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Original Article

Management of acquired punctal stenosis with perforated punctal plugs

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Abstract

Purpose: To evaluate the efficiency of perforated punctal plug in acquired punctal stenosis.
Materials and methods: Forty-five eyes of 33 patients who had epiphora due to punctal stenosis were included in this study. After biomicroscopic examination and lacrimal dilatation punctal stenosis was managed with the perforated punctal plugs in all patients. In the following period epiphora, plug tolerance, lacrimal drainage were evaluated and graded. Lacrimal drainage was evaluated with fluorescein dye disappearing test.
Results: The age of the patients ranged between 31 and 80 (mean 55.78 ± 13.11). Preoperatively punctal dilatation and lacrimal system irrigations were performed on all patients. Lacrimal system irrigation was positive in all patients. Perforated punctal plugs were placed in the inferior puncti in all patients. The plugs were explanted 6 months after operation. The follow-up period ranged between 6 and 24 months. Plug tolerance was good in 97.8% of the eyes in the 1st month visit. Epiphora decreased remarkably in 88.9% of the patients 1 month after plug implantation, except one whose plug dropped off spontaneously in 2 weeks. Fluorescein disappearing times were found under 3 min in 97.8% of the eyes after plug explanations.
Conclusion: Punctum stenosis is one of the several disorders that cause lacrimal drainage obstruction. Perforated punctal plugs are found convenient and effective in managing punctal stenosis.

Keywords: Epiphora, Punctal stenosis, Perforated plug

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Introduction

Punctum stenosis is one of the frequent causes of epiphora besides canalicular or nasolacrimal duct obstruction. It can be congenital or acquired. Acquired punctum stenosis may result from inflammatory or infectious eye disease, systemic or topical drug toxicity, lid malposition, different forms of trauma, tumours or ageing changes. Chronic inflammation and subsequent fibrosis appear to be the basic ultrastructural response to various noxious stimuli. Associated canalicular and nasolacrimal sac or duct stenosis or obstruction might be present in some cases.[1–7]

Pure punctum stenosis treatment relies on punctum dilatation, surgical opening or punctum stenting with canalicular tubes or punctum plugs. However canalicular tubing is unnecessary if there is no intracanalicular pathology.[5,6,8–12]

The purpose of this study was to investigate the clinical outcomes and tolerances of polyvinylpyrrolidone (PVP) coated perforated punctum plugs (PPP) in punctum stenosis and agenesis.

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Materials and methods

Forty-five eyes of 33 patients with punctal stenosis who received perforated punctal plug implants were included in the study. The study conforms to the provisions of the Declaration of Helsinki in 1995. Proper informed consent for both the treatment and participation in the study was obtained from the patients.

Patients with lid malposition, canalicular or nasolacrimal sac or duct obstruction, previous eyelid or lacrimal drainage surgery, untreated conjunctivitis or blepharitis were excluded.

Diagnosis was based in order on a history of tearing, biomicroscopic examination, fluorescein dye disappearance test, punctal dilatation and diagnostic canaliculi probing, nasolacrimal duct irrigation, and if passage is patent after irrigation fluorescein dye disappearance test repetition. Epiphora was scored using the combination of Munk score and epiphora score used by Malet et al. (Table 1).[8,12]

In biomicroscopic examination special attention was given to tear meniscus, lid margin, conjunctiva and punctal orifice. Associated conjunctivitis or blepharitis was treated. Punctal orifice was graded based on biomicroscopic examination which was examined before punctal dilatation (Table 2).

After biomicroscopic examination fluorescein dye disappearance test was performed with a drop of 2% fluorescein and assessment after 3 and 5 min of the remaining dye in the tear meniscus. All patients had over 5 min dye disappearance time. Fluorescein dye disappearance test was graded (Table 3).

Punctal dilatation, canaliculi probing and nasolacrimal duct irrigation were performed in the office or operating room under surgical microscope. After instillation of a topical anaesthetic drop (proparacaine hydrochloride ophthalmic solution), a punctal finder was used to open the papilla and pushed forward to dilate the lower punctum. Afterwards a canaliculi probe was introduced. A soft stop that could not be overcome was defined as canalicular obstruction. A soft stop that could be overcome was defined as canalicular membranous stenosis. A hard stop was defined as patent upper canalicular system. Irrigation was performed with a 5 ml syringe filled with serum saline and a 26 gauge lacrimal cannula through the lower punctum and canaliculi. A normal system was defined as free passage of saline into nose or nasopharynx without any reflux through the upper or lower punctum. Patients with any associated canalicular or nasolacrimal duct pathology were not included in the study.

Fluorescein dye disappearance test was repeated after punctum dilatation and found to be under 3 min (grade 1 or 2) in all patients.

After punctum dilatation PVP coated PPP (FCI, S1-3512u) implantation was performed.

Demographic data, laterality, symptoms, findings of biomicroscopic examination and diagnostic probing and irrigation were recorded. Findings of biomicroscopic examination, fluorescein dye disappearance test and plug tolerance were investigated at postoperative 1st day, 1st month, 3rd month, 6th month, 1st year and 2nd year visits (Table 4). Plugs were explanted after 6 months.

Table 1. Score scale of epiphora.

Score	Description	Clinical findings
0	No epiphora	No tearing
1	Mild epiphora	Tearing sometimes in windy days
2	Moderate epiphora	Always tearing, but sometimes need to wipe
3	Permanent epiphora	Always tearing and need to wipe

Table 2. Grading of punctal orifice.

Grade	Clinical findings
0	No punctum(agenesis)
1	Papilla is covered with a membrane(difficult to recognise)
2	Less than normal size but recognisable
3	Normal (easily recognised)

Table 3. Grading of fluorescein dye disappearance test.

Grade	Fluorescein dye disappearance time
1	<3 min
2	3–5 min
3	>5 min

Table 4. Plug tolerance of patients.

Tolerance	Clinical findings
Good	No irritation. No secretion
Mild	Secretion, mild irritation
Poor	Secretion and irritation

Results

The age of the patients ranged between 31 and 80 (mean 55.78 ± 13.11). Twenty-one (63.6%) patients were female and 12 (36.4%) were male. The right lower punctum was involved in 11 (29.8%) patients, the left lower punctum was involved in 8 (27%) patients and bilateral lower puncti were involved in 13 (43.2%) patients. Upper punctum was involved in 5 eyes (11.1%).

In preoperative examination, thirty-five eyes (77.8%) had papilla covered with a membrane (grade 1) (Fig. 1), and 10 (22.2%) eyes had punctum less than normal size (grade 2). All eyes had moderate (grade 2, n:27) or permanent (grade 3, n:18) epiphora. Fluorescein dye disappearance test was over 5 min (grade 3) in all patients. Free passage into the

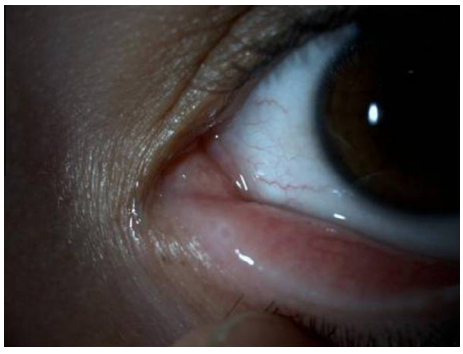

Figure 1. Punctum stenosis grade 1 (punctum covered with a membrane).