6.4. Deep sclerectomy with uveoscleral implant (Esnoper-Clip®)

Esclerectomía profunda con implante uveoescleral (Esnoper-Clip®)

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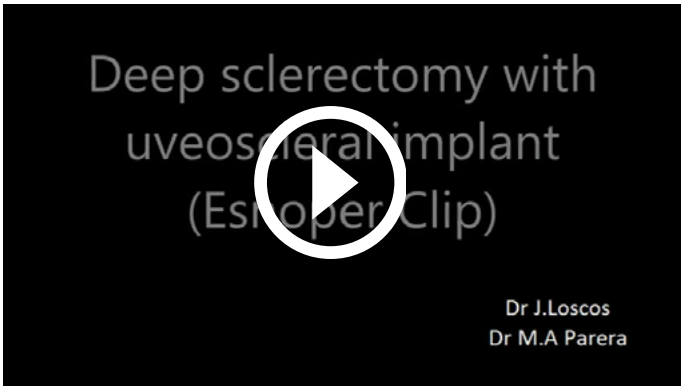
Introduction

Deep sclerectomy with supraciliary implant is a safe and effective technique for the management of OAG with different types of implants[1-3] but the main problem with these implants is that they not specifically designed for supraciliary implantation, so their effectiveness can be limited in time. With supraciliary implantation the intrascleral lake can lose height or even collapse over time and probably lose efficacy, because intrascleral bleb height plays an important role in lowering intraocular pressure (IOP)[3-5]. On the other hand, intrascleral implants do not facilitate uveoscleral outflow as well as supraciliary implants.

Trying to overcome these limitations we developed at the Glaucoma Unit of the Hospital Universitari Germans Trias i Pujol, Barcelona (Universitat Autònoma of Barcelona, Spain) an uveoscleral HEMA (2-hydroxyethyl methacrylate) implant[4], Esnoper-clip® (AJL Ophthalmics, Álava, Spain). It is a non-reabsorvable foldable HEMA implant with two feet designed to maintain supraciliary and intrascleral spaces. The uveoscleral implant allows us to achieve higher intrascleral blebs than intrascleral implants does (Figure 1).

Surgical technique (Video 1)

An intracorneal traction nylon suture (4/0- 5/0 nylon) is passed through the superior cornea and a fornix based conjunctival flap is dissected, followed by cauterization of bleeding vessels. Afterwards a dissection of a superficial scleral flap (5 x 5 mm) of 1/3 of the scleral depth is done extending 2 mm into clear cornea. A sponge soaked in mitomycin-C (MMC) lies between the scleral flap and the remaining sclera as well as over the flap, and left there for 2 minutes and then irrigated thoroughly with a balanced salt solution. Subsequently, a deeper 4 x 4 mm scleral flap is dissected and removed, and Schlemm's canal is deroofted with the capsulorhexis forceps. The uveoscleral implant has two plates; one is placed in a full-thickness suprachoroidal bag 2 mm behind the scleral spur. After folding the implant the other foot is placed into the intrascleral lake.



Video 1. Deep sclerectomy wih uveoscleral implant (Esnoper Clip).

