocaudal, transverse and antero-posterior diameters, respectively. The estimated volume of the abscess was about 130 cc, and it had a marked mass effect on adjacent structures with anterior displacement of the pharynx, oesophagus and trachea.

The patient was put on conservative management but showed no improvement of his condition, thus, it was decided for surgical intervention. Through cervical approach a longitudinal incision was made from the suprasternal notch up to pulsation of left carotid artery at anterior border of the left sternocleidomastoid muscle. About 200 cc of pus was drained from the neck and mediastinal regions.

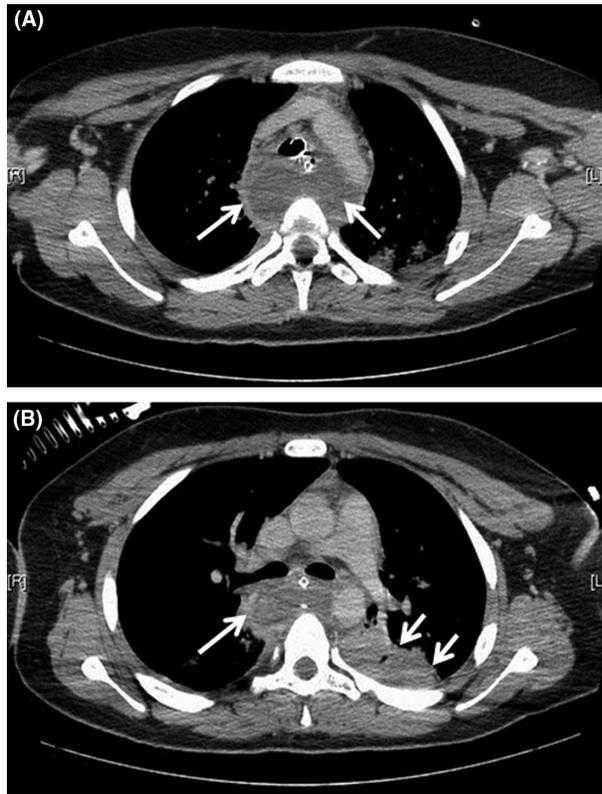
On the first day of post-operation, the patient did well with improvements in his condition. C/S (culture and sensitivity) of the swab showed *Ochrobactrum anthropi* sensitive to imipenem, cefepime, amikacin, gentamicin and ciprofloxacin. The patient was extubated on the second day and he recovered well. He was discharged on the eighth day after operation in a good condition without developing any complications. The patient remained well at a 2-month follow-up.



**Figure 1.** Contrast-enhanced CT of the neck shows a low-density area consistent with an appearance of abscess in the retropharyngeal space with rim enhancement in the peripheral region of the mass (A). The abscess occupies the pre-vertebral space to displace the thyroid glands and blood vessels anteriorly in the neck (B). Arrows refer to the abscess.

## Discussion

Retropharyngeal abscess is an uncommon but potentially life-threatening complication of upper respiratory infections in children. A recently published retrospective review of the clinical presentation, diagnosis, management and complications of children with retropharyngeal and parapharyngeal abscesses during an 11-year period has shown that retropharyngeal abscess is more common in younger children, with 80% occurring under the age of 5 years.<sup>3</sup> This incidence is similar to the findings in other series.<sup>1,4</sup> The majority of cases of retropharyngeal abscess in children are suppurative changes within a lymph node, which becomes infected secondary to an infection elsewhere in the head and neck.<sup>4</sup> Studies have shown an increase in the incidence of retropharyngeal abscess in recent years.<sup>1,3,5,6</sup> This could be due to the wide availability of CT scanner in most emergency departments which contributes to the early diagnosis and early treatment.



**Figure 2.** Contrast-enhanced CT of the upper chest shows that the retropharyngeal abscess extends to the posterior mediastinal spaces at the level of aortic arch (A) and carina (B). Long arrows refer to the abscess, while short arrows indicate left upper lobe consolidation.

