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Infected dermoid cyst at the nasion extending to the right upper eyelid

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ABSTRACT

The most common age group for a dermoid cyst of the nasion is children under the age of five. These dermoid cysts are distinct from dermoid cysts seen elsewhere in the body as they have the potential to extend to cerebral structures. Our goal is to show that complete surgical excision is the only procedure that effectively removes these lesions, despite the existence of substantial anatomical features close by. We describe a 2-year-old girl who had an infected dermoid cyst that extended to her right upper eyelid near the nasion. A widespread swelling was linked to the right side of the sinus tract and the cyst was adherent to the frontonasal suture. A vertical incision near the nasion was used to carefully remove the cyst, making sure that no cyst wall was missed. There was no sign of the cyst's intracranial expansion after its aggressive removal. Similar to that, the abscess above the right upper lid and the infected sinus tract was removed. After achieving hemostasis, the wound was stitched up in layers.

Keywords: Nasion, Swelling, Infected Dermoid Cyst, Excision, Sinus tract

1. INTRODUCTION

A benign cutaneous developmental abnormality called a dermoid cyst develops when ectodermal components are trapped along the lines of embryonic closure. These benign tumours have stratified squamous epithelium as their lining, mature skin appendages on their wall and keratin and hair-filled lumens (Shareef and Ettefagh, 2022). Diagnosing a dermoid cyst mostly depends on clinical examination and radiological investigations. Early diagnosis and surgical resection of the cyst are essential in giving good cosmesis, better prognosis and preventing further complications.

A rare midline condition called a dermoid cyst of the nose can appear as a lump or draining sinus. An estimate of the incidence ranges from 1 in 20,000 to 1 in 40,000. The presence of a "cheesy substance" or hairs poking through the punctum may indicate the diagnosis if there is a sinus opening. 1% of the body's dermoid cysts are nasal dermoid cysts (NDCs) (Jeremy et al., 2020). Dermoid cysts close to the orbit are described as deep and superficial structures with gradual, irregular growth. Dermoid cysts can disrupt eye

mobility throughout their development in addition to their cosmetic impacts and in rare instances, they can also result in optical nerve compression syndrome (Fuchshuber et al., 2002; Veselinović et al., 2010).

Dermoid cysts typically have a slow growth rate, which increases the risk of bone malformations, intracranial extension, or intraspinal extension. It is possible for meningitis or an abscess to develop further as a result of intracranial or intraspinal extension (Prior et al., 2018). When a dermoid cyst with intracranial extension ruptures and leaks its contents into the subarachnoid space or the cerebral ventricle, it can result in severe neurological consequences such as encephalomeningitis and seizures. Therefore, when a patient's primary worry at a medical appointment is a mass in the head or neck region, it is crucial to evaluate whether they have a dermoid cyst (Choi et al., 2018). The failure to completely remove the cyst or the presence of cyst wall remnants in the bone sutures, improper operations brought on by the incorrect identification of a subcutaneous mass and surgery performed without imaging tests are risk factors for recurrence (Wang et al., 2010).

2. CASE PRESENTATION

We present the case of a 2-year-old female who presented with a sinus over the nose near nasion and swelling in the right upper lid since 1 year. According to the history given by the patient's mother, initially, there was an inflammatory swelling over the nose which burst and there was a discharge of pus from it.

On examination, there was a small opening over the dorsum of the nose and this sinus, on probing, reached up to the nasion where an inflammatory swelling of 1x1 cm was present. The swelling was soft in consistency, most probably an abscess. Doing histopathological examination for these lesions would have been difficult, so investigations were performed. MRI of the face showed the presence of a sinus leading to a diffuse swelling at the frontonasal junction and a thin tract across the right upper eyelid. She was explored under general anesthesia, which revealed that the whole sinus tract had an attached diffuse swelling having a cyst wall, pultaceous contents and few hairs in it. The cyst adhered to the frontonasal suture. A vertical incision was given at the dorsum of the nose. To free the cyst from the attached soft tissue, blunt dissection was done. Similarly, to free it from its bony attachment, a periosteal elevator was used. There was no evidence of intracranial extension or muscle, nerve, or vessel engagement. Meticulously the cyst was removed, taking care that no residual cyst wall was left out.

