Parotid abscess at a single institute in Korea
Young Yoon Kim, MD, Dong Hoon Lee, MD, Tae Mi Yoon, MD, Joon Kyoo Lee, MD, Sang Chul Lim, MD

Abstract
Objective: To investigate clinical features, treatment modality, and outcomes of patients with parotid abscess.
Methods: A retrospective chart review was conducted at Chonnam National University Hwasun Hospital January, 2006 to July, 2017.
Results: Among 13 patients, 4 patients had immunocompromised disease, and 3 patients had been diagnosed with pre-existing parotid tumor. Patients were treated with empirical intravenous broad-spectrum antibiotics. Among 13 patients, 7 patients (53.8%) had surgical incision, and drainage was conducted. There was no recurrence or death associated with parotid abscess; however, 1 patient with parotid abscess developed facial nerve palsy that persists, despite adequate treatment.
Conclusion: After adequate treatment, including antibiotics and surgical drainage, the prognosis of parotid gland is good. In the case of parotid abscess of immunocompromised patients, we suggest rapid surgical procedure for speedy recovery and minimizing adverse effects.
Abbreviation: CT = computed tomography.
Keywords: abscess, antibiotics, parotid gland, surgical procedure

1. Introduction
Parotid abscess is rare disease in children and adults, and is most found in patients with immunocompromised, dehydrated, or postoperative conditions. In addition, it is difficult to distinguish between parotid abscess and acute parotitis without further radiologic examinations. Therefore, there have not been many reports on parotid abscess.

This study presents our 12-year experience with 13 cases of parotid abscess in an institute. The purpose of this study was to investigate clinical features, treatment modality, and outcomes of patients with parotid abscess.

2. Materials and methods
After obtaining approval from the Institutional Review Board of Chonnam National University Hwasun Hospital, a retrospective chart review was conducted to evaluate patients with diagnosis of parotid abscess at the Department of Otolaryngology-Head and Neck Surgery (January, 2006 to July, 2017). Thirteen patients with parotid abscess diagnosed by computed tomography (CT) were enrolled in this study.

Charts were reviewed to obtain information about age at diagnosis, sex, underlying disease, symptoms, symptom duration, location and size of parotid abscess, diagnostic modality, treatment method, microbiological results, hospitalization period, and complications.

3. Results
A summary of 13 cases (11 males [84.6%] and 2 females [15.4%]; age range 7–80; mean 51.0±24.3) is presented in Table 1. Among 13 patients, 4 had immunocompromised disease, such as diabetes mellitus (n=2), cyclic neutropenia (n=1), and aplastic anemia (n=1). Three patients had been diagnosed with pre-existing parotid tumor for 1 month, 1 month, and 2 years, respectively, without prior surgical treatment. Two patients had a history of dental problems. There is no one with history of recent operation or recurrent parotid infection.

Thirteen patients with parotid abscess presented with unilateral parotid swelling and pain. Duration of symptoms ranged from 1 to 30 days (mean 9.4±10.3 days). All patients had undergone CT scan to determine the extent of the lesion and to eliminate other diseases. The location of the parotid abscess was the right side of the neck in 9 patients (69.2%), and the left side of the neck in 4 patients (30.8%). Six patients (46.1%) had lesions in the superficial lobe of parotid gland, 3 (23.1%) had a lesion in the deep lobe, and 4 (30.8%) had a lesion in the entire parotid gland. The size of parotid abscess ranged from 1.3 to 4.5 cm (mean 3.4±1.0 cm).

Patients were treated with empirical intravenous broad-spectrum antibiotics, fluid supplementation, and oral hygiene maintenance. Among 13 patients, 7 patients (53.8%) had surgical incision and drainage conducted. There were no major complications resulting from surgical intervention. One patient did not improve the parotid abscess after the first surgical intervention, and required further surgery.

In microbiologic study, abscess culture was derived from 9 patients, 4 patients were positive, and 5 were negative for bacterial...
growth. For 4 patients with positive bacterial culture, *Pseudomonas aeruginosa*, *Prevotella intermedia*, *Staphylococcus epidermidis*, and *Propionibacterium acnes* were isolated, respectively.

Duration of the hospitalization period ranged from 5 to 41 days (mean 13.8 ± 9.1 days). One patient with parotid abscess developed facial nerve palsy, despite antibiotics treatment. The facial nerve palsy was not improved after 2 surgical interventions, and has persisted at 3 years’ follow-up. Among 3 patients with pre-existing parotid tumors, 1 patient had parotidectomy conducted after recovery of parotid abscess, diagnosed as a Warthin tumor. Another patient is expected to undergo parotid tumor surgery this year. The last patient was lost in follow-up after discharge from our hospital.

Recurrence or death associated with parotid abscess was not observed in patients at the time of the last follow-up.

