

Dermoid cyst of the parotid gland

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Abstract

A dermoid cyst is an ectodermally differentiated form of teratoma. Its occurrence in the parotid gland is very rare. Such a presentation must be properly evaluated in order to rule out malignancy. We describe the diagnostic evaluation and surgical management of a parotid dermoid cyst in an 18-year-old man. We also review the embryologic pathogenesis of the tumor and the usefulness of the physical examination, preoperative fine-needle aspiration cytology, magnetic resonance imaging, and computed tomography in evaluating the extent of the tumor, its histologic features, and its cystic characteristics. Finally, we discuss the role of surgical management in terms of preserving facial nerve integrity and preventing recurrence.

Introduction

Dermoid cysts are a type of teratoma. Teratomas are divided into three categories: *mature*, *immature*, and *monodermal*:

- Mature (benign) teratomas are also known as *cystic teratomas*, *dermoid cysts*, and *cystic dermoids*. These neoplasms are mainly derived from ectodermal differentiation and sometimes from mesodermal differentiation.
- Immature (malignant) teratomas are predominantly solid in structure and may feature immature differentiation of all three germinal layers.
- Monodermal teratomas are highly specialized and sometimes functional tissues, the most notable of which are struma ovarii and carcinoid.¹

The salivary glands are potential sites for several abnormal processes, including benign and malignant masses. Benign cysts of the parotid gland can be classified as *acquired* and *congenital*:

- Acquired parotid cysts have various etiologies, including, trauma, neoplasm, obstruction, calculi, and the presence of a parasite.
- Congenital cysts include first branchial arch cysts, which are further divided into *type I* (branchial clefts) and *type II* (branchial pouch anomalies). Type I cysts involve the first branchial arch and are solely of ectodermal origin. Type II cysts, which originate in the first and second branchial arches, are comprised of ectoderm and mesoderm.

A dermoid is a form of congenital cystic lesion.² The incidence of parotid dermoid is very low. When it does occur, a correct preoperative diagnosis is necessary in order to differentiate it from a true malignancy. In this article, we describe a new case of parotid dermoid, and we discuss its management.

Case report

An 18-year-old man presented with a swelling over the right side of his face that had been present for approximately 10 months. The patient said he had first noticed the abnormality while looking in the mirror. Since then, the size of the mass had occasionally fluctuated, alternately growing and shrinking slightly. Its size had never become significantly larger than it was at presentation. The patient denied ever having an infection, pain, or other symptoms in the area, and he had not noticed any similar masses elsewhere on his face. He denied any fevers, weight loss, and other systemic abnormalities.

On physical examination, the patient displayed normal otologic anatomy with the exception of a fullness just beneath the right earlobe. Findings on examination of the nasal cavity, oral cavity, oropharynx, neck, and thyroid were all within normal limits. On palpation, the mass appeared to be fluid-filled. It was nontender and was abutting the pinna of the right ear. Overlying skin changes

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were absent, and a skin connection was not observed. Flexible endoscopy did not find any fistulization into the oropharynx or piriform sinus.

A 5-mm axial computed tomography (CT) scan of the neck from the skull base to the lung apices revealed the presence of a 2.5×3.1 -cm fatty lesion in the right parotid that was suggestive of a possible lipoma (figure 1). Inferior sections also demonstrated a loculated mass with cystic spaces in the same lesion. No solid nodularity was evident to indicate sarcomatous degeneration, and no exophytic mucosal mass or pathologic adenopathy was seen.

The patient underwent a right total parotidectomy with right parapharyngeal space dissection. During the procedure, a cartilaginous mass was noted just medial and anterior to the normal tragal pointer. This mass appeared to be adherent to the mass observed on CT. The original mass was located deep to the facial nerve, and it featured multiple components, including cartilage and hair-bearing structures, as well as cystic components. Dissection into the parapharyngeal space was necessary to help free the tumor into the surgical bed. The tumor was removed en bloc. Nerve integrity monitoring was maintained throughout the procedure. The patient recovered without incident.

Gross pathology of the excised specimen showed it to be a red-tan, soft, spongy tissue that measured approximately $4.5 \times 2.0 \times 0.5$ cm. Sectioning through the specimen revealed a thin-walled cyst with hair follicles and caseous material. In addition to the cyst, at least one area had thick cartilaginous tissue. Histology demonstrated squamous epithelium lining the cyst wall (figures 2 and 3). Dermal adnexal elements—including hair follicles, sebaceous glands, and sweat glands—were observed. Mesodermal elements of cartilage and adipose tissue were also noted.