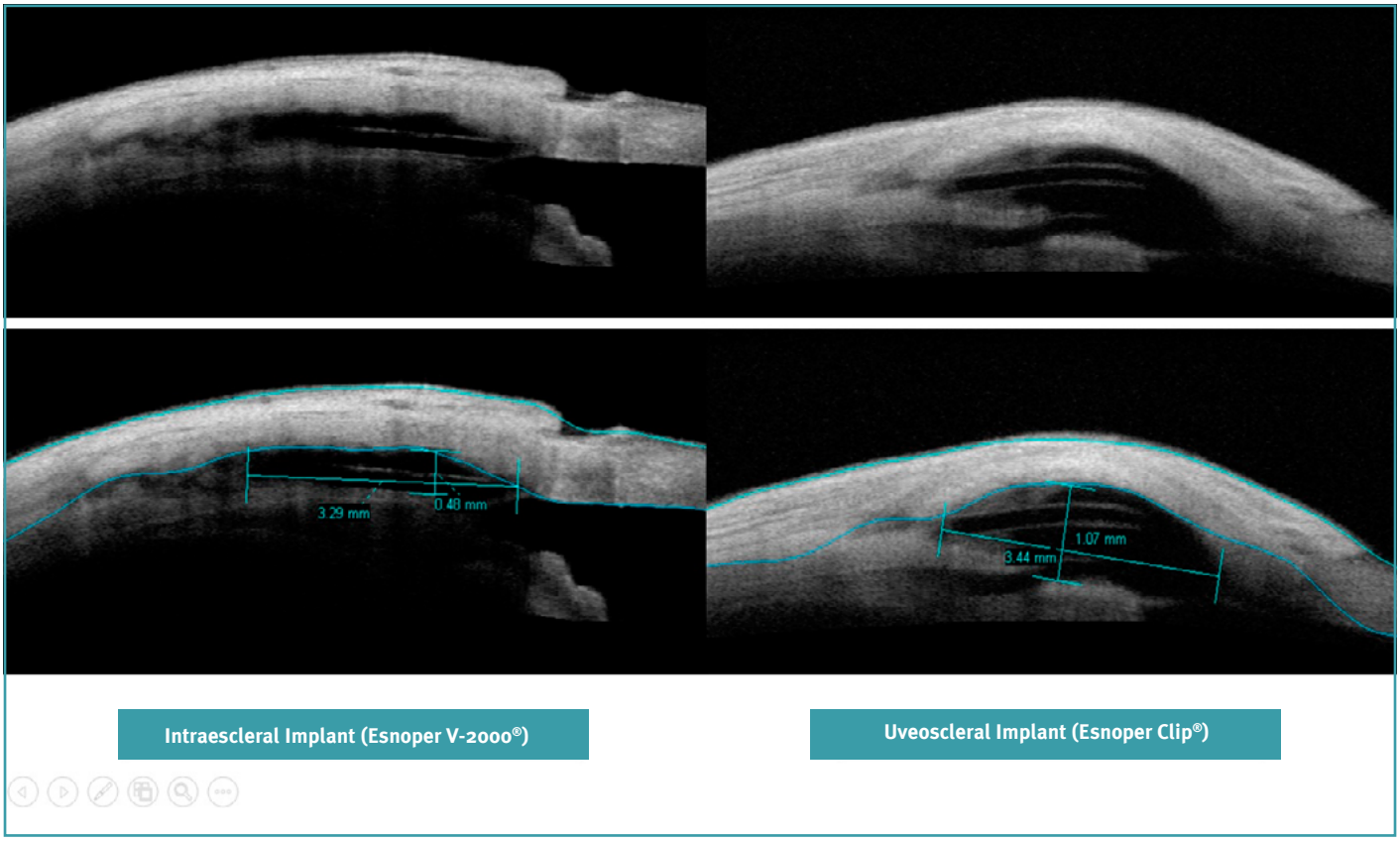


Figure 1. Anterior segment optical coherence tomography (AS-OCT) with and without measures using intrascleral implant (Esnoper® V-2000) and uveoscleral implant (Esnoper-clip®) in the same patient.

It can be fixed without suturing because it has two lateral notches that do not allow anterior displacement. The superficial scleral flap is then repositioned into place without suture or with a loose one. The conjunctiva is closed with a nylon 10/0.

Results

With a minimum follow up of one year we have operated with the uveoscleral implant (Esnoper-clip®), 27 eyes of 26 patients suffering from open angle glaucoma (OAG) (Table 1). A significant decrease in intraocular pressure was observed after surgery, changing from a preoperative mean of 26.2 ± 5.2 mmHg to a postoperative mean of 15.1 ± 4.7 mmHg at 12 months and 16.7 ± 5.5 at 24 months. There was also a significant reduction in the number of glaucoma drugs needed, varying from 2.5 per patient to 0.2 and 0.4 one and two years after surgery respectively. The main postoperative complications were a positive Seidel test result at 24 hours in 2 eyes (7.4%), hyphema in 2 eyes (7.4%). All these complications were resolved successfully. The need for additional MMC injections was recorded in 6 eyes (22.2%), twice in two of them. Seventeen eyes (62.9%) underwent postsurgical Nd:YAG laser goniopuncture (Nd:YAG GP).

	Preoperatory	24 hours (N=27)	12 months (N=27)	24 months (N=20)
IOP (numer ± SD)	26.2 ± 5.2	7.7 ± 7.8	15.1 ± 4.7	16.3 ± 7
No of drugs (number ± SD)	2.5 ± 0.84	0 ± 0	0.2 ± 0.7	0.4 ± 0.7

SD: standard deviation.

Table 1. Intraocular pressure (IOP) evolution and number of medications.

