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## Benign Lymphoepithelial Parotid Tumors in AIDS Patients: CT and MR Findings in Nine Cases

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**Benign lymphoepithelial parotid neoplasm with associated cervical adenopathy is a newly described head and neck manifestation of HIV infection, characterized previously as purely cystic masses on both CT and MR evaluations. The CT and MR findings in nine cases of surgically proved benign lymphoepithelial parotid lesions are presented. Five (56%) of the nine cases demonstrated masses that appeared other than cystic, reflecting a greater variety of radiologic appearances than previously reported. The majority of these cystic masses contained solid components and therefore could not be labeled as cysts; instead, they were considered to be benign lymphoepithelial parotid lesions. For patients with parotid gland enlargement, the lack of a characteristic CT/MR appearance of these lesions necessitates an evaluation of clinical history and a determination of whether cervical adenopathy is present in order to determine their underlying origin.**

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Lymphadenopathy in AIDS and AIDS-related conditions is a universal finding, with nodes being especially prominent in the cervical region. It has been estimated that 41% of patients with AIDS present with, or have on initial evaluation, head and neck manifestations. Of this group, 8% have enlarging neck masses [1].

Benign lymphoepithelial parotid cysts and hyperplastic cervical adenopathy have recently been described as new head and neck manifestations of HIV infection seen in AIDS patients. Their radiologic appearance has been described as purely cystic masses with low attenuation values (10-18 H) on CT [2]. Reportedly, the MR characteristics of these parotid lesions, dictated by high water content, include low signal intensity on T1-weighted studies, intermediate signal intensities on proton-density-weighted studies, and bright signal intensities on T2-weighted scans. These typical findings were consistently demonstrated in all previously reported cases.

This article reports the findings in nine patients, all HIV positive, who were found to have benign lymphoepithelial parotid neoplasms and hyperplastic cervical adenopathy. Unlike previous investigators, we found varying CT and MR appearances of the parotid lesions, including purely cystic and mixed cystic-solid tumors. We therefore concluded that in patients with parotid gland enlargement, benign lymphoepithelial parotid tumors are not always purely cystic in appearance and that the presence or absence of cervical adenopathy and clinical history is crucial in guiding the clinician to their underlying origin.

### Materials and Methods

The CT or MR scans of nine patients who had undergone superficial parotidectomy between October 1985 and July 1989 were reviewed retrospectively. Three of the nine patients were evaluated with CT. From these, two unenhanced scans (Toshiba 650) and one enhanced scan (50-ml bolus of Omnipaque 300) (Toshiba 600S) were obtained. The remaining

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TABLE 1: Clinical Data and Imaging Results

Patient No.	No. of Lesions	Age (years)	Sex	CT	Signal Intensity			Unilateral/Bilateral	Cervical Nodes
					T1	Mixed	T2		
1	1	41	M	Cystic mass*				Unilateral	NA
2	2	41	F	Thick septated mass, peripherally enhancing				Unilateral	NA
3	1	53	F	Uniformly enhancing				Unilateral	Bilateral
4	4	47	M		↓↓	↑	↑↑	Bilateral	Bilateral
5	2	40	M		↓↓	↑	↑↑	Unilateral	Bilateral
6	5	49	M		↓↓	↑	↑↑	Bilateral	Bilateral
7	1	28	M		↑	↑↑	↑↑↑	Unilateral	Bilateral
8	4	29	M		↑	↑↑	↑↑↑	Bilateral	Bilateral
9	1	28	M		NA	↑	↑↑	Unilateral	Bilateral

\* Unenhanced CT examination.

Note.—NA = not available, ↓ = low signal intensity, ↓↓ = mixed signal intensity, ↑ = high signal intensity.

six patients were evaluated with MR imaging; four on a 0.35-T (Diasonics) scanner and two on a 1.5-T (GE) scanner. The CT and MR images were analyzed with respect to number of lesions, solid vs cystic characteristics, unilateral vs bilateral parotid lesions, and presence of cervical adenopathy.

## Results

Table 1 presents a summary of clinical and imaging results for all nine patients included in this study. All were proved HIV positive.

Of the three patients evaluated with CT, one (patient 1) had an unenhanced examination, which showed a homogeneous cystic unilateral parotid mass with a CT attenuation value of 18. CT sections through the neck were not obtained in this case and therefore the presence of cervical adenopathy was unknown.

