Parotid abscess: a retrospective study of 14 cases at a regional hospital in Taiwan

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Abstract. Parotid abscess: a retrospective study of 14 cases at a regional hospital in Taiwan. Problem/objective: Acute suppurative sialadenitis commonly affects the parotid gland. However, acute suppurative parotitis with abscess formation is less common and possibly complicated by deep neck space infection and sepsis. Our aim was to analyze the clinical features, radiological findings, treatment modalities, and microbiology of parotid abscesses treated at a regional hospital in Taiwan over a 15-year period.

Methods: Records from patients diagnosed with acute suppurative parotitis or parotid abscesses between January 1998 and December 2012 were retrospectively reviewed. Parotid abscesses were confirmed by computed tomography (CT) examinations.

Results: Fourteen patients (9 males; mean age ± standard deviation, 49.6 ± 14.4 [range, 22-75] years) with parotid abscesses were included. Painful swelling at the angle of the jaw was the most common symptom. All patients sustained unilateral parotid abscesses, with left-sided lesions in 10 patients, and right-sided ones in 4 patients. Radiographically, 13 of 14 abscess lesions were located in the superficial lobe, and 1 was in the deep lobe of the parotid gland. Besides sufficient fluid hydration, maintenance of good oral hygiene, and administration of parenteral antibiotics, all patients were treated with surgical incision and drainage. Klebsiella pneumoniae was the organism most commonly isolated from abscess cultures.

Conclusions: Parotid abscesses were found in about one fifth of patients with acute infectious parotid disease. Parenteral antibiotics plus surgical incision and drainage was the treatment of choice.

Introduction

Acute suppurative parotitis is a form of acute suppurative sialadenitis that occurs in the parotid gland, one of the major salivary glands. According to the literature, acute suppurative parotitis is most often found in patients who are debilitated, immuno-compromised, or dehydrated, or who have post-operative conditions.1 A parotid abscess is an acute suppurative parotitis with an abscess formation and is relatively uncommon in clinical practice. Clinically, it is not easy to distinguish between parotid abscesses and acute suppurative parotitis without further radiological examination. In the present study, records from a series of 14 patients with parotid abscesses treated at a regional hospital in Taiwan were reviewed. The clinical features, radiological findings, treatment modalities, and microbiological results were further analyzed.

Materials and methods

The medical records of patients diagnosed with acute suppurative parotitis or parotid abscess between January 1998 and December 2012 who were treated at a regional hospital in Taiwan were retrospectively reviewed. Patients who did not complete treatment were excluded. Among 71 patients diagnosed with acute infectious parotid disease, 14 patients with parotid abscesses diagnosed by computed tomography (CT) were enrolled in this study. The factors included for analysis were age, gender, clinical symptoms, CT findings, treatment modalities, and microbiological results. Descriptive analyses of the data were conducted using Microsoft Office Excel.

Results

Of 71 patients diagnosed with acute infectious parotid disease, 14 (19.7%) cases of parotid abscess were diagnosed based on CT findings. Nine of these cases were males (64.3%) and five were females (35.7%) with a male: female ratio of 1.8:1. The mean age ± standard deviation (SD) was 49.6 ± 14.4 years (range, 22 to 75 years). Approximately 78.6% (11/14) of the patients were aged less than 60 years (Table 1).
A lesion in the deep lobe of the parotid gland. No parotid gland calculi were found in any of the patients.

All patients were treated with empiric parenteral broad-spectrum antibiotics, adequate fluid supplementation, and oral hygiene maintenance as well as surgical incision and drainage. Thirteen patients with parotid abscesses in the superficial lobe were treated with the modified Blair incision operation, and the patient with a parotid abscess in the deep lobe underwent an adjusted operation in which the incision was made only from the mastoid process and extended to the upper neck crease. Bipolar cautery and ligation were used for hemostasis throughout the operation. A curved hemostat was used to make multiple openings in the parotid gland and was spread parallel to the presumed course of the facial nerve branches. One patient had (7.1%) postoperative saliva leakage that resolved within one month after conservative treatment.

