

Muhammad Harith Mohamed Rouse^{1,2}, Che Yusfarina Che Yusop²,
Rian Asmeida Farha Ahmad Rejab², Irfan Mohamad¹

Received: 28.07.2021

Accepted: 28.06.2022

Published: 30.12.2022

Uncommon extension of peritonsillar abscess

Nietypowy przypadek ropnia okołomigdałkowego

¹ Department of Otorhinolaryngology – Head & Neck Surgery, School of Medical Sciences, Universiti Sains Malaysia Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia

² Department of Otorhinolaryngology – Head & Neck Surgery, Hospital Sultan Abdul Halim, 08000 Sungai Petani, Kedah, Malaysia

Correspondence: Dr Irfan Mohamad, Department of Otorhinolaryngology – Head & Neck Surgery, School of Medical Sciences, Universiti Sains Malaysia Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia, e-mail: irfankb@usm.my

ORCID iDs

1. Muhammad Harith Mohamed Rouse <https://orcid.org/0000-0002-5279-2615>

2. Che Yusfarina Che Yusop <https://orcid.org/0000-0002-8855-1944>

3. Rian Asmeida Farha Ahmad Rejab <https://orcid.org/0000-0003-4270-9600>

4. Irfan Mohamad <https://orcid.org/0000-0001-8572-0514>

Abstract

Peritonsillar abscess refers to the collection of pus in between the tonsillar capsule and the superior constrictor muscle. The majority of patients with peritonsillar abscess recover uneventfully after intraoral drainage and antibiotic therapy. However, some patients who are immunosuppressed might deteriorate as infection spreads into the deep neck spaces or upper airway mucosa. We report a case of 48-year-old immunocompetent patient with peritonsillar abscess extending primarily into the parapharyngeal and retropharyngeal spaces, followed by unusual secondary extension into the masticator space, the submandibular region, and the anterior neck region. Both intraoral and extraoral incisions were conducted. The patient fully recovered after the drainage procedure and antibiotic treatment.

Keywords: peritonsillar abscess, masticator space, oropharyngeal infection, deep neck spaces infection

Streszczenie

Ropień okołomigdałkowy powstaje w wyniku gromadzenia się treści ropnej w okolicy między torebką otaczającą migdałek podniebienny a mięśniem zwieraczem górnym gardła. Większość pacjentów z ropniem okołomigdałkowym wraca do zdrowia bez powikłań po wykonaniu drenażu wewnątrzustnego i leczeniu antybiotykami. Jednak u niektórych osób z upośledzoną odpornością może dochodzić do pogorszenia stanu w miarę rozprzestrzeniania się zakażenia w obrębie przestrzeni głębokich szyi lub błony śluzowej górnych dróg oddechowych. W pracy przedstawiamy przypadek 48-letniego pacjenta bez upośledzenia odporności, u którego rozwinął się ropień okołomigdałkowy: pierwotnie w obrębie przestrzeni przygardłowej i zagardłowej, a następnie wtórnie – i nietypowo – w przestrzeni żwacza, okolicy podżuchwowej i przedniej części szyi. Przeprowadzono drenaż ropnia z dostępu wewnątrz- i zewnątrzustnego. Po zabiegu drenażu i zastosowaniu antybiotykoterapii pacjent w pełni powrócił do zdrowia.

Słowa kluczowe: ropień okołomigdałkowy, przestrzeń żwacza, zakażenie jamy ustnej i gardła, zakażenie przestrzeni głębokich szyi

INTRODUCTION

Peritonsillar abscess (PTA) is the most common type of deep infection of the head and neck⁽¹⁾. Its incidence peaks in young adults (aged 15–19 years; 167 cases per 100,000 population)⁽²⁾. PTA is described as the collection of pus in between the tonsillar capsule and the superior constrictor muscle. The diagnosis is based on the clinical presentation and examination. Patients usually present with fever, sore throat, dysphagia, voice changes, and sometimes cervical lymphadenitis. Intraoral examination typically demonstrates trismus with unilateral swelling and inflammation of the peritonsillar area and deviation of the uvula. The pathogenesis of PTA is still unclear, but closely related to exudative tonsillitis and bacterial spreads into the peritonsillar space via the salivary duct system⁽³⁾. The pattern of spread varies among patients, but there is a relatively constant trend in the dissemination of the infection through deep neck spaces because of the relationship with the cervical fascia, which directs and limits the spread of these infections^(4,5).

