

Dermoid Cysts of the Maxillofacial Region: Case Series

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Abstract The maxillofacial region can be affected by a number of subcutaneous pathologic conditions that include developmental, inflammatory, infective and neoplastic entities. Many of these lesions present as a soft to firm painless swelling. Differential diagnosis of such lesions requires thorough knowledge of maxillofacial pathology as well as anatomy to come to a correct diagnosis and provide effective treatment. Misdiagnosis and improper treatment can lead to other complications and morbidity. The commonly encountered lesions include dermoid cysts, branchial cysts, lipoma and thyroglossal cyst. Dermoid cysts are dysontogenetic cysts rarely involving the maxillofacial region (1.6–7% of all dermoid cysts of the body). The most common site of involvement in the maxillofacial region is near the frontozygomatic suture followed by cervical region. Some lesions have a deep component which may involve the cranial or orbital cavities. This is a retrospective study of the cases managed at our center from 2001 to 2017. Of the 12 cases in our study, all but one was involving the floor of the mouth. There were 11 males and 1 female. Swelling was the only symptom. The patients age ranged from 16 to 34 years (Table 2). The cysts were present for a period ranging from 6 months to 5 years at the time of reporting. All cases were managed with enucleation. The patients are on follow-up with no report of

recurrence. The period of follow-up was 1 to 16 years. There were no complications postoperatively.

Introduction

The maxillofacial region can be affected by a number of pathologic conditions that include developmental, inflammatory, infective and neoplastic entities. Many of these lesions present as a soft to firm painless swelling which may have existed for a long period of time and the patient reports for treatment only when it interferes in function or assumes a significant size. Differential diagnosis of such lesions requires a good knowledge of the clinical features, radiological appearance and specialized imaging of such lesions. A variety of pathologic lesions should be considered in the differential diagnosis including dermoid cysts, branchial cysts, lipoma and thyroglossal cyst. Rapidis et al. [1] found that 95 of the 1007 head and neck tumors examined by them were dermoid cysts—of which three were located in the floor of the mouth. The term dermoid cyst today is used to indicate any cyst filled with sebaceous material and with an epidermal lining. It represents different entities for the gynecologist, pathologist, pediatrician, neurosurgeon and maxillofacial surgeon. This is a retrospective study of cases managed at our center from 2001 to 2017. Inclusion criteria were histopathologic diagnosis of dermoid cyst and the presence of sufficient clinical records. Exclusion criteria were the absence of clinical records.

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Aims and Objective of the Study

The aim of this article is to describe the clinical features of dermoid cysts occurring in the maxillofacial region through our case series and present two representative cases.

Case 1

A 27-year-old male reported to our center with the presenting complaint of a swelling in the neck since 2 months (Figs. 1, 2). The patient gave a history of slow enlargement of the swelling over a period of time. There was no pain or difficulty in swallowing. On examination, there was a swelling of size 2 cm × 2 cm in the submental region which does not move on swallowing. The skin overlying the swelling was normal and pinchable. It was nontender, doughy in consistency and mobile. Intraoral examination showed the extension of the swelling under the tongue (Fig. 3). Overlying mucosa was normal. CT scan showed a cystic lesion extending from the mandible to the hyoid bone in the axial section and extending from the neck to the tongue on the coronal and sagittal sections (Figs. 4, 5, 6). Aspiration yielded straw-colored fluid. The cyst was enucleated through a submental incision in toto (Fig. 7). Cut section showed the presence of thick cheesy substance inside the lumen (Fig. 8). Histopathologic examination confirmed the diagnosis of dermoid cyst.

Case 2

A 34-year-old male reported with complaints of swelling on the right side of the face since 3 years (Figs. 9, 10). There was no history of pain or trauma. The skin overlying

