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MR of Nasolabial Cysts

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Summary: We report the MR imaging findings in two cases of nasolabial cysts. Demonstration of their extraosseous location with cross-sectional imaging should prevent confusion with maxillary cysts and obviate unwarranted dental or maxillary surgery.

Index terms: Nose, cysts; Nose, magnetic resonance

Nasolabial (nasopalveolar) cysts are rare benign lesions that occur in the nasal alar region. They probably arise either from the anlage of the nasolacrimal duct system or as epithelial inclusion cysts trapped between the merging nasal and maxillary processes of the developing facial skeleton (fissural cysts). We report the magnetic resonance (MR) imaging findings in two cases.

Case Reports

Case 1

A 45-year-old woman had long-standing seasonal nasal congestion that had become unremitting over the past year. On physical examination her upper lip was protuberant and there was slight lateral displacement of the nasal ala. The floor of both nasal vestibules was elevated, which produced narrowing of the anterior airway to one third its expected diameter.

Unenhanced computed tomographic (CT) scans of the face showed bilateral relatively dense ovoid lesions immediately anterior and inferior to the nasal apertures (Fig 1). These contained sedimentation levels, with the dependent layer appearing to be of calcific density, suggesting "milk of calcium." There was mild scalloping of the subadjacent premaxilla by the cysts. MR images showed that the contents of the cysts were mildly hyperintense relative to cerebrospinal fluid (CSF) on T1-weighted images and isointense with CSF on T2-weighted images. The margins of the lesions were sharply demarcated and the cysts' walls were thin and uniform. Sedimentation levels were also evident on the MR study. Contrast-enhanced T1-weighted

images showed no enhancement of the walls or luminal contents of either cyst.

At surgery, the upper gingivolabial sulcus was incised just below the piriform apertures. Dissection exposed smooth, symmetric, well-circumscribed cysts that were each approximately 2 cm in diameter. No attachment to the underlying bone was encountered. The cysts separated easily from the undersurface of the nasal mucosa and skin, and they were removed intact. The premaxilla was slightly scalloped, as shown on the imaging studies.

Histologic examination of the walls of the cysts revealed a respiratory epithelial lining of pseudostratified ciliated columnar cells without inflammatory cells. No calcium crystals were found in the cyst walls on polarized light microscopy. However, no analysis of the fluid contents of the cysts was performed. On the basis of the surgical, radiologic, and pathologic findings, a diagnosis of bilateral nasolabial (nasopalveolar) cysts was made. There has been no recurrence of the cysts at 1-year follow-up.

Case 2

A unilateral presumed nasolabial cyst was identified in a 39-year-old woman who was being examined with MR imaging for headaches (Fig 2). The lesion was asymptomatic. The contents of the cyst were slightly hyperintense relative to CSF on T1-weighted images and isointense with CSF on T2-weighted images. The cyst wall was thin and uniform. No sedimentation level was evident. Postcontrast T1-weighted images revealed no enhancement of the contents or of the wall of the cyst. To date, the patient has had no further examination or treatment.

Discussion

Nasolabial cysts arise in the nasal alar region. Although they are generally considered rare, one medical center treated 26 cases during a 7-year period (1). The cysts are more common in female than in male subjects (3:1), and are bilateral in approximately 11% of cases (2). Although reportedly more common among black

