Gas forming Necrotizing Retropharyngeal and Parapharyngeal Abscess with Mediastinal Extension Causing Supraventricular Tachycardia.

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ABSTRACT

Combination of gas forming necrotizing retropharyngeal and parapharyngeal abscesses with mediastinal extension are rare, especially if the condition is complicated by development of chest pain and supraventricular tachycardia due to mediastinitis. We reported a case of a diabetic elderly man with previously known hypertension who was initially treated in a peripheral hospital with neck cellulitis which was complicated by chest pain, dyspnea and supraventricular tachycardia. He recovered fully after a series of neck surgeries and prolonged course of intravenous meropenem which was later changed to amikacin based on sensitivity over a period of 2 months.

Keywords: Necrotizing Retropharyngeal abscess, mediastinum, mediastinitis, Supraventicular tachycardia.

INTRODUCTION

Combination of necrotizing retropharyngeal and parapharyngeal abscess with mediastinal extension are rare, especially if the condition is complicated by development of chest pain and supraventricular tachycardia (SVT) due to mediastinitis. Such necrotizing infection with gas forming bacteria can spread very rapidly through tissue planes from the retropharyngeal and parapharyngeal space into the anterior mediastinum and carries high morbidity and mortality risk if not recognized and treated early.[1] We reported a case of a diabetic elderly man with previously known hypertension who was initially treated in a community hospital with neck cellulitis, which was complicated by chest pain, dyspnea and SVT. He recovered fully after a series of neck surgeries and prolonged course of intravenous (iv) meropenem followed by iv amikacin based on sensitivity over a period of 2 months.

This case report highlights the significant cardiac morbidity and mortality associated with extensive necrotizing retropharyngeal and parapharyngeal abscess with mediastinal extension and the development of mediastinitis, which if detected early can be successfully managed with prompt surgical drainage and appropriate antibiotic therapy.

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CASE REPORT

A 66-year-old Malay man presented with symptoms of dysphagia, odynophagia and

Figure 1: Diffused anterior left-sided fluctuant neck swelling of the patient (White arrows).

hoarseness for 6 days. He had progressive poor oral intake with lethargy. His diabetes mellitus and hypertension were uncontrolled due to non-compliance with his medications. Clinical examination confirmed an anterior left -sided diffused fluctuant neck swelling (Figure 1). He was initially treated for sepsis secondary to neck cellulitis with iv ampicillin-sulbactam. On the day 4 of admission, he developed tachycardia, dyspnea and chest discomfort with electrocardiogram (ECG) showing SVT. The arrhythmia did not resolve with adenosine and amiodarone. He was then referred to Hospital Sultan Haji Ahmad Shah, a tertiary hospital, for Computed Tomography Pulmonary Angiogram (CTPA) with the suspicion of pulmonary embolism. CTPA revealed an extensive gas forming necrotizing parapharyngeal and retropharyngeal collection with air pockets extending from retropharyngeal region to anterior mediastinum up to T7 level, measuring approximately 23.4 cm in length, surrounding the trachea, great vessels and right side of pericardium. There was no radiological evidence of pulmonary embolism (Figure 2 a & b). He was then referred to the Otorhinolaryngologist for further management.

Flexible nasopharyngolaryngoscopy revealed bulging posterior and left lateral pharyngeal wall partially obscuring the airway. He was admitted to Intensive Care Unit (ICU) for close observation in view of potential airway obstruction and escalated to iv meropenem. The SVT resolved with cardioversion upon arrival in ICU.

Emergency incision and drainage under local anesthesia was performed on the left side of his neck soon after ICU admission to release the trapped gas which relieved pressure on his airway transiently but he developed respiratory distress the next day requiring intubation. On ICU admission day 2, he underwent neck exploration bilaterally with incision and drainage of retropharyngeal and parapharyngeal abscess. Anesthesiologist anticipated prolonged ventilation for this patient due to the extensiveness of the disease and an elective tracheostomy was done in the same setting. A total of 100 ml pus was drained from bilateral parapharyngeal and

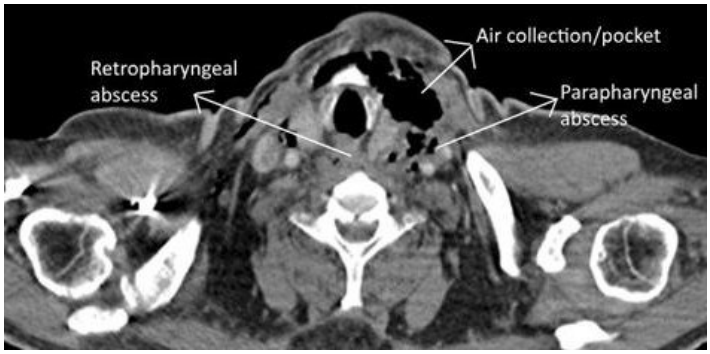

Figure 2a: Annotated CT axial view of neck revealed presence of RPA, PPA and air pockets surrounding upper airway.