The two patients (patients 2 and 3) evaluated with contrast-enhanced CT demonstrated a peripherally enhancing septated mass (Fig. 1) and a unilateral, single, uniformly enhancing mass, respectively, clearly revealing soft-tissue characteristics.

The remaining six patients were evaluated with MR imaging. All signal intensities were compared with respect to adjoining sternocleidomastoid muscle. Three patients (patients 4, 5, and 6) demonstrated mixed signal intensity on T1-weighted images, intermediate signal intensity on proton-density-weighted images, and high signal intensity on T2-weighted images. These findings are consistent with complex, partially cystic masses with soft-tissue components (Figs. 2 and 3). Microscopic examination revealed atrophy of gland parenchyma, marked lymphocytic infiltration with atypical follicular hyperplasia, and replacement of ducts by solid islands of epithelial and myoepithelial cells, consistent with benign lymphoepithelial lesions (Fig. 2D). This histologic appearance has been seen in association with HIV-induced lymphadenopathy as well as with autoimmune and other forms of sialadenitis [3].

Two other patients (patients 7 and 8) evaluated with MR imaging showed progressively increasing signal intensity masses on T1-, proton-density-, and T2-weighted studies, respectively, consistent with cystic mass lesions with proteinaceous fluid content (Fig. 4). In one patient (patient 9) evalu-



Fig. 1.—Patient 2: Postcontrast axial CT scan shows enhancing, complex, partially cystic mass (arrow); with portions demonstrating soft-tissue characteristics.

ated by MR, no T1-weighted images were obtained; however, proton-density- and T2-weighted images revealed increasing signal intensities, respectively.

After parotidectomy, pathologic evaluation was done on all specimens. Grossly, there was nodular or diffuse salivary gland enlargement, with pink-tan fleshy nodules as large as 4.5 cm in maximal diameter. In some instances, recognizable salivary gland parenchyma was seen attached to these nodules. Four of the specimens had grossly visible cysts, which ranged in size from 1.5–3.5 cm in maximal diameter. Specimen findings correlated well with their respective CT/MR appearance, in that four of nine lesions demonstrated primarily homogeneous cystic change.

## Discussion

Benign lymphoepithelial parotid lesions with associated hyperplastic cervical adenopathy in AIDS patients is a relatively new entity reported in the radiologic literature. The pathogen-

Fig. 2.—Patient 5.

A, Coronal T1-weighted (500/40/1) MR image shows large right parotid mass (*wide arrow*) with mixed intensity. Bilateral cervical adenopathy is also shown (*thin arrows*).

B and C, Axial mixed (1500/40/1) (B) and T2-weighted (3000/80/2) (C) images show right parotid mass (*arrow*) with high signal intensity characteristics.

D, Histologic section of parotid mass reveals cystic dilatation of salivary gland duct with extensive lymphocytic infiltration and replacement of ducts by solid islands of epithelial and myoepithelial cells, consistent with benign lymphoepithelial lesion.