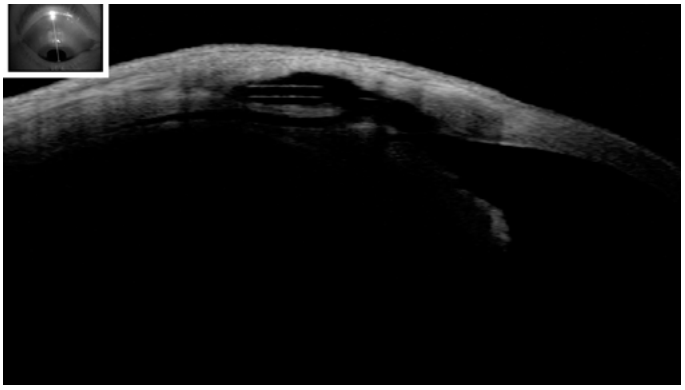


Figure 2. Vertical scan of anterior segment optical coherence tomography (AS-OCT). The intrascleral lake and supraciliar space after the implantation with transcleral outflow can be observed.

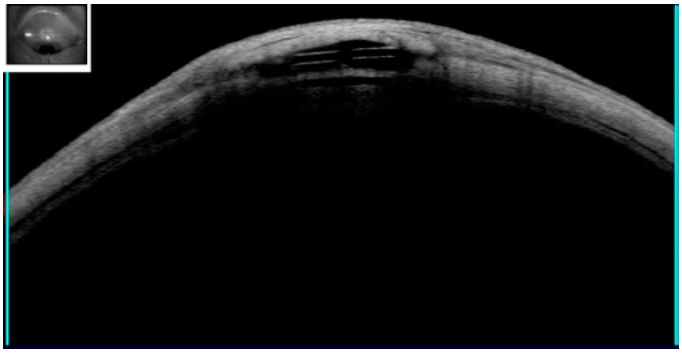


Figure 3. Horizontal scan of anterior segment optical coherence tomography (AS-OCT): the intrascleral lake and supraciliar space after the implantation with transcleral outflow can be observed.

Conclusions

Reports of supraciliary implantation are few and most of them with intrasclerals implants. Muñoz[1] and Loscos *et al.*[2] have reported isolated deep sclerectomy and Bonilla *et al.*[3] described phaco-deep sclerectomy resulting in IOP reductions from 26.4 ± 6.9 to 14 ± 3.3 mmHg, 24.6 ± 6.33 mmHg to 16.5 ± 4.4 mmHg and 23 ± 5 mmHg to 18 ± 3 mmHg, respectively, after one year. Using intrasclerals implants there is only one serie[2] that reports two years follow up results changing from preoperative IOP to 16.1 ± 3.4 mmHg. In isolated deep sclerectomy series, the number of medications were reduced from 2.8 to 0.3, 2.71 to 0.22 at 12 months and to 0.4 at 24 months and in phaco-deep sclerectomy from 2.5 to 0.7. All the series reported a similar incidence of complications to that associated with intrascleral implantations. The only series publish with uveoscleral implant[4] IOP decreased from 26.6 to 15.3 mmHg and the number of drugs reduced from 2.5 to 0.26 at 12 months. The incidence of complications was similar to that associated with intrascleral or supraciliary implantation described by other authors.

The importance and significance of the intrascleral and supraciliary spaces is a controversial issue, but currently it is widely accepted that both are good prognostic factors, but not the ones. This controversy may be due to discrepancies in findings using anterior segment optical coherence tomography (AS-OCT)[5-7] or ultrasound biomicroscopy (UBM)[8-14]. UBM measurements have limited resolution and with AS-OCT, it is very difficult to determine the presence or absence of uveoscleral outflow (Figure 2 and Figure 3). Another point to consider is that the shape of the uveoscleral implant helps us to keep the scleral lips apart, thereby facilitating transcleral outflow and postoperative subescleral needling maneuvers. The transcleral outflow has been found to be a positive prognostic factor with UBM[8] and with SA-OCT[7], with and without an implant[5].

Supraciliary implantation probably favors either a ciliary body detachment with subsequent decrease in aqueous humor production, or a choroidal resorption leading to low postoperative IOP[15]. Although it seems logical to think that this could encourage late chronic ocular hypotony, there is no evidence of this in the literature or in the present series however, it should not be forgotten that young myopics are probably more likely to suffer from hypotony with supraciliary implantation.

DS with uveoscleral HEMA implant is a safe and effective technique for the management of OAG and it is a promising alternative because it ensures the maintenance of both spaces helping to avoid collapse over time.

Tips

- ✔ Deep sclerectomy standard technique.
- ✔ The plate with lateral notches is placed in a full-thickness suprachoroidal bag 2 mm behind the scleral spur.
- ✔ After folding the implant the other foot is placed into the intrascleral lake.
- ✔ No suture or a loose suture for the superficial scleral flap.
- ✔ Postoperative complete follow up.

References

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