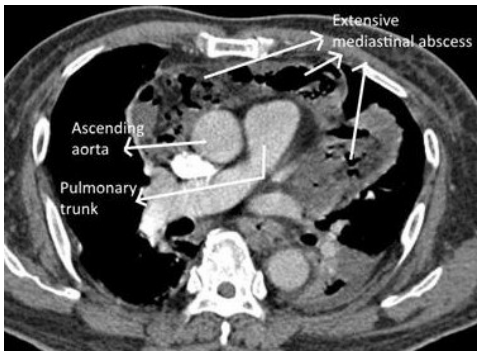

Figure 2b: Annotated CT axial view of thorax revealed extensive superior and anterior mediastinal abscess.

retropharyngeal spaces.

Since the retropharyngeal space was communicating with the anterior mediastinum and also the pleural space was not involved, the cardiothoracic team, after consultation, advised against thoracotomy/thoracostomy or median sternotomy. Daily pus drainage of the neck wounds was performed with povidone dressing. The pus samples grew a mixed culture of ESBL-producing *Klebsiella pneumonia, Pseudomonas aeruginosa and Burkholderia cepacia*, which were sensitive to meropenem.

He underwent wound debridement under general anesthesia after approximately 2 weeks of meropenem due to persistent pus discharge, which drained another 20 ml of pus intraoperatively. The sample cultured multi-drug-resistant *Acinobacter baumanni and Pseudomonas*, sensitive to amikacin and cefoperazone-sulbactam but resistant to meropenem. He subsequently responded very well to 2 weeks of iv amikacin and sulperazone.

He was discharged from ICU to general ward after 1 week. Daily dressing of the neck wounds was done. Serial CT scan revealed significant improvements. He was discharged home from hospital after 5 weeks. He was followed up in outpatient clinic 2 weeks after discharge and his tracheostomy was successfully decannulated. He recovered very well at 2 months from the initial presentation (Figure 3). His neck wounds healed via secondary intention. He was also reviewed at Internal Medicine outpatient clinic for management of his diabetes and hypertension.

Figure 3: CT axial view of thorax demonstrating complete resolution after 2 months of therapy.

DISCUSSION

Escherichia coli, Klebsiella, Bacteroides and *Clostridium* are bacteria strains that are associated with gas formation[1]. These gases are mainly carbon dioxide and hydrogen being produced as byproducts of anaerobic respiration.[1] The accumulation of these gases can exert fatal compression on cardiovascular and respiratory system of the patient. The infection from this patient could be from dental origin as he had poor oral hygiene and there was no other source of infection or cutaneous wounds. We postulate the probable route of infection might have originated from his dental carries. Infections from the submandibular space spread below the anterior belly of the digastric muscles to involve the sublingual, retropharyngeal and parapharyngeal space. It further extends into the mediastinum along the carotid sheath and retropharyngeal space.

Occurrence of SVT in our patient was attributed by the mediastinal infection causing pericardial irritation resulting in cardiac electrical activity disturbance at the sinoatrial node as there were extensive anterior and superior mediastinum collections and air pockets.[2] Sepsis indirectly caused the SVT as well[3]. The systemic release of cytokines, endothelin-1, nitric oxide and prostanoids during sepsis causes myocardial dysfunction resulting in arrhythmia.[4] Compression of the heart by adjacent tumor mass have been documented to cause arrhythmia.[5] Gas formation and accumulation from the mediastinal extension of the cervical necrotizing fasciitis, surrounding the heart has also been postulated to exert the similar effect as well.

Surgical drainage can be performed either via cervical incisions, with or without a limited superior median sternotomy extension or a thoracotomy.[6-8] More conservative approach such as percutaneous aspiration or drainage of the mediastinal abscess has also been previously reported.[8] An alternative drainage approach with the insertion of a thoracostomy tube into anterior mediastinum via a small incision below xiphisternum to drain an anterior mediastinal abscess has also been reported.[9] In our case, we utilized the open cervical approach without a median sternotomy extension or a thoracotomy as the abscess cavity were all interconnected and could be thoroughly drained via the cervical incision alone.

CONCLUSION

Extensive gas forming necrotizing retropharyngeal and parapharyngeal abscess extending into with mediastinal causing mediastinitis can lead to significant cardiac morbidity and mortality if not promptly treated as shown by our case where patient developed SVT. It is important to recognize the subtle clinical features early especially in a diabetic patient and prompt open surgical drainage and appropriate antibiotics can save life.

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