

# Prompt restoration of airway along with rapid neurological recovery following ultrasonography-guided needle aspiration of a tubercular retropharyngeal abscess causing airway obstruction

Borghain B

## ABSTRACT

**Upper respiratory obstruction in cervical spine tuberculosis rarely occurs due to retropharyngeal cold abscess or secondarily from its rupture. Options for securing the airway are intubation, tracheostomy and needle aspiration or surgical drainage. A young boy presented with neck pain, quadriparesis and stridor, suggesting subacute airway obstruction in advanced tubercular spondylodiscitis of cervical spine C3–C4 (cervical 3rd and 4th level) with extradural compressive myelopathy (C3–C5) and a large retropharyngeal cold abscess. An urgent ultrasonography-guided needle aspiration with a head low position through the left posterior triangle was performed with adequate precautions and back-up for advanced airway management. Needle aspiration yielded 200 ml of pus. Stridor and hoarseness of voice decreased immediately. Within two-and-a-half hours, the patient improved neurologically. Although guided needle aspiration is one of the treatment options, there is a strong tendency to undermine this technique in favour of other options, especially surgery.**

**Keywords:** airway obstruction, needle aspiration, neurological recovery, retropharyngeal abscess

*Singapore Med J 2011; 52(11): e229-e231*

## INTRODUCTION

Upper respiratory obstruction in spine tuberculosis occurs due to expanding retropharyngeal cold abscess or secondarily from its rupture.<sup>(1)</sup> Management options include urgent intubation<sup>(1)</sup> or tracheotomy.<sup>(2)</sup> When tense abscess is the cause, transoral needle aspiration<sup>(3,4)</sup> or surgical drainage<sup>(3,5,6)</sup> are the other viable options. Although guided needle aspiration is a viable treatment option, there is a tendency to opt for surgery instead.

## CASE REPORT

An 18-year-old Indian boy presented with complaints of stridor and quadriparesis. He had neck pain for the past six months and a rise in temperature in the evenings. He also experienced decreased neck mobility for the past one month, with weakness in all limbs, particularly the left shoulder and elbow. Hoarseness of voice and stridor were present for four days. There was a left-sided neck bulge and tachycardia but no cyanosis.

Neurological examination revealed that the muscle tone was increased in all four limbs. Motor power, according to the grading of the Medical Research Council (MRC), was 4/5 in the right upper limb, 2/5 in the left shoulder and elbow extensors, 3/5 in the left elbow flexors, 4/5 in the left wrist and lower limbs and 4/5 in all key muscles. Deep tendon reflexes were exaggerated without ankle/patellar clonus. Bilateral plantars were upgoing and abdominal reflexes were present. There was no sensory or bladder-bowel involvement. Spine radiographs documented destruction of the C3/C4 vertebral bodies. Magnetic resonance (MR) imaging, which was performed elsewhere 12 hours ago, showed marrow oedema in C3–C4 bodies, with kyphotic collapse of C3 and intervertebral disc involvement. Epidural collection was causing marked compressive myelopathy of C3–C5 with retropharyngeal abscess extending from the base of the skull to C5 spine (Figs. 1 & 2). Tuberculosis was provisionally diagnosed.

The patient was given oxygen inhalation and a Philadelphia collar. Streptomycin 1 g was administered intramuscularly and ciprofloxacin 750 mg was administered intravenously. Random blood sugar level, platelet count, bleeding and clotting time were within normal limits. Maintaining a head-low position, ultrasonography-guided aspiration with a 16 gauge needle was performed in an emergency radiology suite under local anaesthesia and without sedation. About 200 ml of pus was aspirated. The stridor and hoarseness decreased. No attempt at endotracheal intubation or tracheostomy

Department of  
Orthopaedics and  
Trauma,  
North-Eastern  
Indira Gandhi  
Regional Institute of  
Health and Medical  
Sciences,  
Mawdiangdiang,  
Shillong,  
Meghalaya 793018  
India

Borghain B, MS,  
DNB  
Assistant Professor

Correspondence to:  
Dr Bhaskar Borghain  
Tel: (91) 364 2538 097  
Fax: (91) 364 2538 0209  
Email: bhaskarborg@  
gmail.com

was made. The pus was sent for microbiological analysis. Skull traction was started with 4 kg weight. Systemic steroids were not given.

Within two-and-a-half hours, the patient improved neurologically. His left shoulder power improved from 2/5 to 3+/5, and his right elbow extensors from 2/5 to 4/5. His left elbow and wrist power improved to 4+/5. Rifampicin and isoniazid were then added to his drug regime. Fasting and postprandial blood sugars were normal. Human immunodeficiency virus (HIV) test by enzyme-linked immunosorbent assay (ELISA) was negative. Four days later, the patient again developed similar symptoms. Although the hoarseness of voice was apparent, motor weakness in the left upper limb was minimal. About 25 ml of pus mixed with blood was aspirated, which relieved the patient's symptoms. First-line antitubercular drugs were continued.

Finally, the patient was operated on a week later by corpectomy of C3 with tricortical iliac bone graft without fixation. Intraoperatively, about 200 ml of pus was evacuated. Postoperatively, the skull traction continued with 3 kg weight. The patient's respiration returned to normal in two days. Pus culture was sterile. Biopsy confirmed tubercular osteomyelitis (caseating granuloma). A four-post collar was applied. The patient subsequently regained his power to 4+/5 in all four limbs.

