

A New Punctal Occlusion System as the Conventional Treatment for Recalcitrant Dry Eye: a Case Report

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Abstract

Purpose: To report the usefulness of parasol punctal occluder system in a patient with recalcitrant-chronic dry eye patient.

Methods: Case report.

Results: The author reported a case of 61 years old woman with recalcitrant-chronic dry eye and improved with parasol

punctal occluder punctal occlude (Odyssey Medical). Punctal plugs improve symptoms and signs of dryness: redness, photophobia, discomfort, increase in tear break-up time, improvement in Schirmer I test scores (without anesthesia) and decrease corneal staining.

Conclusions: Punctal occlusion remains an important and effective therapy for patients with ocular surface disease.

Key words: Punctal occluder, Dry eye

A 61 years old Thai woman with well-controlled hypertension who has been suffering from chronic dry eye symptoms: redness, photophobia, ocular discomfort. Previous history of her ocular surgery was bilateral blepharoplasty to correct dermato-chalasis and bilateral conjunctival excision for conjunctivo-chalasis correction 2 years ago. She had cataract surgery with intra-ocular lens implantations done for 5 years ago.

She had previously experienced of many medical eye lubricants such as non preservative artificial tear eye drop up to every 2 hours, lubricating eye gel at least 2 times daily, 0.05% cyclosporine emulsion, and add topical steroid in active dry eye conditions, but she still had been suffering from ocular surface disturbance. Her ocular surface and tear film examinations was show in Table 1.

An author advised patient to insert with Xsorb plug; a temporary punctal plug (synthetic absorbable copolymer of glycolic acid and trimethylene carbonate plugs) in her both lower puncta and follow up till to completely absorb after 2-3 weeks. Owing to ocular symptoms improvement, she preferred to take long term punctal occluder.

The author advised her to insert semi-permanent parasol punctal occluder (Odyssey Medical) (Figure 1, 2) which soft,

silicone plugs for three years.²⁻³ Follow up at 3 months, the parasol punctal occluder was still retained (Figure 3, 4). Her ocular surface and tear film examinations improvement was shown in Table 2 and decreased of symptoms and signs of dryness: redness, photophobia, discomfort, and increased in tear break-up time (Figure 5) and improvement in Schirmer I test scores (without anesthesia) (Figure 6) and decreased corneal staining (Figure 7).

Table 1 Ocular surface examinations before Parasol Punctal occluder insertion.

	Right eye	Left eye
BCVA	20/40-2	20/50-2
IOP (mmHg)	15	14
Tear Break Up time (sec)	3	3
*Fluorescein staining¹	3+	3+
0 1 2 3		
Schirmer I Test (mm)	5	4

* Corneal Fluorescein staining¹ was evaluated by slit lamp using a yellow filter and cobalt blue illumination: the staining was graded as: 0 = none; 1 = mild; 2 = moderate; and 3 = severe.

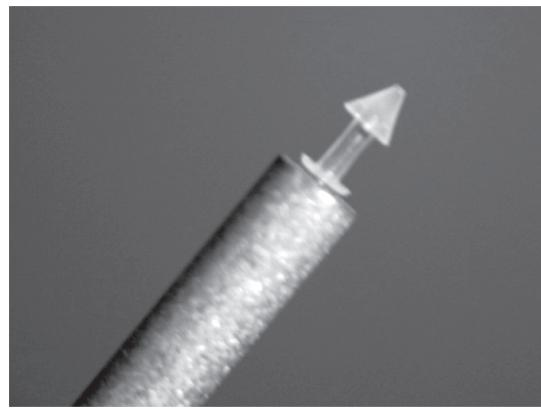


Figure 1 Parasol punctal plug on the insertion tip.

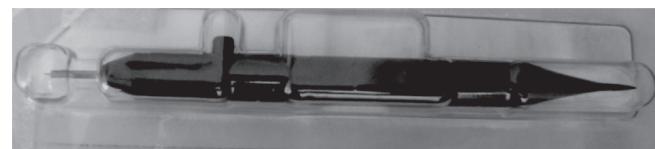


Figure 2 Insertion instrument, dilator on one end and insertion tip on the other end.

