

A Challenging Bilateral Parapharyngeal Abscess

Zorlu Bilateral Parafaringeal Apse

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ABSTRACT

Parapharyngeal abscess is a common deep space neck infection. However, bilateral parapharyngeal abscess is rarely found due to the protective function of neck fascia. In general, bilateral parapharyngeal abscess can cause various fatal complications but early diagnosis, targeted antimicrobial therapy and drainage of the abscess may reduce the risk of these complications and mortality. Here, we reported a case of a healthy man with bilateral parapharyngeal abscess complicated with an upper airway obstruction.

Keywords: Bilateral parapharyngeal abscess, deep neck space infection, upper airway obstruction

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ÖZET

Parafaringeal apse, yaygın bir derin uzay boyun enfeksiyonudur. Ancak boyun fasyasının koruyucu işlevi nedeniyle bilateral parafaringeal apse nadiren bulunur. Genel olarak bilateral parafaringeal apse çeşitli ölümcül komplikasyonlara neden olabilir ancak erken tanı, hedefe yönelik antimikrobiyal tedavi ve apsenin drenajı bu komplikasyon riskini ve mortaliteyi azaltabilir. Burada üst solunum yolu obstrüksiyonu ile komplike bilateral parafaringeal apsesi olan sağlıklı bir erkek olguyu sunduk.

Anahtar Sözcükler: Bilateral parafaringeal apse, derin boyun boşluğu enfeksiyonu, üst solunum yolu obstrüksiyonu

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INTRODUCTION

Parapharyngeal abscess is a common deep neck space infection following peritonsillar abscess. The sources of infection are mainly from the odontogenic origin and upper respiratory tract infection (1). Early initiation of treatment with a broad spectrum of antibiotics helps in managing the infection. Later, the antibiotic should be changed to the targeted antimicrobial according to the sensitivity from the bacterial culture result. Along with it, the other principles of treatment are hydration, analgesic and either incision and drainage or aspiration of the abscess. Anticipation of the possible complications such as an acute upper airway obstruction, mediastinitis and septic shock should be detected early and requires a multidiscipline team management.

CASE REPORT

A 44-year old Malay gentleman was presented with a complaint of bilateral painful neck swelling for 10 days. It started on the left side of his neck followed by another swelling on the right side four days later. He had a fever and limited neck movement due to the pain. There were neither history of insect bite, trauma over the neck, cough, runny nose, sore throat, ear infection, foreign body in throat nor toothache. Both swellings progressively increased in size despite completing one course of antibiotic provided by the local general practitioner. On day six of the illness, he developed orthopnea, dysphagia, odynophagia and limited mouth opening. He was then admitted to a private hospital and was given intravenous antibiotic. He was detected to have diabetes mellitus and his haemoglobin A1c(HbA1c) level was 14%. A contrasted computed tomography (CT) of the neck revealed bilateral collection over the parapharyngeal space with left internal jugular vein (IJV) thrombosis and narrowing of the airway at the oropharyngeal level. A chest radiograph showed no widening of mediastinum.

On examination, he appeared to be pink and not in respiratory distress. He had a muffled voice, but no audible stridor. He was afebrile, normotensive and his oxygen saturation was 100% under room air.

On the neck examination, there was a firm swelling on the right side of the neck measuring 17cm x 11cm extending from infraauricular region until the angle of mandible involving level II, III, IV as well as Ib and Ia over the midline towards the left side of the neck. He also had a 11cm x 10cm firm swelling on the left side of his neck extended from the infra-auricular region to the angle of mandible involving level II, III, as well as Ib (Figure 1). The overlying skin of his neck was inflamed, warm and tender to touch. The laryngeal framework such as thyroid notch and cricoid cartilage were not palpable and the tracheal was deviated to the left. An oral examination revealed trismus with two finger breath mouth opening, coated tongue and nicotine-stained teeth. No dental caries was identified. A flexible nasopharyngolaryngoscopy(FNPLS) revealed medialisation of bilateral lateral pharyngeal wall with narrowing of supraglottic area and the epiglottis appeared edematous. There was no bulging at posterior pharyngeal wall to suggest a retropharyngeal extension. Septic parameter raised with white blood cell count was 17, C-reactive protein (CRP) was 200mg/L and erythrocyte sedimentation rate was 56.

