

Case Report

Management of submandibular abscess with candidiasis complications

Iip Berliananda^{1,2} and Benny Kurnia^{1,2*}

¹Department of Ear, Nose, Throat, Head and Neck Surgery, Faculty of Medicine, Universitas Syiah Kuala, Banda Aceh, Indonesia; ²Departement of Ear, Nose, Throat, Head and Neck Surgery, Dr Zainoel Abidin Banda Aceh, Indonesia

*Correspondence:

Benny Kurnia

Department of Ear, Nose, Throat, Head and Neck Surgery, Faculty of Medicine, Universitas Syiah Kuala, Banda Aceh, Indonesia

E-mail address:

drbenny_kurnia@yahoo.com

Abstract

Submandibular space is part of the deep neck fascial spaces, bordered by the oral mucosa of the mouth floor on the above and the superficial layer on the deep cervical fascia on the bottom, as it extends from the mandible to hyoid bone. Submandibular space frequently involves odontogenic infections, which can cause significant mortality and morbidity. Open surgical incision and drainage are the treatment of choice for submandibular space abscesses. This is a case report of a 47-years-old female with main complaint of mass on the right submandibular that she has experienced for 2 weeks. The mass release pus which is felt flow down the throat. Physical examination revealed a soft, tender mass of 55 mm x 20 mm diameter in the right submandibular region. Oral status of the patient revealed presence of oral candidiasis too. There was no complication of trismus, swallowing pain or paralysis of the lower lip. The patient's temperature was 38.5°C. Laboratory examinations showed a raised white blood cell count and slightly decreased albumin level. Intraoral swelling and redness of gingiva on the right upper middle incisor were observed. The patient was successfully treated by abscess drainage, oral antibiotics and nystatin.

Keywords: Submandibular abscess, candidiasis, open surgical incision, drainage, antibiotics

Introduction

The structures within the neck are surrounded by a fibrous connective tissue called the cervical fascia, which is divided into a deep and superficial layer. These layers create potential spaces: the superficial and deep space. Submandibular space is part of the deep neck spaces (Maharaj, 2018). The deep neck spaces are regions of loose connective tissue between the three layers of deep cervical fascia (superficial, middle, and deep layer) (Rizzo and DaMosto, 2009). It is bordered above by the oral mucosa of the mouth floor and below by the superficial layer of the deep cervical fascia as it extends from the mandible to the hyoid bone (Ardehali et al., 2012). The submandibular space can be affected by many disease processes including acute and chronic infections. These infections can lead to a suppurative process occurring within the submandibular space (Maharaj, 2018).

Submandibular infections are common in children and adults. However, the presentation, progression, and management were very different. Based on a study in 2020 conducted at oto-rhino-laryngeal-head and neck surgery (ORL-HNS) Department of Sanglah Hospital, Denpasar on 36 patients with submandibular access, most of them (61.11%) were men, aged 31-40 years (35.71%). (Setiawan and Putra, 2020).

Submandibular space is frequently involved in odontogenic infections. Several reports have indicated that the origins of most DNI's are odontogenic infections. (Ardehali et al., 2012; Rizzo and DaMosto, 2009). Moreover, submandibular space infections might also be a consequence of submandibular gland sialadenitis, lymphadenitis, trauma, surgery, or involved secondarily in other deep neck spaces infection (Rizzo and DaMosto, 2009). Infections within the submandibular space

Article Information

Received : 01 Jan 2023

Accepted : 24 Mar 2023

Published : 01 Jun 2023

can spread along fascial planes into the neck and the mediastinum and might involve the neurovascular structures within the neck. Infection within these spaces can cause significant mortality and morbidity (Maharaj, 2018).

Open surgical incision and drainage remain as the treatment of choice for submandibular space abscesses, **although** current guidelines also suggest the use of high doses of broad-spectrum intravenous antibiotics. In the cases of large abscesses or multiple space involvement, an open surgical incision and drainage are promptly performed. The external cervical approach is most often used when draining the submandibular space. Minimally invasive techniques have been used more recently for well defined, unilocular abscesses in patients who do not have airway problems (Ardehali et al., 2012). This is a report of a patient with submandibular abscess who underwent an open surgical incision and drainage at Dr. Zainoel Abidin Hospital, Banda Aceh, Indonesia.

Case

A 47-years-old female patient was referred with a chief complaint of mass on the right submandibular region, that she has experienced for 2 weeks prior to hospital visit. The mass released pus which was felt flowing down the throat. The patient also complained of pain and difficulty in swallowing.



Figure 1. Clinical presentation before the open incision and drainage

Previously, the patient also experienced the same complaint on the left submandibular region, but the mass disappeared by itself. The patient was diagnosed with type 2 diabetes.

Physical extraoral examination showed a soft, tender mass of 55 mm x 20 mm in diameter on the right submandibular region (Figure 1). Well-defined border was found, which was extended from the lower border of mandible to the upper border of thyroid cartilage. The surface skin was slightly red. No complication of trismus, swallowing pain or paralysis of the lower lip were reported. The patient's temperature was 36.6°C. Intraoral swelling and redness at the gingiva of the right upper region were observed. Oral status of the patient revealed history of odontogenic infection and presence of oral candidiasis.

Laboratory findings showed increased white blood cell/WBC count (10.800/ μ l), a slightly decreased albumin level (3,20 g/dL) and creatinine serum (0,40 mg/dL). Contrast CT demonstrated localized abscess on the right submandibular space (Figure 2). Based on the clinical findings and other examinations, a preliminary diagnosis of a submandibular abscess was established.

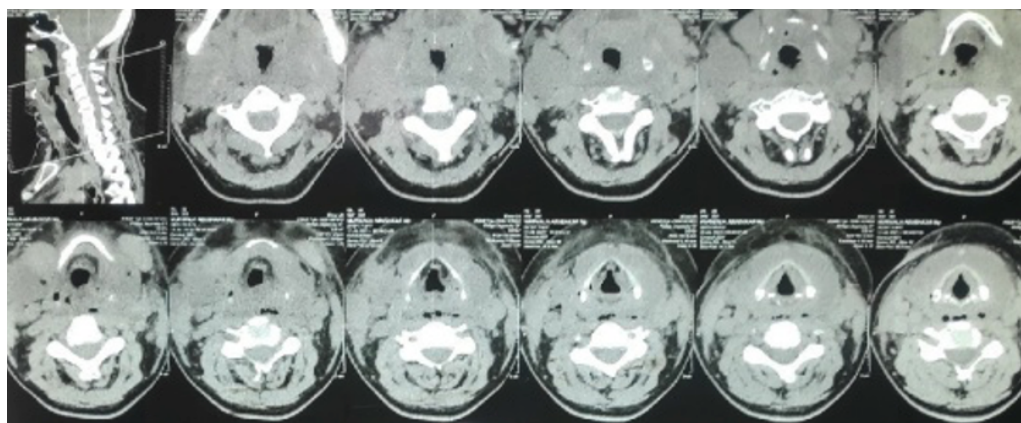


Figure 2. Submandibular abscess contrast CT scan.

The patient was taken to the operation theatre for a right transcervical incision and drainage of abscess and removal of the right submandibular region. The procedure was completed without incidents, and the patient was discharged from the hospital a few days later. No signs or symptoms of infection or other complications were found but a candidiasis oral. Thus, the patient was prescribed peroral nystatin for a few days.



Figure 3. Post open surgical incision and drainage (A) and Candidiasis oral complication, before given treatment (B).

Discussion

Submandibular space is a part of the deep neck spaces that can be affected by many disease including acute and chronic infections. These infections might lead to a suppurative process occurring within the submandibular space and might spread along fascial planes into the neck and into the mediastinum. Moreover, it can also involve the neurovascular structures within the neck (Maharaj, 2018).