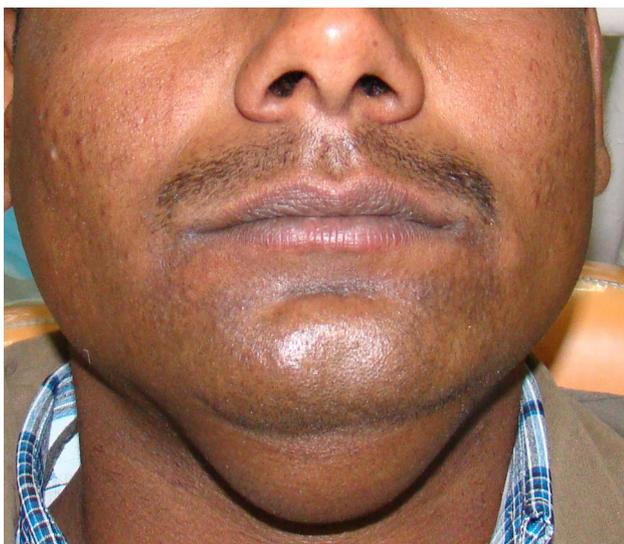


Fig. 1 Cervical dermoid. Typical extraoral appearance of double chin



Fig. 2 Extraoral view showing the clinical extent of the lesion



Fig. 3 Intraoral picture showing the involvement of the base of the tongue

the swelling was normal and pinchable. The swelling was soft in consistency, and margins could not be delineated. The swelling increased in size on clenching. There was no neurologic deficit. CT scan axial section showed the presence of a cystic lesion in the temporal space without any intracranial and intraorbital extension (Figs. 11, 12). The cyst was enucleated in toto (Fig. 13). There were hair fragments in the cyst wall. The cut section showed the presence of thick cheesy material (Fig. 14). Histopathology confirmed the diagnosis of dermoid cyst.



Fig. 4 CT scan axial section showing the anteroposterior extent of the lesion from the hyoid bone to the mandible



Fig. 6 CT scan Sagittal section showing the vertical and anteroposterior extent



Fig. 5 CT scan coronal section showing the typical dumb bell appearance and the actual extent of the lesion deep to the mylohyoid and into the base of the tongue

Discussion

Dermoid cysts appear in a wide variety of presentations, in an age group varying from infants to old age, in locations as diverse as the ovary and testis to the brain and the spinal

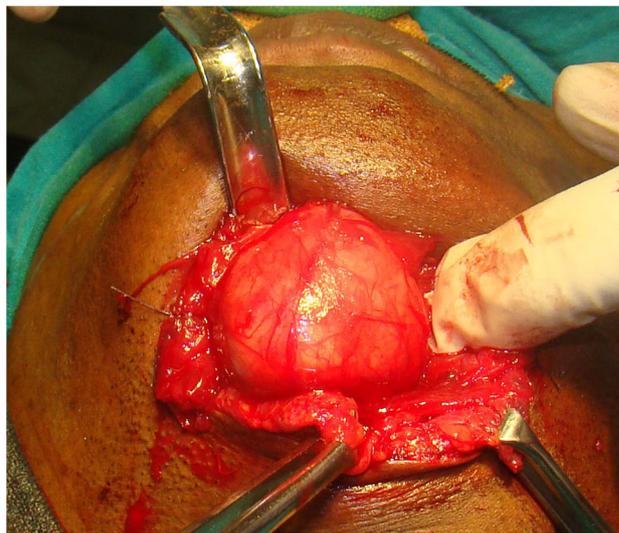


Fig. 7 Intraoperative photograph showing the relationship of the cyst deep to the mylohyoid

cord. It may be superficial, deep or present in dumbbell shape partly superficial and partly deep in the orbit or cranial cavity. The most common site for dermoid cyst in the body is the testis and ovaries [2–4]. They are uncommon in the head and neck region with an incidence ranging from 1.6 to 7% [4–7] (Table 1). Intracranial dermoid cysts comprise 0.04–1% of the head and neck tumors [6, 8]. The



Fig. 8 Syringe containing the aspirate and the cut section of the cyst. Part of the cyst was filled with fluid which is filled with rubber base impression material which was injected into the cyst after aspiration for ease of excision. The main part of the cyst is filled with thick cheesy substance



Fig. 9 Frontotemporal dermoid. Preoperative frontal photograph showing the swelling in the temporal region

most common site of involvement in the head and neck area is the lateral eyebrow followed by the cervical region [1]. Approximately 50% of the dermoids occurring in the head and neck region involve the orbit. Dermoid cysts constituted 24% of 645 consecutive orbital biopsies from all age groups studies by Shields et al. [9]. In patients younger than 18 years, it was seen in 46% of 250 orbital



Fig. 10 Preoperative lateral view showing the extent of the swelling involving the whole of the temporal space. Posterior margin is clearly demarcated

biopsies. In adults, these cysts may become symptomatic and show considerable increase in size in a short period.