Grisaru-Soen et al. along with others reported that children with retropharyngeal abscess most commonly present with restricted neck movements, fever and cervical lymphadenopathy and rarely with respiratory tract symptoms such as stridor or airway obstruction.<sup>3,7,8</sup> Only 5% of children were found to have stridor and dyspnea in their study. Similarly, in another large recent series respiratory findings were noticed in only 3% of the patients.<sup>1</sup> It has been reported that patients presenting with airway obstruction were younger than those without airway obstruction.<sup>4,9</sup> The reported average age of these patients was less than 2 years, while our patient is much older than those reported in the literature, representing a rare situation. Patients with airway obstruction require an admission to the paediatric ICU and intubation prior to surgical drainage as these patients need to be managed urgently due to the complicated clinical course (patients requiring an admission to the paediatric ICU for management or observation, requiring more than one incision or drainage procedure) when compared to the smooth clinical course (patients successfully treated with intravenous antibiotics and/or surgical drainage without

the requirement for intensive care, or multiple surgical procedures).<sup>9</sup> The patient in this case report was first admitted to the emergency department due to lack of ICU bed in another hospital, although the initial diagnosis was not directed to the retropharyngeal abscess. This emphasises the importance of early recognition of these characteristics which should alert the clinician to a potentially complicated clinical course.

Diagnosis of retropharyngeal abscess is based on clinical suspicion with supportive imaging examinations. Plain radiographs show widened pre-vertebral soft tissue on lateral view of the neck, however, its diagnostic accuracy was limited due to patient positioning and differentiation between cellulitis and abscess.<sup>10</sup> Ultrasound is non-invasive, readily available and well tolerated by children, but it does have limitations being a surface probe for deep neck infections. Magnetic resonance imaging (MRI) has not been shown to be more sensitive than CT in distinguishing abscess collection from other infections such as cellulitis or phlegmon.<sup>11</sup> CT is the preferred imaging technique in the diagnostic evaluation of retropharyngeal abscess.

CT has been widely used to detect retropharyngeal abscess with high diagnostic sensitivity ranging from 72% to 100%, but with low specificity (ranging from 45% to 82%) in differentiating abscess from retropharyngeal cellulitis/lymphadenitis.<sup>7,8,12</sup> CT is useful for confirming presence or absence of an abscess, for ruling out other pathology, for predicting pus at surgery and serving as a reference for abscess relations if surgery drainage is being suggested. Our case further confirms the diagnostic value of CT in detecting the retropharyngeal abscess and involvement of mediastinal spaces. There is no doubt that CT has become the most valuable diagnostic modality in the emergency department.<sup>13</sup> However, it is widely recognised that CT is associated with high-radiation dose,<sup>14,15</sup> and this is especially important in paediatric patients as children are at greater risk than adults from a given dose of radiation because they are inherently more radiosensitive to radiation exposure than adults.<sup>16,17</sup> Therefore, use of CT must be medically justified. Ultrasound and MRI are alternative imaging modalities which do not involve ionising radiation,<sup>3,18</sup> so these modalities can be recommended instead of choosing CT as the first-line technique.

The most common microorganisms that cause retropharyngeal abscess are Group A *Streptococcus* and *S. aureus*.<sup>3,8</sup> It has also been reported that there is a high rate of negative cultures due to the fact that many patients had received antibiotics prior to presentation to the hospital.<sup>3</sup> *Ochrobactrum anthropi*, the bacteriologic pathogenesis for inducing retropharyngeal abscess as reported in our case is rarely reported in the literature.

Treatment of *O. anthropi* could be challenging because of widespread and unpredictable resistance to antimicrobial agents and discrepancies between in vitro susceptibility and in vivo efficacy.<sup>19</sup>

In conclusion, we present a rare case with airway obstruction as an initial presenting symptom in a paediatric patient diagnosed with retropharyngeal abscess with mediastinal extension. We emphasise that differential diagnosis of the retropharyngeal abscess should be considered in young patients with airway distress, despite the absence of common symptoms of fever and restricted neck pain.

## Conflict of Interest

The authors declare no conflict of interest.

