

# Airway compromise during central venous cannulation in an undiagnosed tubercular retropharyngeal abscess: A case report

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## ABSTRACT

Central venous cannulation is often associated with complications during insertion even by expert's hand and with the aid of ultrasound. We encountered a patient for central line insertion through the right internal jugular vein having a retropharyngeal abscess of tubercular origin. We accidentally punctured the abscess cavity leading to increased respiratory distress and subsequent need of intubation to the patient. This kind of complication during central line insertion has never been reported before. We intend to report such a case to alert everyone about the grave complications it can lead to and the methods to minimize them in the times ahead.

**Key words:** Airway compromise; Central venous cannulation; Miliary tuberculosis; Retropharyngeal cold abscess

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## INTRODUCTION

Central venous cannulation (CVC) is not free of complications even under the guidance of ultrasound gadget. Complications may vary depending on the anatomic sites chosen, patients' clinical conditions, and operator's expertise. Arterial puncture, hematoma, and pneumothorax are common mechanical complications during the insertion of the central venous catheter. We came across a case where we, punctured a chronic retropharyngeal abscess during right internal jugular vein (IJV) cannulation. Chronic retropharyngeal abscess puncture during central line insertion has never been reported before. It is of high clinical importance due to its potential life-threatening airway complication if ruptured. We did face the grave complication in this case. We wish to report this case to alert everyone as well as to minimize such complication in future.

## CASE REPORT

A 36-year-old male, chronic smoker and alcoholic, presented to the emergency ward with blunt abdominal trauma. Resuscitation

was done with fluids and norepinephrine infusion. He was urgently taken for exploratory laparotomy. Postoperatively he didn't accept feeds orally as well as through nasogastric tube. Intensivist was called for central venous access for parenteral nutritional support. The patient had no apparent external neck swelling or any neurological deficit. We proceeded for right IJV cannulation because of deranged coagulation study with international normalized ratio 1.8. We aspirated blood during pilot puncture with a 2 cc syringe. Surprisingly we aspirated

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white purulent color material while searching for the vein by introducer needle [Figure 1]. We abandoned IJV cannulation. Then, we tried for right subclavian vein cannulation. During preparation of the skin for insertion of CVC, the patient developed a cough and stridor followed by increasing breathlessness. Immediately, the patient was intubated with the help of succinylcholine and an urgent chest X-ray was done. Chest X-ray ruled out pneumothorax. He was transferred to Intensive Care Unit and put on mechanical ventilation. Right sided subclavian CVC was inserted later on. Material aspirated during cannulation was sent for detection of acid-fast bacilli which later on came out to be positive. *Mycobacterium tuberculosis* colonies were seen when pus was cultured on Lowenstein-Jensen media. With further investigations, his blood tests resulted erythrocyte sedimentation rate of 60 mm in the first hour while enzyme-linked immunosorbent assay for human immune deficiency virus was positive (after taking consent). His first CD4 count was 180/ $\mu$ l.

X-ray chest was consistent with changes of miliary tuberculosis (TB) [Figure 2]. We suggested computed tomography (CT) of the neck and it showed an abscess in a retropharyngeal area with the destruction of vertebral bodies at C-5 and C-6 level [Figures 3 and 4]. Orthopedic consultation advised him to use a cervical brace to restrict neck movements. Medicine and pulmonary consultations were obtained. He received category I anti-tubercular therapy (ATT) with cotrimoxazole tablets for *Pneumocystis carinii* prophylaxis. Antiretroviral drugs were started 2 weeks after ATT for 1-month. In view of prolonged mechanical ventilation tracheostomy was done with great care.

