DOUBLE INTUBATION TECHNIQUE FOR THE TREATMENT OF EPIPHORA IN COMPLICATED CASES

TÉCNICA DE DOBLE INTUBACIÓN PARA EL TRATAMIENTO DE LA EPÍFORA EN CASOS COMPLICADOS

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ABSTRACT

Purpose: The aim of this study is to present a surgical technique used to treat epiphora secondary to difficult cases of lacrimal pathway obstruction after fractures, previous surgery or anatomic abnormalities.

Methods: From January 2001 to December 2002 we treated 27 patients with complicated lacrimal pathway obstruction secondary to fractures (10 cases), previous nasal surgery (4 cases), failure of a previous ipsilateral dacryocystorhinostomy (DCR; 6 cases), or failure of a previous contralateral DCR (7 cases). A DCR through an external approach was performed by placing a double concentric intubation in the lacrimal sac and nasal fossa, with the additional introduction of an interpositional silicone structure within a third hollow tube anchored to the sac entrance.

Results: The results were evaluated according to the absence of tearing, the emptiness of the lacrimal meniscus, and the permeability of the lacrimal system after forced liquid infusion. Globally, the technique was effective in 85 percent of cases. The results were satisfactory in 90% of cases of posttraumatic epiphora, in 75% of patients with previous surgery, in 83% of patients with previous ipsilateral DCR, and in 71% of patients with failed DCR in the contralateral eye.

RESUMEN

Objetivo: Presentar un sistema para corregir quirúrgicamente la epífora ante obstrucciones del sistema lagrimal que se presentan de difícil resolución por alteraciones en fosa nasal, traumatismos o cirugía previa.

Métodos: Se realizó una dacriocistorrinostomía (DCR) por vía externa, colocando una doble intubación concéntrica a nivel de saco lagrimal y fosa nasal introduciendo un elemento de interposición macizo de silicona en otro cilindro hueco, anclado en la abertura del saco. Se practicó la técnica en 27 casos durante los años 2001 y 2002, en pacientes afectados por traumatismos faciales con fractura ósea que compromete el sistema lagrimal (diez casos), con cirugía nasal previa (cuatro casos), con DCR fallida previa en el mismo lado (seis casos), y con DCR previa fallida en ojo contralateral (siete casos).

Resultados: Son valorados según la ausencia de lagrimeo, el vaciamiento del menisco lagrimal, y la permeabilidad objetivable del sistema lagrimal mediante paso forzado de líquido. Los resultados globales indican una tasa de eficacia de la técnica de un 85%. El análisis por grupos refleja una eficacia del 90% en pacientes con traumatismo facial previo, del 75% en pacientes sometidos a cirugía nasal previa, del 83% en operados de DCR previa.
**Conclusions:** The double intubation technique is a good option in lower lacrimal system obstructions when conventional techniques have a high index of failure (*Arch SocEsp Oftalmol* 2006; 81: 101-106).

**Key words:** Lacrimal pathway, lacrimal pathway surgery, surgical treatment of epiphora, lacrimal system intubation.

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**INTRODUCTION**

On some occasions, obstructions of the lacrimal system have a relatively easy solution by means of dacryocystorhinostomy (DCR), with the utilization of the approach most familiar to the surgeon (1). On other occasions, we may find a post surgical epiphora after unsuccessful repermeation attempts or identify an adjacent pathology compromising the vertical sector of the pathway such as facial traumatism (2), maxillar-facial or ENT surgery, correction of traumatism, tumor exeresys (3), sinus cleaning and the like (4), which may affect the lacrimal-nose pathway due to the primitive pathology or altered after surgery.

In these cases we may find nasal mucose affected by the primary pathology. On other occasions, the deficient quality of the deterioration of the pituitary due to nose diseases may impair muco-mucose surgical unions which should be the basis of a good newly formed pathway for tears to the nasal fossa.

In a number of patients with complex obstructions of the lacrimal pathway, an epithelial approach surgery has been utilized to carry out a DCR in which a hollow silicone cylinder is utilized as an intermediate element, affixing it in a window made in the lacrimal sac, in which a double cylinder is introduced to guide post-operative healing in order to verify whether the results obtained are better than tutored or untutored conventional DCR.

**SUBJECTS, MATERIAL AND METHODS**

A study has been made on the surgery of 27 lacrimal pathways with vertical segment obstruction, the causes of which are summarized in Table 1. Of all patients, six were intervened due to DCR failure on the same side, 7 had been operated for DCR on the other side which also failed, 10 were affected by traumatism involving the vertical portion of the lacrimal system and 4 had suffered an adjacent pathology, of an inflammatory or oncological type with ENT surgery which affected the lacrimal system.

We discarded patients with lacrimal system horizontal portion compromise due to the same procedure which generated the initial obstruction and which were tributaries of other types of surgery. In all cases, dacryocystography was made prior to surgery.

In the selected patients an epithelial approach DCR was carried out, desiccating the ascending branch of the maxillary and carrying out an ovoid osteotomy (10 x 7 mm long axis) facing downwards at about the height of the lower eyelid. Where previous repermeating surgery had been carried out, the osteotomy was enlarged as necessary and the fibrous tissue preventing the lacrimal sac-pituitary connection was cleaned. After analyzing obstructions and locating the walls of the lacrimal sac, a part of the internal wall thereof was resected in a square shape, prolonging the vertical cuts downwards and inwards in order to obtain enough mucous plane to provide an adequate surface for anchoring the designed permeation surface.