In the abscess cultures derived from these 14 cases, 8 (57.1%) were positive and 6 (42.9%) were negative for bacterial growth. For each positive culture, only one predominant microorganism was characterized. *Klebsiella pneumoniae* was the most frequently isolated bacteria in the

### Table 1
Demographic characteristics of the 14 patients with parotid abscesses

<table>
<thead>
<tr>
<th>No.</th>
<th>Gender</th>
<th>Age, years</th>
<th>Duration of symptoms, days</th>
<th>Hospital stay, days</th>
<th>Location</th>
<th>Underlying diseases†</th>
<th>Abscess culture</th>
<th>Postoperative complication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>48</td>
<td>3</td>
<td>15</td>
<td>L, S</td>
<td>DM</td>
<td><em>Klebsiella pneumoniae</em></td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>62</td>
<td>5</td>
<td>25</td>
<td>L, S</td>
<td>DM, HTN</td>
<td><em>Finegoldia magna</em></td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>65</td>
<td>5</td>
<td>9</td>
<td>L, D</td>
<td>None</td>
<td>Negative</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Male</td>
<td>56</td>
<td>10</td>
<td>8</td>
<td>L, S</td>
<td>HTN</td>
<td><em>K. pneumoniae</em></td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Male</td>
<td>75</td>
<td>7</td>
<td>20</td>
<td>L, S</td>
<td>DM, Pulmonary TB</td>
<td><em>Haemophilus influenzae</em></td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
<td>36</td>
<td>12</td>
<td>15</td>
<td>R, S</td>
<td>None</td>
<td><em>K. pneumoniae</em></td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Male</td>
<td>22</td>
<td>4</td>
<td>8</td>
<td>L, S</td>
<td>None</td>
<td><em>Staphylococcus aureus</em></td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Female</td>
<td>54</td>
<td>6</td>
<td>19</td>
<td>L, S</td>
<td>None</td>
<td>Negative</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>Male</td>
<td>49</td>
<td>6</td>
<td>7</td>
<td>R, S</td>
<td>None</td>
<td><em>K. pneumoniae</em></td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>Female</td>
<td>47</td>
<td>8</td>
<td>13</td>
<td>L, S</td>
<td>DM</td>
<td>Negative</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td>Female</td>
<td>50</td>
<td>6</td>
<td>10</td>
<td>L, S</td>
<td>None</td>
<td>Negative</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>Female</td>
<td>50</td>
<td>4</td>
<td>11</td>
<td>R, S</td>
<td>None</td>
<td><em>S. aureus</em></td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>Female</td>
<td>59</td>
<td>3</td>
<td>27</td>
<td>L, S</td>
<td>DM</td>
<td>Negative</td>
<td>Saliva leakage</td>
</tr>
<tr>
<td>14</td>
<td>Male</td>
<td>22</td>
<td>8</td>
<td>9</td>
<td>R, S</td>
<td>None</td>
<td>Negative</td>
<td>No</td>
</tr>
</tbody>
</table>

†L: left; R: right; S: superficial lobe; D: deep lobe.

1. DM: diabetes mellitus; HTN: hypertension; TB: tuberculosis.
Parotid abscess

Figure 1
Computed tomography scan of the nasopharynx to the neck in a patient with an infection caused by *Klebsiella pneumonia*. The abscess appears as one hypodense lesion of about 1.3 cm × 1.2 cm in the superficial lobe of the left parotid gland.

current patient population (n=4; 28.6%), followed by *Staphylococcus aureus* (n=2; 14.3%), *Haemophilus influenzae* (n=1; 7.1%), and *Finegoldia magna* (n=1; 7.1%).