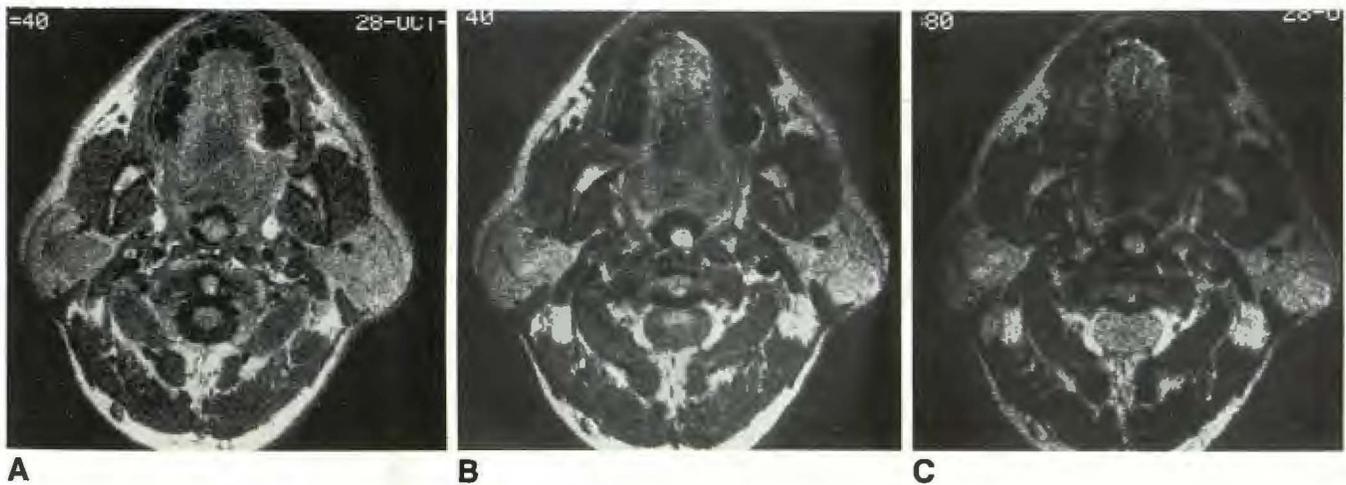
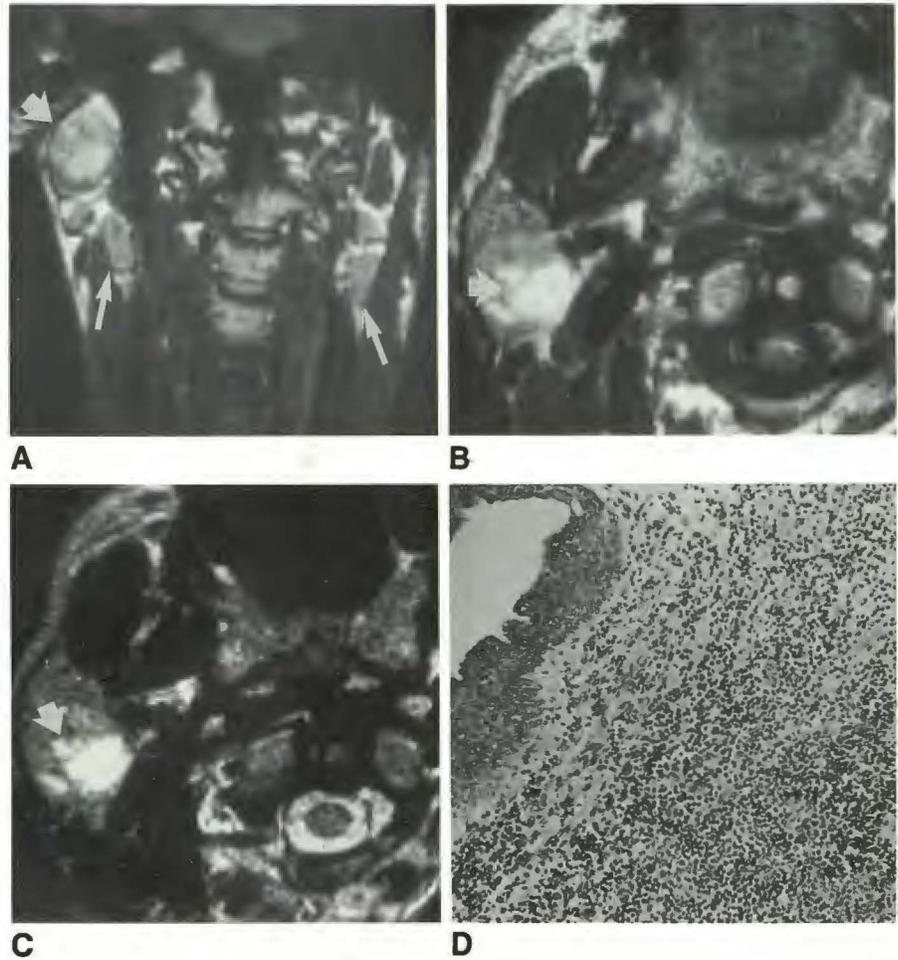


Fig. 3.—Patient 6.

