Original article

Intraductal meibomian gland probing for the treatment of blepharitis

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ABSTRACT
Objective: To describe the results of the meibomian gland probing as a treatment of severe posterior blepharitis.
Methods: Prospective, longitudinal study of patients with signs and symptoms of severe posterior blepharitis, who were treated with meibomian gland probing in Centro Oftalmológico Interlomas (CENOFI). A total of 16 patients were included, 62.5% female and 37.5% male, diagnosed with severe posterior blepharitis. Treatment was performed in one eye. The time of rupture of the tear film was evaluated, using a subjective scale of 0–10 photophobia, the improvement in pain and visual acuity was measured before the procedure, and at one week and 6 months after.
Results: All the patients showed a statistically significant improvement in all 4 variables at 6 months. There were no complications.
Discussion: The dysfunction of the meibomian glands is a common reason for ophthalmology consulting. The study describes the results obtained by performing an intraductal survey, which was shown to be safe and effective in 100% of the sample.
Conclusions: It can be concluded from this study that meibomian gland probing is an effective and promising treatment for blepharitis resistant to conservative treatment.

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Sondaje intraductal de las glándulas de Meibomio para el tratamiento de blefaritis posterior severa

RESUMEN
Objetivo: Describir los resultados del sondaje intraductal de las glándulas de Meibomio como tratamiento de la blefaritis posterior severa.
Métodos: Estudio prospectivo, longitudinal, de pacientes con signos y síntomas de blefaritis posterior severa, los cuales fueron tratados con sondaje intraductal de las glándulas de

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Introduction

Generally, the word blepharitis is used to describe and inflammation on the edge of the eyelids.\textsuperscript{1} The tissue involved may include skin, eyelid edges, eye lashes, and the pilosebaceous and sebaceous glands\textsuperscript{2} within the tarsus, also known as Meibomian glands. Personal hygiene and dermatological diseases can play a role in the development or severity of blepharitis.\textsuperscript{3,4}

Most frequently, blepharitis expresses bilaterally with variable symptoms such as pruritus, itching, foreign body feeling, heaviness, tearing and photophobia.\textsuperscript{5}

The anatomic classification divides blepharitis in anterior and posterior.\textsuperscript{5} The former comprises expressions usually involving the eyelids and pilosebaceous glands, while the latter is related to Meibomium gland disorders. These glands are designed for producing the lipidic component of tears and functional alteration in said glands is known as meibomitis or Meibomium gland dysfunction (MDG).

In blepharitis patients, Meibomium gland secretion is highly saturated and contains lower amounts of hydrocarbons and higher amounts of proteins\textsuperscript{6-8} that produce lipidic secretions with higher viscosity which restrict gland flow. When the gland becomes obstructed, less lipids are available for contributing to the lacrimal film, thus increasing lacrimal evaporation.\textsuperscript{9} In addition, MDG is exacerbated by the presence of bacterial flora such as Propionibacterium acnes and Staphylococcus epidermidis.\textsuperscript{10,11} These bacteria secrete lipase which acts directly on the gland converting lipids into free fatty acids which cause ocular surface irritation and break up the lacrimal film.

One of the currently described treatments for this entity is the Meibomium gland probing described by Maskin,\textsuperscript{12} who published the technique and developed the instruments applied in said probing.

Intraductal Meibomium glands probing (MGP) is an effective intervention for treating Meibomium gland obstruction.\textsuperscript{7,12} The best candidates for this treatment are patients with persistent symptoms despite eyelid cleaning in addition to topical and systemic treatment, or those who exhibit signs and symptoms of Meibomium gland obstruction.

Intraductal changes involving fibrosis and neovascularization could explain the persistence of said obstruction despite full treatments focused on the eyelid edge and orifice.\textsuperscript{7,8} MGP seems very efficient to rapidly alleviate inflammatory symptoms.\textsuperscript{12}