CASE REPORT

A 48-year-old man without underlying medical conditions presented to us with a three days' history of sore throat, odynophagia, dysphagia, change of voice, and decreased oral intake. There was no neck swelling or symptoms of compromised airways.

On general examination, the patient appeared comfortable, and presented with "hot potato voice" and mild trismus with no stridor or respiratory distress. There was no neck swelling or neck tenderness. Intraoral examination revealed a bulge in the right peritonsillar space, with the uvula pushed to the contralateral side and bilateral tonsils grade 3 (Fig. 1). Flexible nasopharyngolaryngoscopy (FNPLS) revealed mild oedema of the right arytenoid with no sign of upper airway obstruction.

He was treated for right-side PTA. Diagnostic needle aspiration followed by an incision over the right peritonsillar region was done, and 3 cc of pus was drained.

Laboratory tests revealed leucocytosis, normal electrolytes, and normal blood sugar level. He was then admitted for intravenous (IV) penicillin 2.4 MU every six hours. The patient's condition improved post-drainage. However, after three days, he developed painful anterior neck fullness with limited neck movement, and his odynophagia worsened, though he presented no sign of respiratory distress. Neck examination revealed diffuse swelling in the right submandibular area extending to the anterior neck from the infrahyoid level until the sternal notch with erythematous and warm underlying skin (Fig. 2). Repeated FNPLS showed oedema of the bilateral arytenoids, and the right side of the epiglottis, right lateral pharyngeal wall, and retropharyngeal wall.

Urgent computed tomography (CT) of the neck revealed right-side PTA extending to the retropharyngeal, right

parapharyngeal regions, right masticator space, bilateral submandibular region, and anterior neck from the infrahyoid level as far as the retrosternal region (Fig. 3). The antibiotic was changed to IV cefuroxime 750 mg every eight hours and IV metronidazole 500 mg every eight hours due to the extension of the collection.

Transcervical incision and drainage of the neck abscess and direct laryngoscopy were performed under general anaesthesia. Intraoperatively, there were multiloculated anterior neck abscesses extending superiorly as far as the bilateral submandibular space and submental space, and inferiorly as far as the level of the clavicle. About 100 cc of frank pus was drained out and sent for culture and sensitivity

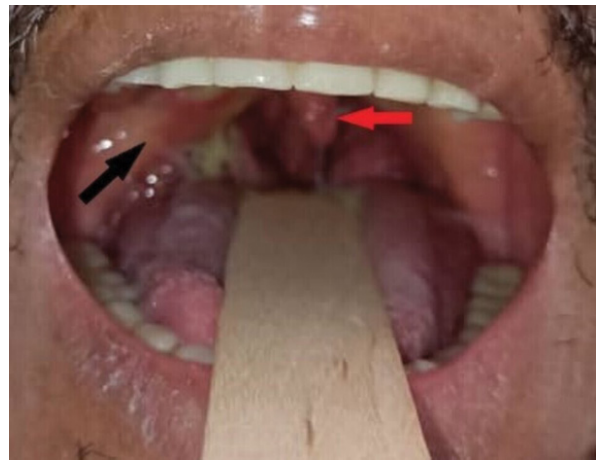


Fig. 1. Bulging and inflammation of the right peritonsillar area (black arrow) with deviation of the uvula to the left (red arrow)



Fig. 2. Swelling and erythema in the anterior neck (arrow)



Fig. 3. Sagittal CT view of the neck showing collection tracking from the hyoid bone (red arrow) downward as far as the retrosternal space (yellow arrow), anterior to the larynx and trachea

assessment. However, the culture resulted in no growth of bacteria. Direct laryngoscopy revealed oedema of bilateral arytenoids, right side of the epiglottis, and right lateral pharyngeal wall, and retropharyngeal wall. Small incisions were made over the oedematous area, however only serous discharge was noted.

Postoperatively, the patient's condition improved. He was discharged home six days later, after eight days of IV cefuroxime and metronidazole treatment. He was instructed to continue oral cefuroxime for another week.

