Head and neck radiology

Salivary-gland lesions in HIV-positive patients

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Abstract: Chronic enlargement of salivary glands and mainly of parotid glands has been noted in HIV-positive patients. Such alterations are due mainly to adenopathies (mainly intraglandular) or to the formation of lymphoepithelial cysts. During the period between January 1990 to June 1993 we studied 63 HIV-positive patients with enlargement (mainly monolateral) of the parotid glands and one patient with involvement of the submandibular gland. There were 59 adults (44 males and 15 females) 22–50 years of age, and five children 3–8 years. The fastest, least expensive and most appropriate investigative means for this pathology is echography, which was carried out in all patients. Only 18 patients were also studied with CT. We observed lymphadenopathies, within or outside the parotid glands, and lymphoepithelial cysts. Within some intraparotid cysts we observed an ultrasonographic pattern consisting of small high-level formations in suspension which, from cytologic evaluation of material obtained by needle aspiration, were referable to small crystals of calcium oxalate. We hypothesize that such microcalculi may play a role in the obstructive mechanism of the ducts in association with lymphoepithelial infiltration of the parotid ducts.

Key words: Chronic enlargement – Salivary glands – Cyst – HIV-positive – Nodes – Ultrasound

Introduction

Among the first manifestations of acquired immunodeficiency syndrome (AIDS) is in a small percentage of cases chronic enlargement of salivary glands, generally accompanied by slight pain. Such lesions have been linked to the presence of the HIV virus in the saliva of many HIV-seropositive patients [1, 2]. The study of parotid tissue in these patients by in situ hybridization has confirmed the presence of HIV RNA in inflammatory cells of parotid specimens [3]. Chronic enlargement of salivary glands (mainly of parotid glands) is determined by a lesion of the gland, often with concomitant lymph-node enlargement within the capsule of the gland and submerged in the glandular parenchyma. Enlargement of parotid and submandibular glands has been attributed to a lymphoepithelial infiltration with formation of cysts in HIV-positive patients [4, 5].

The present study is based on the observation of salivary-gland lesions in some HIV-positive patients by echographic investigations, because this kind of study is the most suitable for evaluation of such lesions for the rapidity of execution and low cost.

Patients and methods

Between 1990 and 1993 we observed 63 HIV-positive patients with evident enlargement of the parotid gland – 36 monolateral, 27 bilateral, and 1 case with involvement of the submandibular gland. There were 59 adults (44 males and 15 females) 22–50 years of age, and five children 3–8 years. Of the 44 adult male patients, 12 were homosexuals, 27 were drug abusers, and 4 were heterosexuals who were not drug abusers. Of the 15 adult females, 12 were drug abusers and 3 were heterosexuals. The mothers of the five children were drug abusers. In 80% of cases the enlargement involved only the salivary glands, and in 20% it was accompanied by latero-cervical adenopathy. Pulmonary symptoms (fever, cough, and dyspnea) were present in 30% of patients.

All patients had sonograms of the parotid and were examined bilaterally in both transverse and longitudinal planes, with occasional oblique views at the angle of the jaw, using a linear 7.5 MHz high-resolution probe and an ATL Ultramark 5 (Advanced Technology Laboratories) ultrasound apparatus. The superficial parotid gland was examined superiorly from anterior to the...
Table 1. Echographic patterns observed in 64 HIV-positive patients

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Incidence (%)</th>
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<tbody>
<tr>
<td>Hypoechoic areas</td>
<td>40</td>
</tr>
<tr>
<td>Anechoic areas</td>
<td>5</td>
</tr>
<tr>
<td>Nonhomogeneous areas</td>
<td>55</td>
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ear to inferiorly below the angle of the jaw. Only 18 cases also underwent CT with a GE 9800 unit. The contrast-enhanced CT scans of these 18 cases revealed multiple intraparotid masses with a homogeneous cystic appearance and a well-circumscribed, minimally enhanced rim. Moreover, CT scans of 10 patients showed multiple parotid cysts involving the deep and superficial lobes of the gland. Echo-guided needle aspiration was performed in 35 patients with 22-gauge, 4-cm-long spinal needles to obtain a specimen from the most involved area. At 18–22 months from the first echographic examination 10 patients without parotid enlargement died from AIDS, and postmortem examination was performed. Viral infections were found in all 10 cases, and cytomegalovirus infections in 90% of cases. Immunodepression is the most important cause of viral infections without a concomitant enlargement of the parotid gland.