Figure 1 Figure showing inflammatory swelling over the right upper eyelid

Similarly, the infected sinus tract with an abscess over the upper eyelid was excised with a horizontal incision over the lesion avoiding injury to the lacrimal duct and the levator palpebrae superioris. After completion of the excision, hemostasis was achieved, and the wound was closed in layers. Histopathologically also, it got confirmed as a Dermoid Cyst.

Figure 2 Intraoperative picture of surgical procedure showing removal of the dermoid cyst

The ultimate result after suture removal was a thin scar which was post-operatively cared for so that it doesn't get hypertrophied and hyperpigmented. There was no loss of function in the upper eyelid.

Figure 3 Postoperative picture showing wound closure

3. DISCUSSION

Currently, two theories have been proposed which attempt to explain the pathophysiology behind the development of Nasal Dermoid Cysts: The Cutaneous theory and The Prenasal space theory. The prenasal space idea, first put up by Pratt in 1965, contends that the issue is due to a failure of the prenasal space to completely disappear during development, located in front of the nasal cartilage. This enables the result of a dermal cyst with an intracranial extension and a foetal dural diverticulum in touch with the skin. The cutaneous theory, a counter argument, has been described. This is predicated on the nasal capsule having an inner mucous membrane and an outside layer of skin. However, at three months, the ossification of the bony nasal structure causes the skin to separate from the cartilage. As a result, a dermoid cyst may develop due to ectodermal fragments that are still adhered to the cartilage (Moses et al., 2015).

Most nasal dermoid cysts are categorized as simple and lack any underlying structures. But more intricate NDCs may involve the nasal bones, the skull base, or an intracranial component. As a result, thoughtful surgical planning is crucial (Bradley, 1983). Adults should undergo a CT scan to identify the bone structure as the initial inquiry, followed by an MR scan to establish cerebral extension and guide surgical planning (Vaghela and Bradley, 2004). To facilitate better surgical planning, NDCs were radiologically classified into four groups: Superficial, Intraosseous, Intracranial intradural and Intracranial extradural (Hartley et al., 2015).

The dermoid cyst often appears as a lump on the nasal dorsum lined by healthy skin and hair and may or may not show signs of a fistulous tract. In around 50% of cases, the dermoid cyst is deeply positioned and occasionally an intracranial connection, septal deformity, or bone erosion may be found. Depending on where an NDC is, different surgical techniques are used. It is possible to access glabellar or nasion lesions, like the one in our patient, during an open rhinoplasty in conjunction with endoscopy. However, performing this is challenging and is typically done on adults by a vertical midline incision (Ortlip et al., 2015; Pollock, 1983).

4. CONCLUSION

Our case is a rare presentation of an infected dermoid cyst at nasion with extension to the upper eyelid through the sinus tract. Careful investigation, diagnosis and early treatment of a nasal dermoid midline cyst is crucial to avoid associated complications. The location of the cyst plays a vital role here. First, facial swelling is cosmetically demanding, so a small vertical incision should be taken, which is better. Secondly, since the pathological nature of a cyst is to get adhered to the bone, complete excision is mandatory to rule out the chances of recurrence. And lastly, the surrounding anatomical structures must be preserved so that there is no functional loss. The intracranial extension of cysts must also be ruled out to prevent further infections.

Informed consent

Written & Oral informed consent was obtained.

Authors' contributions

Anil Reddy has collected information and prepared the manuscript which has been thoroughly reviewed by S.N.Jajoo and Mahakalkar and Siddharth M and others. All the authors have read and agreed to the final manuscript.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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