Discussion

Dermoid cysts are classified on the basis of their pathogenesis and microscopic appearance into three types: *congenital*, *inclusion*, and *congenital-inclusion*:

- Congenital dermoids arise from germinal epithelium. They are almost exclusively found in the testes and ovaries.

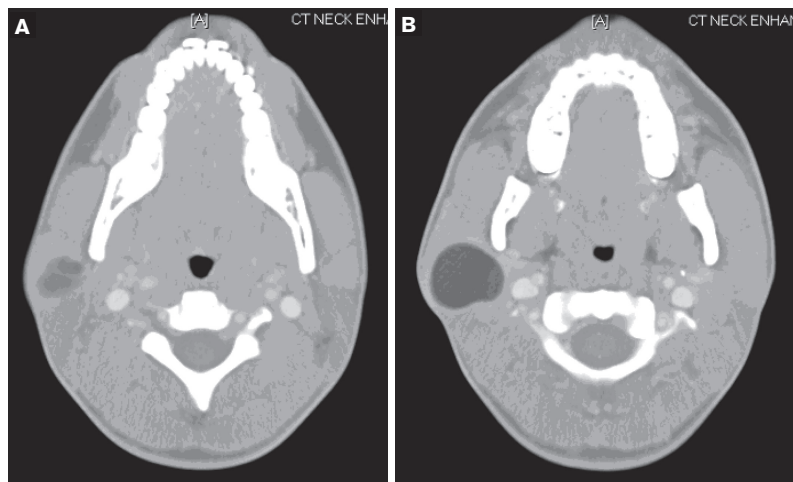


Figure 1. **A:** Contrast-enhanced CT of the neck demonstrates the cystic mass in the area of the right parotid gland. **B:** Another view shows the homogeneity of the mass superiorly.

- Inclusion dermoids usually occur secondary to trauma. A pilonidal cyst is an example of an inclusion dermoid.

- Congenital-inclusion dermoids arise from embryonic fusion sites, including the branchial clefts.³

Most head and neck dermoids fall into the category of congenital-inclusion, as did our patient's. His cyst most likely occurred as a result of ectoderm inclusion during branchial arch formation.

While the diagnostic workup and treatment of dermoids are similar to those for other benign cystic masses, the point of interest in this case was its unusual location. Our survey of the literature since 1950 found only 16 previously published reports describing a dermoid cystic teratoma in the parotid gland. The most recent case was documented in 2004.

Because it is difficult to differentiate dermoids from the more common benign cystic masses by physical examination alone, the value of certain diagnostic and therapeutic methods has been noted. A distinctive feature of dermoids is the combination of cystic spaces and homogeneous features seen on radiologic studies. Magnetic resonance imaging (MRI) is advantageous in ruling out a possible lipoma, but in terms of identifying cystic features and bony detail, CT is the study of choice.⁴

Because of the various cell types in the tumor, surgical excision is the sole means of definitive histologic identification and treatment. In a 1999 report of 2 cases, Baschinsky et al noted that fine-needle aspiration cytology (FNAC) is a reliable adjunct to excision in that