DISCUSSION

Deep neck spaces infections usually have their preferred path for spread, as they develop inside a space which is lined by deep neck fascia^(4,5). Infections in the peritonsillar area usually spread outside into the parapharyngeal and retropharyngeal space. The parapharyngeal space has been reported as a secondary site of spread for PTA from infected pterygoid muscles. Lateral neck extension should be suspected in the presence of swelling or induration below the angle of the mandible or bulging of the pharyngeal wall from FNPLS. From the parapharyngeal space, infections may spread downward into the submandibular space and rarely into the masticator space⁽⁶⁾. There are muscles of mastication such as the masseter, pterygoid and temporalis muscles in the masticator space. Infections in this area are usually odontogenic in origin. However, there was no toothache complaint or findings of odontogenic infection in our case.

Another hypothesis for the extension to the masticator space from the parapharyngeal space is anteriorly from the parotid space^(5,7), but no clear infectious findings in the parotid space were found in our patient's CT scan. Moreover, in our case, CT demonstrated that the collection extended further downward into the anterior neck from the infrahyoid level as far as the retrosternal region. The infection rarely extends into the anterior neck but it can be suspected in the presence of anterior neck pain, erythema, or swelling, as demonstrated in our case.

PTA may also be complicated by necrotising fasciitis, which has been associated with higher mortality rates^(8,9). Another potential complication of PTA is descending mediastinitis, in which cervical infection originating from PTAs may descend through the cervical planes to the mediastinum⁽⁹⁾. The pathogenesis of PTA is still unclear, but closely related to exudative tonsillitis and bacterial spreads into the peritonsillar space via the salivary duct system⁽³⁾. Group A streptococcus is the most frequent organism cultured from PTA⁽¹⁰⁾. Reported predisposing factors for more severe complications of the spread of deep neck infection include diabetes mellitus (DM), advanced age, and treatment with immunosuppressive drug^(4,5,11). Systemic hyperglycaemia results in derangement of the immune system and thus causes the immunosuppressive state. In our case, the patient was a middle-aged man with no known comorbidities. His sugar level was within the normal range, and he had no history of immunosuppressive therapy, previous antibiotics or steroid use.

The diagnosis of PTA is usually based on the patient's clinical presentation and examination. Patients with PTA usually appear ill and report malaise, fever, worsening sore throat, and dysphagia⁽⁶⁾. Physical examination typically reveals trismus, and patients often have muffled or "hot potato voice." Tender cervical lymphadenitis may be palpated on the affected side as well. The oropharynx reveals unilateral bulging and erythema of the peritonsillar area, and also marked deviation of the uvula towards the contralateral side.

The presence of pus on needle aspiration confirms the diagnosis of PTA. However, if the diagnosis remains uncertain after needle aspiration, radiological evaluation such as CT scan may be helpful to demonstrate the presence and extent of the abscess⁽¹⁾. In addition, several small studies have shown that intraoral sonography can identify and distinguish abscess from cellulitis^(12,13). CT scan or magnetic resonance imaging (MRI) is useful, once there is a suspicion that infection has spread beyond the peritonsillar space⁽¹²⁾. CT scan can also be used to detect potential airway compromise. Compared to the CT scan, MRI is superior in terms of soft tissue definition and better at detecting complications of deep neck infection such as internal jugular vein thrombosis⁽¹²⁾.

Treatment modalities include needle aspiration, incision and drainage, and tonsillectomy, combined with antibiotic⁽⁴⁾. In our case, needle aspiration followed by intraoral incision and drainage were performed first, along with the administration of IV penicillin, as no extension was suspected at initial presentation. However, three days later, the patient's

condition worsened, with the development of painful anterior neck fullness. Anterior neck incision and drainage at a level inferior to the thyroid gland under general anaesthesia was preferred in our case, as the collection extended into the anterior neck from the infrahyoid level as far as the retrosternal region, as confirmed by CECT (contrast enhanced computed tomography) of the neck.

Every patient presenting with infection of the head and neck region should be given empiric antibiotic therapy until the culture result is available⁽¹⁴⁾. PTAs are polymicrobial mixtures of aerobic and anaerobic bacteria. Group A *Streptococcus*, *Staphylococcus aureus* and *Streptococcus milleri* group are the most commonly isolated aerobes, whereas *Fusobacterium necrophorum* is the predominant anaerobe^(1,15). Initial empiric antibiotic therapy should include antimicrobials effective against *Streptococcus* and anaerobes. *Streptococcus* species are almost universally sensitive to penicillin, and several studies have shown the clinical efficacy of IV penicillin alone after adequate drainage of abscess⁽¹⁶⁾. However, culture reports demonstrate a greater than 50% proportion of penicillin-resistance organisms in PTA, which has led to the routine use of broad-spectrum antibiotics as the first-line therapy^(12,16). Accordingly, our patient was started on IV penicillin 2.4 MU every six hours, and subsequently changed to broad-spectrum antibiotics, IV cefuroxime 750 mg every eight hours and IV metronidazole 500 mg every eight hours, as the patient's condition failed to improve.

