

Vitreous base visualisation through trans-scleral illumination with a standard 25-gauge light probe

ABSTRACT

Purpose To describe a technique of vitreous base visualisation through trans-scleral illumination using a standard 25-gauge light probe.

Methods All vitrectomies are performed using 25-gauge+ instruments and valved trocars. A non-contact viewing system is used to visualise the retina. After core vitrectomy and the necessary additional procedures, triamcinolone acetonide (Kenacort) is injected in the vitreous cavity. Then, the standard 25-gauge light pipe is covered with a sleeve obtained from a 20-gauge venflon cannula. The light brightness is increased to 100%, and the light probe used to indent the sclera and trans-illuminate the vitreous base. The vitreous cutter is activated between the crystals of triamcinolone acetonide and the retinal surface. Complete vitreous base shaving is carried out for 360°.

Results Iatrogenic peripheral retinal tears, as a result of vitreous shaving, occurred in 4.1% of cases with this technique.

Conclusions This method represents a valid and low-cost option to achieve accurate vitreous base shaving.

BACKGROUND

With current style of endoillumination, visualisation of the posterior vitreous and retina is adequately achieved. However, accessing pre-equatorial structures remains



Figure 1 Sleeve covering the Alcon 25 gauge+light probe. Access the article online to view this figure in colour.

a problem, as even wide-field optics and forced rotation of the globe do not allow visualisation of far periphery. Indenting the sclera becomes mandatory. Available options include relying on an assistant, or the use of accessory light sources with the accompanying additional costs, and sclerectomies. To overcome these challenges, the principle of trans-illumination can be gainfully used. Schmidt *et al*¹ described the 'diaphanoscope illuminator', an indentation device which integrates in its tip a fibre optic light cable. Limitations of this instrument comprise poor visibility caused by reduction of transmission by the sclera. More recently, Veckeneer proposed to indent the sclera with the conventional 20-gauge light pipe, and to enhance vitreous visualisation by filling the vitreous cavity with perfluorocarbon liquid (PFCL) and injecting triamcinolone acetonide on top. An additional refinement of this technique is to use a sleeve on the light probe, like the 'lightindenter' produced by DORC (Zuidland, The Netherlands). Such a sleeve reduces abrasion of conjunctiva and sclera and increases the rigidity of the light pipe. The authors recommend this technique in all cases for which trimming of the vitreous base is considered important.²

I perform thorough vitreous base shaving in all my vitrectomy cases and, although I find the technique proposed by Veckeneer useful for retinal detachments, routine use of PFCL is expensive and usually not necessary for elective procedures.

The purpose of this paper is to describe an alternative technique of vitreous base visualisation by means of trans-scleral illumination.

METHODS

Surgical technique

All vitrectomies are done with the Alcon (Fort Worth, Texas, USA) Constellation vitrectomy system, with an integrated xenon light source, using 25-gauge+ instruments and valved trocars. The Eibos system (Möller-Wedel, Wedel, Germany) is used to provide wide-angle viewing of the retina. After core vitrectomy and the necessary procedures (eg, membrane peeling) triamcinolone acetonide (Kenacort), diluted in 0.5 cc balanced salt solution (BSS), is injected in the vitreous cavity. Then, a sleeve obtained by cutting approximately 30 mm from the 20-gauge Venflon tm Pro cannula (BD, Helsinborg, Sweden) is used to cover the standard 25-gauge light pipe. This device reduces abrasion of conjunctiva and sclera and increases the rigidity of the light pipe (figure 1). Light brightness (usually at 36%) is increased to 100%, and intraocular pressure is set at 20 mm Hg (usually at 30 mm Hg). The light probe, modified by the sleeve, is used to indent the sclera and trans-illuminate the vitreous cavity. The residual vitreous then becomes visible as a relatively optically free space between the crystals of triamcinolone, dispersed in BSS, and the light transmitted through the retinal periphery. Vitreous base shaving is carried out for 360°. At the end of the procedure, careful inspection of the peripheral retina is performed and laser retinopexy carried out when needed. Residual triamcinolone crystals are aspirated.

RESULTS

The technique outlined in this paper, although similar to the one published by

Veckeneer and Wong,² presents some peculiar features and advantages.

The sleeve, obtained from the 20-gauge Venflon tm Pro cannula is cheap and readily available in virtually any operation room. It fits any 25-gauge light probe, also from fabricants other than Alcon. For 23-gauge systems, an 18-gauge Venflon tm Pro cannula, or a similar device, can be used. PFCL is not used, unless when necessary for purposes other than visualisation.

Potential concerns may arise, however.

- ▶ Compared to the 'light indenter', the sleeve, as described here, is more flexible. Excessive tension might therefore bend the light probe at the junction with the hand piece and potentially break it, especially with 25-gauge systems.

Activating the cutter in the mid-vitreous cavity before indenting the sclera reduces the stress exerted on the light pipe, facilitates this step and minimises damages. Another trick is to put a finger on the length of the probe while depressing the sclera.

- ▶ Without PFCL, the double light reflex, as described by Veckeneer and Wong, is not seen.

The vitreous base is visualised as a crystals-free space (negative staining) between triamcinolone, freely moving in the vitreous cavity, and the light transmitted through the eye wall. Shrinking of this space, along with delicate movements of the retinal periphery indicate that the vitreous gel is effectively being removed.

- ▶ Iatrogenic retinal tears may result from aggressive vitreous base shaving with trans-illumination. The charts of patients operated for macular pucker and vitreous floaters by means of this technique, between March 2012 and September 2013, have been evaluated. Only eyes with a pre-existent posterior vitreous detachment were included in this analysis. An iatrogenic peripheral retinal tear, as a result of vitreous shaving, was reported in six out of 143 eyes (4.1%), which is consistent with most literature reports.³ One post-operative retinal detachment occurred in this group (0.6%).
- ▶ Relatively lower transmission of light through the eye wall is achieved in patients with a dark skin. This might be an issue during the learning curve of this technique. However, with increasing experience, and with the exception of few cases, this problem can be easily overcome.

CONCLUSION

This technique integrates the idea of Veckeneer and Wong, and can represent a valid and low-cost option to achieve accurate vitreous base shaving for all those cases where PFCL might not be strictly necessary.

Giulio Bamonte, Pieter R van den Biesen

Department of Ophthalmology, Hagaziekenhuis, The Hague, The Netherlands

Correspondence to Dr Giulio Bamonte, Department of Ophthalmology, Hagaziekenhuis, Leyweg 275, The Hague 2545 CH, The Netherlands; giuliobamonte@hotmail.com

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Contributors GB: conception and design, acquisition of data, drafting and revising the article, final approval of the version to be published. PvdB: development of the described technique.

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Giulio Bamonte and Pieter R van den Biesen

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