Chronic Parotitis with Multiple Parotid Calcifications: Imaging and Sialendoscopy Findings

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Abstract

Objective/Hypothesis

Punctate calcifications are multiple hyperintense lesions < 2mm in size and can be associated with lymphatic malformations, immune-mediated diseases, and tumors. Sialendoscopy can help to distinguish intraparenchymal from intraductal calcifications in the parotid gland.

Methods

A retrospective review of 131 patients undergoing parotid sialendoscopy from 11/2005 to 8/2014, 12 patients (9%) had multiple calcifications on sialendoscopy. Preoperative clinical history, radiographic images and reports, lab tests, and operative reports were reviewed for patients with chronic parotitis and multiple parotid calcifications who underwent parotid sialendoscopy between November 2005 and August 2014. Proportional computed tomography (CT) images were analyzed for parotid calcification size and location.

Results

Twelve of 131 (9%) patients undergoing parotid sialendoscopy had more than one calcification in the parotid gland. Average duration of symptoms was 78 months (4-120 months). Four of 12 patients (34%) had bilateral gland involvement. Four patients (34%) were diagnosed with autoimmune parotitis (positive Sjögren’s antibodies or ANA) and two (17%) were HIV positive. Eight of 12 patients (67%) had at least one stone found in the duct on sialendoscopy. These patients had multiple punctate calcifications within the parotid duct – all of whom had either autoimmune disease or HIV. None of the proximal or punctate parotid calcifications posterior to the masseter were seen on sialendoscopy.

Conclusions

Cases of chronic parotitis with multiple parotid calcifications are uncommon. Multiple punctate parotid calcifications suggest an underlying disease process such as autoimmune parotitis or HIV. Additionally, autoimmune parotitis is rarely associated with obstructive distal parotid duct stones. Proximal parotid calcifications posterior to the masseter are not seen on sialendoscopy suggesting other treatment modalities may be required.

Background

Calcifications in the parotid can reside either in the salivary ducts or in the parenchyma of the gland. Intraparenchymal calcifications, or salivary duct stones, can cause obstructive salivary symptoms. In contrast, intraparenchymal salivary gland calcifications are rare, and can be associated with lymphatic malformations, immune-mediated diseases, and tumors. Sialendoscopy can help to distinguish intraparenchymal from intraductal calcifications.

We aim to characterize patients with multiple parotid calcifications and identify factors that distinguish patients with intraductal versus intraparenchymal calcifications in order to assess the benefits of sialendoscopic therapies.

Methods

A retrospective review of 131 patients undergoing parotid sialendoscopy from 11/2005 to 8/2014, 12 patients (9%) had multiple calcifications on preoperative CT scan.

- Stones were classified by location: 1) anterior or along the masseter muscle, and 2) posterior to masseter muscle.
- Punctate calcifications are multiple hypointense lesions ≈ 2mm in size typically in the parenchymal posterior portion of the parotid gland.
- Immune-mediated systemic diseases included HIV, Sjögren’s syndrome, or ANA positivity

Figure 1: Ductal salivary stones can reside anterior, along, or posterior to masseter muscle in Stensen’s duct. Axial computed tomography image showing intra-ductal parotid stones in multiple locations. Red arrows indicate distal stones anterior to, or along, the masseter muscle (AP dimension, Anterior). Blue arrow indicates stone posterior to the posterior border of masseter muscle (Posterior).

Figure 2: Intra-parenchymal calcifications in the parotid gland are not seen on sialendoscopy. (A) Axial CT image of punctate calcifications (multiple calcifications, 2-5mm in size) located posterior to posterior border of the masseter muscle in the parotid gland. (B) Coronal CT image of patient with HIV-related punctate calcifications in left parotid gland tail. Blue arrows indicate distinct calcifications in the parotid gland.

Figure 3: Average size of calcifications posterior to the masseter muscle are smaller in immune-mediated disease group. Calcifications anterior to the masseter showed no significant difference in size between groups with and without immune-mediated diseases. For calcifications posterior to masseter, patients with systemic immune-mediated disease had significantly smaller calcifications compared to those without a systemic immune disease (** p<0.005).

Results

Table 1: Multiple parotid calcifications in patients with and without systemic immune-mediated disease. (* denotes significant difference between groups, p<0.05).

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Systemic Immune Disease</th>
<th>No Systemic Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (n)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Symptom Duration (years, mean ± SD)</td>
<td>7.13 (±6.27)</td>
<td>6.63 (±4.72)</td>
</tr>
<tr>
<td>Bilateral Calcifications (n)</td>
<td>3 (50%)</td>
<td>1 (17%)</td>
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<tr>
<td>Average # Calcifications (n ± SD)</td>
<td>12.67 (±14.1)</td>
<td>1.67 (±3.3)</td>
</tr>
<tr>
<td>Presence &gt; 3 Calcifications (n)</td>
<td>4 (66%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td>Average Calcification Size (mm ± SD)</td>
<td>2.39 (± 2.1)</td>
<td>3.17 ±3.3</td>
</tr>
<tr>
<td>Calcifications Posterior to Masseter (n)</td>
<td>6 (100%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td>Presence of Sialoliths (n)</td>
<td>3 (50%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Punctate Calcifications in Posterior Parotid (n)</td>
<td>3 (50%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Figure 4: Greater average number of calcifications per patient posterior to the masseter in the immune-mediated disease group. Multiple punctate calcifications occur posterior to the masseter and only in patients with systemic immune-mediated disease such as HIV or autoimmune parotitis. Posterior calcifications were not seen on sialendoscopy likely due to the posterior location and the intraparenchymal nature of punctate calcifications.

Conclusions

- Multiple parotid calcifications are uncommon and is often associated with immune-mediated disease processes such as autoimmune parotitis and HIV.
- Patients with immune-mediated diseases had multiple calcifications posterior to the masseter muscle, typically smaller than 3mm in size on CT. Consequently, Sjögren’s, ANA, and HIV testing can be considered for patients with these findings.
- Patients with sialoliths found on sialendoscopy had calcifications anterior to or along the masseter muscle on CT scan.
- Proximal punctate parotid calcifications posterior to the masseter were not seen on sialendoscopy.
- Autoimmune parotitis is rarely associated with obstructive distal parotid duct sialoliths – 3 of 4 patients in our cohort had no sialoliths seen on sialendoscopy. HIV disease can have both parotid duct sialoliths and punctate calcifications.

References


Table 1: Multiple parotid calcifications in patients with and without systemic immune-mediated disease. (* denotes significant difference between groups, p<0.05).