There were 12 cases in our study of which one was in the temporal region and the rest in the floor of the mouth. There were 11 males and 1 female. All the cysts were asymptomatic other than for the swelling. The patients age ranged from 16 to 34 years (Table 2). The cysts were present for a period ranging from 6 months to 5 years at the time of reporting. CT scan was carried out in all cases. Routine preoperative investigations like complete blood count, differential leukocyte count, hemoglobin, bleeding time and prothrombin time were also done. No patient had airway compromise even though some of the cysts were quite large extending from the submental region to the floor of the mouth. All cases were managed with enucleation. The patients are on follow-up with no report of recurrence. The period of follow-up was 1 to 16 years. There were no complications postoperatively.

The clinical dermoid cyst represents three histologic variants—epidermoid, true dermoid and the teratoid cysts. Epidermoid cysts are filled with sebum, keratin and fat lobules and lining made up of stratified squamous



Fig. 11 CT scan axial section showing the anteroposterior extent as well as “sac of marbles” appearance

epithelium. True dermoid cysts also are filled with sebum, keratin and fat lobules but having skin appendages like sebaceous glands, sweat glands and hair follicles in the cyst wall. Teratoid cysts are lined with a range of epithelia from simple squamous epithelium to ciliated respiratory type, and the cyst lumen contains derivatives of ectoderm, mesoderm and endoderm. All our cases were true dermoid cysts.

Ultrasonography is a valuable tool for investigating soft tissue swellings. It is inexpensive, easily available, reliable and does not involve radiation. In case of small lesions, ultrasonography may be enough for diagnosis. However, for treatment planning purposes, a CT scan is a must in large lesions. CT scan shows the size and extent of the lesion along with its location including the relationship with adjacent bone. In CT scan, dermoid cysts appear as a unilocular cyst with a homogenous hypoattenuating (0–18 HU) fluid within it with some areas showing hyperdense fat density nodules giving the appearance of a “sac of marbles.” MRI shows a well-defined mass lesion with a homogenous internal structure with a well-enhanced wall [10]. In some cases, the lesion is partly homogenous and some portions show multiple heterogenous locules. In such cases, the homogenous part represents the fluid content, while the heterogenous nodules represent the fat locules. MRI is valuable in deep lesions to evaluate the lesions relationship to neighboring neurovascular structures. Vogl et al. [11] reported the use of MRI to delineate



Fig. 12 CT scan coronal section showing the involvement of the temporal space



Fig. 13 Intraoperative photograph before excision of the cyst showing the anterior attachment, multiple hair in the cyst wall as well as the cheesy material extruding from the cyst

the relationship of cystic sublingual mass on the floor of the mouth to the sublingual muscles.



Fig. 14 Gross specimen cut section showing the hair and cheesy substance filling the cyst

Differential diagnosis of the periorbital dermoid includes pilar cysts and lipoma. Differential diagnosis of cervical or floor of the mouth dermoid cysts includes lipoma, ranula, thyroglossal cyst, cystic hygroma, branchial cleft cysts, enlarged lymph node and benign and malignant tumors of the floor of the mouth and the adjacent salivary glands. In a study of cutaneous cysts of the head

and neck by Al-khateeb et al., it was found that epidermoid cysts were the most frequent lesions (49%) followed by pilar cysts (27%) and dermoid cysts (22%) in a descending order [5]. The most common site of the cyst was the scalp (34%) followed by the neck (18%), the periorbital area (17%), the cheeks including the lips (16%), the auricular area (9%) and the nasal area including the forehead (6%). The periorbital area represented dermoid cysts (52%) and epidermoid cysts (42%). The cheek including lips was affected predominantly by epidermoid cysts (77%); dermoid and epidermoid cysts were seen in 11% of patients in equal proportion. The periauricular region showed mostly epidermoid cysts (70%). The nasal area including forehead showed epidermoid cysts (55%), dermoid cysts (29%) and pilar cysts (13%). The clinical diagnosis of dermoid cysts is confirmed easily by the typical appearance of a cyst filled with creamy fluid and hair in the wall of the cyst.

