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Glaucoma

Results of combined cataract surgery with RayOne EMV lens implantation and transscleral micropulse laser therapy (MP-TLT) in glaucoma patients

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Purpose: The purpose of this study is to present the effect of the combined cataract procedure with the use of the RayOne EMV and MP-TLT on the change in intraocular pressure, distance, intermediate and near visual acuity as well as the anterior chamber depth and the width of the iridocorneal angle.

Methods: 30 eyes of 15 patients were included to the study. First, cataract phacoemulsification was performed with intracapsular implantation of a RayOne EMV with the target postoperative refraction closest to zero. Then, MP-TLT was performed using Cyclo G6 (IRIDEX, Mountain View, CA, USA). Preoperatively, 1 day, 1 week, 2 months and 6 months after the procedure, CDVA, UDVA, UIVA, UNVA, iridocorneal angle width, anterior chamber depth and intraocular pressure were measured. Exclusion criteria: astigmatism 1.0 Dcyl, lens subluxation, diseases of the retina, previous ophthalmological surgery, corneal diseases, active inflammatory process around the eye.

Results: Postoperatively, all patients experienced a decrease in intraocular pressure and a statistically significant improvement in visual acuity at all tested distances. Deepening of the anterior chamber and widening of the filtration angle were also noted.

Conclusion: The simultaneous use of a combined cataract removal procedure and MP-TLT using RayOne EMV lenses allows patients to improve visual acuity, reduces intraocular pressure and has a positive effect on the anatomical conditions of the eye.

Glaucoma

Choroidal Thickness in Juvenile Open Angle Glaucoma

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Purpose: The purpose of this study is to compare choroidal thickness in juvenile open angle glaucoma (JOAG) and healthy controls using spectral domain optical coherence tomography (SD-OCT) and study its correlations.

Methods: In this case-control study, 56 eyes of 28 JOAG patients and an equal number of controls were recruited. SD-OCT was used to measure the choroidal thickness (ChT), in the macular region at 5 locations: subfoveal, 1500 µm and 3000 µm nasal and temporal to the foveal center, and in the peripapillary region at 6 locations: up to 1500 µm, nasal and temporal to the disc, respectively. The ChT and its correlations with age, intraocular pressure, cup-to-disc ratio, central corneal thickness, mean deviation, and axial length were studied.

Results: The average macular ChT in JOAG was 306.30 ± 56.49 µm vs. 277.12 ± 64.68 µm in controls. The average peripapillary ChT in JOAG was 197.79 ± 44.05 µm vs. 187.24 ± 38.89 µm in controls. The average total ChT ($p = 0.042$), the average macular ChT ($p = 0.022$), the subfoveal ChT ($p = 0.022$), the ChT 1500 µm (p 0.001), and 3000 µm temporal to the fovea ($p = 0.002$) were significantly thicker in the JOAG group. In the JOAG group, the average macular ChT had a significant negative correlation with age, whereas axial length was positively correlated with the average peripapillary ChT.

Conclusions: In this South Asian cohort of JOAG, the average total ChT, average macular ChT, subfoveal ChT, and ChT at 1500 µm, and 3000 µm temporal to the fovea were significantly thicker when compared to healthy controls.

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Secondary glaucoma and proptosis as a result of indirect carotico cavernous fistula

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Title of the abstract:Secondary glaucoma and proptosis as a result of indirect carotico cavernous fistula

Topic: Glaucoma

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PURPOSE: The aim of the work is to present the case of a 69-year-old female patient who came to the Eye Clinic in Banja Luka, due to pain in the right eye, redness, drooping of the upper eyelid, proptosis and increased intraocular pressure as a result of indirect carotid cavernous fistula.

METODS: A case report of a 69-year-old patient with secondary glaucoma, proptosis, venous congestion of episcleral blood vessels as a result of an indirect caroticocavernous fistula is presented.

