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Dermoid Cyst of the Parotid Gland: Case Report of a Rare Entity and Review of the Literature

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABCDEF 1 Zahra Z. Alhusain*
ABCDEF 1 Karolina Witczak*
ABCD 2 Ahmed Shabaik

1 Health Sciences International, University of California San Diego (UCSD), La Jolla, CA, USA
2 Department of Pathology, University of California San Diego (UCSD), San Diego, CA, USA

* Zahra Z. Alhusain and Karolina Witczak contributed equally

Corresponding Author: Ahmed Shabaik, e-mail: ashabaik@health.ucsd.edu
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Patient: Female, 26-year-old
Final Diagnosis: Dermoid cyst
Symptoms: Neck mass
Clinical Procedure: Surgery
Specialty: Pathology

Objective: Rare disease

Background: A dermoid cyst is a benign, epithelial-lined cavitary lesion composed of ectoderm and mesoderm that can arise anywhere in the body, with a tendency to develop in midline structures such as the coccyx and ovary. It is a rare entity in the head and neck region, where the incidence is 7% of all body dermoid cysts. Of these 7% (dermoid cysts found within the head and neck area), 80% are found localized to areas around the orbit, oral region, and nasal region. Within the parotid gland, they are extremely rare, with less than 25 cases reported in the existing literature.

Case Report: We report a case of a 26-year-old woman with a long-standing left parotid mass that was found to be a dermoid cyst after surgical excision and histological evaluation. We examine the clinical presentation and imaging findings used to establish a presumptive diagnosis to guide treatment options. Although preoperative fine-needle aspiration was not performed in this case, it is often used to clarify the differential diagnosis before definitive surgical management is undertaken.

Conclusions: Intraparotid dermoid cysts are rare, benign entities that require complete cystectomy for definitive management. As surgical excision is the only curative method, preoperative histopathological diagnosis via biopsy may be unnecessary. Our paper adds to the existing literature by presenting a case of an intraparotid dermoid cyst successfully treated surgically in a 26-year-old woman.

Keywords: Dermoid Cyst • Parotid Gland

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Background

Dermoid cysts are benign, closed, epithelium-lined cavities that can form anywhere in the body. The term "dermoid cyst" is a broad term commonly used interchangeably to describe epidermoid, dermoid, and teratoid cysts [1,2]. These are the 3 histopathological variants of the dermoid cyst, and they differ by the content of their lining. Epidermoid cysts originate from ectoderm and are lined by a stratified squamous epithelium. They contain trapped keratin debris. Dermoid cysts, or true dermoid cysts, contain elements from both ectodermal and mesodermal origin, and are lined by stratified squamous epithelium with cutaneous adnexal structures such as sebaceous glands, sweat glands, and hair follicles. Teratoid cysts contain elements derived from all 3 germ layers (ectoderm, mesoderm, and endoderm) and their lining varies from stratified squamous to ciliated pseudostratified columnar epithelium [3,4].

The most common locations for dermoid cysts in the body from most to least common are the coccyx area (44.5%), the ovary (42.1%), and the head and neck region (7%). Of the 7% within the head and neck, 80% are found in areas around the orbit (49.5%), oral region (23%), and nasal region (12.6%), with the rest in various other locations (14.6%) [1,5,6]. Hence, the occurrence of a dermoid cyst in the parotid gland is extremely rare, with less than 25 cases reported worldwide [7]. As a cystic lesion, a dermoid cyst can mimic other parotid cystic lesions clinically and radiologically. Multiple radiologic modalities can help provide a preoperative diagnosis but histopathological evaluation is the only modality to provide a definitive diagnosis. The purpose of this report is to present and discuss the diagnosis, evaluation, and surgical management of a new case of parotid dermoid cyst in a 26-year-old woman.

