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CORRESPONDENCE

Open-sky capsulorrhexis in triple procedure: with or without trypan blue?

Dear Editor,

In the article "Open-sky capsulorrhexis in triple procedure: with or without trypan blue?" by A. Özkiriş, O. Arslan, E. Cicik, N. Köylüoglu, C. Evereklioglu (Eur J Ophthalmol 2003; 13: 764-9) the authors, in a series of 50 open-sky triple procedures, confirm the utility of staining the anterior capsule.

Without any doubt trypan blue may be of great help in these procedures but we think that open-sky capsulorrhexis and cataract extraction are to be avoided as a rule and this is possible in almost every case. Open-sky surgery induces a forward displacement of iris and lens, stretching anterior capsule and facilitating capsular tears: on the contrary closed chamber surgery keeps the iridolenticular diaphragm back, relaxing the anterior capsule so that capsulorrhexis is easier, together with a simpler thorough cortical cleanup and a safer implant of the aptics in the bag. Moreover in case of positive vitreous pressure it is much safer to perform the keratoplasty with a myotic iris and an IOL in the bag instead of facing the posterior capsule with a maximal mydriasis (the incidence of suprachoroideal hemorrage during penetrating keratoplasty is estimated to be about 0.75% (1) and probably in such a case an open-sky procedure may considerably worsen the result).

For these reasons phacoemulsification with foldable IOL implantation through a corneal tunnel is the first choice in triple procedures, before penetrating keratoplasty in the same session. There are at least three methods for performing a closed chamber capsulorrhexis and phacoemulsification in the presence of an opaque cornea. In case of corneal oedema the simplest way is to take out the epithelium: generally in case of Fuchs dystrophy it is sufficient to perform conventional phachoemulsification (2). Another way is to perform a lamellar conical resection removing conical stroma until there is sufficient transparence for closed chamber surgery: after phacoemulsification lamellar keratoplasty may be converted into perforating keratoplasty. The third way is to utilize a temporary graft (with a corneal tissue not suitable for penetrating keratoplasty) for phacoemulsification and IOL implantation; after obtaining myosis it is safe to to replace the temporary graft with a permanent one (3). This third method has been very rarely necessary in our experience. Other authors tried to use a temporary keratoprosthesis (4) however this has proven to be impractical in our experience.

Finally working with a closed chamber avoids the use of a Flieringa ring which is cumbersome and may affect postoperative astigmatism. We stopped performing open-sky surgery six years ago and during this time in 33 eyes we have had no problem related to capsulorrhexis or vitreous positive pressure. Obviously in these procedures corneal transparency is not ideal and once again trypan blue staining has showed its usefulness.

Another point to stress is the importance of ultrasound biomicroscopy preoperatory assessment of eyes with opaque corneas: it gives us precious information about anterior segment status and is often fundamental in planning surgery.

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Author reply

In the letter to the Editor by Nardi et al, the authors stated that open-sky conditions carry the risks of incomplete capsulorrhexis, unintended extension of the capsule tear toward the periphery, incomplete irrigation and aspiration of cortex, posterior capsular rupture, vitreous loss and predisposition to choroidal effusion and suprachoroidal hemorrhage as we emphasized in our paper (1). Therefore, they recommend another method to perform closed-system capsulorrhexis for combined phacoemulsification and keratoplasty (2, 3). Without any doubt, we agree about the risks of open-sky conditions as we mentioned in our paper. However, visually significant corneal opacification can prevent the evaluation of the lens opacities and coinciding with cataract during penetrating keratoplasty is not uncommon. In our study, cataract formation was determined during surgery due to corneal opacity in 19 eyes (38%). In these situations, temporary grafts may be used to perform closed-system capsulorrhexis (2), but it prolongs the surgery and open-sky conditions still continue before the graft saturation is all completed. This time period may be long enough to perform open-sky cataract extraction with intraocular lens implantation. Moreover, in case of high vitreous pressure, fluid leakage from the anterior chamber may cause a shallow anterior chamber, which makes performing capsulorrhexis difficult. In addition, use of temporary keratoprosthesis (3) may be inpractical as Prof. Nardi et al emphasized.

A high degree of corneal opacification in which removal of corneal epithelium is not sufficient to improve corneal transparency may preclude closed-system surgery, requiring the use of an open-sky cataract extraction (4-6). As we did in our study, application of IOP-lowering treatment including oral carbonic anhydrase inhibitors and intravenous hyperosmotic agents, and general anesthesia with 1-1.5 % sevoflurane in 33-66 % O_2-N_2O mixture and nondepolarizing muscle relaxant, injection of a high viscosity material (Healon GV) in the space between the recipient cornea and the lens, small capsulorrhexis with the aid of 0.1% trypan blue minimize the risks of open-sky conditions. We did not observe any choroidal effusion or suprachoroidal hemorrhage during our study. This may be related to the precautions mentioned above. In addition, 0.1% trypan blue capsule staining during open-sky capsulorrhexis has positive effects on the next steps of the surgery and decreases the capsule-related complications as we emphasized in our paper.

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