Neonatal acute suppurative parotitis is rare. *Staphylococcus aureus* is the most common pathogen and antibiotic treatment is the first line therapy. Here, we report a case of acute suppurative parotitis caused by *Escherichia coli* in a 7-day-old male with febrile sensation, parotid swelling, and purulent discharge from the Stensen duct who was treated successfully with intravenous antibiotics. To the best of our knowledge, this is the first case of neonatal suppurative parotitis caused by *E. coli* in Korea.

**Key Words:** Suppuration; Parotitis; Newborn; Escherichia coli

**INTRODUCTION**

Acute suppurative parotitis is rare in neonates with a rate of 13.8 per 10,000 admissions. It was considered a vanishing disease; however, cases have been reported sporadically within literature since 1970. Prematurity and dehydration have been reported as major risk factors of neonatal suppurative parotitis. Diagnosis is made clinically and parotid swelling and purulent discharge from the Stensen duct are both pathognomonic. *Staphylococcus aureus* is the most common pathogen. Antibiotic therapy is the treatment of choice and prognosis is usually good with rare cases of recurrence. The authors experienced a case of acute neonatal suppurative parotitis caused by *Escherichia coli* in a 7-day-old male. To the best our knowledge, this is the first reported case of acute neonatal suppurative parotitis caused by *E. coli* in Korea.

**CASE REPORT**

A 7-day-old breast milk-fed male was transferred from an outside hospital due to acute swelling of the left cheek and febrile sensation. He was born at 37 weeks of gestation by spontaneous vaginal delivery after an uneventful pregnancy. The patient’s birth weight was 2,980 g and Apgar scores were 9 at 1 minute and 10 at 5 minutes after birth. Upon admission,
the infant’s weight was 2,880 g, rectal temperature was 37.4°C, and vital signs were stable. On physical examination, the patient had an asymmetric face with a swollen left cheek with approximately 3×4 cm erythematous swelling with tenderness and heating sensation overlying the left cheek and preauricular area (Figure 1A). Purulent discharge from the left Stensen duct was presented when pressure was applied to the left parotid gland (Figure 1B) which was sent for examination. The remainder of the physical examination were unremarkable. There were no enlarged lymph nodes or hepatosplenomegaly present. Laboratory tests revealed hemoglobin of 16 g/dL, white blood cell (WBC) count of 14,650 / mm³ (53.8% neutrophils and 34.6% lymphocytes), platelet count of 302,000/mm³, C-reactive protein (CRP) was 11 mg/dL (normal range, 0 to 5), and amylase was 28 U/L (normal range, 30 to 100). Serum electrolytes were as follows: sodium 137.3 mmol/L; potassium 4.4 mmol/L; chloride 106.3 mmol/L; and total CO₂ 18 mmol/L. The results of venous blood gas analysis were as follows: pH 7.36; PCO₂ 33 mm Hg; PO₂ 37 mm Hg; bicarbonate 18 mEq/L; and base excess -6.5 mEq/L. Urinary specific gravity was measured at 1.005. Prothrombin time was 13.9 seconds (normal range, 10 to 16) and activated partial thromboplastin time was 39.5 seconds (normal range, 31 to 54). Serologic analyses for cytomegalovirus, herpes virus, toxoplasmosis, rubella, and mumps were all negative. Ultrasonography (USG) was performed to exclude structural abnormalities or abscess formation in the parotid glands. USG revealed a markedly enlarged left parotid gland with increased vascularity (Figure 2). Given the swollen cheek with inflammatory signs, pus from the left Stensen duct, and the results from the USG, acute suppurative neonatal parotitis was then diagnosed. Intravenous antibiotics of ampicillin/sulbactam (50 mg of ampicillin/kg/day) and gentamicin (4 mg/kg/day) were initiated. Purulent discharge from the left Stensen duct yielded growth of *E. coli* with susceptibility to 16 antibiotics tested including ampicillin, cefazolin, imipenem, gentamicin, and amikacin. Blood, urine, and cerebrospinal fluid cultures were negative. The left parotid swelling improved within 2 days and antibiotic therapy was continued for 14 days. USG of both parotid glands was performed after 7 days of antibiotic treatment and showed that the left parotid gland had decreased in both size and vascularity. The patient was discharged from the hospital after 14 days without complication. The patient has been well for 1 year without recurrence.

Figure 1. (A) A 7-day-old male revealed asymmetric face and diffuse left cheek swelling and erythema. (B) Purulent discharge was drained from the left Stensen duct (red circle) when the left parotid gland was pressed.

Figure 2. Ultrasonography revealed (A) marked enlargement and (B) increased vascularity of left parotid gland.
DISCUSSION

Acute neonatal suppurative parotitis is rare and approximately 50 cases have been reported sporadically globally since 1970 (Table 1). Male predominance (38/53) and unilateral parotid gland involvement (43/53) are characteristics of neonatal suppurative parotitis. Each parotid gland is evenly involved (right: left, 14:15). The disease occurs a mean of 17.3±10.5 days after birth (median 17 days; range, 3 to 33). Diagnosis is based on parotid gland swelling, pus drainage from the Stensen duct, and the growth of microorganisms. The current case was a 7-day-old male with left parotid gland involvement presenting as left parotid gland swelling, pus from the left Stensen duct, and the growth of E. coli in pus culture, which fulfilled the diagnostic criteria. Laboratory investigations have been generally non-specific. Leukocytosis above 15,000/mm³ was seen in 69% of cases and elevated serum amylase was shown in 25% of cases. In this case, WBC count was 14,650/mm³ (53.8% neutrophils and 34.6% lymphocytes) and CRP was slightly elevated at 11 mg/dL. Serum amylase was 28 U/L on admission and there was no increase during hospitalization. This may be associated with low activity of salivary isoamylases in infancy. Serologic tests were beneficial for the differentiation of infectious causes, including mumps, cytomegalovirus, tuberculosis, and human immunodeficiency virus (HIV). In this case, mumps and cytomegalovirus immunoglobulin G (IgG) and IgM were negative. Tuberculosis and HIV infection were excluded by previous maternal tests.