RESULTS: We present the case of a 69-year-old female patient who came to the Eye Clinic due to pain in the right eye, redness, drooping of the upper eyelid, proptosis, blockage of episcleral blood vessels and increased IOP. She was treated with local and systemic antiglaucoma therapy without the possibility of pressure compensation in the right eye. In consultation with a neurosurgeon, CT angiography and DSA were performed, which showed the existence of an indirect carotid cavernous fistula on the right side. She underwent operative treatment in neurosurgery with endovascular embolization of the carotid artery. Postoperative IOP values within normal limits, reduced proptosis as well as congestion of episcleral blood vessels.

CONCLUSIONS: A multidisciplinary approach to a patient with secondary glaucoma and signs of venous congestion of episcleral blood vessels led to an accurate diagnosis of a serious disease that can be the cause of vision loss if not recognized in time.

Financial Disclosure: No

Key words: red eye, secondary glaucoma, proptosis, carotid cavernous fistula, embolization.

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Glaucoma

Debate on Indications for Neuroimaging in Glaucoma Decides whether Strategy is Rational or Useless

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Introduction. There is debate among glaucoma practitioners about the indications for neuroimaging. Many argue that such testing is mandatory in differential diagnosis because of the risk of missing pathology. However, this time-consuming and expensive strategy is not always rational or even possible in busy medical institutions.

Purpose: To study the possibilities of magnetic resonance (MR) morphometry and positron emission tomography (PET) with fluorodeoxyglucose in the diagnosis of cerebral neuropathy in patients with primary open-angle glaucoma (POAG).

Materials and methods. The complex ophthalmological, MRT and PET/CT examination of 32 patients with different stages of POAG was conducted.

Results. A significant decrease in the volume of subcortical nuclei was diagnosed in POAG. In the brain of patients in the subgroup with normal-tension glaucoma, the volumes of brain ventricles were increased.

A significant correlation was established between degenerative changes in the cerebral cortex during morphometry and areas of abnormal metabolism during PET in the gyrus temporalis medius.

It should be noted that single false-negative and false-positive cases in the subgroup of patients with the early and moderate stages of POAG were due to the minimal severity of the decrease in volume indicators of the cortex of various brain structures.

Conclusion. The MRT and PET/CT methods, based on the calculation of quantitative indicators of the volume of the cortex and metabolism of the gray matter of the brain, allow with high accuracy to detect degenerative changes in the early stages of their development, and also carry out differential diagnostics between various POAG forms.

Glaucoma

Phacoemulsification as a treatment option for Primary open-angle glaucoma – YES or NO

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Purpose: To examine the influence of phacoemulsification (PHACO) on intraocular pressure (IOP) and its short-term fluctuations (IOPst) in medically treated patients with primary open-angle glaucoma (group POAG) and in patients with cataract and absence of any other ocular disease (group Cataract).

Methods: Diurnal tension curve (DTC) of IOP was conducted before PHACO and in 1st, 3rd and 6th month postoperatively in 31 patients (eyes) with POAG and in 31 patients (eyes) in group Cataract as controls. During these prospective intervention study, postoperative changes in average IOP (IOPav) and IOPst were examined, as well as their correlations with preoperative values.

Results: The postoperative IOPav reduction was the most pronounced for the POAG group in the 6th month (-2.73 mmHg, -15.6%), and for the Cataract group in the 3rd month (-2.44 mmHg, -16.4%). A significant postoperative reduction of the IOPst parameter was present only in the POAG group (-1.40±1.89 mmHg; -25.86%). During follow-up, a negative correlation of preoperative IOPav and IOPst with their postoperative change was found in both groups.

Conclusions: Phacoemulsification results in a statistically significant reduction of the IOPav and IOPst in patients with POAG, and the degree of postoperative reduction is greater if their preoperative values are higher. The largest number of patients with POAG, in whom PHACO did not result in clinically significant IOP lowering, are in a more favorable position for further treatment with filtering surgery, compared to patients who have not previously undergone cataract surgery.

Financial Disclosure: No

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Change in signs of ocular surface disease in open-angle glaucoma or ocular hypertension patients treated with preservative-free latanoprost eye drop cationic emulsion or preserved latanoprost

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Purpose
Corneal fluorescein staining (CFS) analysis from an international, Phase 3, non-inferiority trial examining intraocular pressure (IOP) and ocular surface disease signs with the preservative-free (PF) latanoprost eye drop cationic emulsion or preserved latanoprost (P-latanoprost).