Results

Normal parotid tissue with a homogeneous echogenic texture was observed between the adenopathies and lymphoepithelial cysts in most cases (90%). In 60% of cases persistence of glandular parenchyma was less than 50%, and in 40% it was greater than 50%. The characteristics of the echographic patterns were similar in the patients and are reported in Table 1. There were oval, solid hypoechoic areas composed of fine and regular echoes referable to adenopathies (Fig. 1). The few anechoic areas we observed were referable to simple cysts, due to retention of glandular secretion (Fig. 2). The nonhomogeneous areas were generally referable to lymphoepithelial cysts in the context of which high-level echoes in suspension, due to the precipitation of calcium oxalate, were clearly recognizable (Fig. 3). Such lesions were the most frequently observed in our series. The lymphoepithelial cysts as well as the adenopathies were often bulky and adjacent to each other, thereby provoking the loss of echographically appreciable glandular parenchyma (Fig. 4). The persistence of more than 50% of the glandular parenchyma, as in some children of our series (Table 2), was due to a reactive inflammation of the parotid with an associated lymphatic infiltration (Fig. 5).

Parotiditis is a frequent manifestation of pediatric AIDS. The histology of parotid tissues in these cases involves lymphocytic infiltration. Sonography revealed many small hypoechoic areas suggestive of lymphoid infiltration. Diffuse lymphadenopathy, hepatosplenomegaly, and pneumonia were frequently concomitant with parotid swelling (Fig. 5) [6, 7]. The normal parotid tissue was observed between the adenopathies and lymphoepithelial cysts in only a few cases.

Enlargement of the parotid area may be monolateral, although the simultaneous appearance of bilateral alterations is also common. Associated laterocervical lymphadenopathies were present in 20% of cases.

Fine-needle aspiration (FNA) performed in 35 patients revealed: (1) 14 cases of cystic lesions with a mucinous content and negative bacteriology, (2) 11 cases with samples characterized by bacteria and yeast growth (Fig. 6), (3) 7 cases with a negative culture, (4) 1 case of granulomatous tuberculous lymphadenitis, (5) 1 case of cytomegalovirus adenitis, and (6) 1 case with a mixed tumor of the parotid. The aspirated material was always sufficient, because a cytologist was present to immediately judge the positivity and quantity of the sampled material.

Discussion

Enlargement of the salivary glands, alone or associated with laterocervical lymphadenopathies [2, 8–10], is one of the earliest and sometimes first clinical manifestations in immunodeficient HIV-positive patients, especially drug abusers [3, 5, 11]. Recent reports have emphasized that many adult HIV-positive patients with biopsy-proven lymphoepithelial infiltration of the parotid gland were free of symptoms at the time of disease presentation. Generally, this group is free of opportunistic infections. The finding of chronic parotid enlargement in adults is therefore significant, because it suggests the diagnosis of HIV infection. Furthermore, it may indicate a milder clinical course [8, 12, 13].

When the immunologic state of the patient is not good, glandular enlargement often spontaneously regresses, as in the 10 patients of our series examined postmortem, in which at autopsy we found viral infections without parotid enlargement and, in 90% of cases, cytomegalovirus infections. In fact, immunodepression is the most important cause of viral infections without a concomitant enlargement of the parotid gland. The gland most often affected is the parotid, as was also shown by our study. In the normal architecture of the parotid there are also some lymph-node structures within the capsule. Pathologic findings have demonstrated that in addition to the laterocervical lymph nodes there may also be enlargements of such intraglandular formations.

There is no single cause of enlargement of the salivary glands, particularly of the parotid, in HIV-positive patients, and different interpretations have been given in the literature. Shugar et al. [4], reporting on nine patients, noted a prevalence of lymphoglandular alterations that involved the periparotid lymph nodes as well as intraglandular lymph nodes with a uniform follicular hyperplasia. Such nodes generally are not colliquative. In other cases, as reported by Smith et al. [5] and Tunkel et al. [3], follicular hyperplasia was associated with epithelial structures and cysts. The presence of epithelial elements appears to be related to an embryogenetic