A common cause of deep neck infections is an odontogenic infection in which the causative germ is usually a mixture of aerobes and anaerobes germs. In a study conducted by Megran et al, 76.9% of submandibular abscesses were odontogenic. In this patient, the risk factor that caused the disease was odontogenic infections, since the patient had a history of tooth ache around 1 month prior to the complaint (Megran et al., 2017; Setiawan and Putra, 2020).

Knowing the cause of the disease is very important, because the administration of antibiotics in cases of infection is urgently needed. In addition, inappropriate use of antibiotics, steroids, and nonsteroidal anti-inflammatory drugs can mask signs of infection and alter the clinical presentation, making it more difficult to diagnose, and might also lead to slower disease course, delayed recovery, and development of complications (Rizzo and DaMosto, 2009).

Clinical symptoms of submandibular abscess include fever, pain with swelling under the mandible and/or under the tongue, and fluctuation. There may also be pain in the floor of the mouth, trismus, submandibular induration and erythema and oedema of the under chin's skin (Setiawan and Putra, 2020). Swelling under the mandible and pain were found in this patient, where the submandibular got slightly erythema and oedema of the skin under the chin was found. Megran et al. stated that the symptoms of swelling and pain were the main complaints of most patients with deep neck abscesses. This is supported by his study of 128 deep neck abscess patients who found that 98% of patients complained of swelling, 96% of patients complained of pain while 73% of patients complained of fever (Megran et al., 2017). Computed tomography with contrast was the gold standard of supportive examination to diagnose and assess the abscess extent. CT contrast on this patient showed a localized abscess in the right submandibular space (Brito et al., 2016).

Many studies have shown the association of diabetes mellitus (DM) with submandibular abscess. Huang et al. and Lee et al. showed that elderly patients with DM were susceptible to deep neck infections. In DM patients, hyperglycemia can interfere with several host humoral defence mechanisms, such as various neutrophil functions: adhesion, chemotaxis and phagocytosis and predispose to infection and complications. This patient has a history of type 2 diabetes that might be associated with the disease (Brito et al., 2016).

The management of submandibular abscess remains particularly troublesome due to the complex anatomy of the neck, polymicrobial etiology, and life-threatening complications that may arise. The mainstay of treatment of submandibular abscess consists of airway control, antibiotic, and, if necessary, surgical drainage. The maintenance of a safe and secure airway is mandatory. In patients with bilateral submandibular swelling, an airway obstruction can be the result of the tongue pushing against the roof of the mouth and the posterior pharyngeal wall, or as a consequence of anterior visceral space involvement with laryngeal edema (Rizzo and DaMosto, 2009).

Antibiotic therapy was empirically initiated before culture and sensitivity results are available. The choice of amoxicillin plus clavulanic acid as the first-line treatment in 82.1% of cases was based on the coverage of bacteria commonly found in our environment, both aerobic and anaerobic gram (Brito et al., 2016). In regards to bacterial culture in submandibular abscess, Hossein et al. reported that as much as 46% was aerobic bacteria, 33% anaerobic bacteria and 21% was a combination of aerobic and anaerobic bacteria. In submandibular abscess originating from dental infection, the most often found bacteria were Streptococcus group and anaerobic bacteria (Hosein et al., 2015).

Open surgical incision and drainage are considered the mainstay of treatment for submandibular space abscesses. Surgery is often necessary to establish drainage and for the culture diagnosis of microorganisms. (Ardehali et al., 2012; Maharaj, 2018). In the case of large abscesses or multiple space involvement, an open surgical incision and drainage are promptly performed. Meanwhile, in patients with small abscesses, a watch and wait policy is applied for 48 hours; if a lack of response to medical treatment is noted clinically, the patient is then treated with an open surgical drainage (Rizzo and DaMosto, 2009).

Complications of submandibular abscess include airway obstruction, mandibular osteomyelitis, spread of infection to the nearby deep neck space, mediastinitis and sepsis. Rainer et al. stated that there was another deep neck space involvement in 38.6% of patients with submandibular abscess (Rainer et al., 2016).