Early diagnosis and treatment are crucial to prevent severe complications. Despite early surgical drainage combined with antibiotic treatment, our patient still developed a complication of PTA. Successful drainage was achieved in our case by combining intraoral incision at the original region of infection (peritonsillar space) with the extraoral approach (anterior neck region).

CONCLUSION

Peritonsillar abscess is a common head and neck infection, with a tendency to extend posteriorly or inferiorly, and rarely into the anterior neck or the retrosternal area. Spread of the infection may be predisposed by diabetes mellitus or advanced age, however patients with no comorbidities may also develop extensive head and neck infections. Early diagnosis and treatment are crucial to prevent severe complications. But the potential for preventing complications was difficult to estimate until the patient presented with complicated PTA.

Conflict of interest

We have disclosed any financial or personal connections with other persons or organisations which might negatively affect the content of this publication and/or claim authorship rights to this publication.

References

1. Galio NJ: Peritonsillar abscess. *Am Fam Physician* 2017; 95: 501–506.
2. Klug TE: Incidence and microbiology of peritonsillar abscess: the influence of season, age, and gender. *Eur J Clin Microbiol Infect Dis* 2014; 33: 1163–1167.
3. Klug TE, Rusan M, Fursted K et al.: Peritonsillar abscess: complication of acute tonsillitis or weber's glands infection? *Otolaryngol Head Neck Surg* 2016; 155: 199–207.
4. Hasegawa J, Hidaka H, Tateda M et al.: An analysis of clinical risk factors of deep neck infection. *Auris Nasus Larynx* 2011; 38: 101–107.
5. Maroldi R, Farina D, Ravanelli M et al.: Emergency imaging assessment of deep neck space infections. *Semin Ultrasound CT MR* 2012; 33: 432–442.
6. Albertz N, Nazar G: Peritonsillar abscess: treatment with immediate tonsillectomy - 10 years of experience. *Acta Otolaryngol* 2012; 132: 1102–1107.
7. Al-Belasy FA: Ultrasound-guided drainage of submasseteric space abscesses. *J Oral Maxillofac Surg* 2005; 63: 36–41.
8. Boninsegna M, Marioni G, Stramare R et al.: Cervical necrotizing fasciitis: an unusual complication of genuine peritonsillar abscess. *J Otolaryngol* 2005; 34: 258–261.
9. Klug TE, Greve T, Hentze M: Complications of peritonsillar abscess. *Ann Clin Microbiol Antimicrob* 2020; 19: 32.
10. Klug TE: Peritonsillar abscess: clinical aspects of microbiology, risk factors, and the association with parapharyngeal abscess. *Dan Med J* 2017; 64: B5333.
11. Hidaka H, Ishida E, Suzuki T et al.: Unusual parapharyngeal extension of peritonsillar abscess to the masticator space: successfully drained by extraoral and intraoral endoscopic approaches. *Ann Otol Rhinol Laryngol* 2014; 123: 333–337.
12. Powell J, Wilson JA: An evidence-based review of peritonsillar abscess. *Clin Otolaryngol* 2012; 37: 136–145.
13. Scott PM, Loftus WK, Kew J et al.: Diagnosis of peritonsillar infections: a prospective study of ultrasound, computerized tomography and clinical diagnosis. *J Laryngol Otol* 1999; 113: 229–232.
14. Vieira F, Allen SM, Stocks RMS et al.: Deep neck infection. *Otolaryngol Clin North Am* 2008; 41: 459–483, vii.
15. Powell EL, Powell J, Samuel JR et al.: A review of the pathogenesis of adult peritonsillar abscess: time for a re-evaluation. *J Antimicrob Chemother* 2013; 68: 1941–1950.
16. Kieff DA, Bhattacharyya N, Siegel NS et al.: Selection of antibiotics after incision and drainage of peritonsillar abscesses. *Otolaryngol Head Neck Surg* 1999; 120: 57–61.