He was admitted to Intensive Care Unit(ICU) for close observation due to impending respiratory failure and was planned for incision and drainage. The challenges were during intubation for the surgery due to the edematous epiglottis and slit-like opening of supraglottis despite multiple attempts of fiberoptic intubation performed by senior anaesthesiologist (Figure 2). A life-saving emergency tracheostomy was performed later after patient developed cyanosis. It was also a challenging tracheostomy procedure as the overlying skin was indurated, the cricoid cartilage was not palpable, the trachea position was deviated with large thyroid gland was found overlying the trachea. However, we managed to secure the airway with an appropriate size of tracheostomy tube. The incision and drainage at right and left side of neck were done through separate incision. A 150cc thick pus mixed with blood was drained out from the right side and 50cc pus from the left side. The pus sent for culture revealed *Klebsiella pneumonia* and microscopic AFB was negative. He recovered well post-operation with intravenous antibiotics and regular wound care. The tracheostomy tube was decannulated at day 7 post drainage and he was discharged home at day 4 post decannulation.



Figure 1: Bilateral neck swelling that compressed the upper airway. Tracheostomy was performed after failed intubation.

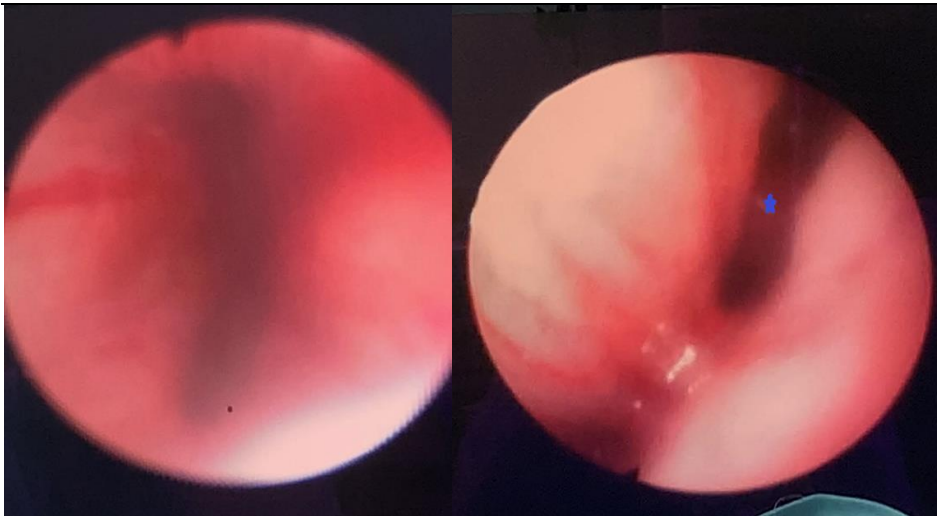


Figure 2: Flexible nasopharyngolaryngoscopy (FNPLS) images showing the medialisation of bilateral lateral pharyngeal wall with slit-like opening. Edematous epiglottis was obscuring the view of vocal cord (blue asterisk)

