

Retrospective Analysis of Head and Neck Dermoid Cysts Over A 5-Year Period

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Abstract: *This retrospective analysis reviews nineteen cases of surgically treated dermoid cysts in the head and neck region between 2019 and 2024. The study highlights the clinical presentation, anatomical locations, imaging findings, surgical approaches, and complications associated with these congenital lesions. Most cases involved periaural and nasal regions, with MRI serving as a critical tool for preoperative planning. One notable recurrence underscored the importance of complete excision and accurate imaging. The findings emphasize early diagnosis and a multidisciplinary surgical approach to minimize recurrence and complications, particularly in pediatric patients.*

Keywords: Dermoid cysts, head and neck lesions, paediatric surgery, MRI evaluation, craniofacial anomalies.

1. Introduction

Dermoid lesions in the craniofacial region represent a spectrum of pathological conditions ranging from simple localized cysts to complex lesions involving fistula formation and intracranial extension. In children, these lesions are commonly congenital and arise from ectodermal cell remnants trapped in abnormal positions during development.

Approximately 7% of all dermoid cysts occur in the head and neck, with more than half diagnosed before six years of age. In children, orbital rim lesions are particularly notable, with dermoid cysts being the most commonly encountered orbital pathology (1).

Congenital dermoid cysts of the head and neck are categorized as periorbital, nasal, submental, and midventral/middorsal neck lesions. More detailed classifications focus on nasolabellar, orbital, and frontotemporal occurrences (3). Simple dermoid cysts often remain asymptomatic; however, if left untreated, they can grow progressively, leading to pain, soft or hard tissue distortion, functional impairment, or infection. Rare cases involving dermal sinus tracts carry significant risks, including tumor formation, meningitis, or brain abscess (5).

The primary goals of surgical treatment are complete excision to achieve a definitive histopathological diagnosis, prevent recurrence, and avoid neurological complications in specific cases. Pediatric craniomaxillofacial surgeons must be familiar with the presentation and management of these lesions due to their congenital nature, relative frequency, and pathological variability.

This study aims to analyse the clinical characteristics, radiological findings, surgical management, and outcomes of head and neck dermoid cysts over a five-year period.

2. Materials and Methods

A retrospective chart review was conducted from January 2019 to December 2024, analyzing medical records of patients treated for dermoid cysts. Nineteen surgically managed patients were included in the study. Data collected included demographic details, age, gender, presenting complaints, duration, lesion location, extension, associated infections, and treatment outcomes.

The reviewed medical records consisted of clinical charts, imaging results, and histopathological findings.

Inclusion criteria-

Patients of all age group presenting to opd with head and neck swelling.

3. Results

Age and Sex

Among the 19 patients analyzed, 9 were male and 10 were female. The average age of presentation was in the second decade of life.

Clinical Features

Most patients presented with swelling in the head and neck region, that had been present since childhood and progressively increased in size.

Location

Lesion locations were categorized based on anatomical sites as per the Pryor et al. classification. The most common sites were the neck, nose, and periaural dermoids being the most frequently observed.

Radiological Evaluation

Imaging played a crucial role in defining lesion margins and extensions. All patients underwent MRI according to institutional protocol. MRI helped exclude intracranial extension and determine the lesion's plane of attachment. For lesions in the parotid region, imaging also revealed relationships with vital structures such as the facial nerve and retromandibular vein. According to the institute protocol, Fine Needle Aspiration Cytology (FNAC) was not performed as dermoid cysts were clinically diagnosed and confirmed via imaging, with subsequent surgical management.

Surgical Approach

Depending on the site and extensions, all 19 patients underwent surgical removal using a direct approach. In one case involving a dumbbell-shaped intracranial extradural dermoid, an open approach was combined with endoscopy. The inner dura was elevated, and the cyst was meticulously delineated and excised. Closure involved covering the opening with periosteum and Surgicel. A nasopharyngeal dermoid was removed endoscopically. Nasopharyngeal dermoid was removed endoscopically. Dermoids with

intracranial extension should be evaluated to prevent meningitis.

Depth of the Cyst

The analysis revealed that 15 cysts were confined to the subcutaneous layer, 1 involved the intramuscular layer, and 1 reached the periosteum without penetrating it.

Complications

1 case of recurrence was observed among 19 patients. A 4-year-old child previously operated on for a nasal dermoid else were, presented with bilateral eye swelling, fever and a swelling in the root of nose, MRI confirmed a residual dermoid cyst tracing deep between the nasal bone towards cranium and ethmoid sinus, which was subsequently excised.

Table 1: Demographic variables

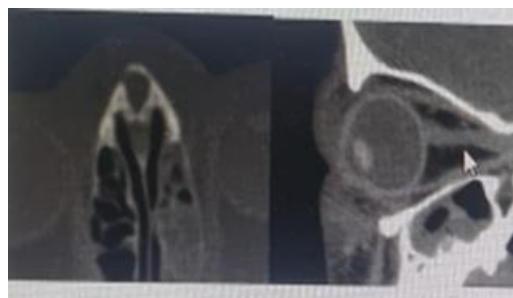
Demographic variables	Mean ± SD	Frequency	Percentage distribution
Age	25.94 ± 21.85		
Gender			
Male		8	41.18 %
Female		11	58.82%
Side			
Right		3	17.64%
Left		8	41.18%
Others		8	41.18%
Site			
Neck		2	11.77%
Periaural		9	50.64%
Parotid		1	5.88%
Nasopharynx		1	5.88%
Nose		6	29.42%

Case 1

A 4-year-old female presented with complaints of bilateral eye swelling, fever, and nasal discharge. A cystic lesion was observed at the root of the nose. The child had previously undergone excision of a dermoid cyst from the same location three months prior.

