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TITLE: Patent Nasopalatine Duct- A Case Report

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ABSTRACT
We describe a 17 year old male patient who presented with pus coming out from a defect in the upper part of roof of mouth and investigations revealed a central defect in the upper jaw connecting the oral and nasal cavities through a fistulous tract. A diagnosis of persistent nasopalatine duct was made and the different surgical options for treatment were given to the patient but patient was not willing to take any treatment. The case is reported because of it’s rarity and also to make aware of the clinicians about such an anomaly and it’s management.

Patent nasopalatine duct was first described by Leboucq in 1881. The lining epithelium of the duct is ciliated columnar upto the level of opening into the palate which is subsequently replaced by transitional and then by squamous epithelium. In animals, the vomeronasal system is used for communication and nasopalatine duct forms a major duct of the vomeronasal system. In other mammals, the nasal and oral cavities are connected by nasopalatine duct which together with the vomeronasal organ of Jacobson has got important role in olfaction. Studies proved that there is important role for the nasopalatine duct to deliver pheromones and chemosignals entering the oral cavity to the vomeronasal organ.

The nasopalatine duct or its remnants are part of the content of the incisive canal. The other contents of the incisive canal include connective and adipose tissues, mucous glands, blood vessels (nasopalatine artery and vein), and nasopalatine nerve. Embryologically, the fusion of premaxilla and the secondary palate in the midline results in the formation of the incisive canal in mammals. But in humans the nasopalatine ducts are closed at birth. Even though the nasopalatine duct is totally patent in many mammals, in humans, the nasopalatine duct remain patent in the fetus only and is usually closed at birth. The persistent ducts degenerate and replaced by mucous membrane usually by birth or within the first postnatal year. There is failure of
obliteration of the duct in some cases and the duct may persist in adult
which can be unilateral, bilateral, or central. The opening of the patent duct
in the oral cavity can be a small unilateral or bilateral opening and a pit or
slit like invagination of oral cavity mucosa lateral to the incisive papilla.
Between 1881 and 2007 only forty three cases of persistent nasopalatine duct
have been reported.

**Keywords:** patent nasopalatine duct, incisive papilla.
INTRODUCTION
Patent nasopalatine duct was first described by Leboucq in 1881. The ducts are usually lined by ciliated columnar epithelium to the palatal opening where it is replaced by transitional and then squamous epithelium. Nasopalatine duct is a major duct of the vomeronasal system used in animals for chemical communication. Nasopalatine ducts provide direct communication between the oral and nasal cavities and together with the vomeronasal organ of Jacobson, function as auxiliary olfactory sense organs in other mammals. The nasopalatine duct may serve to deliver pheromones and chemosignals entering the oral cavity to the vomeronasal organ. The nasopalatine duct or its remnants are part of the content of the incisive canal. The incisive canal consists of connective and adipose tissues, mucous glands, blood vessels (nasopalatine artery and vein), and nasopalatine nerve. Embryologically, the incisive canal marks the fusion between the premaxilla and secondary palate in the midline, resulting in a “Y” shape, the tip of which corresponds to the incisive foramen in mammals. In man, however, the ducts are generally closed at birth. Although the nasopalatine duct is totally patent in many mammals, in humans, the nasopalatine duct remain patent in the fetus only. Nevertheless, the ducts degenerate and are obliterated by a mucous membrane at their ends before birth or within the first postnatal year. In some cases, patency of the nasopalatine duct may persist or arise in adults and can be unilateral, bilateral, or central, with the duct. The oral aspect of a patent duct consists of a small unilateral or bilateral opening, and pit or slit-like invagination of the oral mucosa on the lateral edge of the incisive papilla. Only forty-three cases of persistent nasopalatine duct have been reported between 1881 and 2007;

CASE REPORT
A 17 year old boy presented with complaints of pus coming out from the front portion of the roof of mouth for the past six months and a few days back he had history of a rice grain coming out from the same site. The patient had no history of trauma, infection, or surgical treatment in the mouth.
Clinical oral examination showed a small central defect posterior to the incisor teeth in the anterior part of the palate. Palatine mucosa was normal. On anterior rhinoscopy there is a small defect in the left nasal cavity at the level of the floor of the nasal cavity adjacent to the lower end of the nasal septum along with deviation of the nasal septum to the right. A computerized tomography (CT) scan was taken (figure 1,2 and 3) which showed a fistulous tract connecting the oral and nasal cavities at the site of incisive canal foramen. Mucosal thickening and air pockets noted within the fistulous tract and a diagnosis of patent nasopalatine duct was made. Patient was advised about the treatment options including surgery but was not willing to undergo any type of surgical procedure. The case is reported because of the rarity.

**DISCUSSION**

Chapple and Ord discussed the possibility that central damage results from epithelial breakdown rather than failure of embryologic fusion. The diagnosis is made on the basis of patient history, physical examination, and radiographic findings. Treatment is generally not required for this developmental anomaly. Surgical closure include closure of the defect with a palatal flap which is rarely needed. It is important to differentiate this from other oronasal fistulas and that is mainly by the location in which it is seen in the anterior part of the hard palate at the incisive foramen area of the alveolus.

Most of the patients are asymptomatic and it is an incidental finding in some. The common symptoms include an abnormal high pitched sound from the roof of the mouth when sucking hard, altered taste sensation, entrapment of food particles in the patent duct, passage of food particles or fluid into the nasal cavity through the duct, discharge from the site of defect, collection of debris within the duct, whistling noises, swelling at or near the site, or pain.
CONCLUSION

A 17 year old male patient who presented with pus coming out from a defect in the upper part of roof of mouth for past 6 months and recently a rice grain coming out from the same site and investigations revealed a central defect in the upper jaw connecting the oral and nasal cavities through a fistulous tract. After clinical examination and radiological investigation a diagnosis of persistent nasopalatine duct was made. Even though the surgical management of closure of the defect by palatal flap was discussed with, the patient was not willing to take any treatment. The case is reported because of it’s rarity and also to make aware of the clinicians about such an anomaly and it’s management.

REFERENCES

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FIGURE LEGEND

Figure 1: CT Scan sagittal section showing the patent nasopalatine duct.

Figure 2: CT Scan coronal section showing the patent nasopalatine duct.

Figure 3: CT Scan axial section showing the patent nasopalatine duct.
Figure 1: CT Scan sagittal section showing the patent nasopalatine duct.

Figure 2: CT Scan coronal section showing the patent nasopalatine duct.
Figure 3: CT Scan axial section showing the patent nasopalatine duct.