Materials and methods

The study included 16 patients, 10 females (62.5\%) and 6 males (37.5\%) between 32 and 64 years of age with a mean value of 8 years, who exhibited signs and symptoms of severe posterior blepharitis such as foreign body feeling, subjective discomfort while blinking, photophobia, diminished vision which improved with blinking, ocular heaviness with evaporative dry eye data and resistance to conventional treatment. Only one eye was treated in order to use the contralateral eye as control. Assessments included lacrimal film breakup time (in seconds), with instillation of one drop of fluorescein and the subjective improvement of visual acuity, palpebral discomfort and photophobia, related by patients utilizing a subjective scale of 0–10 (analog visual scale) before the procedure and after one week. The technique consisted in palpebral exploration with and without transillumination to demonstrate hyperemia in the palpebral edge, telangectasias, foam, rings on the eyelashes and the exclusion defects of Meibomium glands to transillumination, defined as glands which do not transilluminate and remain occluded. The occluded glands were probed with a 2 mm Maskin cannula (Rhein Medical Florida, USA (Fig. 1), under biomicroscopy and with prior installation of a 5\% tetracaine drop. When required, posterior probing was performed with a 4 mm long cannula to demonstrate permeability (drawing when applicable glandular orifice metaplasia and fibrovascular obstruction bridges) (Fig. 2). One week and 6 months after the initial treatment, the lacrimal film breakup time was measured again together with the assessment
on subjective improvements in the visual acuity, palpebral discomfort and photophobia. The data thus obtained were analyzed with a paired t for Student test, utilizing SAS Analytical Software, obtaining the results described below. The study, as well as the review of the informed consent signed by patients, was approved by the bioethics committee of the Interlomas Ophthalmological Center. The inclusion of other documents was not required as the study involved a routine technique.

**Results**

All patients (100%) exhibited statistically significant improvements in the 4 variables of the study at the six-month assessment (Table 1). The following results were found for the lacrimal film breakup time: in the assessment prior to the intervention, the mean value was of 3.44 s, while the assessment after the intervention demonstrated improvements with a mean value of 8.06 s (p < 0.0001) (Fig. 3).

The results for the subjective visual acuity assessment are as follows: the previous assessment produced a mean value of 4.19 (analog visual scale), while the subsequent assessments yielded a mean value of 6.81 (p < 0.001) (Fig. 4).

The results for the subjective discomfort while blinking are as follows: the previous assessment produced a mean value of 6.44, while the subsequent assessment gave a mean value of 3.62 (p = 0.008) (Fig. 5).

The results found for photophobia are as follows: the previous assessment produced a mean value of 7.38, while the subsequent assessment produced a mean value of 3.94 (p < 0.001) (Fig. 6).

All the results exhibited normal statistical distribution curves.

The mean number of treated glands was 26, with a mean treatment time of 40 min.

None of the patients referred significant discomfort during the intervention and no associated complications emerged.
Discussion

Meibomian gland dysfunction is a frequent cause of visits to ophthalmological practices. Publications found in the literature report an incidence ranging from 12% to 47% of populations.13

The aim of this study was to describe the results obtained when performing MGP in patients with severe dysfunction thereof. The mean age of treated patients matches the mean age reported in the literature for MGD incidence.2

Prior to the intraductal probing, 100% of patients referred symptoms including photophobia, subjective diminished visual acuity and discomfort such as foreign body feeling, heaviness, itching and pruritus).

<table>
<thead>
<tr>
<th>Patient</th>
<th>Lacrimal film Breakup time (s)</th>
<th>Subjective Visual improvement</th>
<th>Subjective Discomfort improvement</th>
<th>Photophobia</th>
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<tr>
<td>p &lt; 0.0001</td>
<td>3.44</td>
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<td>Standard deviation</td>
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<tr>
<td>p</td>
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The retrospective study by Maskin12 reported the results of 5 consecutive patients. On average, each patient had 41 probed glands. All except one referred immediate relief and 100% exhibited improvement after 4 weeks. The results of this study are similar to those reported by Maskin and Wladis in patients with blepharitis associated to rosacea.14

In the 6 month follow-up, only 2 treated eyes (12.5% of sample) required retreatment (new probing) due to reactivation of symptoms and recurring glandular occlusion.

It is important to emphasize that only the probing of excluded glands was sufficient to relieve discomfort and enable subjective visual acuity improvement. None of the assessed patients were given additional treatment for blepharitis (i.e., cleansing, antibiotic eyedrops, anti-inflammatory or...
lubricants). None of the treated patients exhibited complications.

This study paves the way for subsequent studies comparing the long-term results between both eyes of a single patient, treating only one. Similarly, the same study could be carried out with a much larger sample in order to expand on the results obtained herein because the only controls were carried out at 6 months. As with any other technique, the authors consider it necessary to carry out studies with longer follow-up times to validate the results and consider the technique safe and efficient for patients.

Regarding this study, it can be concluded that MGP is a promising procedure for blepharitis cases exhibiting resistance to conservative treatment. In the experience of the authors, it was a safe procedure which produced significant improvements in 100% of patients who exhibited improvements after 6 months, with only 2 requiring retreatment.

Conflicts of interest

No conflict of interests has been declared by the authors.

References