Table 1. Surgery tributary pathology and number of cases

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous ipsilateral failed DCR</td>
<td>6</td>
</tr>
<tr>
<td>Previous contralateral failed DCR</td>
<td>7</td>
</tr>
<tr>
<td>Traumatism involving lacrimal system</td>
<td>10</td>
</tr>
<tr>
<td>Previous ENT surgery (nasal, sinus)</td>
<td>4</td>
</tr>
</tbody>
</table>

DCR: dacryocistorrhinostomía.

**Conclusiones:** El método presentado nos parece una buena solución en los casos de obstrucciones bajas del sistema lagrimal de pacientes con patología previa, en los que sospechamos un fracaso al enfrentarnos a la cirugía convencional de repermeabilización.

**Palabras clave:** Vía lagrimal, cirugía de la vía lagrimal, corrección quirúrgica de la epifora, intubación sistema lagrimal.
A square orifice was made in the lacrimal sac, obviously when having enough portion of sac to do it, for example when the problem was caused by ENT nasal surgery or due to finding a failed DCR in the contralateral eye.

When we faced a second DCR in which we no longer have enough sac material, the square opening is reduced to a mucous tunnel or funnel which, in retrograde direction, leads to the common conduit, which is where the solid silicone elements come through. In this case, we joined the (thick) eccentric tube to the widest part (or nasal part) of said «funnel». Obviously, in these cases we cannot desiccate the lacrimal sac, utilizing instead the remaining mucose which may be found.

A hollow 15G synthetic tube (synthetic probe 06004419, IZASA S.A., Barcelona, Spain), in which a dual canaliculus intubation set is subsequently introduced (25 G solid silicone Canaliculus Intubation Set 8590450, Medtronic Solan, Jacksonville, FL, USA). This set was introduced through the proximal orifice with exit through the distal of the hollow tube introduced previously. The proximal orifice of the hollow tube is anchored to the lacrimal sac with double 6-0 silk suture in the anterior and posterior portion of the window made in the lacrimal sac (fig. 1). The distal orifice of the hollow tube is cut at the height of the nasal window and the dual canaliculus silicone tubes are attached to the cheek with tape (fig. 2). The withdrawal of the hollow tube is made two weeks later in the practice, and the withdrawal of the dual canaliculus intubation is made in the practice 3 weeks later. All patients were operated under general anesthesia because in these cases it was not possible to assess the difficulty and/or duration of surgery.

A descriptive longitudinal study of the sample was made, with quantitative variables described in the average, 25% and 75%, and qualitative variables with the distribution of relative frequencies. Subsequently, a bivariant analysis was made to search for the relationship between variables for age, gender and reason for the surgery with the results obtained. We utilized the Chi square test, the Fisher exact test with two leads for qualitative variables and the U Mann-Whitney test for quantitative variables. A statistically significant level of 5% was defined, presenting confidence intervals at 95% in brackets. All analyses were carried out with the SPSS v.8.0 for Windows application (SPSS Inc., Chicago, ILL, USA).

RESULTS

The results were assessed on the absence of tearing, emptying of the lacrimal meniscus (tear retention) and the objective permeability of the lacrimal systems via forced passage of liquid (syringation). The global results indicate an efficiency rate for the technique of 85%. The group assessment shows an efficiency of 90% in patients with previous facial traumatism, 75% in patients who had previous nasal surgery, 83% in patients with previous DCR operations in the same eye and 71% in failed DCR patients in the other eye. In studied patients, 69.2% (49.6-88.9) were men, with an average age of 55.7 years (50.6-60.8). 25% were under 46.7 and a further 25% was over 66. In 34.6% (14.4-54.8) of cases, DCR was justified by the existence of bone fracture, in 26.9% (7.9-45.9) due to previous failed DCR in the contralateral eye, in 23.1% (9-43.6) due to previous failed DCR in the same eye and in 15.4% (4.4-34.9) due to previous nasal surgery.
In what concerns the global results of the technique (considering jointly the absence of tearing, no emptying of the lacrimal meniscus and objective permeability of the lacrimal system), it was effective in 80.8% (60.6-93.4) of cases. In 19.2% of cases (6.6-39.4) there was no emptying of the lacrimal meniscus, while in 15.4% (4.4-34.9) there was persistence of tearing, and in a further 15.4% permeability was not objective. No other types of complications arose. In relation to the influence of the different variables in the results, the data are collected in table II. In said table it can be seen that the patients in whom the technique proved effective have a lower average age that those in whom the technique was not effective, reaching statistical significance in relation to forced permeability. No statistically significant differences were found in the effectiveness of the technique (at the global level or in each component) due to gender or reason for the surgery.

**DISCUSSION**

In general terms, when a patient has epiphora due to obstruction in the lacrimal/nasal pathway, it seems reasonable to think that conventional repermeating surgery may reestablish its continuity because its success rate ranges between 87 and 97% according to different authors (5,6), obtaining an adequate function (7) with improvements in the patient’s quality of life.

When a patient must be treated due to important involvement of the lacrimal/nasal pathway or of another area of the vertical lacrimal pathway, it could be thought that repermeating surgery will be difficult if the cause of the problem lies in traumatisms or in previous surgery (8).

There also are cases of patients in whom repermeating surgery has failed for several reasons, sometimes due to the bad condition of the mucose when joining the flaps. Additional reasons for fail-

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