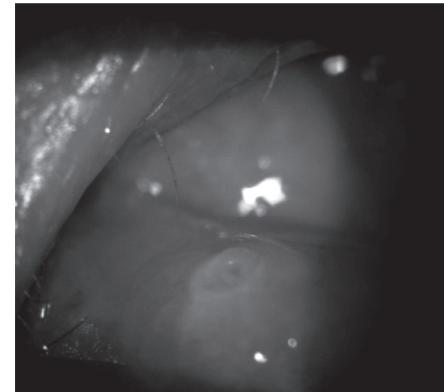
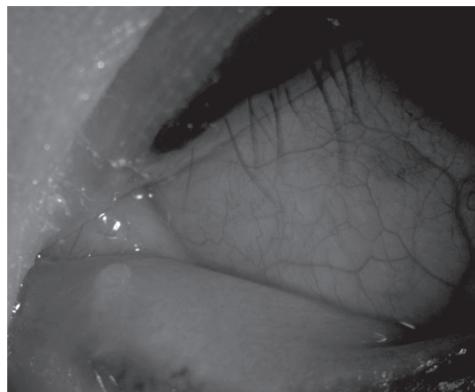


Figure 3-4 Parasol punctal plugs in lower punctum follow up at 1-month and 3-months.

Table 2 Ocular surface examinations 3-months after Parasol Punctal occluder insertion.

	Right eye	Left eye
BCVA	20/30+2	20/30
IOP (mmHg)	15	15
Tear Break Up time (sec)	8	6
* Fluorescein staining¹	1+	1+
0 1 2 3		
Schirmer I Test (mm)	10	9

* Corneal Fluorescein staining¹ was evaluated by slit lamp using a yellow filter and cobalt blue illumination: the staining was graded as: 0 = none; 1 = mild; 2 = moderate; and 3 = severe.

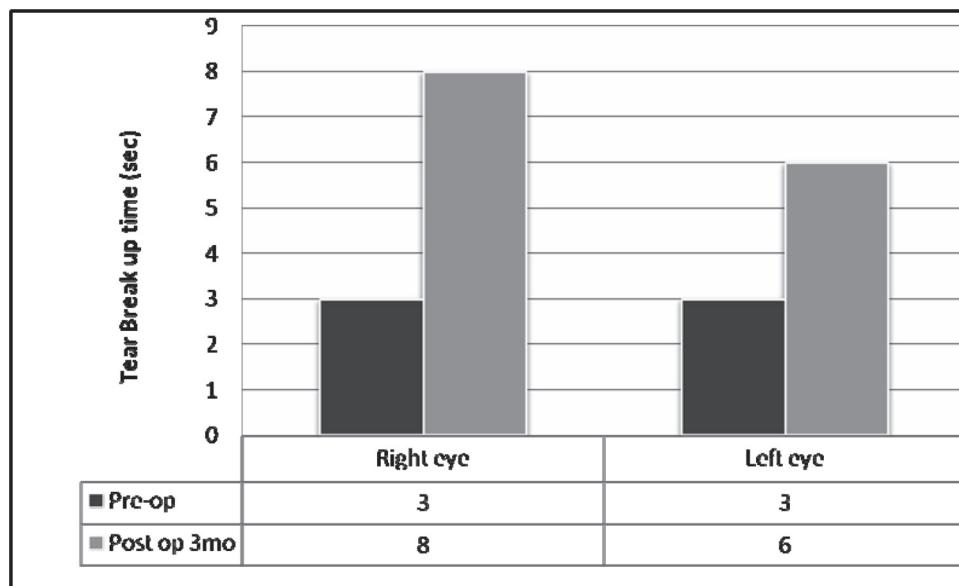


Figure 5 Tear Break up time measurement (Pre-op and 3-months after Parasol Punctal occluder insertion).

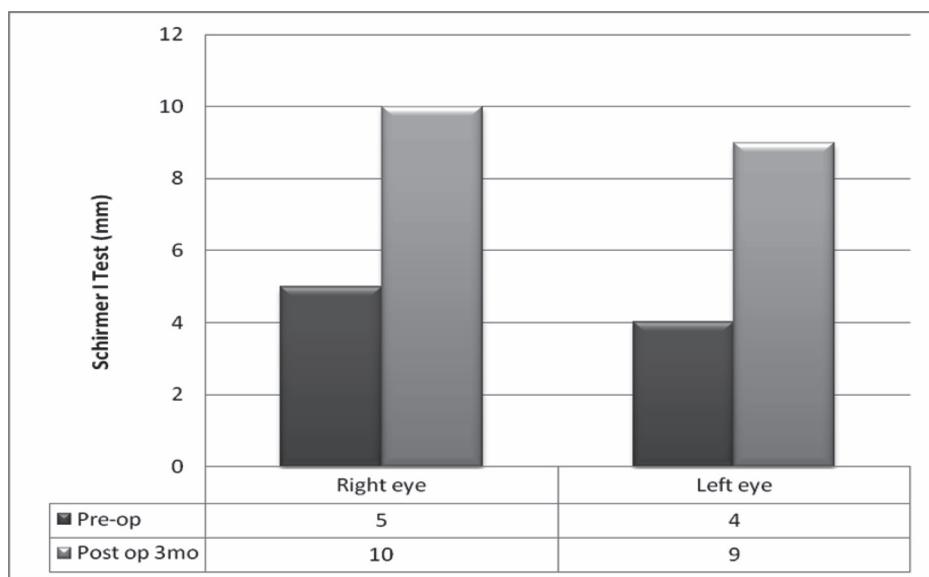


Figure 6 Schirmer I Test (mm) (Pre-op and 3-months after Parasol Punctal occluder insertion).

