

Nasopalatine Duct Cyst : A Case Report & Literature Review

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Abstract

The Nasopalatine duct cyst (NPDC) also known as naso-palatine cyst is a developmental, nonneoplastic cyst that is considered to be the most common nonodontogenic cyst. It is one of many pathologic processes that may occur within the jawbones, but it is unique in that it develops in only a single location, in the midline anterior maxilla. Nasopalatine cysts are usually asymptomatic and are discovered incidentally during routine radiological examination. This article reports a case with a thorough discussion regarding epidemiology, etiology, diagnostic work-up, therapeutic strategies.

Introduction

The nasopalatine duct cyst described first by Meyer in 1914 was believed to arise from remnants of nasopalatine duct, an embryologic structure connecting the oral and nasal cavities in the area of incisive canal. It is one of the most common non-odontogenic cyst, comprising 10% of jaw cysts and occurring in 1 of every 100 persons with slight male predilection, the mean age being 42.5 years. These cysts are usually asymptomatic, unless they are secondarily infected. The most commonly reported clinical symptom is swelling in the anterior part of the palate. These entities are usually treated with surgical enucleation.

Patho-Physiology

The development of the face and the oral cavity takes place between the fourth and eighth weeks of intrauterine life. The secondary palate is formed during the eighth and 12th weeks. In the midline between the primary and secondary palates, 2 channels (the incisive canals) persist. The palatine processes probably partly overgrow the primary palate on either side of the nasal septum. Thus, the incisive canals represent passageways in the hard palate, which extend downward and forward from the nasal cavity. Just before exiting the bony surface of the hard palate (incisive foramen or incisive fossa), the paired incisive canals usually fuse to form a common canal in a Y shape.

The fusion of facial processes in the embryologic development of the maxilla results in the formation of a pair of epithelial strands (the nasopalatine ducts) that traverse the incisive canals downward and forward, connecting the nasal and oral cavities. The nasopalatine duct leads from the incisive fossa in the oral cavity to the nasal floor, in which it ends in the nasopalatine infundibulum.

The types of epithelia that line the nasopalatine duct are highly variable, depending on the relative proximity of the nasal and oral cavities. The most superior part of the ducts is characterized by a respiratory-type epithelial lining. Moving downward, the lining changes to cuboidal epithelium. In the most inferior portion closest to the oral cavity, squamous epithelium is the usual type. In addition to the nasopalatine ducts, branches of the descending palatine and sphenopalatine arteries, the nasopalatine nerve, and mucus-secreting glands are present within the incisive canals. In some vertebrates (eg, snakes), the nasopalatine duct plays a role in the reception of odorants.

The nasopalatine ducts ordinarily undergo progressive degeneration; however, the persistence of epithelial remnants may later become the source of epithelia that gives rise to nasopalatine duct cyst, from either spontaneous proliferation or proliferation following trauma (eg, removable dentures), bacterial infection, or mucous retention. Genetic factors have also been suggested. The mucous glands present among the proliferating epithelium can contribute to secondary cyst formation by secreting mucin within the enclosed structure. Nasopalatine duct cysts can form within the incisive canal, which is located in the palatine bone and behind the alveolar process of the maxillary central incisors, or in the soft tissue of the palate that overlies the foramen, called the cyst of the incisive papilla.

Case Report

A 5 year old male patient reported to the out patient Department Dental & Maxillo-facial Surgery, T.M.C. & Dr. B.R. Ambedkar Memorial Teaching Hospital, Agartala with a complaint of soft swelling in the incisive papillae region. The patient first noted swelling 2 years back which subsided with antibiotics but then gradually increased to the present size. The swelling was not associated with pain, it was non-pulsatile lesion. Intra-oral examination revealed a well defined oval shaped swelling located in the incisive papillae region. Occlusal- X-ray revealed a well-defined radiolucency located anteriorly between apical third of roots of maxillary central incisors, the periphery of the lesion was well defined. There was no evidence of resorption or displacement of the tooth. On the basis of clinical & radiographic findings, a provisional diagnosis of nasopalatine duct cyst was made.

Under General Anesthesia anterior palatal muco-periosteal flap raised, cystic lesion enucleated & specimen sent for histopathological examination which confirmed the provisional diagnosis.