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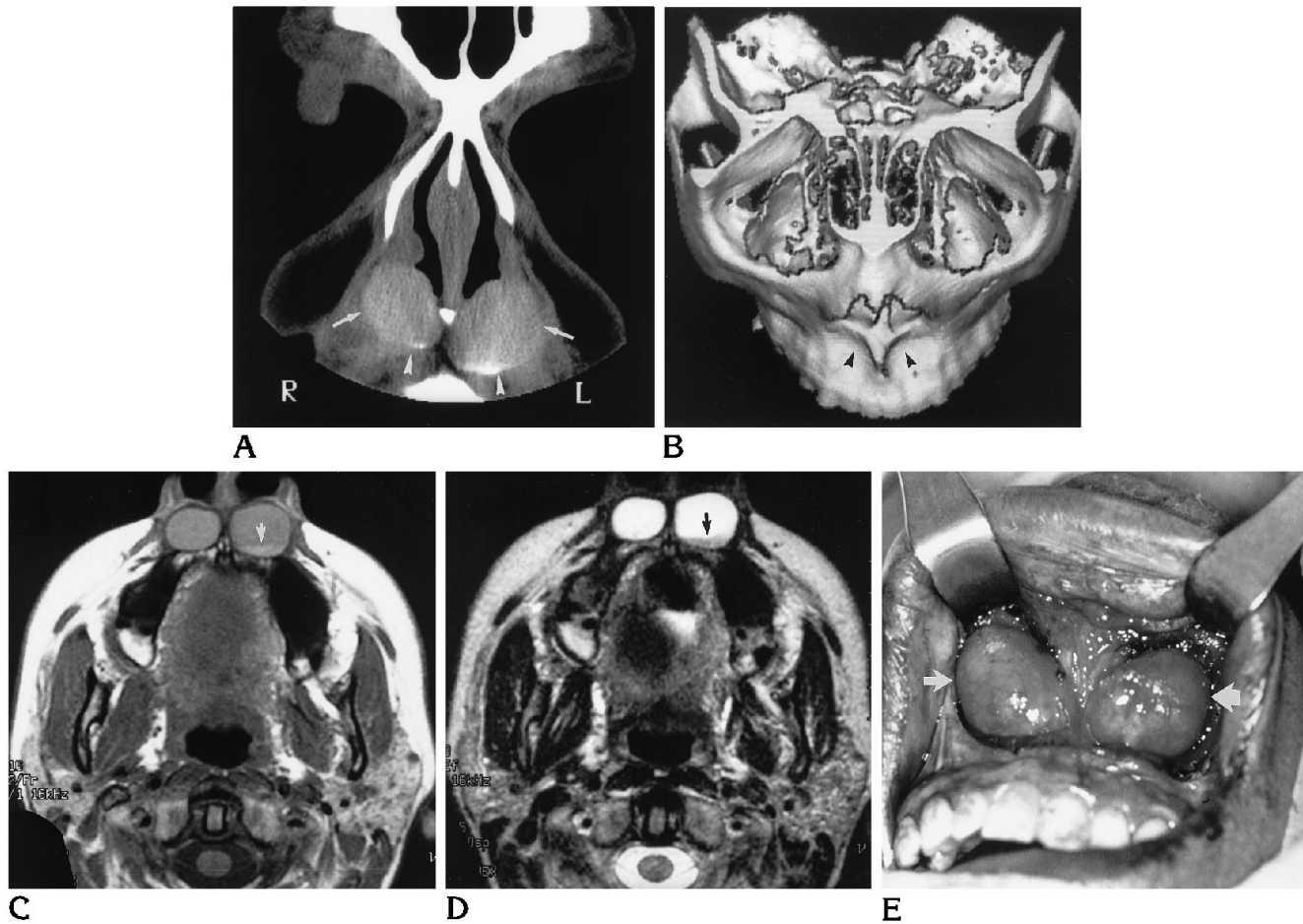


Fig 1. Case 1: 45-year-old woman with long-standing nasal congestion.

A, Coronal CT scan shows bilateral ovoid densities inferior to the nasal apertures (*arrows*). Note bilateral sedimentation levels, suggesting the lesions are cystic (*arrowheads*).

B, Three-dimensional surface rendering of the CT data, projected in a brow-down orientation, shows bilateral paramedian scalloping of the premaxilla (*arrowheads*).

C, Axial T1-weighted MR image shows that the lesions are sharply circumscribed and that the left-sided cyst contains a sedimentation level (*arrow*). The cyst's contents are mildly hyperintense relative to CSF.

