CASE REPORT

Long-term efficacy of deep sclerectomy in Posner-Schlossman syndrome

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SUMMARY

The Posner-Schlossman syndrome (PSS) is an elusive disease that can lead to serious consequences such as glaucomatous damage. Deep sclerectomy has been proven thus far to be the most effective surgical intervention to keep intraocular pressure (IOP) elevation under control compared with other surgical techniques, because it presents the least amount of postoperative complications. The aim of this case report is to demonstrate the efficacy of deep sclerectomy with T-Flux and the long-lasting effects that persist after 7 years in an eye affected by PSS. This case report demonstrates that an intervention of deep sclerectomy can lead to excellent results in terms of visual acuity as well as IOP lowering early in the history of the patient affected by PSS so that it can preclude establishment of glaucomatous damage.

BACKGROUND

The Posner-Schlossman syndrome (PSS) is an acute, intermittent, recurrent glaucomatocyclitis characterised by anterior uveitis with markedly elevated intraocular pressure (IOP).^{1 2}

PSS is a challenging diagnosis, especially at its first presentation, as it may mimic other ocular disorders, especially Fuchs' heterochromic iridocyclitis (FHI).^{3 4} FHI and PSS have some aspects in common and they are frequently confused. The differential diagnosis was based on the characteristics of keratic precipitates: the precipitates were limited to the central and inferior cornea, while in FHI they occurred over the entire surface.⁵ Furthermore, in the FHI syndrome, cataract is frequent and the inflammation has a chronic course.^{6 7}

In addition, IOP may not be controlled in a significant proportion of patients with PSS despite maximal topical medications, and surgery may be indicated as the IOP may be dangerously high.⁸ Non-penetrating glaucoma procedures, such as deep sclerectomy (DS), seem to be indicated in eyes with intraocular inflammation because of less post-surgical inflammation.⁹

This case report is significant to underline the efficacy of DS in controlling IOP in PSS with good visual function outcome.

CASE PRESENTATION

A 41-year-old Caucasian woman presented for the first time in 2006. She was in good health, her medical and ocular family history was negative for pathologies, but she had been diagnosed with FHI. Her visual acuity was 20/20 in both the eyes. The

right eye was normal. The cornea of the left eye showed a few keratic precipitates; there were no cells in the anterior chamber at the slit-lamp examination and gonioscopy showed an open angle. IOPs were 12 mm Hg in the right eye and 10 mm Hg in the left eye by Goldmann tonometry with the fixed combination of timolol 0.5% and dorzolamide 2% twice daily plus latanoprost 0.005% once daily in both eyes. The visual field (figure 1A) and the optic nerve head observed by indirect biomicroscopy of both the eyes were found to be normal. At this first visit in our clinic we prescribed topical pranoprofen 0.1% twice daily for 1 month for the left eye.

Later, the patient experienced three episodes of acute elevation of IOP together with anterior uveitis in her left eye over the course of a year. The first crisis was characterised in the left eye by a diffusely hazy cornea with multiple small keratic precipitates on the inferior third of the corneal endothelium. The anterior chamber was clear except for very rare cells. The pupil was intact and the lens was clear. The IOP was 26 mm Hg. The second episode was similar to the first. The first two episodes were controlled with antiglaucoma and anti-inflammatory medications (fixed combination of timolol 0.5% and dorzolamide 2% twice daily, latanoprost 0.005% once daily, topical pranoprofen 0.1% thrice daily and acetazolamide 125 mg orally twice daily).

The third episode was more severe with 42 mm Hg IOP in the left eye, despite maximal topical therapy (fixed combination of timolol 0.5% and dorzolamide 2% twice daily, latanoprost 0.005% once daily and brimonidine twice daily) and acetazolamide 250 mg orally twice a day. The slit-lamp examination revealed diffuse white precipitates limited to the inferior sectors and haziness of the left cornea.

The patient's diagnosis was then replaced with one of PSS, given the acute intermittent glaucomatocyclitic crises with a few fine keratic precipitates only in the central and inferior cornea together with markedly elevated IOP.

TREATMENT

The last episode of medically uncontrolled glaucomatocyclitic crisis required a surgical intervention. A DS with implant of a non-absorbable drain (T-Flux) was undertaken. Mitomycin C was applied intraoperatively under the Tenon capsule, as it has been proven to improve the IOP outcomes of DS.¹⁰

DS is a non-penetrating filtering procedure used for the surgical treatment of glaucoma.¹¹ It consists

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Figure 1 Standard automated perimetry of the left eye of the patient with Posner-Schlossman syndrome before the glaucomatocyclitic crises (A) and after 7 years from the deep sclerectomy with T-Flux (B). Her left visual field is still normal without any glaucomatous defects.

of removing the resisting element to aqueous outflow as well as the inner wall of Schlemm's canal and juxta-canalicular trabecular meshwork.¹² The surgery induces selective filtration of aqueous humour from the anterior chamber through the trabeculodescemet membrane.¹³ Some studies showed that the use of implants in DS maintains the space created by the removal of the deep sclerocorneal flap, providing better long-term IOP control.^{14 15} In this case, we implanted a non-absorbable drain made of highly hydrophilic acrylic (T-Flux, Ioltech, La Rochelle, France). The T-Flux implant is made of Poly-Megma, a biocompatible material that is not colonised by cells. It has a T-shape where the length of the arms is 4 mm, the body height is 3.40 mm and thickness ranges from 0.15 to 0.35 mm. Each arm of the T-Flux was inserted into one of the surgically created openings of Schlemm's canal and the foot of the implant was introduced through the space between the sclera and the choroid. The implant was left without sutures in order to speed and simplify the surgical procedure (figure 2).^{16 17}

Figure 2 The hydrophilic acrylic implant T-Flux (Ioltech, La Rochelle, France) and a schematic image of its dimensions in mm.