Discussion

The nasopalatine duct cyst is a developmental, non-neoplastic cyst that is the most common of the non-odontogenic cysts of the oral cavity, occurring in about 1% of population. Most studies show a higher incidence of naso-palatine duct cyst among males than females with the ratio being 1.7:1.5. The age distribution is broad, with most cases being discovered in the fourth through sixth decade. In spite of being a developmental cyst, it is rarely seen in the first decade of life. Naso-palatine cysts are believed to develop from epithelial remnants of paired embryonic naso-palatine ducts within the incisive canal. The stimulus for cyst formation from the epithelial remnants of the naso-palatine canal is uncertain, although trauma and bacterial infection are thought to have a role. It has also been suggested that the mucous glands within the lining may cause cyst formation as a result of mucin secretion.

Most of these cysts are asymptomatic or cause such minor symptoms that they are tolerated for very long periods. Usually patients complain of a small asymptomatic swelling just posterior to palatine papilla. If the cyst is near the surface the swelling will be fluctuant and blue. The deeper cyst

is covered with normal appearing mucosa which may be ulcerated due to masticatory trauma. In some cases, the swelling may occur in the midline on the labial aspect of the alveolar ridge and in some patients through and through fluctuation can be palpated between the labial and palatal swellings. The cyst may produce bulging of the floor of nose. In various cases, the swelling is associated with a burning sensation, numbness over the palatal mucosa and pain as a result of pressure on the nasopalatine nerves. Various combinations of swelling, discharge and pain may occur. Discharge may be mucoid, in which case the patients describe a salty taste, or it may be purulent and the patients may complain of a foul taste. Displacement of teeth is a rare finding.

Even though definitive diagnosis of a nasopalatine cyst is more easily made on plain films, other advanced imaging modalities such as computed tomography and magnetic resonance imaging are being used to differentiate this entity from other lesions. CT findings of a nasopalatine cyst reveal a midline location, smooth expansion with sclerotic margins.

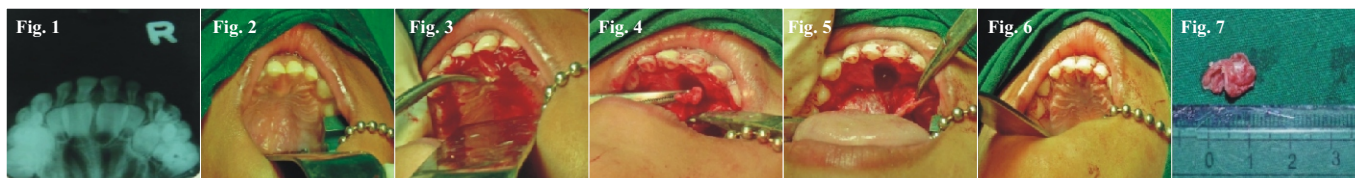
As the incisive canal and foramen may normally vary greatly in size, the clinician may have some difficulty in distinguishing between a large incisive foramen and a small asymptomatic incisive canal cyst on the basis of radiographic evidence alone. Some clinicians follow the rule of thumb that radiolucencies of the incisive canal measuring less than 0.6 cm in diameter should not be considered cystic in the absence of other symptoms. A radicular cyst or a granuloma associated with the central incisor should also be considered in differential diagnosis as these entities may be similar in appearance to an asymmetric NPDC. The presence or absence of the lamina dura and enlargement of the periodontal ligament space around the apex of the central incisor indicates an inflammatory lesion. NPDC and radicular cysts can also be differentiated by taking a second periapical view at a different horizontal angle, which show an altered position of the image of a NPDC, whereas a radicular cyst should remain centered about the apex of involved tooth. A vitality test of the regional teeth may also be useful. Nasopalatine cysts are usually treated by enucleation, in case of large cysts, marsupialization may be considered before definitive enucleation. Recurrence rate ranges from 0% to 11%.

Conclusions

Nasopalatine duct cysts occur in approximately 1% of the population with mean age of 42.5 years. The lesions may be asymptomatic or may manifest as swelling, pain, and drainage from the hard palate. A well-circumscribed, round, ovoid, or heart-shaped radiolucency is seen on radiograph. Enucleation is the preferred treatment with low recurrence rates.

References

References are available on request at editor@healtalkht.com



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