Case Report

A 26-year-old woman with multiple comorbidities presented to the otolaryngology clinic with a long-standing history of a slowly growing left parotid mass. She had previously sought medical management at an outside institution where she underwent ultrasound and MRI examinations, which revealed a cystic mass. For unknown reasons, she did not undergo fine-needle aspiration cytology (FNAC). Due to progressive growth of the lesion, the patient's primary care physician referred her to the University of California San Diego Head and Neck Oncology Department for definitive evaluation and treatment. Physical examination of the head and neck revealed a prominent 8×9 cm circular, protuberant subcutaneous mass with fluid-like contents in the left parotid gland region. Examination revealed no other abnormalities. The patient denied pain, weight loss, or weakness of facial movement. No cervical lymphadenopathy was present. Facial nerve function was intact bilaterally.

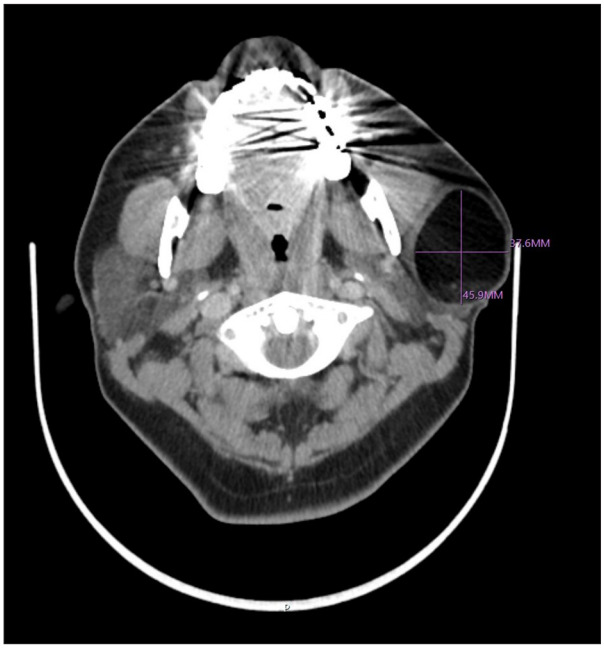

Figure 1. CT scan of the head and neck showing a 4.7 cm well-defined, encapsulated, fat-attenuating, and non-enhancing mass within the superficial left parotid gland with some layering debris. No associated nodular enhancing soft-tissue component was observed.

Soft-tissue neck computed tomography (CT) with contrast revealed a 4.7 cm well-defined, encapsulated, fat-attenuating, non-enhancing mass within the left superficial parotid gland (**Figure 1**). A presumptive diagnosis of intraparotid lipoma with some layering debris was most compatible with the radiographic findings. The patient's CT was otherwise unremarkable; no associated nodular enhancing soft-tissue component was noted and no enlarged lymph nodes were present in the neck. She was referred to Head and Neck Surgery for excision of the mass. FNAC was considered before surgery, but it was decided that it would not alter management, nor would it help with surgical planning.

Consequently, the patient underwent left superficial parotidectomy with facial nerve preservation corresponding to "parotidectomy I-II" per the European Salivary Gland Society classification of parotidectomies [8]. The entire resected specimen weighed 26 g and measured 5.0×5.0×2.5 cm in total. Grossly, the specimen consisted of an irregular discoid, rubbery, tan-yellow lobulated salivary gland containing a collapsed cyst measuring 3.8×2.2×0.5 cm in size with smooth tan-to-tan-white lining (**Figure 2**). Microscopic examination revealed a benign serous salivary gland consistent with parotid gland with a central cystic space lined by benign keratinizing stratified squamous epithelium with skin adnexal structures. Focally, the cyst lining was ulcerated with reactive changes in the subepithelial tissue (**Figure 3**). There were few smooth muscle bundles