Methods
Open-angle glaucoma (OAG)/ocular hypertension (OHT) patients with IOP ≤18 mmHg and CFS score 4 (modified Oxford scale) were randomized to receive 0.005% PF latanoprost emulsion or P-latanoprost for 12 weeks. Primary endpoint was the Week 12 IOP change from baseline (peak/trough). Current analyses examined changes in CFS score from baseline at Week 12 according to baseline CFS (≥1 or 1).

Results

PF latanoprost emulsion (N=192) was non-inferior versus P-latanoprost (N=192) concerning Week 12 least square (LS) mean (standard error [SE]) change in peak (−8.8 [0.3] mmHg versus −8.2 [0.3] mmHg; P=0.023) and trough (−8.6 [0.2] mmHg versus −8.1 [0.3] mmHg; P=0.080) IOP. Overall, 44.5% (PF latanoprost emulsion arm) and 46.6% (P-latanoprost arm) had CFS scores ≥1 at baseline, reducing to 28.2% (PF latanoprost emulsion) and 44.2% (P-latanoprost) at Week 12. Patients with baseline CFS ≥1 showed LS mean (SE) CFS changes of -0.7 (0.07; PF latanoprost emulsion) and −0.4 (0.08; P-latanoprost) at Week 12 (difference: −0.3; P=0.0006), while changes of 0 (0.04; PF latanoprost emulsion) and 0.1 (0.04; P-latanoprost; difference: −0.1; P=0.0330) were seen for those with baseline CFS 1.

Conclusion
The PF latanoprost cationic emulsion showed non-inferior IOP-lowering efficacy and retention of lower CFS scores compared with P-latanoprost in OAG/OHT patients. Between-arm differences were greatest among patients with baseline CFS scores ≥1.

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Glaucoma

Neovascular Glaucoma Post Carotid Stenting: A Narrative Review

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Backround: Neovascular Glaucoma is a rare complication following carotid procedures. However is an acute condition that can cause vision loss if not detected early. Especially regarding Carotid stenting, very few cases have been reported. It is believed that due to the disruption of circulation, the possibility of cerebral hyperperfusion injury and consecutively establishment of ocular ischemia increases. Retinal ischemia prompts the release of vascular endothelial growth factor, stimulating neovascularization. This in turn leads to obstruction of aqueous humor outflow and increase of intraocular pressure.

Methods: NVG as an ocular complication post CAS is an extremely rare phenomenon with very few cases reported in the medical literature over the years. All of the cases include males of similar age group and co-morbidities who were symptomatic and underwent carotid artery stenting.

Results: The cases reviewed highlight the potential for NVG to be developed post-carotid stenting, particularly in patients with co-morbidities related to ocular ischemia. The underlying mechanism often involves the ischemic process leading to the release of VEGF, stimulating neovascularization in response to inadequate blood supply.

Conclusion: Patients with risk factors for development of glaucoma could receive pre-operative ophthalmologic screening prior to carotid revascularization, more importantly in the routine setting. Additionally, routine bedside tonometry may be a useful tool after CAS, especially in those with predisposing risk factors for ocular hypertension and glaucoma. Monitoring and collaboration between vascular surgeons, neurology specialists and ophthalmologists is imperative in managing these patients effectively.

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Glaucoma

Efficacy and safety of the VISULAS green with option SLT in pseudoexfoliative syndrome glaucoma and pseudoexfoliative syndrome ocular hypertension

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Purpose

To assess the effectiveness and safety of VISULAS® Green laser selective laser trabeculoplasty (SLT) in lowering intraocular pressure (IOP) in patients with pseudoexfoliative syndrome glaucoma (PXG) and pseudoexfoliative syndrome-associated ocular hypertension (PXS-OHT).

