Does sinusitis play a pathogenic role in primary acquired obstructive disease of the lacrimal system?

Teresa Matos, MD; Pedro Ángelo, MD; Helena Ribeiro, MD; Tiago Costa, MD; João Subtil, MD; Paulo Borges Dinis, MD
CHLN, Department of Otorhinolaryngology II, Hospital Pulido Valente, Lisbon, Portugal

ABSTRACT

Objectives: To investigate the etiopathogenic role of inflammatory sinonasal disease in primary acquired obstructive disease of the lacrimal system. 

Study Design: Prospective controlled study of patients who underwent lacrimal surgery.

Setting: Tertiary care center.

Subjects and Methods: 60 consecutive patients with primary acquired dacryocystitis and chronic obstructive disease of the lacrimal drainage system selected for unilateral or bilateral endoscopic endonasal dacryocystorhinostomy (DCR), who had an ordered pre-operative sinus CT scan, had their sinus scans assessed for inflammatory sinonasal disease using the modified Lund-Mackay classification (Figure 1) and 2), and had also been ordered a sinus CT scan as part of the patient’s preoperative assessment, were enrolled. Clinically, patients were considered as having one of three syndromes: either A) chronic dacryocystitis (perennial daily purulent discharge from the punctal openings in the eyelids); or B) epiphora only (with no history of past or present purulent nasal discharge, lacrimal punctum incompetence, or C) recurrent dacryocystitis (mostly non-purulent epiphora but with a past history of dacryocystitis episodes).

In each subsequent unilateral surgery the non-operated side served as control, but a further group of 40 non-selected, consecutively, mostly acute head trauma patients, was also enrolled as control group. Supposed representation of the prevalence of the disease in the general population. They all had attended the emergency room of a tertiary-care hospital and were diagnosed with acute pathology other than eye or nose disease, and at a head CT –scan (scan cephalo-caudally) was ordered. Their scan was reviewed and left for right and sinus disease extension, again using the modified Lund-Mackay classification (Figure 1) to assess for each side the total sinus site scores on each side as well as their anterior, ethmoidal and sphenoidal scores, as described above. Statistical analysis, unpaired Student’s t-tests to specific requirements, Pearson’s chi-square test, independent samples t-test, analysis of variance test (ANOVA), and linear regression. For all, a significance level was set at p = .05.

The study group has a mean age of 61.48 years (ranging from 5 to 91 years), 84 males (50.3%) and 52 females (48.7%). The mean age of the control group is 65.8 years (ranging from 24 to 91 years), with 45 males (63.6%) and 25 women (36.4%). No statistically significant differences between the two groups were found regarding age but a statistically significant difference regarding sex distribution was observed due to the high number of females in the DCR study group.

In ophthalmological literature, sinus disease has been incriminated in cause extra-orbital, non-acute pathology, such as primary acquired dacryocystitis and other chronic inflammatory and obstructive pathology of the membranous lacrimal system. This association remains, however, largely speculative. In order to shed some light on an eventual pathogenic role of inflammatory sinonasal disease on chronic obstructive/inflammatory pathology of the neighboring lacrimal system, we developed the present investigation.

INTRODUCTION

In a prospective controlled study, 60 consecutive patients with primary acquired dacryocystitis (DC) and chronic obstructive disease of the lacrimal drainage system selected for unilateral or bilateral endoscopic endonasal dacryocystorhinostomy (DCR), who had an ordered pre-operative sinus CT scan, had their sinus scans assessed for inflammatory sinonasal disease using the modified Lund-Mackay classification (Figure 1 and 2), and had also been ordered a sinus CT scan as part of the patient’s pre-operative assessment, were enrolled. Clinically, patients were considered as having one of three syndromes: either A) chronic dacryocystitis (perennial daily purulent discharge from the punctal openings in the eyelids); or B) epiphora only (with no history of past or present purulent nasal discharge, lacrimal punctum incompetence, or C) recurrent dacryocystitis (mostly non-purulent epiphora but with a past history of dacryocystitis episodes).

RESULTS

In each subsequent unilateral surgery the non-operated side served as control, but a further group of 40 non-selected, consecutively, mostly acute head trauma patients, was also enrolled as control group. Supposed representation of the prevalence of the disease in the general population. They all had attended the emergency room of a tertiary-care hospital and were diagnosed with acute pathology other than eye or nose disease, and at a head CT –scan (scan cephalo-caudally) was ordered. Their scan was reviewed and left for right and sinus disease extension, again using the modified Lund-Mackay classification (Figure 1) to assess for each side the total sinus site scores on each side as well as their anterior, ethmoidal and sphenoidal scores, as described above. Statistical analysis, unpaired Student’s t-tests to specific requirements, Pearson’s chi-square test, independent samples t-test, analysis of variance test (ANOVA), and linear regression. For all, a significance level was set at p = .05.

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The Lund-Mackay score results in the study and control groups are displayed in Table 1. No statistically significant differences were found in prevalence or absence, disease location or specific location, of inflammation in the sinuses in any clinical or anatomic pathologic of the lacrimal system (chronic dacryocystitis, recurring dacryocystitis, or epiphora only), compared to control group.Eyes did not display any statistically significant anatomic or clinical pathologic of the lacrimal system compared to the study group (non-operated control or the control group) and only 16.6% of the study group was employed to assess how all the sinus disease variables could predict ophthalmologic disease. In this study, McFadden’s test was p<.014, which means that they can only accurately predict the statistical behavior of any ophthalmologic variables in up to 1.4%, a relatively very low percentage.

DISCUSSION

The etiopathogenesis of idiopathic or primary acquired obstructive disease of the lacrimal drainage system is still not known. 

Fibrosis and scar tissue secondary to chronic inflammation of the mucous membrane of the lacrimal sac and/ or nasolacrimal duct seems to be the critical issue. In the last years research has focused on the importance of preexisting anatomical lacrimal variations, such as nasolacrimal valve narrowing and end of the nasolacrimal duct which functions in a highly hormonal-dependent manner, aspects that render the disease more likely in pre- and postmenopausal women. In these cases no specific etiopathological findings have been identified. 

Frequent cine sinusitis can play a causative factor, in spite of limited scientific data to substantiate its

CONCLUSIONS

Our results seem to allow the conclusion that chronic inflammatory sinonasal disease is a co-morbidity that is no more prevalent or more severe in these patients than in the general population; and when present, regardless of its location and extremity, apparently it is not statistically related to any specific clinical or anatomical type of primary lacrimal disease of the lacrimal system. DCR eyes, and DCR patients overall, do not have higher scores of sinonasal disease than non-surgical or normal subjects. And the inflammatory status of the sinonasal site or disease proximity does not seem to increase the risk of lacrimal system obstruction.

Table 2: Hypothesis for the initial naso-lacrimal lesion issue

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<table>
<thead>
<tr>
<th>Study Group</th>
<th>Coronal Group</th>
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<tr>
<td>Anterior</td>
<td>Ethmoid</td>
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<td>Anterior Ethmoid Score</td>
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<tr>
<td>Sphenoidal Score</td>
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<td>Total Lund-Mackay Score</td>
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REFERENCES