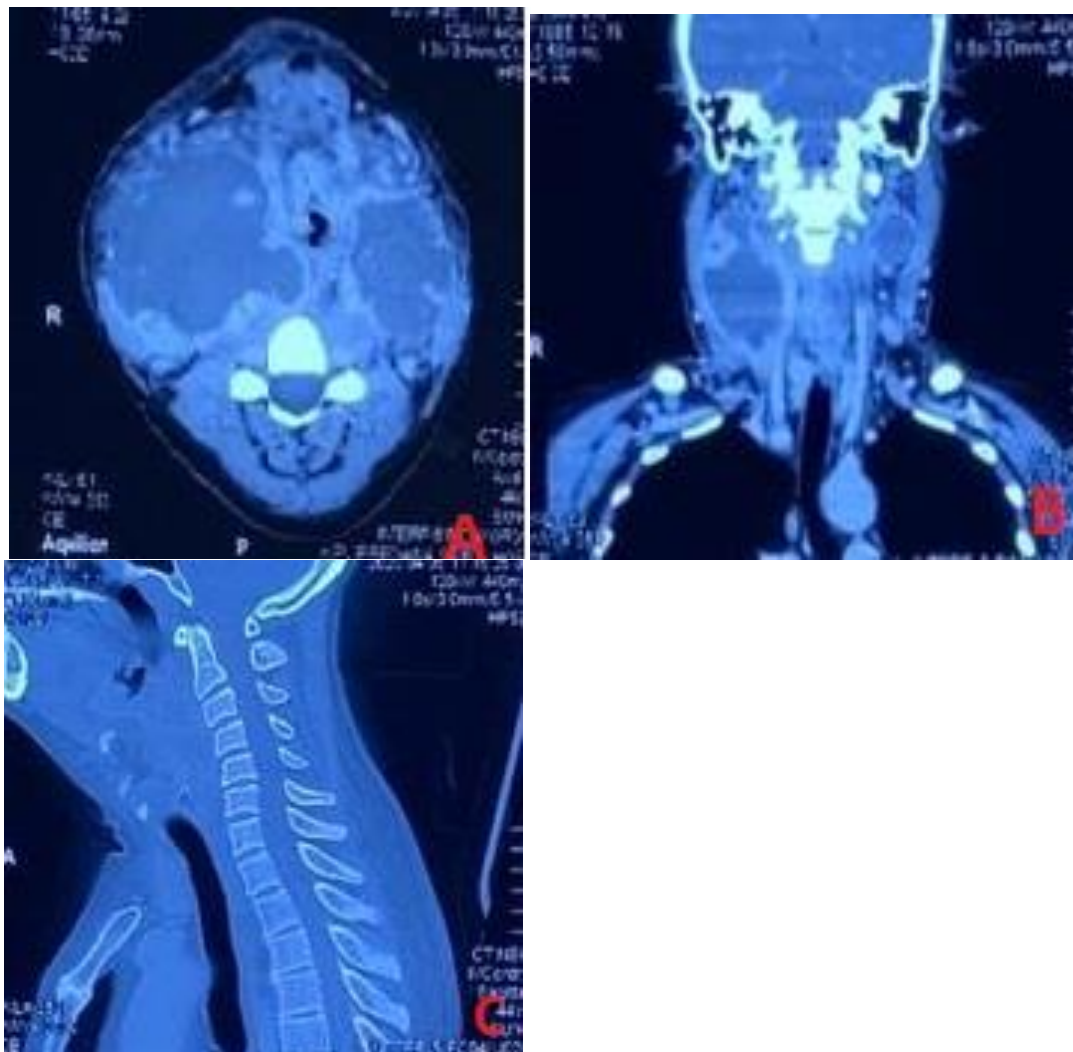


Figure 3: Computed Tomography (CT) of neck with contrast depicted hypodense collection at bilateral parapharyngeal space with ring enhancement (A, axial view). Left internal jugular patency was disrupted compared to the right side which suggested left IJV thrombosis (B, coronal view). There was obstruction of upper airway from the level of hyoid bone until thyroid cartilage (C, sagittal view).

DISCUSSION

Parapharyngeal abscess is the second most frequent deep neck space infection following peritonsillar abscess (2). The involvement of the bilateral parapharyngeal space in acute infection is rare as it is an enclosed space at both sides of the neck which is formed by fascia planes. It consists of lymph nodes, fat, connective tissues and vital structures such as carotid artery, internal jugular veins and cranial nerves. It is connected to the neighbouring space such as retropharyngeal and prevertebral space posteriorly, peritonsillar space anteriorly and carotid space. Infection at the retropharyngeal space and carotid space can easily spread to the mediastinum. Some authors suggested that abscess in carotid space can cause mediastinitis via Lincoln highway of the neck (3). This may imply why the parapharyngeal abscess is life-threatening and should be diagnosed early to prevent more complications. Bilateral parapharyngeal abscess collection may also occur either from a complication of tonsillitis or from the infection at one side parapharyngeal which spreads through retropharyngeal space to contralateral side but in our patient's case, there was no bulging identified at the posterior pharyngeal wall during the scope and there was no widening prevertebral space in the CT scan. He also had no acute tonsillitis previously and was denied for other risk factors.

An infection is a red flag in an immunocompromised patient especially with deep neck space infection. Early recognition of risks for low immunity population such as uncontrolled diabetes mellitus, history of chemotherapy, intake of immunosuppressant drugs and Human Immunodeficiency virus (HIV) infection is essential to start the treatment and intervention earlier. In our patient's case, the extensive neck abscess formation is possible secondary to his uncontrolled diabetes mellitus that weakens his immune system. His HIV screening was non-reactive, and he had no history of oncology treatment or on any immunosuppressant drugs before.

The diagnosis of deep neck space infection is by clinical and radiology. Magnetic Resonance Imaging (MRI) study is ideal for the assessment of the soft tissue and IJV thrombophlebitis with the benefits of being non-radiating. A CT scan with contrast was more easily available than the MRI in our hospital due to long queue and the time consumption for each MRI session. The CT study was adequate to identify the deep abscess collection and its extension for surgical mapping and as well as for an airway assessment prior to surgery. The appearance in the CT scan will be single or multiloculated hypodense appearance with an air (in anaerobic infection). There was also contrast enhancement at the abscess wall with its surrounding tissue edema (4). Hounsfield unit is another predictive value in a CT but unfortunately it cannot differentiate the collection much whether it is an abscess or a phlegmon (5). Ultrasound neck is another low-cost, non-radiating and portable radiology tool however it does not have sufficient information regarding deep anatomical involvement for the surgery (2).