Of the 252 congenital masses studied by Al-Khateeb and Al-Zoubi [12] in 2007, 166 (66%) were midline and 55 (22%) were lateral. Of these, the most frequent was thyroglossal cyst/fistulas (53%) followed by branchial

Table 1 Incidence of head and neck dermoid cysts

Author (year)	Cyst/tumor and location studied	Head and neck dermoid cysts reported
New et al. (1937) [8]	1495 dermoid cysts of the body	103 (6.97%) H&N, 24 FOM (1.6%)
Taylor (1966) [9]	541 dermoid cysts of body	184 (34%) H&N, 6.5% FOM
Rapidis (1988) [1]	1007 tumors of head and neck	95 (9.41%) H&N dermoid, 3 FOM
Ragesh (2002) [10]	50 Pediatric head and neck masses	2 (4%) dermoid cysts
Golden (2005) [11]	82 cutaneous cysts of head and neck	2 (3%) dermoid cysts; 79% epidermal inclusion cysts
Al-Khateeb (2007) [12]	252 congenital neck masses	28 (11%) dermoid cysts
Lucumay (2014) [13]	148 pediatric neck masses	6 (4.1%) dermoid cysts

H&N head and neck, FOM floor of mouth

Table 2 Age, sex and site distribution of dermoid cysts

Pt no.	Age in years	Sex	Site	Size of lesion	Duration of the lesion (in years)	Follow-up (in years)
1.	22	M	Floor of mouth	3 × 3 cm	1	16
2.	28	M	Floor of mouth	5 × 5 cm	2	14
3.	31	M	Floor of mouth	4 × 4 cm	1	13
4.	19	M	Floor of mouth	3 × 3 cm	1	10
5.	27	F	Floor of mouth	3 × 3 cm	1	7
6.	16	M	Floor of mouth	4 × 4 cm	1	5
7.	34	M	Temporal region	9 × 7 cm	5	3
8.	24	M	Floor of mouth	3 × 3 cm	1	3
9.	26	M	Floor of mouth	3 × 3 cm	2	3
10.	28	M	Floor of mouth	4 × 4 cm	1	2
11.	32	M	Floor of mouth	3 × 3 cm	1	1
12.	23	M	Floor of mouth	3 × 3 cm	0.5	1

cyst/fistulas (22%) followed by dermoid cysts (11%), hemangiomas (7%) and lymphangiomas (6%). The mean age of patients was 16 years. The majority presented with painless neck swelling. It is easy to exclude infectious processes and malignancies by proper history and clinical examination. The consistency of the lesion helps in excluding mass lesions and solid tumors such as salivary gland tumors and schwannomas. Further the CT imaging will definitely help in coming to the correct diagnosis of a dermoid cyst.

In most of the cases, the diagnosis is very simple in that it presents as a soft to firm or doughy painless slow growing freely movable subcutaneous swelling with the skin/mucosa overlying pinchable and normal. In the peri-orbital region, it is seen most commonly at the lateral eyebrow near frontozygomatic region in infants and older children. In the cervical region, it presents as a midline swelling with similar features either involving the floor of the mouth or in the submental region—presenting as a double chin in a patient of age 15–30 years. However, deep lesions can be difficult to diagnose. Even though ultrasound gives a good picture of the lesion, coronal and axial CT scan is required to assess the location and extent of the lesion. MRI, if available, may help in delineating the muscle involvement and guide the approach to be used. CT scan will also show orbital and intracranial extension. Intracranial extension may require neurosurgical assistance. Aspiration of the cysts should ideally be carried out just before excision to avoid infection of these cysts [13]. Treatment of dermoid cysts is excision. Some authors prefer decompression of the cyst before excision. Extravasation of the cyst content during excision can cause postoperative inflammation. A thorough irrigation of the area should be undertaken in such situations in order to avoid postoperative inflammation. Recurrence has not been reported. Floor of the mouth dermoids can be easily removed intraorally, while submental dermoids are managed better extra orally.

Conclusion

Dermoid cysts are uncommon lesions appearing as soft tissue masses in the head and neck region. These lesions should be carefully evaluated for intracranial or intraorbital extensions before planning surgical removal. In addition, maxillofacial surgeons may be called upon to treat cervical

teratomas in the infant and the new born. The importance of airway management must be of prime consideration.

Compliance with Ethical Standards

Conflict of interest All authors declare that there is no conflict of interest.

Ethical approval The work has been approved by the ethical committee of the institution, and informed written consent of all the patients was taken for the study as well as publishing of the photographs. All authors have viewed and agreed to the submission.

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