Discussion

Acute suppurative parotitis is the most frequently observed form of acute suppurative sialadenitis. The causes of acute suppurative parotitis include overgrowth of oral microbes migrating to the gland due to obstruction of Stensen’s duct, diminished production of saliva, or poor oral hygiene. In the practice of otolaryngology, acute suppurative parotitis is not encountered frequently and is usually diagnosed in aged, debilitated, or postoperative patients. *S. aureus* is reported to be the most common pathogen associated with acute parotid infections.5

In the present study, we reported that about one fifth (14/71, 19.7%) of the patients diagnosed with acute infectious parotid disease had parotid abscesses. Most of the patients with parotid abscesses were aged 60 years or younger. Painful swelling at the angle of the jaw and dry mouth were the main presenting symptoms. However, it was difficult to distinguish the parotid abscesses from acute suppurative parotitis clinically because of the dense capsule of the parotid gland. Reliable image resolution and rapid image acquisition have made CT the primary tool for assessing and differentiating between parotid abscesses and acute suppurative parotitis. The features of deep neck abscesses that can be revealed by CT examination include low attenuation coefficient, single cystic-like presentation, multiple loculated appearance, air-fluid level, or contrast enhancement of the abscess wall.4 In this study, all patients showed single, cystic-like, low attenuation lesions with peripheral tissue edema. Among them, the superficial lobe (13/14, 92.9%) of the parotid gland was the most frequent site where abscesses developed.

According to a report by Cheng et al.5 in 2011, diabetes mellitus is a predisposing factor and 27.3% (3/11) of patients with parotid abscesses had underlying diabetes mellitus. In our study, 5 of 14 (35.7%) patients had underlying diabetes mellitus. Patients with diabetes mellitus had longer hospital stays compared with patients without diabetes mellitus. This may be due to their declined immunity and consequent susceptibility to infection, and more occurrences of severe infections related to diabetes mellitus.6

Considering the oral flora, which is composed of a mixture of aerobic and anaerobic bacteria, patients with parotid abscesses should be treated with broad spectrum antibiotics to target most of the possible oral microorganisms. Among the positive abscess cultures, the most common microorganism identified was a gram-negative bacterium, *K. pneumoniae*, with a detection frequency of 50.0% (4/8). The second most common microorganism identified was a gram-positive bacterium, *S. aureus*, with a frequency of 25.0% (2/8). This finding differs from that of a previous report indicating that the most common cause of parotid abscess in Singapore was *S. aureus* (40%).7 In the current series, all patients were adults aged 18 years or older. According to the literature, although parotid abscess is less commonly found in neonates, premature infants with dehydration and long-term gavage feeding are more susceptible. *S. aureus* is the most common organism found in neonates with parotid abscess.8

Compared with acute suppurative parotitis, which can usually be successfully treated with conservative medical treatment, parotid abscesses often require drainage. Although ultrasound-guided
needle aspiration of parotid abscesses is reported in the literature, it is not feasible for draining the enormous parotid abscesses. Surgical drainage has become the mainstream approach nowadays. The modified Blair incision made from anterior auricular crease, encircling the lobule, to the upper neck crease about two-finger breadths under the mandible has become the standard of care for all kinds of parotid lesions. This approach provides the advantage of direct forward exposure of the parotid gland. In our patients with parotid abscesses in the superficial lobe, the modified Blair incision was performed followed by drainage. There was only one postoperative complication of saliva leakage, which was cured with conservative treatment. In order to drain the abscess without directly affecting the facial nerve trunk, the patient with the parotid abscess in the deep lobe underwent our adjusted surgical approach in which the incision was made only from the mastoid process and extended to the upper neck crease. No postoperative complication occurred following the procedure in this patient. In our study, parotid abscess drainage was achieved with a curved hemostat opened parallel to the presumed course of the facial nerve branches. Multiple openings were made to allow the pus to flow freely and eliminate any possible loculations. Hemostasis with bipolar cautery has the advantages of having a minimal thermal effect on neighboring tissues, and a better surgical field. An earlier study from Greece by Prokopakis et al. reported that the use of the Legasure™ Vessel Sealing System provided sufficient hemostasis and shortened the operation time.

Conclusions

In the present study, parotid abscesses accounted for about one fifth of patients with acute infectious parotid disease, and *K. pneumoniae* was the most common type of bacteria isolated. According to the CT findings, lesions in the superficial lobe were found in more than 90% of patients with parotid abscesses, and all patients presented with single, cystic-like, low attenuation lesions with peripheral tissue edema. All patients were successfully treated with a regimen consisting of sufficient fluid hydration, maintenance of good oral hygiene, and administration of parenteral antibiotics as well as surgical drainage.

References