Methods

This prospective, single-center, interventional study included 20 eyes from 20 patients diagnosed with PXG or PXS-OHT. Patients underwent SLT using the VISULAS® Green, a frequency-doubled Nd:YVO4 laser with a 532 nm wavelength. Intraocular pressure (IOP) was measured at baseline and post-treatment at 1, 3, and 6 months. Primary outcomes included mean IOP reduction, while secondary outcomes assessed medication use, visual and structural parameters, and safety.

Results

At baseline, the mean IOP was 22.9 ± 2.9 mmHg. A significant reduction in IOP was observed at all follow-up intervals: 18.5 ± 3.1 mmHg at 1 month (18.8% reduction, p 0.001), 19.0 ± 4.2 mmHg at 3 months (16.7% reduction, p = 0.002), and 18.6 ± 4.3 mmHg at 6 months (18.3% reduction, p = 0.001). No significant change in medication use was noted throughout the study. Subgroup analysis showed greater IOP reduction in Shaffer grade 4 angles, phakic eyes, and those with PXS-OHT compared to PXG. No significant changes were detected in visual and structural parameters. Safety analysis revealed no severe adverse events, with only transient IOP spikes (5 mmHg) in 20% of cases at 1 hour post-procedure.

Conclusion

SLT with the VISULAS® Green laser is an effective and safe treatment for PXG and PXS-OHT, achieving significant IOP reduction without increasing medication burden or causing severe complications.

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Glaucoma

Micropulse transscleral diode laser cyclophotocoagulation as a bridge therapy to definitive treatment in glaucoma associated with Sturge-Weber Syndrome

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Purpose:

To assess the role of micropulse transscleral diode laser cyclophotocoagulation (MP-TSCPC) as a bridge therapy to facilitate trabeculotomy in pediatric patients with Sturge-Weber Syndrome (SWS) associated glaucoma due to angle dysgenesis.

Methods:

Three pediatric patients with congenital glaucoma secondary to SWS and significant corneal opacity underwent MP-TSCPC to improve corneal transparency before trabeculotomy. The procedure was performed under general anesthesia using an 810 nm diode laser in micropulse mode, with probe placement guided by transillumination from the limbus.

Postoperative follow-up included clinical assessments of corneal transparency and intraocular pressure (IOP) at multiple time points.

Results:

MP-TSCPC effectively improved corneal transparency, enabling successful trabeculotomy in all cases. Trabeculotomy is the preferred surgical approach for pediatric glaucoma due to angle dysgenesis, as it preserves the conjunctiva and Tenon`s capsule, is repeatable, and carries minimal risk of hypotony. However, its primary limitation is the requirement for sufficient corneal clarity to perform the procedure safely and effectively. MP-TSCPC serves as a crucial step in achieving this prerequisite.

No severe complications were observed postoperatively, and all patients proceeded to definitive surgical management.

Conclusions:

MP-TSCPC is an effective bridge therapy in pediatric patients with SWS-associated glaucoma, addressing the critical challenge of corneal opacity and facilitating subsequent trabeculotomy. Its use can optimize surgical outcomes by ensuring adequate visualization for angle surgery, thereby enhancing the long-term management of congenital glaucoma.

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Glaucoma

Ocular Response Analyser in Glaucoma phasing studies

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Introduction

Glaucoma, a leading cause of irreversible blindness, is characterised by optic nerve damage, with intraocular pressure (IOP) as a key modifiable risk factor. IOP exhibits diurnal variation, influencing diagnosis and progression. While Goldmann applanation tonometry (GAT) is the standard for IOP measurement, the Ocular Response Analyser (ORA) provides a faster, non-invasive alternative that accounts for corneal biomechanics. Although studies have compared between ORA and GAT, the utility ORA in diurnal phasing studies remain unexplored.

Purpose

We compared diurnal IOP variation measured by the ORA versus GAT in glaucoma or suspect patients.

Methods

Consecutive patients undergoing daytime phasing (8:00 AM–5:00 PM) at a UK University Hospital over six months were included. IOP was measured by a single operator using both devices, with additional data collected on corneal biomechanics, demographics, diagnosis, and medications.

