



ORIGINAL RESEARCH ARTICLE

INTRANASAL FINDINGS IN UNILATERAL PRIMARY ACQUIRED NASOLACRIMAL DUCT OBSTRUCTION

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ABSTRACT

Background: Primary acquired nasolacrimal duct obstruction (PANDO) is a common entity with associated different types of intranasal abnormalities. The pathogenesis of PANDO is unknown. The objective of the study was to describe the intranasal findings in cases of PANDO and find out any association of these findings to the disease.

Methods: A comparative cross-sectional study was designed consisting of 50 cases of unilateral PANDO with epiphora and 50 normal volunteers with no history of epiphora. Nasal Evaluation was done with anterior rhinoscopy and nasal endoscopy. Data was tabulated and analyzed using SPSS version 21.

Results: The mean age in the unilateral PANDO group was 33.6 years and 34.5 years in the normal volunteer's group (P=0.84). Left sided dominance of PANDO was observed in 64% (32/50) cases. The odds of having Nasolacrimal duct (NLD) obstruction was 1.6 times more among individuals having septal deviation versus no deviation (95% CI, 0.907–2.78). The laterality of septal deviation was corresponding to the side of NLD obstruction in 91% (31/34) cases. High located DNS was more common in the PANDO group which was significant (P-value 0.012). Turbinate hypertrophy, the presence of septal spur or rhinitis had no significant association with NLD obstruction.

Conclusions: Deviated nasal septum (DNS), turbinate hypertrophy, septal spur and rhinitis were the associated intranasal findings in cases of unilateral PANDO. A significant association exists between DNS and PANDO, although a cause and effect relation require further probing.

INTRODUCTION

The nasolacrimal duct (NLD) is an anatomical structure that opens into the inferior nasal meatus. Nasolacrimal duct obstruction (NLDO) is a disease characterized by constant watering of the eyes, ocular discharge, and recurrent attacks of acute infection.¹The relationship between nasolacrimal duct obstruction and nasal pathologies has been a controversial topic for many years. Secondary

acquired NLDO can be caused by infectious, inflammatory, neoplastic, traumatic, or mechanical processes, but the pathogenesis of primary acquired nasolacrimal duct obstruction (PANDO) is unknown.^{2,3} The incidence of PANDO is commoner in women than men.⁴ Facial asymmetry and nasal septal deviation have been postulated to be the cause of unilateral NLD obstruction. The side of deviation of septum corresponded to NLD obstruction in several studies.⁵⁻⁷ Computed tomography scan based

data exists on associated sino-nasal anomalies in PANDO.⁸⁻¹⁴ Significant endoscopic intranasal anomalies and pathologies have been described to be associated with congenital nasolacrimal duct obstruction.¹⁵ The objective of the study was to describe the intranasal features in patients with unilateral PANDO, and find out any association of the findings to the disease.

METHODS

A prospective comparative cross-sectional study was conducted at Nobel Medical College in the ENT Outpatient department (OPD) from January 2018 to December 2018. All of the patients presenting to our OPD with unilateral epiphora were included in the study. Ethical Approval was obtained from the Institutional Review Committee of Nobel Medical College and Teaching Hospital. All patients with informed consent were assessed.

Relevant histories, including presenting symptoms, duration and details of any previous nasal surgery were recorded. Lacrimal probing and irrigation were performed to confirm the diagnosis of PANDO in the study group. Comparative group was the normal volunteers, the attendants of patients, with no history of epiphora. Exclusion criteria were the subjects with maxillofacial trauma, past history of nasal surgeries or any other known lacrimal duct disease and malignancy.

Anterior rhinoscopy and nasal endoscopic

evaluation was performed using a 4 mm zero-degree telescope (Karl Storz, Germany) in both the groups. Data were collected that included demographics, details of PANDO, type of septal deviation (bony or cartilaginous; high or low), side of deviation, the presence of septal spurs, caudal dislocation, any turbinate hypertrophy and endoscopic features suggestive of sinusitis.

Data analysis was carried out using SPSS version 21 (SPSS Inc, Chicago). Descriptive statistics was done using Microsoft excel. Mann-Whitney test and Fisher exact test was used to compare both the groups. Chi-Square test was used to calculate the association between each of intranasal findings and the side of nasolacrimal duct obstruction. P value <0.05 was considered to be significant.

RESULTS

Fifty cases of the study group and 50 normal volunteers group were analyzed. The mean age in the study group was 33.6 years and 34.5 years in the volunteers (P=0.84) as shown in Table 1. Females outnumbered the males in both group (P=0.029). Overall, the demographics were comparable in both the groups. PANDO was found to be more frequent among women (62%;31/50). Left sided dominance of PANDO was observed in 64% (32/50) cases. Thirty four patients (68%) had deviated nasal septum in PANDO group versus 18 (36%) in the volunteers (P=0.04). The odds of having NLD obstruction are 1.6 times more among individuals having septal deviation versus no

Table 1: Demographic and intranasal findings of the study and normal volunteers group

	Study group (N=50)	Normal volunteers group (N=50)	P-value	Odd's ratio
Mean age	33.6 years	34.5 years	0.84, Mann-Whitney test	
Male:Female	19:31	30:20	0.029, Fisher exact test (FET)	
Deviated nasal septum	34(68%)	18(36%)	0.04, FET	1.6 (95% CI, 0.907 to 2.78)
High:low septal deviation	21:13	6:12	0.012, FET	
Septal spur	7(14%)	4(8%)	0.429, FET	
Rhinitis	8(16%)	2(4%)	0.435, FET	
Turbinate hypertrophy	10(20%)	3(6%)	0.389, FET	

deviation (95% CI, 0.907–2.78). Of the 34 patients with DNS in the study group, the laterality of septal deviation was corresponding to the side of NLD obstruction in 91% (31/34) cases, which was quite significant. High located DNS was more common in the study group compared to the normal volunteers group, which was significant (P=0.012). Turbinate hypertrophy, the presence of septal spur or rhinitis had no significant association with NLD obstruction.

DISCUSSION

Primary acquired nasolacrimal duct obstruction (PANDO) is described as a condition of nasolacrimal duct obstruction caused by inflammation or idiopathic fibrosis.¹⁶ It is more common in women than men.^{4,10} In our study too PANDO was common in females. This increased incidence in females could be related to the anatomical difference between the bony nasolacrimal excretory system in men versus women.¹⁷

The causes of PANDO are still a subject of speculation. Several studies have found a frequent association of sinonasal abnormalities to PANDO. Nasolacrimal system obstruction and consequent complication could result from rhinologic or sinus disease because of close anatomical relation. A higher incidence of sinusitis and nasal septal deviation in patients with nasolacrimal outflow obstruction and supported by computed tomography findings was found in the study by Kallman et al.⁸ Similar results were also reported by Eyigor and colleagues.¹⁸ Habesoglu et al found a significant important etiological role of anatomical variations of nose like inferior turbinate hypertrophy, septal deviation, irregular and paradoxical middle turbinate etc. and sinonasal disease in the causation of PANDO.¹⁹

A high frequency of deviated nasal septum (68%) in the study group, as compared to the normal volunteers group, in our study, was found. The odds of having NLD obstruction were 1.6 times more among individuals having septal deviation versus no deviation. Also, the laterality of septal deviation was corresponding to the side of NLD obstruction in 91% cases.

Yazici et al in a case-control study found that the side of the septal deviation correlated with the side of the PANDO ($p=0.008$). However, no significant difference was found for other paranasal abnormalities.²⁰ Lee

et al found that the unilateral nasolacrimal duct obstruction appeared to occur on the side in which the nasal septum was deviated. Also, they postulated that the degree of facial asymmetry and nasal septal deviation could have an effect on the NLD obstruction.⁶ Taban et al also found a correlation as to the side of nasolacrimal duct obstruction, facial asymmetry and septal deviation.²¹

High located DNS was more common in the study group, which was significant (P=0.012) in our study. However, the turbinate hypertrophy, the presence of septal spur or rhinitis had no significant association with NLD obstruction.

The study by Orlandi has shown that septal deviation is associated with an increased prevalence of rhinosinusitis.²² Yousem and colleagues have found that the patients with more severe nasal septal deviation and more horizontally-oriented uncinate processes had a higher frequency of sinus opacification.²³ Passali et al stated that the chronic rhinosinusitis, in particular allergic rhinosinusitis, are one of specific predisposing factors to the development of NLDO.²⁴

Cervelli et al found a reduced flow of the medium contrast in nasolacrimal duct due to a partial obstruction at the level of the internal ostium in patients with septal deviations and turbinate hypertrophy.¹⁰ Paulsen et al described the pathological changes leading to occlusion and fibrosis of lacrimal passage due to infectious process of nasal cavity.²⁵

Thus, we can draw an inference that a significant association exists between deviated nasal septum and primary acquired nasolacrimal duct obstruction, although a cause and effect relation cannot be established, until a study with larger sample and subgroup analysis can be performed.

CONCLUSION

Deviated nasal septum, turbinate hypertrophy, septal spur and rhinitis were the associated intranasal findings in cases of unilateral PANDO. A significant association exists between deviated nasal septum and primary acquired nasolacrimal duct obstruction in terms of frequency and laterality, however, a cause and effect relation require further probing.

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