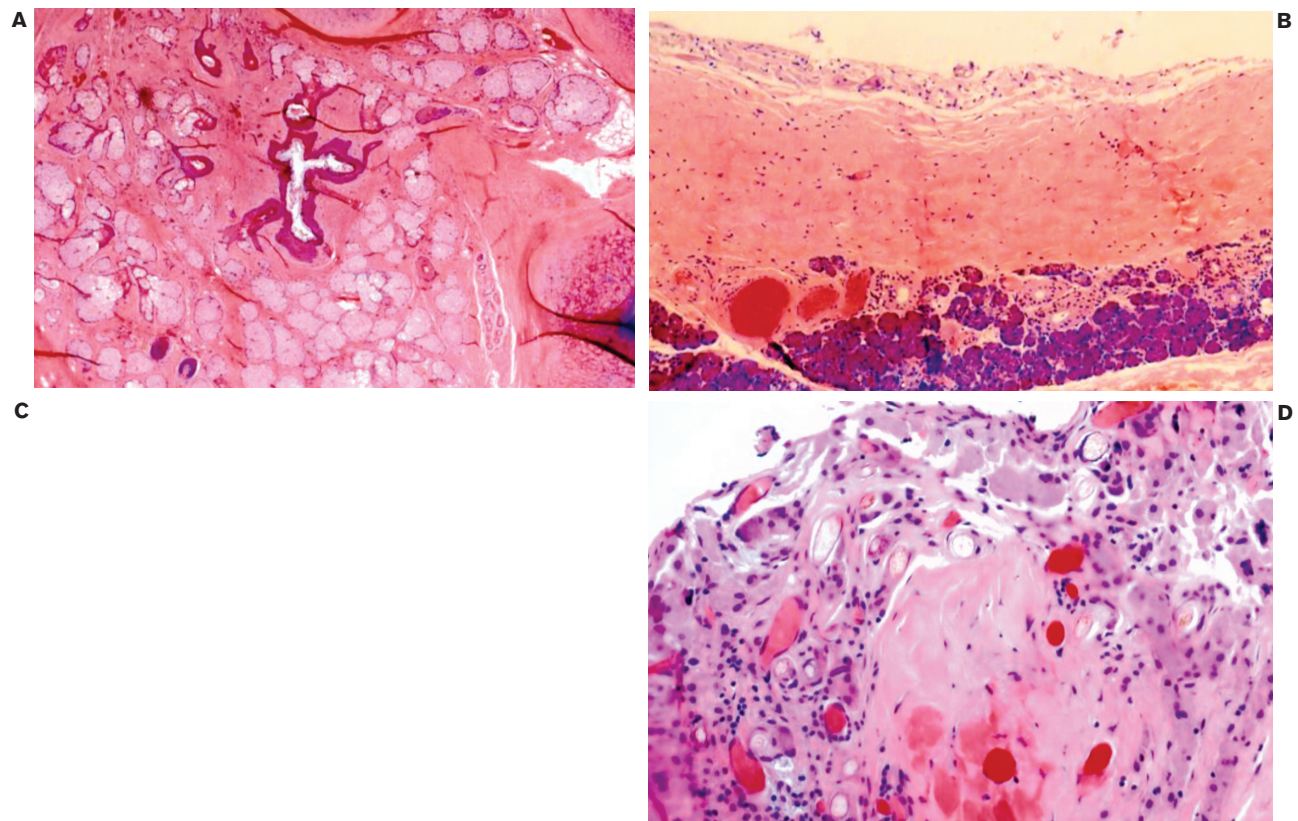


Figure 2. **A:** This portion of the cyst is a solid nodule with cartilage, squamous epithelium, sebaceous glands, and fat. **B:** Most of the cyst lining is denuded. It is lined only with histiocytes without epithelium. **C:** Focal areas of the cyst lining feature stratified squamous epithelium with keratinization and associated sebaceous glands. **D:** The cystic contents and cyst wall include numerous hairs with an associated giant-cell reaction, similar to those seen in benign ovarian teratomas.

it is useful in preoperative planning.⁵ With regard to surgical technique, careful dissection beyond the cyst wall is necessary in order to prevent recurrence.² While it was not an issue in our case, we would have had to leave residual tumor tissue behind if our patient's facial nerve had been involved. All attempts should be made to preserve the integrity of the facial nerve, even in the case of its involvement with the tumor.

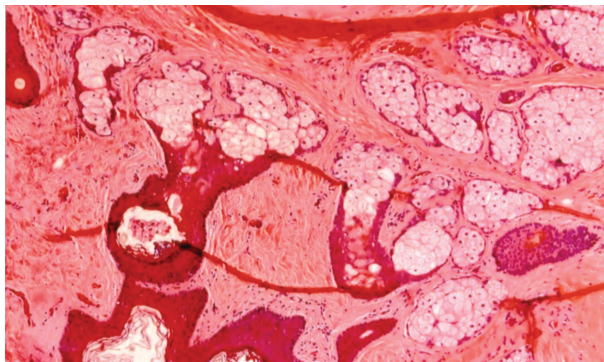


Figure 3. Islands of mature cartilage are present below the epithelium.

In conclusion, dermoid cysts of the parotid gland are rare tumors with multiple modes of pathogenesis, including traumatic, congenital, and developmental. Although they are generally approached in a manner similar to that used for other benign cystic masses, previous authors have revealed certain nuances in diagnosis and excision. While CT and MRI aid in structural characterization, FNAC is helpful in the preparation of the definitive diagnostic and therapeutic surgical excision.

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