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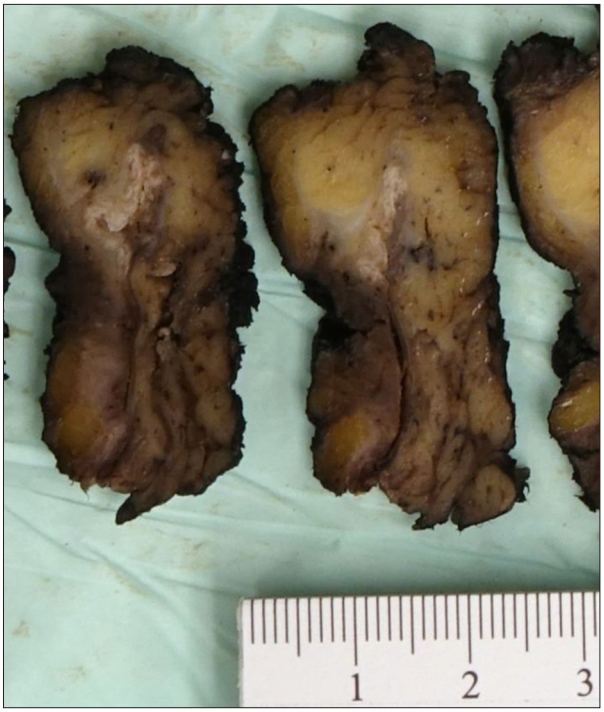

Figure 2. Gross examination reveals a collapsed cystic structure within the parotid gland with a whitish lining.

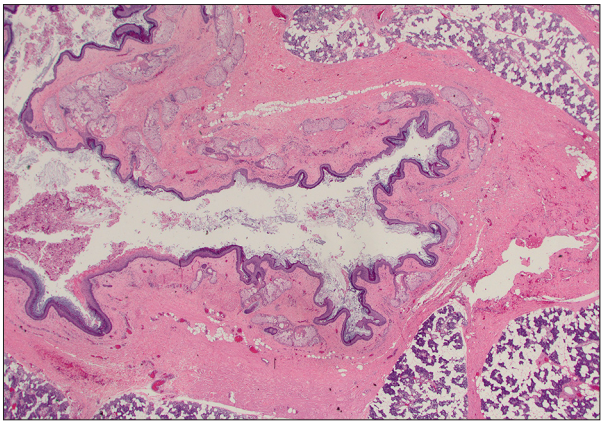

Figure 3. Microscopic examination revealed a benign keratinizing squamous epithelium-lined cyst containing keratinous debris and surrounded by skin adnexal structures, mainly sebaceous glands and some smooth muscle. The cyst was surrounded by purely serous salivary gland acini consistent with parotid gland. The findings are consistent with dermoid cyst of the parotid gland. (125×, H&E). H&E – hematoxylin and eosin stain.

in the subepithelial tissue. The cyst was completely excised. On followup 1 month after the procedure, the patient had recovered well and had intact facial nerve function.

Discussion

Dermoid cysts are histologically benign lesions that can arise anywhere in the body and contain elements of the 2 germ layers, ectoderm and mesoderm, but not endoderm. By definition, dermoid cysts include the entrapment of epidermal and dermal elements within deeper tissue [5,9]. The cyst wall lining consists of epidermal and dermal elements and is lined by stratified squamous epithelium containing various amounts of dermal appendages including pilosebaceous units, sweat glands, and hair follicles. The presence of dermal appendages differentiates dermoid cysts from epidermoid cysts, and a lack of endoderm structures differentiates them from teratoid cysts. Often, the dermoid cyst lumen is filled with sebaceous material and keratin debris, with occasional hair [10,11].

Although dermoid cysts can be classified in several ways, a simple way is to divide them into 2 groups: congenital and acquired. Congenital cysts result from entrapment of epithelial cells along lines of embryonic closure, whereas acquired cysts result from traumatic implantation of skin within deeper layers of tissue. Another way in which dermoid cysts are classified is into 3 groups as first described by New and Erich, as follows: congenital cysts of the teratoma type, acquired cysts, and congenital inclusion cysts [6,12].