## References

- Craig FW, Schunk JE. Retropharyngeal abscess in children: Clinical presentation, utility of imaging, and current management. *Pediatrics* 2003; **111**: 1394–8.
- Wong DKC, Brown C, Mills N, Spielmann P, Neeff M. To drain or not to drain-management of pediatric deep neck abscesses: A case-control study. *Int J Pediatr Otorhinolaryngol* 2012; **76**: 1810–3.
- Grisaru-Soen G, Komisar O, Aizenstein O, Soudack M, Schwartz D, Paret G. Retropharyngeal and parapharyngeal abscess in children-epidemiology, clinical features and treatment. *Int J Pediatr Otorhinolaryngol* 2010; **74**: 1016–20.
- Kirse DJ, Roberson DW. Surgical management of retropharyngeal space infections in children. *Laryngoscope* 2001; **111**: 1413–22.
- Al-Sabah B, Bin Salleen H, Hagr A, Choi-Rosen J, Manoukian JJ, Tewfik TL. Retropharyngeal abscess in children: 10-year study. *J Otolaryngol* 2004; **33**: 352–5.
- HCUPnet, Cost information for Kids' Inpatient Database (KID) in 2006. Healthcare Cost and Utilization Project. Agency for Healthcare Research and Quality, Rockville, MD, 2009. Available from: <http://hcupnet.ahrq.gov/>.
- Page NC, Bauer EM, Lieu JEC. Clinical features and treatment of retropharyngeal abscess in children. *Otolaryngol Head Neck Surg* 2008; **138**: 300–6.
- Daya H, Lo S, Papsin BC, Zachariasova A, Murray H, Pirie J, Laughlin S, Blaser S. Retropharyngeal and parapharyngeal infections in children: The Toronto experience. *Int J Pediatr Otorhinolaryngol* 2005; **69**: 81–6.
- Elsheer AM, Park AH, Alder SC, Smith ME, Muntz HR, Grimmer F. Indications of a more complicated clinical course for pediatric patients with retropharyngeal abscess. *Int J Pediatr Otorhinolaryngol* 2010; **74**: 198–201.
- Courtney MJ, Mahadevan M, Miteff A. Management of paediatric retropharyngeal infections: Non-surgical versus surgical. *ANZ J Surg* 2007; **77**: 985–7.
- Nazir KA, Fozia PA, Ul Islam M, Shakil A, Patigaroo SA. Paediatric acute retropharyngeal abscesses: An experience. *Afr J Paediatr Surg* 2013; **10**: 327–35.
- Shefelbine SE, Mancuso AA, Gajewski BJ, Ojiri H, Stringer S, Sedwick JD. Pediatric retropharyngeal lymphadenitis: Differentiation from retropharyngeal abscess and treatment implications. *Otolaryngol Head Neck Surg* 2007; **136**: 182–8.
- Sun Z, Ng KH, Vijayanathan A. Is utilization of computed tomography justified in clinical practice? Part I: Application in the emergency department. *Singapore Med J* 2010; **51**: 200–6.
- Sun Z, Ng KH. Is utilization of computed tomography justified in clinical practice? Part IV: Applications of paediatric computed tomography. *Singapore Med J* 2010; **51**: 457–63.
- Brenner DJ, Hall EJ. Computed tomography – an increasing source of radiation exposure. *N Engl J Med* 2007; **357**: 2277–84.
- Committee on the Biological Effects of Ionizing Radiations (BEIR V), National Research Council. Health Effects of Exposure to Low Levels of Ionizing Radiation: BEIR V. National Academy Press, Washington, DC, 1990; 1–436.
- International Commission on Radiological Protection. 1990 recommendations of the International Commission on Radiological Protection. ICRP publication no. 60. Pergamon, Oxford, UK, 1991; 1–201.
- Chen CH, Wang CJ, Lien R, Chou YH, Chang CC, Chiang MC. Mediastinal and retropharyngeal abscesses in a neonate. *Pediatr Neonatol* 2011; **52**: 172–5.
- Daxboeck F, Zitta S, Assadian O, Krause R, Wenisch C, Kovarik J. Ochrobactrum anthropic bloodstream infection complicating hemodialysis. *Am J Kidney Dis* 2002; **40**: E17.