A–C, Axial MR images show bilateral mass lesions demonstrating mixed, intermediate, and moderately high signal intensity characteristics on T1-weighted (500/40/1) (A), mixed (2000/40/1) (B), and T2-weighted (2000/80/2) (C) images, respectively.

esis of benign lymphoepithelial lesions has not been determined with absolute certainty. This lesion does not appear to be a true neoplasm and is most likely a reactive phenomenon. It may represent a form of sialadenitis or reactive changes in

intraglandular lymph nodes. When seen in association with HIV infection, the latter situation appears most likely. The HIV agent is targeted against lymphoid cells, resulting in generalized lymphadenopathy throughout the body, including intra-

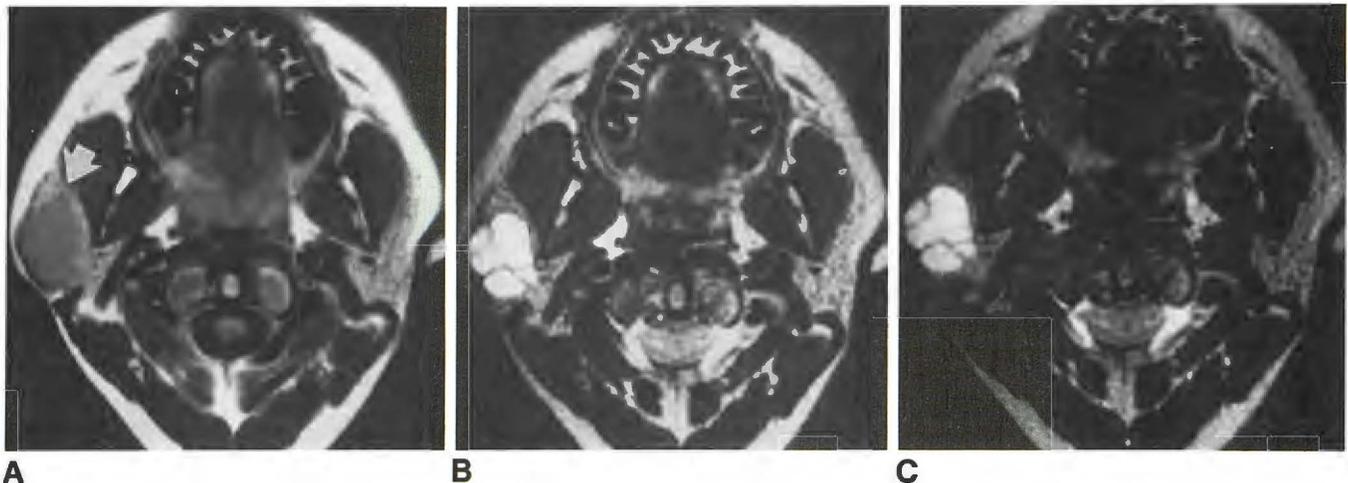


Fig. 4.—Patient 7.

A–C, Axial MR images show right parotid mass (arrow in A) demonstrating progressively increasing signal intensity characteristics on T1-weighted (600/30/1) (A), mixed (2000/40/1) (B), and T2-weighted (2000/80/2) (C) images, respectively.

parotid lymph nodes that manifest as benign lymphoepithelial lesions.

A total of 18 cases have previously been reported [2, 4], with parotid lesions characterized on CT and MR as purely cystic masses with low attenuation values on CT and low, intermediate, and high signal intensities on T1-, proton-density-, and T2-weighted MR scans, respectively. Holliday et al. [2] have proposed that this appearance is sufficiently characteristic for the diagnosis of benign lymphoepithelial parotid disease.

In our retrospective review of nine patients, we found varying CT and MR appearances to the parotid lesions. Five (56%) of the nine patients demonstrated complex cystic masses with definite soft-tissue components, while the other four demonstrated primarily homogeneous cystic characteristics. These findings reflect a greater variety of radiologic appearances than has previously been reported, with pathologic correlation confirming the variable presence of both cystic and solid components in these lesions.

In addition, there has been a reported predominance of bilateral parotid involvement, with 15 of the 18 previously reported cases showing bilaterality. Our study reveals a unilateral predominance with only three of nine patients demonstrating bilateral parotid lesions. All 18 of the published cases

were men, while our study includes two women, in whom this disease has not previously been described, probably reflecting the increasing frequency of HIV infection in women.

In conclusion, we have demonstrated a variable radiologic appearance of parotid masses, among which the majority contained solid components. We therefore suggest that they be labeled benign lymphoepithelial parotid lesions rather than cysts. Thus, since one cannot rely on a characteristic cystic CT/MR appearance of benign lymphoepithelial parotid lesions, the diagnosis must be assisted by the presence or absence of cervical adenopathy and clinical history.

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