Garré’s Osteomyelitis of the Mandible Caused by an Infected Wisdom Tooth

Hiroyuki Nakano1, Tetsuei Miki2, Keiko Aota2, Tetsuro Sumi2 Ken Matsumoto2 and Yoshiaki Yura2

1Department of Oral and Maxillofacial Surgery, Yamaguchi University
Graduate School of Medicine
2Department of Oral and Maxillofacial Surgery, Osaka University
Graduate School of Dentistry

Abstract: Garré’s osteomyelitis is generally considered to be synonymous with chronic osteomyelitis with proliferative periostitis and occurs most commonly in the first molar region of the mandible. We report a case of Garré’s osteomyelitis caused by the infected tooth-germ of a wisdom tooth. A 12-year-old boy had a swelling of the right cheek and his right mandibular second molar was covered by gingiva with pus retention. X-ray examination showed a radiolucent area around the impacted tooth-germ of the wisdom tooth and extracortical new bone at the angle of the mandible. After preoperative treatment with antibiotics, the tooth-germ and extracortical bone were removed. The antibiotics treatment was continued for 18 days postoperation. No recurrence of pain or swelling has been observed thereafter.

Key words: Garré’s Osteomyelitis, tooth-germ of a wisdom tooth, mandible

Introduction

Garré’s osteomyelitis was first defined as a distinct disorder by Garré1 who reported a case in the tibia in 1893. This disorder is characterized by chronic nonsuppurative osteomyelitis with proliferative periostitis, which is caused by inert stimulation from low grade infection and frequently occurs in infants. Since then, many terms have been used to describe this reactive proliferation of the periosteum. These include proliferative periostitis of Garré, Garré’s osteomyelitis, periostitis ossificans, nonsuppurative ossifying periostitis, osteomyelitis sicca, osteomyelitis with proliferative periostitis, and perimandibular ossification. The first case of proliferative periostitis affecting the jawbone was described by Pell2 in 1955. The most common site of involvement is the inferior border of the mandible in the first molar region. Only four cases originating from lower impacted wisdom teeth have been reported. We report a rare case of Garré’s osteomyelitis of the mandible caused by the infected tooth-germ of a wisdom tooth.

Case Report

A 12-year-old boy came to our hospital with a complaint of swelling of the right cheek. He had a history of mild pain and gingival swelling associated with the lower right second molar for 1 month and treatment with antibiotics. On clinical examination, there was a swelling involving the right masseter with severe trismus (Fig. 1). The distal part of the right mandibular second molar was covered by gingiva and pus retention was observed between the tooth and covering gingiva.
Panoramic radiography showed a radiolucent area around the impacted tooth-germ of the wisdom tooth, although such alteration had not been apparent 1 month earlier (Fig. 2). When the mandible was examined by postero-anterior radiography, extracortical new bone formation was found at the angle of the mandible (Fig. 3A). Computed tomography showed a fistula between the tooth-germ and the bone mass (Figs. 3B and 3C). In laboratory analyses, protein level was normal and white cell count was slightly elevated with a shift to the left. A provisional diagnosis was Garré’s osteomyelitis caused by the infected tooth-germ of the third molar. Because pus was observed and white cell count was slightly elevated, treatment with an antibiotic, flumoxef sodium, was performed for 4 days. After the inflammatory symptoms such as pus discharge and gingival swelling had improved, treatment with clarithromycin was continued for a further 1 week. Thereafter, the tooth-germ was enucleated and multiple fragments of newly formed spongy bone laterally located to the cortical bone of the mandible were removed under general anesthesia (Fig. 4). The bone fragments could be easily separated by inserting a raspatory in the space between new bone and cortical bone. By this procedure, a fistula associated with the tooth-germ was confirmed and the infected tissues were removed. The tooth crown of the second mandibular molar was exposed in the oral cavity by gingivectomy. Microscopic examination revealed thickened fibrous tooth-germ. There was bone arranged horizontally and vertically and many osteoblasts in the tissue surrounding the tooth-germ (Fig. 5). After surgery, treatment with cefazolin sodium for 4 days and then treatment with amoxicillin for 2 weeks were performed. Three months after surgery, extracortical bone formation of the mandible was undetectable by postero-anterior radiography (Fig. 6). No recurrence of pain and swelling has been observed thereafter.