### 4. Discussion

Parotid abscess can arise from ascending infection via Stensen duct, or secondary to bacteraemia. Parotid abscess is commonly associated with elderly debilitated, or immunocompromised patients. In this study, there were 7 patients (53.8%) in old age, or immunocompromised state. One occurrence in our study: there were 3 patients with pre-existing parotid tumors.

The most common symptom of parotid abscess is painful swelling at the angle of the jaw, and patients had presented this symptom. Regional lymphadenopathies, facial nerve palsy, or purulent secretion from Stensen duct can sometimes be detected. Facial nerve palsy may develop due to virulent microorganism, perineuritis, or nerve compression. In some patients, parotid abscess progress necrosis of parotid gland, deep neck space infection, or septicaemia, and can be life-threatening. In this study, necrotizing parotitis and septicemia occurred in 7-year-old boy with cyclic neutropenia. We treated the patient with intravenous antibiotics and 2 surgeries.

However, it is difficult to distinguish between parotid abscess and acute parotitis by clinical features, and radiologic examinations are required. CT and ultrasound are critical diagnostic modalities of parotid abscess. Ultrasound has the advantage of being noninvasive, easy, fast, and inexpensive. In addition, it is also useful in parotid abscess aspiration and evaluation of treatment results. CT is most commonly used to diagnose parotid abscess.

We conducted CT scans in patients. In parotid abscess, CT scans reveal low attenuated lesion, single cystic like lesion, multiple loculated appearance, or contrast enhancement of the abscess wall. The most common pathogen of parotid abscess is *Staphylococcus aureus*. However, low rate of positive culture of parotid abscess has been reported because of preadmission antibiotic therapy, as with our results.

Management of parotid abscess includes administration of broad-spectrum antibiotics, hydration, and surgical drainage. Compared with acute parotitis, parotid abscess often requires surgical drainage. Surgical drainage is necessary if failure of medical therapy and facial nerve involvement, spread to deep neck space, or risk of septicemia. In this study, 7 patients (53.8%) had surgical incision and drainage conducted according to above indications. One patient did not improve the parotid abscess after the first surgical incision and drainage, and superficial parotidectomy was conducted.

After adequate treatment of parotid abscess, the prognosis is good. Facial nerve palsy due to parotid abscess also has good prognosis. In this study, we found no recurrence or death associated with parotid abscess; however, 1 patient with parotid abscess developed facial nerve palsy that has persisted at 3 years’ follow-up. Immunocompromised patients had lengthier hospitalization period, as with previous reports. The limitation of this study was the small sample size and retrospective review.

### 5. Conclusions

Parotid abscess is a rare clinical condition, and radiologic examinations are required for differentiating from other parotid diseases. If adequate treatment, such as administration of broad-spectrum antibiotics and surgical drainage may be conducted, prognosis of parotid gland is good. In case of parotid abscess of immunocompromised patients, we suggest rapid surgical procedure for speedy recovery and minimizing adverse effects.

### Author contributions

Conceptualization: Dong Hoon Lee.
Data curation: Young Yoon Kim, Dong Hoon Lee, Tae Mi Yoon, Joon Kyoo Lee, Sang Chul Lim.
Formal analysis: Young Yoon Kim, Tae Mi Yoon.
Investigation: Joon Kyoo Lee.
Supervision: Dong Hoon Lee, Tae Mi Yoon, Joon Kyoo Lee, Sang Chul Lim.
Writing – original draft: Young Yoon Kim, Dong Hoon Lee.
Writing – review & editing: Dong Hoon Lee, Sang Chul Lim.

References
[1] Tan VE, Goh BS. Parotid abscess: a five-year review: clinical presentation, diagnosis and management. J Laryngol Otol 2007;121:872-9.
[2] Chi TH, Yuan CH, Chen HS. Parotid abscess: a retrospective study of 14 cases at a regional hospital in Taiwan. B-ENT 2014;10:315-8.
[3] Ganesh R, Leese T. Parotid abscess in Singapore. Singapore Med J 2005;46:553-6.
[4] Ozkan A, Oys CH, Kosar S, et al. Parotid abscess with involvement of facial nerve branches. J Coll Physicians Surg Pak 2015;25:613-4.
[5] Viselner G, van der Byl G, Maira A, et al. Parotid abscess: mini-pictorial essay. J Ultrasound 2013;16:11-5.
[6] Kristensen RN, Hahn CH. Facial nerve palsy caused by parotid gland abscess. J Laryngol Otol 2012;126:322-4.
[7] Saarinen RT, Kolho KL, Pirkärinta A. Cases presenting as parotid abscesses in children. Int J Pediatr Otorhinolaryngol 2007;71:879-901.
[8] Lakshmi Narayana M, Azeem Mohiyuddin SM, Mohammadi K, et al. Parotid abscesses in children: a tertiary rural hospital experience. Int J Pediatr Otorhinolaryngol 2015;79:1988-90.