D, Axial T2-weighted MR image reveals hyperintense cystic contents. Again, note the sedimentation level (*arrow*).

E, An intraoperative photograph shows the bilateral nasolabial cysts (*arrows*). The buccal mucosa has been incised and retracted.

subjects, the largest number in Kuriloff's series occurred in the Hispanic community (1). In that series, all patients were adults (mean age, 51 years).

Many lesions probably remain undetected unless they become infected or are associated with facial deformity. A nasolabial cyst presents as a smooth, mobile, soft-tissue mass between the upper lip and nasal aperture, producing protrusion of the upper lip, elevation of the nasal ala and inferior turbinate, and effacement of the nasolabial fold. Slow painless enlargement of these lesions may be noted over several years, or they may present with more sudden, painful swelling when infected. Infection occurred in

half of the patients in Kuriloff's series (1). Infected cysts may spontaneously drain into the nose or mouth (3-5). The cysts may produce pressure erosion of the underlying bone, as in our case 1, and may grow quite large and erode the maxillary alveolus (6). The cystic contents are typically mucoid or serous unless infected or hemorrhagic.

The origin of these cysts is a matter of controversy. Early theories suggested that they were retention cysts arising from inflamed mucous glands (7). Subsequent theories have included an origin analogous to fissural cysts, in which embryonic nasal epithelium is trapped between the merging maxillary process and the

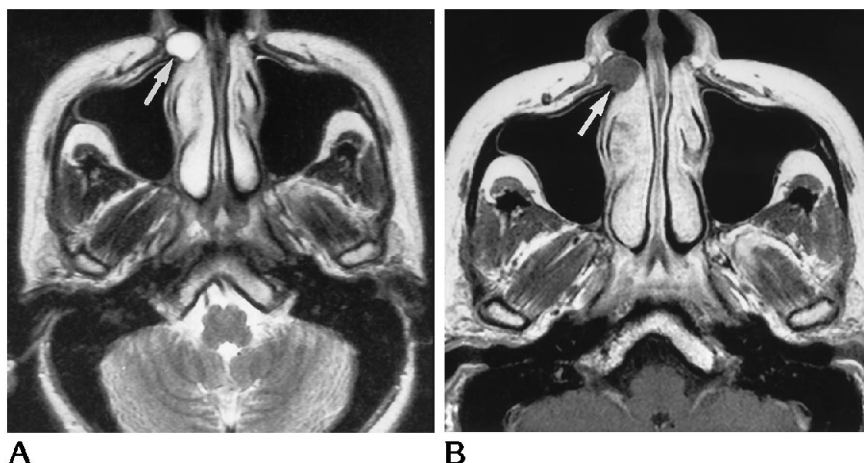


Fig 2. Case 2: 39-year-old woman with a unilateral presumed nasolabial cyst.

A, Axial T2-weighted MR image shows a unilateral sharply marginated cyst with hyperintense contents (*arrow*).

B, A contrast-enhanced T1-weighted axial MR image shows no enhancement within the lesion. Note the close relationship between the lesion and the inferior turbinate (*arrow*).

medial and lateral nasal processes (8). The developing embryologic midface includes bilateral medial and lateral nasal and maxillary swellings. The medial nasal swellings form the middle portion of the nose, and, along with the maxillary swellings, contribute to the central upper lip. The nasal alae form from the lateral nasal swellings. Brüggenmann was the first to postulate that nasolabial cysts form from the anlage of the nasolacrimal duct (9). The nasolacrimal duct arises from the nasolacrimal groove, a deep furrow that separates the lateral nasal swellings from the maxillary swellings. Epithelial cords arise from ectoderm in the base of the nasolacrimal groove and are initially attached to the overlying ectoderm. After detaching from the overlying ectoderm, these cords canalize to form the nasolacrimal duct, and the maxillary and lateral nasal swellings subsequently fuse (10). Epithelial remnants of the nasolacrimal groove might therefore persist just deep to the junction of the nasal ala with the lip. A cyst arising from these remnants would ultimately lie more anteriorly than the opening of the nasolacrimal duct into the inferior meatus. A report of a family with an unusual syndrome involving bilateral aplasia of the nasolacrimal ducts coincident with bilateral upper labial cysts supports a relationship between the nasolacrimal system and these lesions (11).