Advancement in the technology especially in medical instrumentation also helps in managing the difficult airway case during intubation. Fiberoptic intubation is a gold standard procedure for management of difficult airway. In our case, this patient was well prepared for the difficult intubation and it was performed by an experienced anaesthesiologist in the operation theatre where all airway equipments were available with close monitoring of vital signs. This would reduce the risk of mortality and unnecessary procedure such as tracheostomy in certain cases where we anticipated a short-term use of a tracheostomy tube. Despite steroid therapy being controversial for causing immunosuppression, it has a promising result in reducing the airway edema (6) and to relieve the odynophagia and trismus (2). In our case, the patient was given a short course of intravenous dexamethasone with low dose 4mg thrice a day for a three days with close monitoring of his capillary blood sugar level.

study by Huang et al shows the common organisms which cause the deep neck space infection could be *Streptococcus* (38.3%), followed by *Klebsiella pneumoniae* (32.0%), *Peptostreptococcus* (17.2%), *Neisseria* species (9.4%), β -hemolytic streptococci (7.8%), *Staphylococcus aureus* (7.8%) and anaerobic bacterial infection (29.7%)(1). *Fusobacterium necrophorum* is associated with deep neck space infection with septic thrombophlebitis (2). The principle of the management of deep neck space infection is achieved by appropriate antibiotic use. Early antibiotic usage may reduce the risk of spreading the infection to its adjacent structures and might prevent the surgery. Most of the study recommended antibiotic therapy that primarily covers gram-positive, anaerobic as well as beta-lactamase producing bacteria.

An example of empirical antimicrobial therapy is Augmentin (a combination of amoxicillin and clavulanic acid) (2) alone or in combination with metronidazole and clindamycin (7). Our patient was also covered with broad spectrum antibiotic Tazocin (Piperacillin and Tazobactam), Metronidazole and Cloxacillin. Targetted antimicrobial according to the culture sensitivity is important in against the infection and prevent further spreading.

Surgical intervention is considered when there is poor response to the medical treatment and if it is a complicating abscess (2). Aspiration of the pus by ultrasound or CT guided is an alternative to the surgery. However, it is effective when the abscess is uniloculated with greatest dimension of 3cm or less in the imaging study. Insertion of pigtail catheter connected to vacuum suction will provide continuous drainage such as in the surgical drainage with the benefits of no large surgical scar and avoidance of painful post operation dressing. It is used when the collection is uniloculated, 3cm or larger in largest dimension or in a case of abscess that is within glandular structure such as thyroid or parotid gland (8). However surgical drainage is better in managing the multiloculated neck abscess as aspiration may not be able to drain out all of infectious loci and risk of re-accumulation of collection.

In a larger, multiloculated and complicated abscess, post-operative wound care is necessary following the surgery. The necrotic tissue overlying the wound bed should be removed as it is a nodus of bacterial growth and it disrupts the wound healing mechanism. Removal of non-viable tissue may not be sufficient during the incision and drainage operation and it requires multiple debridement during the wound dressing. It can be achieved through multiple methods such as mechanical, autolytic, enzymatic and biology depending on wound status, skills of physician and available resources (9). For our patient, we used a combination of mechanical debridement by using ribbon gauze packing inside the wound cavity with the povidone iodine which acted as a broad spectrum topical antimicrobial with its anti-inflammatory effects to reduce the bacterial load and facilitate the medical therapy. Subsequently upon discharge, the wound was improved and we changed to a modern wound dressing using an Aquacell Ag which aided in the wound fluid absorption and autolytic debridement of the necrotic tissue inside the wound.

CONCLUSION

Parapharyngeal abscess involving both sides of the neck is rare. It is diagnosed by clinical and radiology study. Anticipation of complication such as upper airway obstruction with the risk of difficult intubation should be considered. Therefore, a multidiscipline team management from the radiology, anesthesiology and medical teams were mandatory to get the definite diagnosis, securing airway, managing sepsis, optimization of diabetes mellitus and for the wound care. Both medical therapy and surgery should be in parallel in managing the deep neck abscess.

Conflict of interest

No conflict of interest was declared by the authors.

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