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The Enigma OfNasopalatine Duct Cyst: A Tale Of Diagnosis And Treatment-ACase Report.

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Abstract:
Nasopalatine duct cysts are the most common developmental non-odontogenic cysts in the oral cavity. The remnants of the nasopalatine duct's embryology give birth to nasopalatine duct cysts. The cyst is frequently asymptomatic and is associated with swelling that is typically found in the anterior palate's midline. The nasopalatine duct's epithelial remains are the source of the cyst. The cells may naturally activate during life or may eventually be triggered by the irritative effects of different substances (infection, etc.). The definitive diagnosis should be supported by histological, radiological, and clinical evidence. This is case report of an 18year old male patient who presented with a swelling intraorally on palatal aspect. Well-defined unilocular radiolucency with corticated edges was visible in cone beam computed tomography and anterior maxillary periapical views. After pulp vitality tests, root canal treatment was performed and surgical enucleation was done. Patient was reviewed after 1 year follow-up and was asymptomatic.

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I. INTRODUCTION

Nasopalatine duct cyst is a developmental, epithelial, non-odontogenic cyst of the maxilla. It is believed that this cyst can be originated from the epithelial remains of the nasopalatine duct.The duct is known to regress in fetal life, however the persistence of ductal epithelium leads to cyst formation.It is considered to be the most common non-odontogenic cyst of the gnathic bones.[1] Most studies show a significantly higher frequency in men than woman, with the ratio being 2.5 : 1 . It is the most common nonodontogenic cyst of the jaw, accounting for 1% to 11.6% of all jaw cysts.[3]

The nasopalatine duct cyst was first described by Meyer in 1914.[2] Other names were also used for the lesion such as maxillary midline cyst, anterior midline cyst, and incisive duct cyst and anterior middle palatine cyst. Nasopalatine duct cyst occurs in the median of the palate within the incisive canal, which is located in the palatine process, posterior to the alveolar process of the upper maxillary central incisors.

The vitality of nearby teeth should not be affected; however, it is not uncommon to see evidence of endodontic therapy because the nasopalatine duct cyst was previously clinically misdiagnosed as a periapical

cyst or granuloma. [4]The standard treatment for NPDC has been complete surgical removal using a sublabial or palatine approach.[5,6]

II. CASE REPORT

An 18- years old male patient, who complained of a swelling inside the mouth and looseness of the anterior teeth with no facial asymmetrywas referred to the Department of Conservative dentistry and Endodontics. (Fig 1) The patient noticed the swelling about a year ago and he had no a complaint of pain and no a history of the trauma. Patient started noticing a mildincreasing swelling in the anterior mid palate region 2 months back which gradually increased in size.Patient gave history of pain since 4 days.

In the intraoral examination swelling in the maxillary anterior regionpalatally was noticed. (Fig2) No evidence of lymphadenopathy was observed. Inflation was firm, painless, non - fluctuate and without the presence of a pulse.

Intra-orally, the swelling covered with the normal mucosa was seen in the buccal vestibule of both central incisors that was extended to the hard palate. A solitary mid palatal swelling is seen near incisive foramen measuring 2 cms x 2 cms in approximately.Blanching was seen on compression. Tenderness on percussion of teeth irt 11 , 21.The mesial deviation of tooth crown of the central incisor and grade 1 mobility of central incisors was observed.

On periapical radiograph of the maxillary anterior teeth showed a single unilocular, radiolucent heart shaped defectwith a well-defined, regular, and cortical border in the anterior and in the midline that was approximately extended to the periapical region of the both central incisors. The lesion had been extended to nasal floor. In the radiographicimage lamina dura is not seen around the anterior teeth, and no evidence of apical resorption of the roots. (Fig 3).

In Cone beam computed tomography (CBCT) images, in axial and coronal view, a radiolucent lesion in the anterior of maxilla was seen that has caused swelling in the lateral walls of the nasal cavities and the anterior of maxillary alveolar process. (Fig 4)

A brownish color aspirate with no purulent discharge was seen. (Fig 5)

Based on clinical (apart from the looseness of tooth) and radiographic findings, the primary differential diagnosis included radicular cyst,Enlarged incisive fossa, nasopalatine duct cyst and central giant cell granuloma (CGCG).