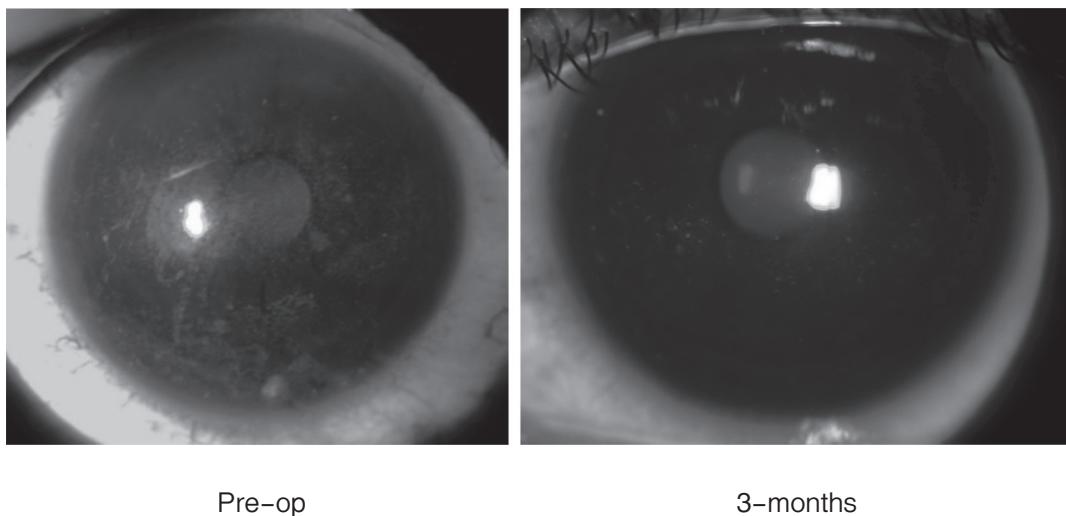


Figure 7 Corneal Fluorescein staining of her left eye (Pre-op and 3-months after Parasol Punctal occluder insertion).

Discussions and Conclusion

Multifactorial etiologies of dry eye syndrome or ocular surface disease result in symptoms of visual disturbance, discomfort and tear films instability. Most dry-eye patients may simply have age-related cicatricial changes to the lacrimal glands.

The most popular treatment for dry eye syndrome in general practice is lubricant supplement especially artificial tear eye drop. The conventional treatment in recalcitrant severe dry eye symptom, the author use punctal plug to block the lacrimal drainage system and enhance the contact time between the tears and ocular surface.

At present, punctal occlusion is one of the most popular minor procedures to treat moderate to severe dry eye in ophthalmology practice. These include the insertion of temporary collagen plugs⁴ which dissolve over several days to a week, semi-permanent extended-duration polymers such as silicone or thermal labile acrylic polymers which dissolve over several months or years and permanent punctal occlusion with thermal or laser cautery.⁵ Temporary collagen plugs are often used as a trial to determine whether more semi-permanent or permanent punctal occlusion are effective.

Parasol Punctal Occluder (Odyssey Medical) is a pair of soft, silicone semi-permanent plugs that can retain for three years. In this report, the author used a medium-sized (0.60 to 0.85 mm) punctal occluder. The Parasol automatically collapses like an umbrella (Figure 1), reduces its

size and expands to fit the canaliculus. With its sharper tip and push-button inserters make Parasol occluder the easiest plug to use (Figure 2).

The insertion of punctal plugs is an impressive curative therapy that can dramatically improve the ocular surface symptoms, the corneal and conjunctival epithelial disorders and the amount of lacrimal fluid accumulated in the conjunctival sac.

The author still has to follow on the patient and be vigilant for punctal plug complications⁶; particularly the irritation, infection, and chronic inflammation such as canaliculitis or granuloma formation.