Postoperatively, the patient was treated with dexamethasone 0.1%/netilmicin 0.3% four times a day for 4 weeks and oral prednisone 12.5 mg die for 2 weeks.

OUTCOME AND FOLLOW-UP

The patient was subject to a complete ophthalmic examination once a week in the first month postoperatively and then every 3 months. Visual field was tested once per year.

During the first 9 months, the intrascleral bleb was filtering and IOP ranged from 9 to 12 mm Hg without the use of IOP-lowering agents. On the third and sixth month visit the patient had a few keratic precipitates, limited to the central and inferior cornea, but without any cells in the anterior chamber.

Nine months after surgery, IOP rose to 23 mm Hg (G). An Nd:YAG laser goniopuncture was performed to increase the outflow of aqueous humour through the trabeculo-Descemet membrane.¹⁸ After this procedure the patient was controlled once a week in the first month and then every 3 months for the first year, which later turned into every 6 months. IOP remained 15–16 mm Hg (G) without any topical treatment and no other episode of ocular inflammation occurred to date, 6 years after Nd:YAG laser goniopuncture (figure 3A, B). Actual visual acuity, 7 years after the DS, is 20/20 in both eyes and the visual fields are normal (figure 1B), as are the patient's optic nerve morphology and nerve fibre layer thickness, evaluated with Fourier Domain Optical Coherence Tomography (figure 4).

DISCUSSION

Despite lack of definite guidelines to manage PSS, DS has been proven so far to be the most effective method to keep elevated IOP due to complex syndrome under control compared with other surgical techniques, because it presents the least amount of postoperative complications.^{8 9} The aim of this case report is to demonstrate the efficacy of DS with T-Flux and the long-lasting effects that persist after 7 years in an eye affected by PSS.

Figure 3 Postsurgical images of the left eye from a frontal view (A) and of intrascleral filtering bleb with T-Flux implant in superior area (B) 6 years after deep sclerectomy with T-Flux.

While DS seems to be the best method, any surgical intervention is significant in case of PSS because there have been studies proving the seriousness of PSS consequences. Jap *et al*¹⁹ concluded that PSS is not as benign as previously thought, as one-fourth of PSS affected eyes without primary open-angle glaucoma developed glaucomatous damage.

Trabeculectomy (filtering surgery) has been proven to be less safe than DS. The latter is more suitable for patients with ocular inflammation as a non-penetrating surgical operation designed to minimise the incidence of complications and seems to be the best choice for most patients with uveitic glaucoma.^{20–24}

Figure 4 The retinal nerve fibre thickness of the left eye evaluated with the Fourier Domain Optical Coherence Tomography (Heidelberg Spectralis) after 6 and 7 years from the deep sclerectomy with T-Flux. Only the temporal–superior thickness is classified as borderline compared with the normative database, all the other sectors are normal.

A study published by Dupas *et al*²⁵ in 2010 compared the results of DS and trabeculectomy in the management of uveitic glaucoma and proved DS to induce less inflammation.

When uveitic glaucoma is present, DS is indicated also according to the review conducted by Mendrinos *et al*.²⁶ This indication is supported by the result of other studies, which report a controlled IOP after non-penetrating surgery in 87.5–90% of eyes with uveitic glaucoma resistant to medical treatment.^{27–28}

DS has improved over the years with the use of implants, augmentation with antiproliferatives and use of laser goniopuncture.^{10–11–13–18–22}

All of these improvements contribute to the efficacy of the surgery in their own different ways. Goniopuncture is performed in the trabeculodescemet membrane. It converts DS in a penetrating procedure, and further lowers IOP.¹⁸ Ambresin *et al*²⁹ observed that 45% of eyes after DS in non-uveitic glaucoma underwent goniopuncture, and a similar percentage of goniopuncture (51%) was performed after surgery by Khairy *et al*.³⁰

The use of an implant during the procedure further lowers IOP by enhancing the intrascleral lake drainage between the external flap and the trabecular meshwork.¹⁵ There are actually several commercially available implants such as T-Flux.^{13–16–17} Some studies evidenced a higher IOP decrease when an implant is used.^{14–31}

In conclusion, infrequent complications and fewer incidence of postoperative intraocular inflammation make DS a correct and safe procedure in the management of PSS. This procedure may fail to control long-term IOP, but this drawback can be overcome with close follow-up.

It is true that DS is a more recent technique than trabeculectomy. In addition, further studies focusing on the long-term results of DS in patients with PSS are needed in order to draw general conclusions on the efficacy and correct timing of intervention in this rare and complex disease.

Our case report has demonstrated that DS can lead to excellent results in terms of visual acuity as well as IOP when performed early in the history of a patient affected by PSS, thus precluding glaucomatous damage.

Learning points

- Posner-Schlossman syndrome (PSS) is an elusive and hard to diagnose disease.
- It is important to differentiate PSS from Fuchs' heterochromic iridocyclitis.
- In the case of PSS with uncontrolled intraocular pressure with maximum medical therapy, considering deep sclerectomy may prevent optic nerve damage and visual field loss.
- Deep sclerectomy does not prevent recurrences, thus the patient should be followed up.

Contributors All authors (FC, GC, LD and TR) made substantial contributions to the conception of the work, and the acquisition and analysis of data. TR and LD drafted the manuscript and FC and GC revised the manuscript for important intellectual content and they all approved the final version. In regard to the clinical contribution, GC and FC conducted the surgical intervention of deep sclerectomy while TR and LD managed the preintervention and postintervention visits.

Competing interests None.

Patient consent Obtained.

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