Discussion

The radiographic appearance of Garré’s osteomyelitis is characterized by a convex radiopaque shadow with a smooth contour. A laminated appearance with radiolucent zones may be seen, whereas the adjacent jawbone usually appears normal. The following lesions must be considered
in the differential diagnosis of proliferative periostitis: Ewing’s sarcoma, fibrous dysplasia, osteogenic sarcoma, infantile cortical hyperostosis, calcius exostosis, calcifying hematomata and osteotoma.

In a literature review, Eversole et al. outlined the following criteria for the differentiation of proliferative periostitis from other periostoses. These include: (1) facial asymmetry resulting from localized osseous enlargement; (2) histological findings of a benign periosteal fibroosseous lesion; (3) a source of infection, trauma, or other irritation, not necessarily of odontogenic origin; and (4) complete or partial remodeling of excess bone after elimination of the cause. In the present case, facial asymmetry was the first symptom that the patient was aware of and radiographic examination revealed periosteal reaction at the angle of the mandible. The histology of the spongy bone indicated fibroosseous tissues. After removal of the wisdom tooth and surrounding tissue, the excess bone disappeared completely. Thus, we diagnosed this
case as Garré’s osteomyelitis of the mandible.

A number of cases of Garré’s osteomyelitis are caused by infection from periapical inflammation of the lower first molar, but there have been few cases originating from lower impacted wisdom teeth; to the author’s knowledge, only 3 Japanese and 1 Chinese cases have been reported (Table 1). The first case was reported by Iseki et al. in 1988. In the case of Nakamura et al. the second molar was suspected to be the route of infection to the wisdom tooth, although no obvious inflammation of the gingiva was detectable. In the Chinese case, there was an impacted lower wisdom tooth and new bone formation over the lateral cortical surface of the mandible extending from the third molar region to the posterior border of the ramus, but no dental or periodontal source of infection was identified. In the case of Asada et al., abscess and defect in the cortical bone of the mandible were evident. The involvement of the second molar was not demonstrated in these previous studies. In the present case, however, we found that the impacted wisdom tooth was associated with the distal gingival pocket of the second molar and pus retention. Thus, it is likely that the tooth-germ of the wisdom tooth was infected from the adjacent second molar and became the source of Garré’s osteomyelitis.

Although antibiotics therapy reduces odontogenic infection, inadequate use of antibiotics does not eliminate the infection completely. Rather, it may prolong a mild inflammation in the mandible and provide a chance for chronic osteomyelitis to develop with proliferative periostitis. A routine panoramic radiography is useful to find radiolucent areas around a tooth-germ in the mandible. In such cases, it is advisable to perform additional radiographic examination including postero-anterior radiography and CT to determine the presence of extracortical new bone formation. It

Table 1  Summary of reported cases of Garré’s osteomyelitis of the mandible caused by an infected wisdom tooth

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Part</th>
<th>Infection</th>
<th>Abscess</th>
<th>Cause</th>
<th>Treatment</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iseki et al</td>
<td>13</td>
<td>F</td>
<td>8</td>
<td>×</td>
<td>×</td>
<td>7</td>
<td>CH · EX · C</td>
</tr>
<tr>
<td>Nakamura et al</td>
<td>10</td>
<td>F</td>
<td>8</td>
<td>×</td>
<td>×</td>
<td>7</td>
<td>CH · EX · C · R</td>
</tr>
<tr>
<td>Tong AC et al</td>
<td>12</td>
<td>M</td>
<td>8</td>
<td>×</td>
<td>×</td>
<td>unknown</td>
<td>EX</td>
</tr>
<tr>
<td>Asada et al</td>
<td>11</td>
<td>F</td>
<td>8</td>
<td>slight</td>
<td>○</td>
<td>7</td>
<td>CH · EX · C · INC</td>
</tr>
<tr>
<td>Present case</td>
<td>12</td>
<td>M</td>
<td>8</td>
<td>slight</td>
<td>×</td>
<td>7</td>
<td>CH · EX · C · R</td>
</tr>
</tbody>
</table>

CH: Chemotherapy, R: Removal of bone mass, C: Curettage, EX: Extraction, INC: Incision

Fig. 6 Panoramic radiography (A) and P-A radiography (B) postoperation.
should also be taken into consideration that a lower second molar with pericoronitis may induce Garré’s osteomyelitis in young patients.

References