Endodontic examination and diagnosis: Pulp vitality test's irt 12,11,21,22
Interpretation: Non vital teeth irt 11,21

Treatment plan included completion of root canal therapy of maxillary incisors followed by enucleation of the lesion under local anaesthesia.

The tooth was anesthetized with buccal infiltration technique using 1.8–3.6 mL 2% lidocaine with 1:100,000 epinephrine local anaestheticsolution. An access cavity was performed, and the tooth was isolated with a rubber dam. The working length was determined using an electronic apex locator (Dentsply Propex Mini) and then confirmed with intraoral periapical radiography to be 0.5–1 mm shorter than the radiographic apex. The granulation tissues were effectively removed as much as possible through cleaning and shaping with a minimum of K-type file size #40 (Mani Inc., Japan) and maximum with file size #70 (Mani Inc., Japan). The canals were thoroughly irrigated between each successive file using 5.25% sodium hypochlorite (PRIME Dental Products,India). Finally, ultrasonic activation of NaOCl was carried out for 1 min for better canal disinfection, then the canals were dried with absorbent paper points and medicated with calcium hydroxide (PRIME Dental Products,India).The access cavity was temporarily sealed with a sterile cotton pellet and temporary restorative material.

At the second visit (2–4 weeks from the first visit), buccal infiltration was administered. The rubber dam was placed, temporary cement was removed using a high-speed handpiece and reirrigation of root canals was performed with 20 mL 17% EDTA for 1 min followed by saline irrigation. The canals were dried using absorbing paper points. Obturation was done using 2% Gutta percha cones and lateral compaction technique. Post endodontic composite restoration was placed and curing was done.(Fig 6)

On the following day, Bilateral infraorbital and nasopalatine nerve blocks were given. Full thickness trapezoidal. Mucoperiosteal flap was raised from 13 to 23.Mucoperiosteal flap was raised from 13 to 23. A bony window was created in the midline between the apices of maxillary central incisors.The cyst lining was enucleated and submitted for histopathologic examination. Root ends of the teeth were seen within the cyst cavity and were resected to achieve complete removal of the lining from behind the tooth root and undercuts. Resected root ends were prepared using ultrasonic tips to receive MTA as retrograde root canal filling and to achieve a periapical seal.

Haemostasis was achieved and closure done with 3-0 vicryl resorbable sutures.(Fig 7) Periodontal pack was applied over labial and palatal and maintained for a week. Patient was prescribed antibiotics, analgesics and mouthwash in postoperative period

After performing biopsies and ultimately Surgery of the lesion using enucleation method, a histopathological examination was performed on the lesion. In a microscopic examination, the given soft tissue section shows cystic lining epithelium with underlying tissue wall. The lining epithelium is simple cuboidal to stratified squamous epithelium, 2-3 layered and epithelial connective tissue interface is flat. The connective tissue wall is fibro cellular showing dense to delicate haphazardly arranged collagen fibres with spindle shaped fibroblasts, chronic inflammatory calls infiltrate chiefly lymphocytes and plasma cells, longitudinal sections of nerve bundles. The final diagnosis was suggestive of nasopalatine duct cyst.

One year after surgery the patient referred for follow-up. Intraoral examination showed the absence of anterior teeth looseness. Panoramic radiography and photography were performed for patient. Panoramic radiography showed healing of the surgical area.

III. Discussion:

Kramer in the year 1974 defined cyst as "a pathological cavity having fluid, semi-fluid or gaseous contents that are not created by the accumulation of pus, frequently but not always is lined by epithelium."

