MRI of the parotid glands in a patient with Sjogren's syndrome
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Section: Head & neck imaging
Imaging Technique: MR
Case Type: Clinical Cases
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Patient: 25 years, female

Clinical History:
A patient presented with a swelling on both her cheeks and a dry mouth.

Imaging Findings:
A young woman presented with a swelling on both her cheeks and a dry mouth. She was requested to undergo an MRI examination to exclude the possibility of her having any mass lesion in the parotid glands.

Discussion:
Sjögren’s syndrome (SS) is an autoimmune chronic inflammatory disorder characterized by lymphocytic infiltration of the exocrine glands, especially the lacrimal and salivary glands, associated with the clinical features of keratoconjunctivitis sicca and xerostomia. Sjögren’s syndrome exists in both the primary and secondary forms. The former occurs alone, whereas the latter is diagnosed in the presence of other connective tissue disorders, usually rheumatoid arthritis, systemic lupus erythematosus, systemic sclerosis or polymyositis. The histological findings include periductal lymphocytic infiltration and epimyoepithelial islands, which may undergo a malignant transformation, accounting for the increasing incidence of lymphoma. In later stages, fatty degeneration of the glands becomes a prominent feature. In general, no single test is known to be diagnostic for this disease; therefore, it is based on several criteria, which include serological tests and examinations that indicate the involvement of the lacrimal and salivary glands. The serological tests include those based on the detection of SS-A and SS-B antibodies; however, these may only be detected in the active phase of the disease, and there are serologically negative forms, particularly in males. Conventionally, a minor salivary gland biopsy and X-ray sialography have been considered to be the most reliable tests for diagnosing and staging the disease. However, these procedures are invasive and contain the risks of complication and can cause inconvenience to the patients. In recent years, reliable non-invasive methods for the detection of structural changes in the salivary gland such as ultrasonography, CT and MR imaging have been reported. Ultrasonographic findings include heterogeneous echogenicity of the affected gland with multiple hypoechoic areas. In more advanced stages, hyperechoic areas are found scattered throughout the gland and represent fibrous proliferation replacing the gland lobules. However, similar features can also be seen in those with chronic sialadenitis. The sensitivity of ultrasonography range from 47% to 89% and the specificity from 82% to 100% in a previous study. On the CT scan, the parotid glands are seen to be enlarged and are denser than the normal glands (isodense to hyperdense compared to the masseter muscle). Like ultrasonography, these early findings are non-specific and are also seen in patients with chronic sialadenitis and sialosis. Later, the glands become heterogeneous and appear micronodular to honeycombed patternise. Among the non-invasive methods, MR imaging is considered to be the most reliable method of imaging in assessing glandular changes. In addition, MR sialography is a novel promising method used to examine the abnormalities of the salivary gland in which normal saliva is used as a contrast medium. Despite the fact that peripheral branches of the ductal system are less
visible on MR sialography than on X-ray sialography because of the lower spatial resolution, MR sialography has been shown to have a high correlation with conventional sialography. The most commonly used parenchymal classification based on MR imaging (T1W and T2W signal intensities) is proposed by Spath and colleagues, which is as follows: Grade 0 = normal, homogeneous parenchyma; Grade 1, fine reticular or small nodular. Grade 2 = medium nodular or glandular. Grade 3 = coarsely nodular. This grading system depends on the ability of the equipment to visualize small structural details. Another staging criterion based on MR sialography was determined according to the criteria of X-ray sialography proposed by Rubin and Holt, which is as follows: Stage 1 = punctate pattern of numerous punctate collections of contrast material or high signal foci, less than 1 mm in diameter. Stage 2 = globular pattern, the contrast collections or high signal foci measure between 1 and 2 mm. Stage 3 = cavitary pattern, irregular collections of the contrast larger than 2 mm in diameter. Stage 4 = complete destruction of the parotid gland parenchyma. Nevertheless, a recent study reveals that there is a poor correlation between MR imaging and MR sialography in terms of staging. The proposed explanation is that the abnormal findings on MR imaging demonstrate enlarged lobules with mononuclear cell infiltration, increase in collagen fibers, and fatty tissue within and around the lobules and dilated ducts, whereas MR sialography represents changes (narrowing, strictures and dilatations) of the ductal system and the cavities. In summary, MR sialography seems to be more sensitive when used in the early stage of the disease, but MR imaging gives complimentary information of the glandular parenchyma change. In our case, this lady had a typical clinical presentation of the sicca syndrome and detectable SS-A antibody levels but not SS-B antibody levels in the serum. MR imaging of the parotid glands shows a feature that is typical of Sjögren's syndrome. The differential diagnosis includes benign lymphoepithelial lesions in HIV patients, Warthin's tumor and cystic intraparotid lymphadenopathy. However, the history and clinical findings allow for the differentiation of these conditions. In this patient, the minor salivary gland biopsy reveals periductal lymphocytic infiltration compatible with the diagnosis of Sjögren's syndrome. There is no malignancy found. The treatments are symptomatic unless there is recurrent bacterial infection or malignant transformation in which case a parotidectomy is required.

**Differential Diagnosis List:** Sjögren's syndrome.

**Final Diagnosis:** Sjögren's syndrome.

**References:**


Description: A coronal T1-weighted image showing a bilateral parotid gland enlargement with heterogeneity and granular appearance. Origin:
**Description:** A coronal T2-weighted image showing diffuse small high intensity nodules in both parotid glands. These nodules appeared to be hypointense on T1-weighted images.

**Origin:**
Description: An axial T2-weighted image with the same appearance. These small high signal foci correspond to multiple dilated peripheral ducts. Origin:
Description: A post-gadolinium injection with a fat suppression image revealed no enhancing mass lesion. Origin: