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Evulation of Intranasal Anatomy and Pathologies in the Etiopathogenesis and Treatment of Nasolacrimal Duct Obstruction

Original Investigation

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Abstract

Objective: Patients who underwent endoscopic dacryocystorhinostomy (DCR) operation were analyzed for their nasal obstructive anatomic and pathologic infrastructures.

Methods: Thirty two patients with distal lacrimal system pathology who underwent endonasal endoscopic DCR surgery in the Ear Nose and Throat Clinic were examined with endoscopy and their computed tomographies were evaluated for the nasal and paranasal pathologies. These findings were compared with 50 healthy subjects' physical examination and computed tomography results. During the DCR operation patients were re-evaluated peroperatively for the nasal pathologies to be corrected if necessary.

Results: No statistically significant difference was detected for the nasal septal deviation, agger nasi, concha bullosa, osteomeatal complex or ethmoid pathologies.

Conclusion: The relation of the etiopathogenesis of the disease and nasal variations were evaluated because of the close proximity of the nasolacrimal system with the intranasal variations, but there was no statistical connection between them. During the endoscopic endonasal DSR operation obstructive nasal pathologies should be corrected in the same session if necessary.

Key Words: Dacryocystorhinostomy, paranasal computed tomographies, nasolacrimal duct obstruction

Introduction

Obstruction of lacrimal outflow results in complaints such as epiphora and dacryocystitis. Obstruction may be either congenital or acquired. Whilst primary acquired nasolacrimal duct obstruction (NDO) is usually idiopathic, secondary acquired NDO may result from trauma, infection, inflammation, neoplasm or mechanical factors (1-3).

Treatment includes dacryocystorhinostomy (DCR), in which a connection is established between the lacrimal sac and nasal cavity. DCR can be performed either by endonasal or external approach.

In the present study, we evaluated the relationship between NDO and nasal variations in terms of anatomical adjacency and problems during surgical interventions, and discussed the results in the light of the literature.

Methods

The present study comprised 32 patients, who underwent Endonasal Endoscopic Dacryocystorhinostomy (EEDCR) due to NDO between 2005 and 2009 in the Ear Nose and Throat Clinic Fatih Sultan Mehmet Training and Research Hospital, Ministry of Health, and 50 subjects without NDO as the control group. The patients were retrospectively compared. Ethics committee approval was obtained from the third Istanbul Clinical Research Ethics Committee (2009-KK-057).

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Patient Evaluation

The findings of anterior rhinoscopy and 0 and 30 degrees telescopic examinations of the patients were recorded. All patients underwent paranasal sinus computed tomography (CT) in the coronal and axial plane with 5 mm sections. Each patient was individually evaluated in terms of disease of the ethmoid cells and osteomeatal region, and the presence of concha bullosa, and agger nasi. Physical examinations of the patients without NDO, who underwent paranasal sinus computed tomography for another reason, were also performed in the same way.

The diagnosis of NDO was made by an ophthalmologist by means of irrigation tests and dacryoscintigraphy, and localization of the site of obstruction was made by dacryocystography and dacryoscintigraphy. Patients with no upper lacrimal system pathology but with pure sac or ND obstruction were included in the study.

In addition, patients were questioned for epiphora, and they underwent nasal endoscopic examination and dacryoscintigraphy after the surgery.

Statistical analysis

SPSS (Statistical Package for Social Sciences) for Windows 13.0 program was used for statistical analysis. Study data were evaluated using descriptive statistical methods (mean, standard deviation, maximum, minimum, frequency and percentage). Since the data were qualitative, comparison was done by Chi-square test for independence. Results were assessed within 95% confidence interval and significance was assessed at the level of 0.05.

Results

The present study examined 36 eyes of a total of 32 patients, of whom 19 were male and 13 were female, who stayed at Fatih Sultan Mehmet Training and Research Hospital, ENT Clinic between 2005 and 2009 due to NDO. The mean age of the patients was 50.47±7.95 years.

Preoperative dacryoscintigraphy revealed distal NDO in both eyes of 4 patients, in the right eyes of 13 patients and in the left eyes of 15 patients. No activity of passage to the nasal cavity was observed in these patients.

Concurrency with Agger Nasi

Ipsilateral Agger nasi was detected in 17 (53.1%) of the patients with NDO. Two of these patients underwent drainage simultaneously with surgery since there was opacity on CT. Agger nasi cells were detected in 25 (50%) subjects in the control group. No statistically significant difference was observed between the groups with and without NDO (p=0.782).

Concurrency with Concha Bullosa

Concha bullosa was detected in only 10 (31.3%) patients with NDO, whereas 18 (36%) of the subjects in the control group had concha bullosa (Figure 1). There was no significant difference between the groups regarding the presence of concha bullosa (p=0.658).

Presence of Osteomeatal Complex Disease

Osteomeatal complex disease was detected in 4 (12.5%) patients with NDO and in 6 (12%) control cases (Figures 2 and 3). Again, there was no statistically significant difference between the two groups (p=0.946).

Opacification of Ethmoid Cells

While opacification of ethmoid cells was present in 6 (18.8%) cases with NDO, it was present in 5 (10%) control cases (Figure 3). Comparison of these two groups revealed no statistically significant difference (p=0.257).

Discussion

Obstruction of nasolacrimal duct leads to epiphora. Although secondary acquired NDO may be due to a wide variety

Figure 1. A 33-year-old male patient with bilateral concha bullosa

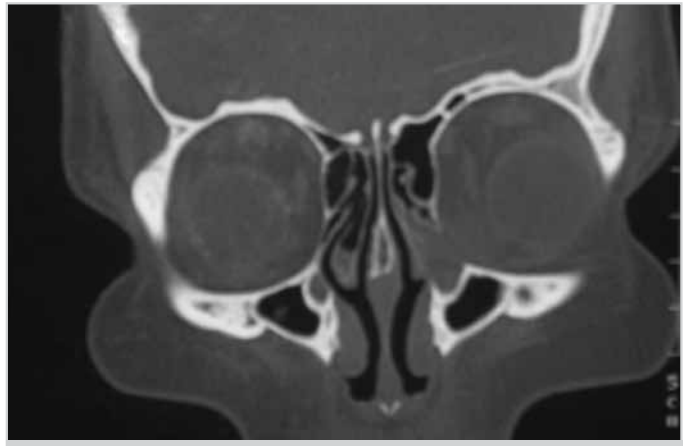

Figure 2. A 43-year-old female patient with opacification in the left osteomeatal complex

Figure 3. A 51-year-old female patient with extensive opacification in the bilateral anterior ethmoid cells, in the left osteomeatal complex and maxillary sinus

of reasons, the reason for obstruction could not be found in two-thirds of the patients and they were considered as idiopathic. There are two types of lacrimal duct obstruction. Congenital NDO, seen in small children, is quite likely concurrent with nasal pathologies. Gray (4) detected septal deviation in all of 100 children with lacrimal duct obstruction. For comparison, septum deviation was detected at a rate of 42% in 2308 consecutive births. Bernstein (5) claimed that dacryocystitis, and even conjunctivitis, may occur as a complication of chronic sinusitis in pediatric patients.

The close proximity of the nasolacrimal system to the lateral nasal wall and paranasal sinuses raises the thought that anomalies and infections of this region might play a role in the etiology of idiopathic nasolacrimal duct obstruction. Some studies assert that chronic rhinitis and sinusitis form a basis for acquired NDO (6, 7).

Kallmann et al. (8) claimed that 87% of patients who had NLC obstruction also have sinus diseases related to anterior etmoid, agger nasi and frontal sinus. Also they asserted that because of adjacency of structures this situation leads inflamation in the nasolacrimal canal causing fibrosis and in time blocking of the NLC.

Habesoglu et al. (9) found concha bullosa, inferior concha hypertrophy, osteomeatal disease and maxillary sinusitis, but not nasal septal deviation, middle concha disorders and ethmoid sinusitis, to be significant in this patient group. In contrast, there are studies reporting that NDO is not associated with nasal pathologies. Linberg and Mc Cormick, (10) in biopsy studies, found no parallelism between duct pathology and nasal pathologies. They asserted that these two events are of different origin.

Based on the results of the present study, we came to a conclusion that nasal obstructions are not associated with nasal pathologies.

Conclusion

No statistical relationship could be detected between nasal variations and NDO and it was concluded that nasal variations do not play a role in NDO except for causing difficulties during surgery.

Conflict of Interest: No conflict of interest was declared by the authors.

Peer-review: Externally peer-reviewed.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics committee of the 3rd İstanbul Clinical Studies (Date: 2009 Protocol no: KK-057).

Informed Consent: Patient consent was not obtained due to the retrospective nature of the study.

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