

Perforated Punctum Plugs in Treatment of Lacrimal Punctal Stenosis

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SUMMARY

Perforated Punctum Plugs in Treatment of Lacrimal Punctal Stenosis

Purpose: Retrospective evaluation of treatment of epiphora due to punctal stenosis with application of perforated plugs as well as evaluation of complications.

Material and method: There were inserted perforated plugs into inferior lacrimal puncta to twelve patients with epiphora due to proximal stenosis in efferent lacrimal ducts. Their size were predetermined by caliper measuring. Patients were followed for an average of eighteen months, at least one year.

Results: Patients ceased to suffer from epiphora shortly after the application of perforated plugs, the plugs stayed firmly anchored in correct position and didn't cause foreign body sensation. Two patients showed temporary edema surrounding the plug after its insertion and one patient a small corneal erosion with rapid healing. There was no plug loss within one year.

Conclusion: Punctal plug insertion presents a simple, less invasive, effective and safe method to treat epiphora due to punctal stenosis.

Key words: epiphora, lacrimal punctal stenosis, perforated punctum plugs

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INTRODUCTION

Epiphora represents a rare finding in outpatient ophthalmological care, but one which is frequently highly resistant to treatment. It causes the patient unpleasant difficulties, which leads to a significant deterioration in quality of life.

One of the possible causes of epiphora is pathological changes of the lacrimal puncta. These include the following:

1. Malpositioning of the punctum, which is not in contact with the conjunctiva,
2. Disorder of lacrimal pump,
3. Lacrimal punctal stenosis, which may be the result of the following:
 - a) Inflammation (Herpes simplex, Herpes zoster, trachoma, pustulosis),
 - b) Post-injury scarring, lesions, burns, iatrogenic damage following repeated dilatations (5, 9),
 - c) Effect of pharmaceuticals (adrenalin, timolol, pilocarpine, cyclostatics),
 - d) Skin complaints, which frequently lead to simultaneous disorder of the position of the edge of the eyelashes (acne rosacea, psoriasis vulgaris, pemfigoid, Ste-

- vens-Johnson's syndrome),
- e) Cysts of sweat and Moll's glands,
- f) Tumours of the conjunctiva, lacrimal pathways, skin (papilloma, pigmented naevus, malignant melanoma, basocellular and spinocellular carcinoma),
- g) Radiation treatment,
- h) Involution changes which occur especially in menopausal women (5).

Stenoses in the area of the lacrimal puncta and canals are rarer than in the area of the lacrimal sac and tear duct (6).

The basic condition for adjustment of the function of the lacrimal puncta is correct positioning of the eyelashes and lacrimal punctum towards the eye, which sometimes requires a surgical solution (5, 6). The method of treating punctal stenosis is repeated dilatation of the lacrimal puncta (5, 7). A further possibility of treatment is incision of the lacrimal punctum (by which the lacrimal punctum however loses its capillary function) (7). In the English language literature this technique is known as the "one, two or three snip". If a tumour is extirpated from the area of the tear duct, temporary intubation of the tear ducts should be used concurrently (5).

At present it is possible to use silicon perforated punctum plugs in the tre-

atment of lacrimal punctal stenosis. Silicon intubation of the tear ducts was first introduced into practice by Quickert and Dryden in 1969 (3).

MATERIAL AND METHOD

We began using perforated punctum plugs in August 2010. The indication for treatment was epiphora, manifested in an overfilled lacrimal lake and an overflow of tears over the margin of the lower lashes, since treatment by repeated dilatation of the lacrimal puncta did not ensure sufficient and long-term correction of excessive epiphora. A further condition for the application of perforated plugs to the lacrimal puncta was the patency of the tear ducts, which we verified by flushing.

Contraindications were any manifestations of conjunctivitis, blepharitis, impeded stenosis or closure of the distal lacrimal efferent pathways.

Bilateral application of perforated plugs into the lower lacrimal puncta was used to treat twelve patients, of which seven were men and five women. The causes of constriction of the lacrimal puncta in our group of patients in two cases was inflammation following purulent conjunctivitis, in one patient lacrimal punctal stenosis

was the result of Stevens-Johnson's syndrome, in one case following a lesion and in the other seven cases idiopathic, in which five patients started sinusitis in the pre-disorder stage. All patients were affected bilaterally. In our patients we did not record any pathological position of the eyelashes and lacrimal punctum towards the eye, and as a result surgical treatment was not required. Ordinarily it was possible to perform application without local anaesthesia. Only in cases of highly sensitive eyes we used the instillation anaesthetic oxybuprocaine (Benoxi, drops).

We used "tearflow" silicon perforated punctum plugs on all patients. The plugs are made of white silicon of soft consistency. The plugs are of a length of 2 mm. They are supplied in various sizes, with an outer diameter from 0.5 to 1 mm (fig. 1). We determined the appropriate diameter of the plug on the basis of measurement of the diameter of the lacrimal punctum by calliper. We placed the entire plug into the lower lacrimal punctum, with the exception of the low profile of the rim, which remained projecting above the

lacrimal punctum. The sterile plugs were pre-installed on an inserter, the reverse side of which we used as a dilators. We inserted the plugs after slight dilatation of the lower lacrimal punctum (fig. 2, 3 and 4), whilst the patient looked upwards. Immediately after we examined the precise location of the perforated plug on a slit lamp (fig. 5).

The patients were instructed not to touch their eyes and to wipe the area of the internal ocular corner carefully. We performed a check on the first day after the procedure, and then in the first, second and third months, then one year after the application of the plugs and also according to the requirement of the patient. We performed the last check in February 2012.

RESULTS

In accordance with the literary data [2], an alleviation of subjective complaints and also the absence of an overfilled lacrimal lake was attained in all twelve patients immediately after the insertion of the perforated plugs. This favourable effect persisted throu-



Fig. 1

ghout the entire observation period, which was on average eighteen months, and at minimum one year.