Dermoid cysts within the head and neck commonly (up to 80%) arise around the orbital, oral, and nasal regions of the head [1,5]. These areas are midline fusion sites of many embryonic structures [5], explaining the rare occurrence of dermoid cysts in lateral regions of the head and neck, including the parotid gland. Due to the rarity of dermoid cysts in the parotid gland, only a few published case reports exist. Furthermore, cystic lesions in general only account for 2-5% of all lesions in the parotid gland [13].

Similar to other benign masses of the parotid gland, dermoid cysts present as slowly growing asymptomatic masses, unless they compress adjacent structures such as the facial nerve. There are no physical examination findings that can differentiate dermoid cysts from other entities. The list of possibilities for differential diagnosis is long, and includes lipoma, branchial cleft cyst, lymphoepithelial cyst, mucous retention cyst, suppurative infections, blockage of the parotid duct, and benign and malignant tumors of the parotid itself, including pleomorphic adenoma, as well as fibroma and neurofibroma, among others [14]. Radiologic modalities (ultrasound, CT, and MRI) can help to visualize the contents of dermoid cysts, differentiating cystic and solid components and thereby narrowing down the differential possibilities. However, a definitive diagnosis can only be reached by histopathological evaluation [15]. A combination of cystic and solid material, or “sack of marbles” appearance, is a typical radiographic finding consistent with dermoid cyst, as are linear stripes within the cyst resembling hair [1,16].

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Although FNAC is often performed preoperatively to provide a presumptive diagnosis, histopathological confirmation is still required after full excision of the lesion. Furthermore, FNAC may in fact provide a misdiagnosis or be non-diagnostic [2]. In light of this, careful consideration should be exercised when deciding whether to pursue FNAC, as it is neither fully diagnostic nor curative. Surgical excision is the only known curative method. In our case, imaging tests presumed the lesion was a lipoma, as in a previously reported case by Dwivedi et al [12]. Because our patient sought full excision of the lesion, FNAC was not done as it would not alter surgical management. Although some authors view FNAC as a useful tool in preoperative management of intraparotid dermoid cyst (Bushra et al [11], Baschinsky et al [15], Islam et al [17], and Hoffman et al [18]), others disagree. Our case, like other cases reported by Gonzalez-Perez et al [9], Dwivedi et al [12], and Shakeel et al [18], found that preoperative FNAC is unnecessary [18].

The standard surgical approach to dermoid cyst removal in the parotid is superficial parotidectomy, unless the lesion is embedded deeply within the gland, in which case total parotidectomy should be performed [1]. There have been a few cases in which isolated cystectomy was the treatment of choice (Dwivedi et al [12], Damar et al [19], Yang et al [20]). Whatever type of surgical approach is taken, it is essential to remove the cyst in total with the capsule intact [21]. This is due to certain risks associated with incomplete resection, notably infection, recurrence, and even malignant transformation [10]. Although malignant transformation has not been documented in dermoid cysts originating within the parotid gland, it has been observed in the submental and sublingual regions of the head and neck at a rate of around 5% [22]. Considering the possibility of malignant transformation of dermoid cysts in the parotid, complete surgical excision is the recommended treatment of choice [22-24].

Conclusions

Intraparotid dermoid cysts are rare, benign entities. Some disagreement exists regarding the best approach to establishing a preoperative diagnosis. Imaging can help narrow the diagnosis, with a combination of cystic and solid material visible, referred to as a "sack of marbles" appearance, as the most descriptive radiographic finding consistent with dermoid cyst. Linear streaks visualized within the cyst on imaging resembling hair can also help point to the diagnosis of dermoid cyst. Whether or not FNAC is performed to establish a preoperative diagnosis before surgery is done, the only true curative method for dermoid cyst is surgical excision with full cystectomy. This is especially true due to the risk of complications such as infection, recurrence, and malignant transformation in the case of incomplete excision. Our paper adds to the existing literature by presenting a case of intraparotid dermoid cyst successfully treated surgically in a 26-year-old woman without preoperative FNAC.

Department and Institution Where Work Was Done

Department of Pathology, University of California San Diego Health, La Jolla, CA, USA.

Declaration of Figures' Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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