Results

Thirty-eight patients were included. Mean (SD) IOP values recorded by ORA (peak: 17.41 ± 4.45 mmHg; trough: 13.77 ± 3.73 mmHg) were significantly higher than those measured by GAT (peak: 16.33 ± 3.90 mmHg; trough: 12.72 ± 3.22 mmHg) (p 0.0001). However, there was no significant difference in diurnal variation between maximum and minimum IOP values detected by ORA (3.64 ± 1.97 mmHg) and GAT (3.61 ± 1.89 mmHg) (p = 0.993).

Conclusions

ORA and GAT demonstrated no significant difference in detecting daytime IOP variations in glaucoma patients and suspects, supporting the use of ORA for phasing studies. However, our findings emphasise that the two techniques should not be used interchangeably in glaucoma management.

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Ahmed valve tube cutting for tube-iris rubbing: a case report

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PURPOSE:
The purpose of this case report is to remind clinicians the existence of iris rubbing as a potential complication of posterior chamber Ahmed valve implantation, as well as to describe our surgical technique to solve it.

METHODS:
We present the case of a 43-year-old man with Fuchs heterochromic iridocyclitis in his left eye, with secondary glaucoma and two Ahmed valve surgeries: one in vitreous chamber two years before and another one in posterior chamber seven months before. The patient received triple antihypertensive topical therapy, and topical dexamethasone every 24h. Despite this, intraocular pressure (IOP) was 17 mmHg with progressive visual field affection. The eye showed a 2+-Tyndall reaction, with Ahmed tube in the visual axis, remarkably rubbing iris. As uveitis-glaucoma-hyphema syndrome has been described in Ahmed valves, a third surgery was indicated: to shorten the Ahmed tube, apart from ab externo XEN implantation due to the background of difficult IOP control.

RESULTS:
The surgery was carried out and 24 hours later IOP was 2 mmHg, with no rubbing between the Ahmed tube and the iris. One month later, IOP is 9 mmHg and Tyndall reaction remains negative, although this is not assessable due to the topical corticosteroid postoperative protocol.

CONCLUSIONS:
Although rare, iris rubbing is a potential complication of posterior chamber Ahmed valve implantation and must be taken into account in the case of surgery failure. Fortunately, the solution might be as simple as cutting the tube, even though there are several alternatives, such as valve explantation.

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Late complication in non-penetrating deep sclerectomy: Descemet´s detachment

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Clinical case of a women, 75 years old, open angle glaucoma (total medical therapy with 4 drugs) who was underwent with NPDS with esnoper implant. 4 years later, she complaints about blurred vision. Descemet´s detachment is diagnosed. Intracameral injections of air and SF6 20% and superior descemetorrhexis gas were performed, but detachment of Descemet membrane occurs again. Finally, DMEK surgery was performed with great difficulty because of very bad visualization, but with good results, complete adherence and functional vision. Images of clinical stages and video surgery are shown

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Glaucoma

Excision and reconstruction of an hypertrophic and functional bleb with bovine pericardium (tutopatch®) and amniotic membrane: a case report

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Purpose: Bleb dysfunction is a late complication following glaucoma filtration surgery. We describe our surgical technique for excision and reconstruction of a hypertrophic bleb complication using bovine pericardium patch graft (Tutopatch®) and amniotic membrane.
Methods: Case report, presenting an hypertrophic bleb over the cornea with a good intraocular pressure control. The hanging bleb without leak caused dysesthesia and high irregular astigmatism. Bleb reconstruction involved excision of corneal fibrous material and avascular conjunctiva, preserving original scleral and tennon. Bovine pericardium patch graft (Tutopatch®) was sited over these with fixed sutures, reinforcing the underlying scleral, and the conjunctiva advanced. Superior epithelium corneal defect was covered using amniotic membrane.
Results: Reconstruction with bovine pericardium patch graft and amniotic membrane resulted in pain relief, visually rehabilitation and good aesthetic results, with preservation of bleb function.
Conclusion: Repair of bleb dysfunction with varied techniques has been reported, including conjunctival advancement, use of scleral patch graft, dural patch graft or pericardium. Additional use of amniotic membrane promotes epithelialization and exhibits anti-fibrotic and anti-inflammatory features.