The plugs remained firmly anchored in the correct position over the long term and did not cause a feeling of irritation by a foreign body. During the first year there was no loss of the perforated plug in any single case. In two patients there was a unilateral loss of the perforated plug in the interval between the twelfth and the eighteenth month. However, the reason why these patients reported to the facility

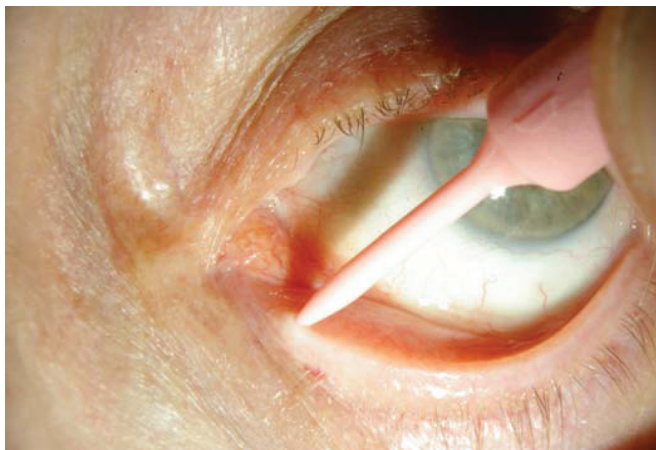


Fig. 2

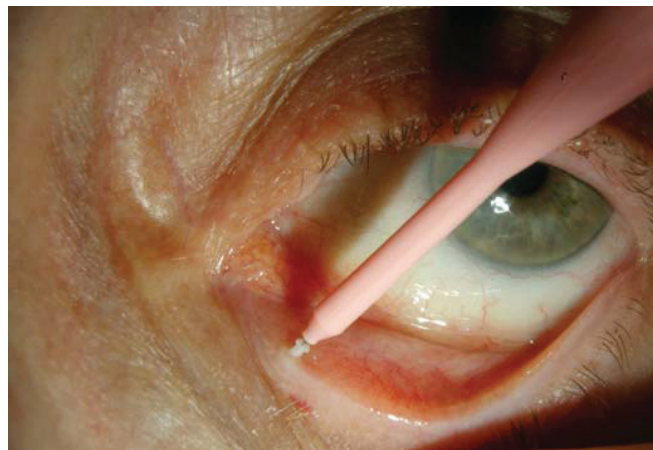


Fig. 3

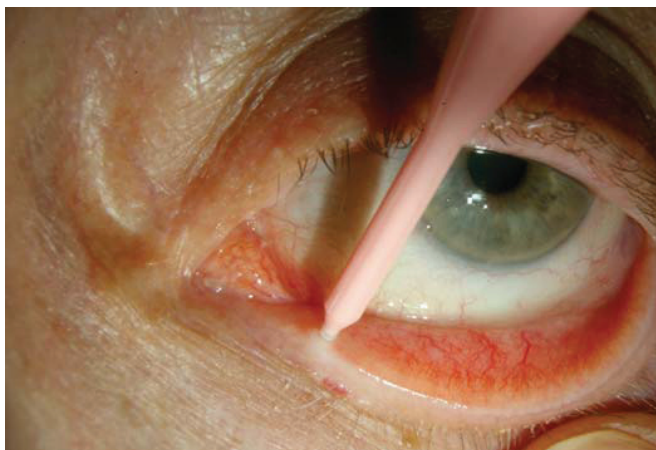


Fig. 4



Fig. 5

was not epiphora. Their lower lacrimal puncta remained loose, dilated, well patent and their condition did not require repeat application of perforated plugs.

A transient edema was found around the plug in another two patients shortly after the application of the plugs, and in one eye there was a small erosion of the cornea with rapid healing. In addition to alleviation the patients also stated a subjective improvement in vision, which however was not the subject of our observation.

DISCUSSION

Patients, as well as ophthalmologists, welcome every innovative and effective treatment of epiphora.

For patients with epiphora resulting from lacrimal punctal stenosis, perforated punctum plugs have become such a possibility, providing permanent patency of constricted lacrimal puncta, ensuring the drainage of tears by a natural method and rectifying ex-

cess epiphora by a simple method.

The application of plugs to lacrimal puncta is rarely linked with complications such as edema and irritation around the lacrimal punctum, erosion of the cornea, extrusion of lacrimal plugs, suppurant inflammation of the lacrimal canaliculus. Another potential complication is pyogenic granuloma around the plug, which is associated with the use of plugs with a wider diameter [4].

According to the literature, loss of plugs occurs most frequently during the course of the first three months after application. Our patients managed to retain the perforated plugs in situ thanks to thorough education. On the basis of the recommendations from the literature we decided in favour of monthly checks, which reminded patients of the necessity to exercise increased caution upon handling the internal ocular corners [1]. If loss occurred after a period of more than one year, the lacrimal puncta remained dilated, patent and without the

need for re-application.

We consider careful selection of patients on the basis of correct determination of the locality of the stenosis, use of optimal size of plugs and observation of the patients, mainly in the first three months, to be essential in order to prevent loss of the plugs and ensure success of the treatment [8].

Perforated punctum plugs provide an effective method of treatment of lacrimal punctal stenosis mainly in the field, in which each surgical procedure deepens scarring. The main advantage is securing patency of the lacrimal puncta without bleeding.

CONCLUSION

Treatment of lacrimal punctal stenosis using the application of perforated punctum plugs is an effective, simple, safe and reversible method, which is suitable in particular for busy people who can then avoid frequent visits to an outpatient ophthalmologist for repeated dilatation of lacrimal puncta.

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