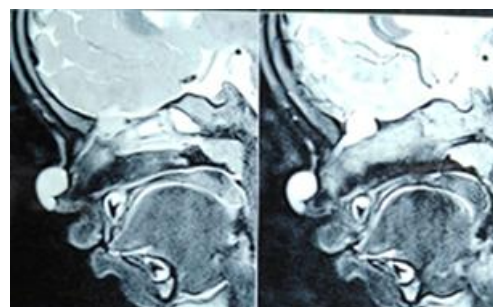
MRI of the orbits revealed a cystic lesion measuring 7x5x9 mm at the root of the nose, accompanied by soft tissue swelling, fat stranding, and involvement of the preseptal compartment of the left eye.

The patient was initially managed with intravenous antibiotics and subsequently underwent excision of the cyst. Histopathological examination (HPE) confirmed the diagnosis of a dermoid cyst.



Case 2

A 4-year-old female presented with complaints of bilateral eye swelling, fever, and nasal discharge. A cystic lesion was noted at the root of the nose. The child had a history of dermoid cyst excision from the same site three months earlier. MRI of the orbits revealed a cystic lesion measuring 7x5x9 mm at the root of the nose, with associated soft tissue swelling, fat stranding, and involvement of the preseptal compartment of the left eye. The patient was initially managed with intravenous antibiotics and subsequently underwent excision of the cyst. Histopathological examination (HPE) confirmed the diagnosis of a dermoid cyst.



4. Discussion

This analysis provides valuable insight into the surgical and diagnostic challenges of craniofacial dermoid cysts and reinforces the importance of radiological assessment in guiding the successful treatment.

Dermoid cysts are benign congenital tumors that develop early in life due to ectodermal and mesodermal tissues becoming abnormally isolated during embryonic development (1). Histologically, they are lined by keratinizing squamous cells and contain adnexal structures such as hair follicles, sweat glands, and sebaceous glands. Intracranial extension of dermoid cysts can result in severe neurological complications, including encephal meningitis and seizures, especially if the cyst ruptures and its contents enter the subarachnoid space or cerebral ventricles (3,4).

Most dermoid cysts are congenital, with approximately 70% of cases occurring in children under five years old. However, in our study revealed that only 52% of the cases occurred in this age group, suggesting that dermoid cysts in adults should not be overlooked during diagnosis and management.

In 1937, New and Erich classified congenital dermoid cysts in the head and neck region into four groups: the periorbital region, the nose, the submental region, and the midventral/mid-dorsal fusion areas, including suprasternal, thyroidal, and suboccipital regions (2). Consistent with prior studies, this analysis found that most dermoid cysts occurred in the periaural region (9 out of 19 cases, representing 50%) and second most common being nasal dermoids (6 out of 19 cases representing 29%).

MRI was the most commonly used imaging modality in this study. It effectively visualized the location, content, and relationship of the cyst to surrounding structures while also helping identify intracranial extensions. Imaging plays a critical role in preventing life-threatening complications, such as rupture, during surgery. In our first case, the inner component was not removed due to inadequate imaging. Since nasal dermoids being second most common in our study, the extent was assessed using MRI and complete excision is mandatory as in case 1. In our study we emphasize adequate imaging and complete excision of the lesion.

This study supports the recommendation that recurrent inflammation or infection in the lateral canthal region warrants more aggressive imaging and evaluation. Though intracranial cases are rare, care must be taken during surgical excision to avoid rupture and associated complications (3).

Treatment of dermoid cysts is generally surgical, with options including open or endoscopic approaches. Craniotomy may be necessary for intracranial extensions. This study demonstrated that dermoid cysts could involve deeper structures, such as the periosteum, and even invade bony structures, as seen in some patients.

A significant case in this study involved a child presenting with orbital cellulitis following a previous dermoid cyst surgery. The infected recurrent dermoid cyst highlights the importance of considering infection as a potential

complication of long-standing or inadequately treated cysts. Another case involved a nasal dermoid cyst with intracranial extension, underscoring the importance of detailed imaging before surgical intervention.

This study also noted the occurrence of dermoid cysts in adult patients and deep-seated lesions, including those involving bone. These findings emphasize the need to consider dermoid cysts across all age groups and the importance of early diagnosis and comprehensive treatment planning.

The likelihood of intracranial extension must always be assessed, and thorough imaging studies such as MRI should be conducted to guide surgical treatment. Surgeons must remain vigilant regarding the possibility of deep-positioned or recurrent cysts to ensure effective management and minimize complications.

5. Conclusion

Dermoid cysts of the head and neck, though benign, require timely and complete surgical excision to prevent cosmetic and functional complications. Radiological evaluation, particularly MRI, is essential for detecting potential intracranial extension and guiding operative planning. The findings of this study reinforce the importance of a multidisciplinary approach, especially in pediatric cases, to ensure effective treatment outcomes and minimize recurrence. Early diagnosis, precise imaging, and carefully planned surgical intervention remain the cornerstones of optimal management.

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