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Case Report

Nasopalatine Duct Cyst – A Case Report

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Abstract

The nasopalatine duct cyst (NPDC) is the most common non-odontogenic cyst of the oral cavity. It is a developmental, non-neoplastic lesion that arises from epithelial remnants of the nasopalatine duct. Characteristically, it occurs in a unique and well-defined location—the midline of the anterior maxilla, near the incisive canal. Clinically, it may present as a swelling in the anterior palate and is often asymptomatic, though larger lesions can cause discomfort. Radiographically, it appears as a well-circumscribed radiolucency. Its distinct location and origin are key features in diagnosis and differentiation from other cystic lesions. This article reports a case clinical presentation, radiographic and pathological findings and treatment.

1. Introduction

First documented by Meyer in 1914, the nasopalatine duct cyst (NPDC) has historically been referred to by several terms, including anterior midline cyst, maxillary midline cyst, anterior middle palatine cyst, and incisive duct cyst, and was once classified as a fissural cyst. According to the current classification by the World Health Organization, it is now recognized as a developmental, epithelial, non-odontogenic cyst of the maxilla, alongside the nasolabial cyst. NPDC is the most prevalent non-odontogenic cyst, affecting approximately 1% of the population, most commonly individuals in the fourth to sixth decades of life, with a slight male predominance. These cysts are typically asymptomatic, although they may occasionally manifest as a soft tissue swelling.

The nasopalatine duct forms a communication between the nasal cavity and the anterior maxilla, situated along the palatal midline superior to the incisive papilla. During fetal development, the duct undergoes progressive narrowing, resulting in the formation of one or two canals. It encloses the nasopalatine neurovascular bundle, which emerges through the nasopalatine foramen. Typically, two foramina are present, although additional openings may occur; those transmitting only vascular structures are referred to as Scarpa's foramina [1].

2. Case Report

A 42-year-old male patient presented to the Department of Oral and Maxillofacial Surgery with a chief complaint of pain and swelling in the upper anterior teeth region for the past two months. The patient did not report any history of trauma or previous dental procedures associated with the affected area.

On general physical examination, no signs of systemic involvement were noted. Specifically, icterus, clubbing, and edema were absent. The patient's vital parameters were within normal physiological limits Figure 1.

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Figure 1: Extraoral photographs of patient

Intraoral examination revealed a localized swelling measuring approximately 2 × 2 cm in the maxillary anterior region. The lesion extended mesiodistally from the region of tooth 13 to 23 and anteroposteriorly from the labial frenum to the region of the incisive foramen. The overlying mucosa appeared intact. The associated teeth were non-mobile and responded positively to vitality testing, indicating that they were vital, except 11 and 21 Figure 2.

On palpation, the swelling was tender, with no evidence of fluctuation or discharge. Based on the clinical findings, endodontic intervention was initiated, and root canal treatment (RCT) was started for teeth 12, 22 as part of the initial management plan.

Figure 2: Extraoral photographs of patient

An orthopantomogram (OPG) was obtained to further evaluate the extent and nature of the lesion. Radiographic examination revealed a well-defined, pear-shaped radiolucent area in the anterior maxilla, extending from the mesial aspect of tooth 13 to the mesial aspect of tooth 23. The borders of the lesion appeared corticated and relatively well demarcated, suggesting a slow-growing pathological process.

The radiolucency was centered in the midline region, causing divergence of the roots of the adjacent teeth without any evident root resorption. The lamina dura of the associated teeth appeared to be intact in most areas, correlating with the clinical finding of tooth vitality. The lesion extended superiorly to involve the floor of the nasal cavity, indicating its vertical progression and close anatomical relationship with adjacent structures.

No obvious evidence of calcifications or internal septations was observed within the lesion. The size, shape, and location of the radiolucency, along with nasal floor involvement, suggest a lesion of developmental or odontogenic origin Figure 3.

Figure 3: OPG reveals well- corticated lesion involving nasal floor extending from 13-23.

The patient subsequently underwent surgical management under general anesthesia as an in-house procedure. Following standard preparation and draping, local anesthesia was administered at the surgical site to achieve adequate hemostasis.

A trapezoidal mucoperiosteal flap was carefully designed and raised in the region extending from tooth 13 to 23. Subperiosteal dissection was performed to expose the underlying bone. Deroofing of the thinned cortical bone overlying the lesion was carried out, which led to the exposure of the cystic cavity Figure 4.