## DISCUSSION

When retropharyngeal abscess in the mid-cervical region causes respiratory obstruction,<sup>(4)</sup> the standard management includes the options mentioned earlier. Unfortunately, bias exists toward aggressive surgical drainage; surgery usually follows urgent intubation or tracheostomy. This bias can be attributed to a lack of specific bactericidal antibiotics in the past. Therefore, traditional methods of treatment persisted among clinicians despite the emergence of interventional radiology.

Intubation may be difficult and dangerous in potentially unstable cervical spine tuberculosis,<sup>(1)</sup> unless it is performed by experts, as hyperextension of the neck may damage the spinal cord. Normal anatomy is distorted by the abscess; hence, the vocal cords may not be seen. In such cases, blind or forceful intubation may result in rupture of the abscess.<sup>(1)</sup> Hence, only fiberoptic intubation is considered safe.<sup>(1)</sup>

Tracheostomy may be life-saving if cyanosis is present. Otherwise, it may contaminate the future operating field in the anterior approach toward the cervical spine. Neither tracheostomy nor intubation yields any sample for diagnosis, nor do they have any decompressive effect on the abscess to lead to a potential neurological recovery.



**Fig. 1** Mid-sagittal T2-W MR image shows the large retropharyngeal abscess causing the airway obstruction and its intraspinal extension.



**Fig. 2** Cross-sectional T2-W MR image shows the widest part of the abscess.

Drainage of cervical cold abscess is done through an extra-oral approach unless acute respiratory presentation with cyanosis dictates restoration of the airway by urgent transoral drainage.<sup>(6)</sup> However, stridor without cyanosis suggests incomplete upper airway obstruction.<sup>(7)</sup> Hence, needle aspiration was performed in our patient instead, through the bulging portion of the mid neck through the posterior triangle, behind the sternocleidomastoid belly and the carotid pulsation, aiming toward the anterior aspect of the transverse process of the 4th cervical vertebra.<sup>(4,5)</sup> Head-low position

and a no-sedation policy should be used to avoid a risk of aspiration. In our patient, a high-flow oxygen facility, pulse-oxymeter and large bore needles for cricothyroid puncture were ready. In the previous two multi-specialty hospitals that the patient attended, he had been recommended urgent surgery.

Needle aspiration may, by reducing pressure, allow the antibiotics to reach the diseased area rapidly in adequate concentration to control further pus formation. Needle aspiration has several advantages. It may be repeated, if required, and can be used after intubation to relieve pressure of the abscess. It also saves time in the event that a spine surgery facility is not immediately available. Furthermore, needle aspiration may be used to exclude other differential diagnoses such as malignant tumours that may present clinico-radiologically as an prevertebral abscess.<sup>(8,9)</sup> Therefore, it gives physicians time to exercise better judgement in order to lower the risks involved in anaesthesia and surgery. Surgery may be avoided altogether in selected cases, as massive cold abscess has reportedly disappeared on medical treatment alone.<sup>(10)</sup> However, in cases where pus could not be aspirated, thick collection should be suspected,<sup>(4)</sup> and urgent fibre-optic intubation/tracheostomy and surgical drainage may be more appropriate.

In subacute upper airway obstruction caused by retropharyngeal abscess, guided needle aspiration may potentially be a better therapeutic option than intubation, tracheostomy or surgery. Besides the prompt restoration of compromised airway in expanding abscess, its decompressive effect may create an environment for

neurological recovery. Since intubation is challenging, guided aspiration by experienced clinicians may be particularly useful when emergency fibrescopic intubation by experts is unavailable or when quick transfers to higher facilities are not possible.

## REFERENCES

1. Pollard BA, El-Beheiry H. Pott's disease with unstable cervical spine, retropharyngeal cold abscess and progressive airway obstruction. *Can J Anaesth* 1999; 46:772-5.
2. Bhargava SK, Gupta S. Large retropharyngeal cold abscess in an adult with respiratory distress. *J Laryngol Otol* 1990; 104:157-8.
3. Nagy M, Pizzuto M, Backstrom J, Brodsky L. Deep neck infections in children: a new approach to diagnosis and treatment. *Laryngoscope* 1997; 107(12 pt 1):1627-34.
4. Duthie RB, Nelson CN. Infections of the Musculoskeletal System. In: Duthie RB, eds. *Mercer's Orthopaedic Surgery*. London: Arnold, 1996: 631.
5. Tuli SM. *Tuberculosis of the Skeletal System*. 2nd ed. New Delhi: Jaypee Brothers, 1997.
6. Wood GW II. Infections of the Spine. In: Canale ST, ed. *Campbell's Operative Orthopaedics*. St. Louis: Mosby Inc, 1998:3107-8.
7. Kothari PR, Kumar T, Jiwane A, Kulkarni B, Paul S. An unusual cause of stridor: retropharyngeal cold abscess. *Pediatr Surg Int* 2002; 18:165-7.
8. Kennedy KS, Wilson JF. Malignant thyroid lymphoma presenting as acute airway obstruction. *Ear Nose Throat J* 1992; 71:350, 353-5.
9. Ridder GJ, Technau-Ihling K, Sander A, Boedeker CC. Spectrum and management of deep neck space infections: an 8-year experience of 234 cases. *Otolaryngol Head Neck Surg* 2005; 133:709-14.
10. Unal O, Kayan M, Akpınar F, Cankaya H, Akdeniz N. MRI demonstration of cervical spondylodiscitis and distal full-length bilateral paraspinous cold abscesses successfully treated by drug regimen only. *Skeletal Radiol* 2004; 33:741-3.