Editorial

Updating the treatment of encapsulated blebs following trabeculectomy

Actualización del tratamiento de las ampollas encapsuladas postrabeculectomía

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At present, a large number of surgical techniques have been developed for glaucoma surgery in the quest for less invasive approaches and more predictable outcomes. However, conventional trabeculectomy continues to be the surgery of choice for treating glaucoma neuropathy. It aims at reducing intraocular pressure (IOP) by creating a drainage or fistula that facilitates the exit of the aqueous humor from the ocular globe. Frequently, instead of surgery a filtration bleb is formed which can adopt a discreetly raised, diffuse and posterior appearance usually accompanied by IOP reduction.

Occasionally, in about 2.5% and 29% of cases, the filtration bleb can become encapsulated at the beginning of the postop period (between 2 and 8 weeks), adopting a raised appearance with thickened walls (tenon cyst). The bleb encapsulation gives rise to deficient drainage and secondarily increased IOP, which is the cause of additional medical or surgical intervention and accordingly a greater risk of long-term surgery failure.

Treatment of encapsulated blebs associated to high IOP is controversial. Some authors have described it as a temporary stage that requires medical treatment associated or not to digital massage for controlling IOP. However, other papers suggest that puncturing the encapsulated the bleb together with the use of antimetabolites (mitomycin C [MMC] or 5-fluorouracil [5FU]) is a surgical procedure that can be effective for restoring aqueous humor drainage and accordingly bringing down the IOP. More recent publications have described that the injection of antiangiogenics in the encapsulated lead can be effective for cases exhibiting neovascularization, without this being an extended practice.

Encapsulated filtration blebs can be punctured with the aid of the slit lamp or in the operating theater. The puncturing technique may vary from one surgeon to another but essentially it consists in the introduction of a 24–30 gauge (G) needle under the conjunctiva approximately at 1 cm from the encapsulation area and moving the tip of the needle to dislodge the subconjunctival adherences. Subsequently, antimetabolites injection can be applied to reduce scarring in the treated area. The potential risks of this technique include endophthalmitis and excessive bleb filtration with shallow posterior chambers.

As this a relatively invasive technique compared to the medical treatment, the effectiveness of puncturing encapsulated blebs has been discussed in various publications. In this regard, it must be taken into account that if the bleb puncture is satisfactory the need of additional medical or surgical therapies would be minimized.

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When faced with an actual case of a glaucomatous patient intervened a few weeks back for filtering trabeculectomy in which a raised and encapsulated bleb can be seen accompanied by unacceptable IOP levels for the degree of glaucomatous involvement of our patient, the clinician must take a therapeutic decision. To indicate the adequate treatment it is recommendable to have a considerable amount of information about the case as well as knowing what other professionals have done in the same situation.

New ophthalmological imaging techniques have signified a large step forward for many ocular pathologies. In the case of encapsulated blebs, the anterior segment module of the optic coherence tomography (OCT) could be useful to determine the anatomic alterations of the filtration bleb which cannot be seen with the slit lamp as well as to assess the morphological results in the functionality of the bleb after puncturing it.

In what concerns scientific evidence on the treatment of encapsulated blebs, it seems clear that the first therapeutic approach should be reinstituting medical therapy which in many cases would achieve adequate control of IOP. In this regard, Costa et al. published a prospective study in which the medical therapy obtained higher success rates against bleb puncture (without antimetabolites); however, in the long-term follow-up this treatment proved absolutely inefficient, possibly because this surgical maneuver may induce fibroblast proliferation inhibiting the development of an operational bleb and even compromising future procedures.

However, other authors sustain that a bleb puncture associated to the application of antimetabolites such as 5FU or MMC could inhibit fibroblast proliferation and increase the success rate of this procedure. In this regard, Ben-Simon and Glovinsky reported 76% success of punctures associated to MMC in 41 eyes after 6 months follow-up. Mardelli et al. obtained an IOP reduction of 24.1 ± 6.4 mmHg to 11.5 ± 4.8 mmHg by MMC puncturing of 62 non-operational blebs with a mean follow-up of 9.9 ± 3.7 months and a mean of 1.9 ± 1.4 punctures per eye. Iwach et al. reported 71.6% success when puncturing with simultaneous MMC application with a sponge after 2 years of follow-up. More recently, Kapasi and Birt published the results obtained after sub conjunctival puncture with 5FU (0.1 ml/50 mg/ml) in non-filtering blebs 1 year after the original surgery with 2 years follow-up. This technique yielded 29.7% of absolute success by achieving IOP control without the need of additional procedures, and 35.1% of patients in which IOP was reduced with additional medical treatments, laser or new puncture.

However, all the above published series also included eyes with non-operational flat blebs, which could exhibit a different behavior after puncture when compared with encapsulated blebs. This was not the case in the publication of Allen et al. who carried out a retrospective study assessing the efficacy and safety of encapsulated bleb puncture with 5FU. In the study, comprising 32 eyes, a rate of success of 87% was achieved (IOP ≤ 18 mmHg with or without treatment) after 10.7 ± 2.9 months follow-up. Even so, it is true that there is no published paper showing the long-term results of the puncture of encapsulated blebs and treated with antimetabolites.

In summary, in the presence of an encapsulated filtration bleb after functional trabeculectomy in which no obstructions can be observed at the level of the trabecular ostium, the first therapeutic option to be assessed is medical treatment associated or not to digital massage. After the failure of this therapy, puncture of encapsulated blebs associated to the utilization of antimetabolites and (5FU or MMC) is a minimally invasive procedure that can be useful for a significant percentage of patients which in some cases will not require additional treatment. Even though it is true that the fact of exhibiting encapsulated blebs involves a greater risk of failure of filtering surgery and even though we do not have published data comprising more than 2 years, it seems logical to think that in these patients IOP control throughout the evolution of the glaucomatous disease would not be achieved only with filtration bleb puncture.

REFERENCES