Trauma, lymphadenitis, hemangioma, tumor, parotid duct anomalies, and intraglandular abscess formation should be considered and USG of the parotid glands may facilitate differentiating suppurative parotitis from the differential diagnoses. USG of both parotid glands was performed twice in this case.

Table 1. Clinical Characteristics and Isolated Pathogens in the Reported Case of Acute Neonatal Suppurative Parotitis

<table>
<thead>
<tr>
<th>Study</th>
<th>No. of cases</th>
<th>Prematurity</th>
<th>Onset (days after birth)</th>
<th>Male</th>
<th>Involved sites</th>
<th>Antibiotics</th>
<th>Surgery</th>
<th>Pathogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiegel et al. (2004)</td>
<td>32</td>
<td>11</td>
<td>7–30</td>
<td>23</td>
<td>5 Bilateral, 7 right, 7 left, 13 undefined</td>
<td>Cloxacillin and gentamicin</td>
<td>7</td>
<td>18 S. aureus, 11 G (+)<em>, 9 G (-)</em></td>
</tr>
<tr>
<td>Ismail et al. (2013)</td>
<td>12</td>
<td>2</td>
<td>3–20</td>
<td>11</td>
<td>4 Bilateral, 3 right, 4 left, 1 undefined</td>
<td>Cloxacillin and cefotaxime/vancomycin and gentamicin</td>
<td>3</td>
<td>9 S. aureus, 1 Pseudomonas aeruginosa</td>
</tr>
<tr>
<td>Costa et al. (2016)</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>Left</td>
<td>Vancomycin and cefotaxime</td>
<td>0</td>
<td>S. aureus</td>
</tr>
<tr>
<td>D’Souza et al. (2012)</td>
<td>1</td>
<td>1</td>
<td>20</td>
<td>0</td>
<td>Right</td>
<td>Vancomycin</td>
<td>0</td>
<td>Enterococci, MSSA</td>
</tr>
<tr>
<td>Deepak et al. (2015)</td>
<td>1</td>
<td>1</td>
<td>27</td>
<td>1</td>
<td>Bilateral</td>
<td>Ceftriaxone and amikacin</td>
<td>0</td>
<td>E. coli</td>
</tr>
<tr>
<td>Megged et al. (2018)</td>
<td>1</td>
<td>0</td>
<td>6</td>
<td>1</td>
<td>Right</td>
<td>Amoxycillin-clavulanic acid</td>
<td>0</td>
<td>MSSA, Streptococcus mitis</td>
</tr>
<tr>
<td>Avcu et al. (2015)</td>
<td>1</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>Right</td>
<td>Cefotaxime/teicoplanin</td>
<td>0</td>
<td>S. aureus</td>
</tr>
<tr>
<td>Hamid et al. (2014)</td>
<td>1</td>
<td>0</td>
<td>18</td>
<td>0</td>
<td>Left</td>
<td>Amoxycillin and clavulanate</td>
<td>1</td>
<td>S. aureus</td>
</tr>
<tr>
<td>Kadam et al. (2017)</td>
<td>1</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>Right</td>
<td>Vancomycin and meropenem</td>
<td>1</td>
<td>Pseudomonas aeruginosa</td>
</tr>
<tr>
<td>Kolekar et al. (2016)</td>
<td>1</td>
<td>0</td>
<td>25</td>
<td>0</td>
<td>Left</td>
<td>Cefotaxime to vancomycin</td>
<td>0</td>
<td>MRSA</td>
</tr>
<tr>
<td>Current case</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>1</td>
<td>Left</td>
<td>Ampicillin/sulbactam and gentamicin</td>
<td>0</td>
<td>E. coli</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>15</td>
<td>17 (median)</td>
<td>38</td>
<td>10 Bilateral, 14 right, 15 left</td>
<td></td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

*G (+): Streptococcus viridans 4, Streptococcus pyogenes 2, coagulase negative staphylococci 2, Streptococci (unspecified) 1, Moraxella catarrhalis 1, peptostreptococci 1; *G (-): Escherichia coli 2, Klebsiella pneumonia 3, Pseudomonas aeruginosa 1, Bacteroides 2, Prevotella 2.

Abbreviations: S. aureus, Staphylococcus aureus; MSSA, methicillin sensitive S. aureus; E. coli, Escherichia coli; MRSA; methicillin-resistant S. aureus.
Facial palsy has been reported as a complication[11], but prognosis is generally good with the appropriate parenteral antibiotic therapy. Acute neonatal suppurative parotitis is rare but easy to diagnose. Immediate and appropriate antibiotic combination therapy is required for rapid clinical recovery and the prevention of complications.

**ARTICLE INFORMATION**

**Ethical statement**

This case report was reviewed and approved by the Institutional Review Board of Gyeongsang National University Hospital (GNUH 2018-09-019). Informed consent was waived by the board.

**Conflicts of interest**

No potential conflict of interest relevant to this article was reported.

**Author contributions**

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Drafting the work or revising: J.Y.C., J.S.P.

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