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References

1. Wimolwan Tangpagasit, Kosol Kumpituk. Efficacy of Cyclosporine A 0.05% Emulsion for the Treatment of Dysfunctional Tear Syndrome. *Asian J Ophthalmol.* 2008;10:377-82.
2. Michael Birne. New Options in Punctal Occlusion. *Review of Ophthalmology:* August 2001:1-6. Available at: <http://www.revophth.com/2001/September/feature3.htm>.
3. Craig McCabe, MD, PhD, FACS, Murfreesboro, Tenn. Plugs Reduce Dry-Eye Symptoms, Improve Vision. *Review of Ophthalmology:* 2009; 16:11 (Issue: 11/1/2009) Available at: <http://>

/www.revophth.com/index.asp?page=1_14537.htm

4. Manchima Makornwattana. Efficacy and Safety of Silicone Punctal Plug Treatment in Moderate to Severe Dry Eye at Thammasat University. *TTJO* 2007;2:1:14–21.
5. Centers for Medicare and Medicaid Services. Part B Extract Summary System (BESS) Data File. CD-ROM. Available at: www.cms.hhs.gov/NonIdentifiableDataFiles/03_PartBExtractSummarySystem.asp#TopOfPage. (Accessed 2006).
6. Horwath-Winter J, Thaci A, Gruber A, Boldin I. Long-term retention rates and complications of silicone punctal plugs in dry eye. *Am J Ophthalmol* 2007;144:441–4.
7. วิมลวรรณ ตั้งปภาติ. ผลการประเมินความรุนแรงของโรคตาแห้งหลังทำการรักษาด้วยน้ำตาเทียมชนิดไม่มีสารกันเสียกับยาหยดไซโคลสปอร์ินทร์. วารสารจักษุธรรมศาสตร์ ปีที่ 3 ฉบับที่ 2 กรกฎาคม–ธันวาคม 2551:25–33.
8. Takashi Hamano. Lacrimal Duct Occlusion for the Treatment of Dry Eye. *Seminars in Ophthalmology* 2005;20:2:71–4.
9. Obata H, Yamamoto S, Horiuchi H, Machinami R. Histopathologic study of human lacrimal gland. Statistical analysis with special reference to aging. *Ophthalmology* 1995;102:678–86.
10. Broadway DC, Grierson I, O'Brien C, Hitchings RA. Adverse effects of topical antiglaucoma medication: 1. The conjunctival cell profile. *Arch Ophthalmol* 1994;112:1437–45.
11. Tai MC, Cosar CB, Cohen EJ, et al. The clinical efficacy of silicone punctal plug therapy. *Cornea* 2002;21:135–9.
12. Balaram M, Schaumberg DA, Dana MR. Efficacy and tolerability outcomes after punctal occlusion with silicone plugs in dry eye syndrome. *Am J Ophthalmol* 2001;131:30–6.
13. Burgess PI, Koay P, Clark P. SmartPlug versus silicone punctal plug therapy for dry eye: A prospective randomized trial. *Cornea* 2008;27(4):391–4.
14. Levinson BA, Rapuano CJ, Cohen EJ, et al. Referrals to the Wills Eye Institute Cornea Service after laser in situ keratomileusis: Reasons for patient satisfaction. *J Cataract Refract Surg* 2008;34:32–9.
15. Khalil MB, Latkany RA, Speaker MG, Yu G. Effect of punctal plugs in patients with low refractive errors considering refractive surgery. *J Refract Surg* 2007;23(5):467–71.

รายงานผู้ป่วย: การรักษาผู้ป่วยภาวะโรคตาแห้งเรื้อรังโดยใส่สัดสูดท่อน้ำตา

ผู้ช่วยศาสตราจารย์แพทย์หญิงวิมลวรรณ ตั้งปภาติ
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บทคัดย่อ

วัตถุประสงค์: เพื่อนำเสนอผู้ป่วยภาวะโรคตาแห้งเรื้อรังโดยใส่สัดสูดท่อน้ำตา

วิธีการศึกษา: รายงานผู้ป่วย

ผลการศึกษา

ผู้ป่วยหญิง อายุ 61 ปี มีภาวะโรคตาแห้งเรื้อรัง ได้รับการรักษามาด้วยกลุ่มยาหยดตาและยาป้ายรักษาโรคตาแห้งมาหลายชนิดมานาน แต่ยังคงมีอาการของกลุ่มภาวะอาการตาแห้ง อาทิ เช่น ตาแดง, แสบตา, ระคายเคือง หลังได้รับการรักษาโดยใส่สัดสูดท่อน้ำตา (Parasol Punctal Occluder; Odyssey Medical) ผู้ป่วยมีอาการสบายนตา ตาแดง และแสบตาบ่อยๆ นอกจากนี้ อาการแสดงของโรคตาแห้ง ระดับค่าน้ำตา (tear break-up time และ Schirmer I test) และผิวกระจากตาดีขึ้น (cornea staining)

สรุป: การรักษาโดยใส่สัดสูดท่อน้ำตา (punctal occluder) เป็นอีกทางเลือกที่ให้การรักษาโรคตาแห้งเรื้อรังร่วมกับยาหยดตาและได้ผลเป็นที่น่าพอใจ

คำสำคัญ: Punctal occluder, Dry eye