NPDC is the most common non-odontogenic developmental-evolutionary cyst of oral cavity .[8,9]The pathology is unique in that it develops only at single location, which is the maxillary midline between the roots of central incisors.They are usually asymptomatic and get discovered during routine radiography. This cyst includes 10% of the jaw cysts and involves 1% of the total population. The age distribution is broad and, in most cases, it can be discovered in the fourth and sixth decades of life.[7,8]

The current case is a nasopalatine duct cyst in a 21-year-old person that the lesion can be notable in terms of age range. There was not a history of orthodontic treatment and evidence of periodontal disease as well as traumatic occlusion. The invasive nature of these cysts should not be ignored because they can cause wide destruction. Although infrequent, neurological symptoms including numbness or burning sensation over anterior palate may be experienced due to pressure on the nasopalatine nerve.

NPDC must be differentiated with common periapical lesion like a radicular cyst, present in anterior maxilla associated with root apex of maxillary central incisor. Radicular cyst unlike NPDC is commonly associated with non-vital teeth with positive history of trauma to anterior teeth or chronic pulpitis.

The maxillary incisor teeth were nonvital due to the lesion itself. The midline lesion caused slight displacement of roots of maxillary central incisors. Intraoral periapical radiograph, maxillary occlusal view and orthopantomogram are used to radiographically evaluate the lesion. The contours of the cyst arc round, ovoid or pear shaped! Since the pear shape is thought to be caused by the resistance of the roots ofthe teeth, such cysts are considered to be present in the oral part of the incisive canal, the round ones being located more nasally. Sometimes the cyst may appear heart shaped because it becomes notched by the nasal septum. Root resorption, caused by osteoclastic activity initiated by the cyst pressure, is rarely seen. The radiologic differentiation between a nasopalatine duct cyst and the normal anatomical incisive fossa can be difficult.(10,11.12)

In present case the cyst appeared as a well-circumscribed radiolucency in or close to the midline, usually with. In rare cases accessory cysts can be seen. NPDC appear as a well-defined, round or oval radiolucency located between the roots of maxillary central incisors with sclerotic white marginal lining, indicating a cortical circumscription. Superimposition of anterior nasal spine gives the lesion typical heart shaped radiolucency.

Treatment of NPDC is surgical excision. The lesion can be approached from palatal or labial aspect depending on its location. In the present case the lesion was localized over labial vestibule and was in close proximity to the root apex of maxillary incisors. After completion of endodontic treatment, the lesion was surgically approached from labial aspect.

IV. Conclusion

NPDC occurs in approximately 1% of the population. Presentation may be asymptomatic or include swelling, pain and drainage from the hard palate. A well circumscribed, round, ovoid or heart shaped radiolucency is seen on radiograph. Histopathological findings reveal squamous or respiratory cell types, or a combination of these, infiltrated by inflammatory cells. Enucleation is the preferred treatment with low recurrence rate. Vitality testing of teeth adjacent to or involved with a cyst-like lesion is mandatory andthe final diagnosis can be confirmed after pathological examination. Clinician's awareness of clinical and radiographic characteristics of the nasopalatine duct cyst is important. Histopathologic examinations help us in making the correct diagnosis and alleviate us from unnecessary treatments.

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Figure 1:-Extra oral images

Figure 2:-Intraoral images

Figure 3:-IOPA IRT 11,21

Figure 4:-CBCT IMAGES

Fig 5:-E

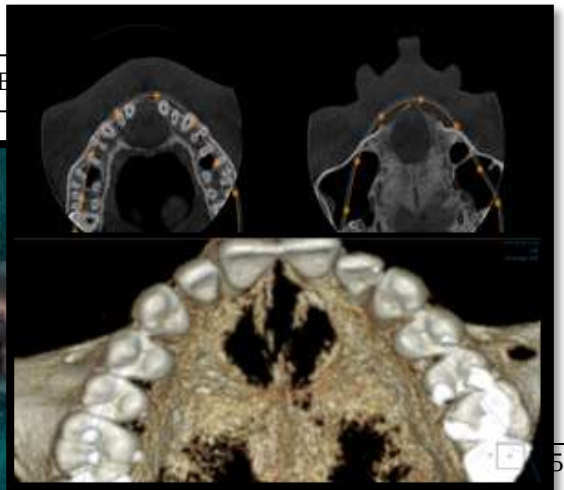

Fig 6:-Endodontic Treatment

Fig 7:-Surgical Procedure