Nasolabial cysts are lined by respiratory epithelium (pseudostratified ciliated columnar and/or low columnar epithelium with interspersed goblet cells), although squamous metaplasia may be encountered in infected cysts. The cyst wall contains fibrous connective tissue. The cysts usually respond well to conservative enucleation via a sublabial approach.

Adherence of the cyst wall to surrounding tissues may occur as a result of infection of the cyst and may complicate enucleation (5, 12).

One clinical case report documented calcium oxalate crystals within the luminal contents of the nasolabial cyst (13). Similar crystals might explain the "milk-of-calcium" appearance of the dependent fluid levels in the first case. Although identifiable changes may be evident on occlusal radiographs (14), CT or MR demonstration of the soft-tissue origin of these lesions may prevent unwarranted dental surgery and may eliminate the need for diagnostic cyst puncture with injection of radiographic contrast material.

Cystic lesions that should be considered in the differential diagnosis of nasolabial cysts include nasopalatine duct (also known as incisive canal) cysts and so-called globulomaxillary cysts. Incisive canal cysts are midline inclusion cysts arising from epithelial remnants within the incisive canal. Maxillary cysts arising off the midline between the lateral incisor and canine teeth have been called *globulomaxillary cysts*. At least one recent article suggests that these cysts are of odontogenic origin and are not true fissural cysts (they do not arise from epithelial inclusion between the merging facial processes during formation of the facial skeleton) (15). Both nasopalatine duct and globulomaxillary cysts are intraosseous. The extraosseous location of nasolabial cysts should make differentiation from these and other maxillary nonodontogenic or odontogenic cysts straightforward. Nasolacrimal mucocoeles (also known as congenital nasolacrimal cysts of the duct drainage system) arise from failure of canalization of, or obstruction of, the nasolacrimal duct. These

usually appear in infancy, along with dacryocystitis, epiphora, or an intranasal mass with respiratory distress (16). The clinical presentation and location of these lesions are distinct from that of nasolabial cysts. Epidermoid or dermoid cysts may arise along the course of dermal sinus tracts in the midline nasal region or laterally in the paranasal/medial canthal region. A sublabial location below the nasal alae would be unusual. Additionally, most epidermoid and dermoid cysts are diagnosed in childhood, whereas nasolabial cysts almost invariably present in adulthood. It would be difficult to differentiate a nasolabial cyst from a unilocular lymphatic malformation, since each might appear cystic and contain fluid-fluid levels. Soft-tissue masses including benign tumors (schwannomas or neurofibromas) or malignant tumors (squamous cell carcinoma or minor salivary gland tumors) might be considered, but lack of enhancement and the presence of fluid-fluid levels would be atypical in these solid lesions. A periapical dental abscess should be readily distinguished from a nasolabial cyst on the basis of inflammatory symptoms and the presence of periapical lucency on dental radiographs.

In conclusion, nasolabial cysts are benign cystic lesions that the radiologist may encounter incidentally or in conjunction with a mass immediately below the nasal aperture. The lesions are extraosseous, but scalloping of the underlying bone may be seen. Sedimentation levels, when present, confirm the cystic nature of the lesions. Contents of uncomplicated lesions may be hyperdense on unenhanced CT scans, slightly hyperintense relative to CSF on T1-weighted MR images, and isointense with CSF on T2-weighted MR images. In our experience, no enhancement of the cystic walls or

contents was seen. Because of its lower cost, CT is preferable to MR imaging in the evaluation of a suspected nasolabial cyst. Familiarity with the imaging features of these lesions will prevent confusion when they are encountered incidentally on CT or MR studies.

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