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Editorial

Latest advances in the treatment of corneal diseases

Neurotrophic factors are important factors associated with epithelialization and stromal wound healing after corneal injury.[1] In this issue of the *Taiwan Journal of Ophthalmology*, Lin et al[2] and Wu et al[3] present two autologous preparations from blood, autoserum and autologous platelet-rich plasma to treat recalcitrant LASIK-induced neurotrophic epitheliopathy and refractory corneal defects respectively. In Lin et al's study, all cases of neurotrophic epitheliopathy were healed using conventional autologous serum preparation after LASIK surgery.[2] In Wu et al's study, three patients with neurotrophic ulcer, exposure corneal ulcer and limbal deficiency with corneal ulcer after HSV keratitis respectively were healed successfully with platelet-rich plasma.[3] Both studies indicate the importance of neurotrophic factors in the treatment of neurotrophic epitheliopathy and stromal defects caused by impairment of trigeminal innervation leading to corneal epithelial breakdown, impairment of healing, and development of corneal ulceration, melting, and perforation.[4] LASIK, diabetes and herpetic infection, as shown in these two studies, will cause impairment of trophic nerve fibers in the trigeminal nerve maintaining the anatomical integrity and function of the ocular surface.[1]

Autologous serum has been shown to contain essential components of tears in comparable concentrations to natural tears.[5] Therefore, it has been used as adjunct or alternative treatment of persistent epithelial defects or neurotrophic ulcer. In fact, autoserum eye drops was the first hemoderivative product used in the ophthalmology field.[6] However, the presence of leukocytes during the preparation procedure increases the levels of pro-inflammatory cytokines, including IL-6, IL-1β and TNF-α, which cause further corneal inflammation and ulceration.[7]

Similarly, platelet-rich plasma contains a large pool of proteins and factors such as PDGF, TGF-β, VEGF, IGF-I, hepatocyte growth factor (HGF), angiopoietins, platelet factor-4 (PF-4) and thrombospondin, which can also promote corneal epithelialization and stromal wound healing like autologous serum.[8] Some preparations such as the new platelet-rich growth factor eye drops are not diluted as usually happens with autologous serum in particular medical devices which are EU and FDA accepted at present.[5] However, it is almost impossible to reach an agreement about a definition of platelet-rich plasma from the variety of preparations described in the literature.[5] There are more than 30 different protocols and platelet-rich plasma products reported in the literature, many of which have been commercialized.[5] Wu et al's preparation is relatively simple to make and easy to use clinically.[3]

An important point to note is that with both blood derivatives, there is the inevitable increased risk of microbial contamination leading to corneal infection during treatment. The problems of contamination and breakdown of components in these blood-derivative eye drops should be carefully monitored and inspected during preparation and preservation. A standard protocol for preparation needs to be established in the future.

Also in this issue of the *Taiwan Journal of Ophthalmology*, Wang et al[9] present two cases of occult Descemet's membrane detachment after phacoemulsification surgery mimicking pseudophakic bullous keratopathy who were scheduled for corneal transplantation. They warned that occult Descemet's membrane detachment should be suspected in patients with persistent severe corneal edema after phacoemulsification surgery. Corneal transplantation should be deferred for 6–12 months until the surgeon can exclude this possibility. Their case report is interesting and clinically relevant as it has never been reported in the literature. We agree with the opinions from their case presentation. However, the possibility of corneal decompensation during long-term follow-up also needs to be considered.

The final article I highlight from this issue of the journal is that of Sarnicola et al,[10] who present their 4-year follow-up results of suture insertion of graft donor in Descemet stripping automated endothelial keratoplasty. Their unique technique uses a double-armed 10-0 suture with a straight transchamber needle and half-circle needle to insert the folded donor lenticule. Only 9 (4.6%) patients suffered a dislocation of donor tissue; all were successfully reattached with a second air injection. Only 3 (1.5%) eyes developed graft failure. Pupillary block was present in 15 (7.7%) eyes. The results of their method were equivalent to those achieved with current insertion devices such as spoon-shaped glide. Their method provides an alternative should current devices not be available. Their study also demonstrates that both improvement in surgical skills and in the devices used in Descemet stripping automated endothelial keratoplasty are equally important for the outcome of this surgery.

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