Figure 4: Exposure of cystic cavity

The cystic lesion was identified and meticulously enucleated in toto with the aid of gauze and blunt dissection, ensuring minimal damage to the surrounding structures. 11,21 were extracted. Following complete enucleation, the cystic cavity was thoroughly curetted and irrigated with normal saline and metronidazole solution (Metrogyl) to reduce the microbial load and ensure a clean surgical field Figure 5.

Figure 5: The cystic cavity which was thoroughly irrigated by NS and Metrogyl

The excised specimen was preserved and sent for histopathological examination (HPE) to establish a definitive diagnosis Figure 6.

Figure 6: The cystic lining sent for HPE

The residual cavity was then packed with Whitehead's varnish gauze to promote healing and prevent dead space formation. Hemostasis was achieved, and primary closure of the surgical site was accomplished using 910 polyglactin (Vicryl) sutures.

The patient tolerated the procedure well and was advised appropriate postoperative care, along with follow-up for monitoring healing.

The excised specimen was subjected to histopathological examination, and the report was suggestive of a nasopalatine duct cyst. The microscopic features were consistent with a developmental, non-odontogenic cyst arising from epithelial remnants of the nasopalatine duct.

On the fifth postoperative day, the Whitehead's varnish gauze pack was carefully removed under aseptic conditions. The surgical site was inspected and showed no signs of infection, excessive inflammation, or discharge. The healing process appeared to be progressing satisfactorily at this stage.

The patient was kept under regular follow-up, and postoperative instructions were reinforced to ensure optimal healing. At the one-month review, the surgical site demonstrated satisfactory healing, with good soft tissue closure and no evidence of recurrence or residual pathology. The patient remained asymptomatic, and recovery was uneventful Figure 7.

Figure 7: 1 Month post operative picture of intraoral surgical site revealing satisfactory healing.

3. Discussion

The nasopalatine duct cyst (NPDC), also known as the incisive canal cyst, is recognized as the most common non-odontogenic cyst of the maxilla [2, 3].

Clinically, NPDC is often asymptomatic and may be discovered incidentally on routine radiographic examination. However, symptomatic cases may present with swelling in the anterior maxilla, pain, drainage, or a salty taste due to cystic fluid discharge [4]. In the present case, the patient's complaint of swelling and pain is consistent with the symptomatic spectrum of this lesion.

Radiographically, NPDC presents as a well-defined radiolucency in the midline of the anterior maxilla, typically between the maxillary central incisors. The lesion is commonly round or ovoid, but a characteristic pear-shaped appearance may be observed due to the superimposition of the anterior nasal spine [5]. The lesion may cause divergence of adjacent roots; however, root resorption is uncommon, and the associated teeth usually remain vital—an important distinguishing feature from odontogenic cysts such as radicular cysts [3]. In the present case, the radiographic findings of a well-defined pear-shaped radiolucency with nasal floor involvement are in accordance with previously reported features of larger NPDCs.

Histopathologically, NPDC exhibits a variable epithelial lining, which may include stratified squamous, pseudostratified columnar, cuboidal, or respiratory epithelium [2]. The connective tissue wall often contains neurovascular bundles, mucous glands, and fibrous tissue, reflecting its origin from the incisive canal [3]. These features are considered diagnostic and help differentiate NPDC from other cystic lesions.

The differential diagnosis includes periapical (radicular) cyst, enlarged incisive foramen, odontogenic keratocyst, and central giant cell granuloma. Clinical correlation, particularly vitality testing of adjacent teeth, plays a crucial role in establishing the diagnosis [5]. Advanced imaging modalities such as cone-beam computed tomography (CBCT) can further delineate the extent of the lesion and its relationship to surrounding structures, especially the nasal floor.

The treatment of choice for NPDC is complete surgical enucleation, which generally results in excellent prognosis and low recurrence rates [6]. Marsupialization may be considered in selected cases with large lesions. In the present case, surgical enucleation followed by appropriate postoperative care resulted in satisfactory healing, consistent with outcomes reported in the literature.

Recurrence is rare, and long-term follow-up is recommended to monitor healing and detect any possible recurrence. Malignant transformation is extremely uncommon and has only been reported in isolated cases.

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