In regards to diabetes and submandibular space complications, a controlled glucose level is warrant. Controlled glucose is considered good if the A1c rate is less than 7%, and poor if the A1c level is greater than 8%, according to the American Diabetes Association. The presence of *Candida albicans* fungal infection in the oral cavity was found to be substantially linked with an A1c value > 12 %. A research conducted at Haji Hospital in 2017 on 6 patients with controlled diabetes mellitus and 12 patients with uncontrolled diabetes mellitus found that the later had oral candidiasis. However, oral candidiasis might also occur in patients with well-controlled diabetes. The function of the salivary glands is also affected in patients with diabetes mellitus. Hyposalivation (decreased saliva volume) is produced by salivary gland dysfunction, results in xerostomia (dry mouth). *Candida albicans* can remain attached to the surface of the oral cavity, decreases salivary flow rate, causes a decrease in self-cleansing activity (Huang et al., 2005).

The reported patient was successfully treated with open surgical incision and drainage, where the procedure was completed without incident. However, a complication of oral candidiasis was found in this patient.

In the light of these considerations, particular attention should be paid to diabetic patients, and early surgical drainage should also be considered in apparently less severe cases. Comorbidities and immunosuppression from polypharmacy, frequently occurring in older patients, may predispose these patients to more severe infections as well as make clinical presentation more elusive (Rizzo and DaMosto, 2009).

Conclusion

From this case, it can be concluded that submandibular abscess can be well treated with an open surgical incision and drainage management. Surgery is often necessary to establish drainage and microorganisms culture. Antibiotics are vital in treatment, and need to adequately cover the microorganisms that cause infection. The choice of antibiotic is best determined by culture and sensitivity reports. Moreover, antibiotic treatment is also important to avoid complications.

Authors' contributions

Conceptualization: IB and BK; Data curation: IB; Investigation: IB; Resources: IB and BK; Supervision: BK; Validation: IB and BK; Writing-original draft preparation: IB; Writing-review and editing: IB and BK.

Acknowledgments

The authors would like to thank to all staff at Department of Ear, Nose, Throat, Head and Neck Surgery, Dr Zainoel Abidin Banda Aceh, Indonesia.

Conflict of interest

There is no conflict of interest was reported by the authors.

Funding

This study received no external funding.

References

- Ardehali MM, et al. Submandibular Space abscess: a clinical trial for testing a new technique. *American Academy of Otolaryngology–Head and Neck Surgery*, 2012; 146(5): 716-718.
- Brito TP, et al. Deep neck abscesses: study of 101 cases. *Brazilian Journal of Otorhinolaryngology* 2016; 83(3): 341-348.
- Hosein GX, et al. Bilateral Submandibular abscess: A case presentation and review of the current literature with regard to the controversies in diagnosis and treatment. *Case Reports in Medicine*, 2015.
- Huang TT, et al. Deep neck infection in diabetic patients: comparison of clinical picture and outcomes with nondiabetic patients. *Otolaryngol Head Neck Surgery* 2005; 132(6): 943-247.
- Maharaj SH. A Review of the Microbiology of Submandibular Space Infections. *The Association of Oral and Maxillofacial Surgeons of India*. 2018; 18(4): 584-588.
- Megran DW, et al. Odontogenic infections. in: *pediatric infection disease FD*. Oral Surgery. Berlin: Springer-Verlag, 2017.
- Rainner S, et al. Unilateral Marginal mandibular nerve paresis: A rare complication of submandibular space infection. *Journal of Nepal Dental Association*, 2016.
- Rizzo PB and DaMosto MC. Submandibular space infection: a potentially lethal infection. *International Journal of Infectious Disease*. Italy. Elsevier, 2009.
- Setiawan PDA and Putra DAE. 2020. Karakteristik penderita abses submandibular di departemen tht-kl rsup sanglah denpasar. *KSM Kesehatan THT-KL Fakultas Kedokteran Universitas Udayana*. Bali Indonesia. *Medicina*, 2016.