### DISCUSSION

CVC is associated with many complications during insertion. Such complications may vary depending on site, surrounding anatomical structures, patient's clinical conditions, technical expertise, etc. Arterial puncture,



**Figure 1:** White color purulent material aspirated in the syringe during central venous cannulation



**Figure 2:** Chest X-ray showing miliary tubercular changes



**Figure 3:** Contrast-enhanced computed tomography of neck at C-5 level showing destruction of anterior vertebral body (black arrow) and retropharyngeal abscess (yellow arrow)



**Figure 4:** Contrast-enhanced computed tomography of neck at C-6 level showing destruction of anterior vertebral body (black arrow) and retropharyngeal abscess (yellow arrow)

hematoma, and pneumothorax are the most common mechanical complications. Subclavian catheterization is complicated more by pneumothorax and hemothorax than internal jugular catheterization whereas internal jugular catheterization is more likely to be associated with the arterial puncture. Hematoma and arterial puncture are common during femoral venous catheterization.<sup>[1]</sup>

Carotid sheath with its contents comes in lateral relation to chronic retropharyngeal abscess. There is always a possibility of puncturing the retropharyngeal abscess when anatomy is distorted by pressure from the abscess. Tubercular spondylitis, a slowly progressive destructive infection commonly involves thoracic, and lumbar vertebrae followed by sacral and cervical vertebrae. Tubercular spondylitis of cervical spine accounts for 7% of all cases of skeletal TB and is an important causative factor of the chronic retropharyngeal abscess.<sup>[2]</sup> Tuberculous infection starts in cancellous bone of subchondral region of vertebral bodies, the progression of which leads to the collapse of the vertebral body. Typical destruction of an anterior portion of vertebral bodies either superiorly or inferiorly may cause wedging, kyphosis, sharp angulation, or gibbus deformity. The intervertebral disc may herniate into the infected bone resulting in narrowing of disc space thus losing the vertebral height. A collection of exudative material comprising of leucocytes, caseous material, dead bone, and tubercle bacilli results in the formation of an abscess in the interior of the cervical spine. Cold abscess in cervical spine region ruptures through anterior and posterior longitudinal ligaments and tracks in retropharyngeal space thus forming a retropharyngeal abscess. The most dreaded complications of retropharyngeal abscess are airway compromise, rupture of abscess with the aspiration of purulent material, descending mediastinitis, and septic shock.<sup>[3]</sup> In most instances, a diagnosis is made by the clinical suspicion with proper history and examination. Early stages of spinal TB present with low-grade fever, weight loss, malaise, night sweat, and vague neck pain. Noisy breathing and respiratory distress if associated, indicate airway compromise. CT scan is more sensitive in demonstrating evidence of early tubercular infection in vertebrae.<sup>[4]</sup> Contrast-enhanced CT (CECT) helps in differentiating an abscess from cellulitis and checking the extent of the disease. Central hypodensity with a surrounding thick rim of enhancement is most suggestive of an abscess.<sup>[5]</sup> Ultrasound, although has many advantages over CECT, is not a preferred investigation for deeply located abscesses as it does not provide the anatomic information necessary for planning the surgical approach for drainage.<sup>[6]</sup> Chest radiograph is useful in screening complications such as mediastinitis, pneumonia, and pleural effusion. Surgical aspiration is the cornerstone of management for a cold

retropharyngeal abscess under the cover of ATT. If signs of airway compromise are present, it should be managed by tracheostomy or intubation first. One clinical report showed chronic retropharyngeal abscess of tubercular origin as a cause of progressive airway compromise where they effectively managed to assess as well as intubate the patient with the help of fiber optic endoscopy.<sup>[7]</sup> In our case, puncture of the abscess might have stimulated the para or retropharyngeal muscles leading to airway spasm or it could have been a vagus nerve mediated laryngospasm. The patient was already tachypnic so additional threats on the airway mandated a definite airway secure. From a complication during CVC insertion we discovered the patient's serious disease pathology.

The author suggests that clinical suspicion of the retropharyngeal abscess should be kept in mind during CVC in a country where TB is an endemic disease. Intensivist should be extremely cautious regarding perforation of retropharyngeal abscess and subsequent life-threatening airway complication during CVC. If any clinical suspicion of the disease is there, it is better to do CVC under ultrasound guidance or to choose a different site (subclavian approach) for cannulation and is to be performed by expert hands only.

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