

## COMBINED SUTURELESS PROCEDURE: PHACOEMULSIFICATION WITH INTRAOCULAR LENS IMPLANTATION AND 25 GAUGE PARS PLANA VITRECTOMY

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**SUMMARY** – Since its introduction in 2002, 25-gauge transconjunctival vitrectomy (25G TSV) has become popular throughout the world. With proper patient selection, this sutureless technique is safe for the surgeon and comfortable for the patient. Every patient over age 50 will develop cataract after vitrectomy procedure. Combined sutureless procedures should be taken in consideration when thinking about patient comfort undergoing single act surgery with no stitches. Twenty eyes of 20 consecutive patients with cataract and vitreoretinal pathology were operated on using combined phacoemulsification, intraocular lens implantation and 25G TSV. Indications for surgical interventions were diabetic vitreous hemorrhage, vitreous opacities, vitreomacular traction syndrome and diabetic macular edema. Surgery related complications, visual outcome and intraocular pressure (IOP) were evaluated. The mean follow up was 4 months. The mean visual acuity was finger counting (light perception to 0.2) preoperatively and 0.3 (range 0.05-1.0) postoperatively. Corneal incision needed suture in one case and scleral in two cases. The mean IOP was 18.5 preoperatively (range 13-22 mm Hg) and 13.5 mm Hg on postoperative day 1 (range 10-16 mm Hg). Two eyes showed IOP in the second week, and three had recurrent vitreous hemorrhage. Capsule opacification was observed in two eyes, anterior chamber fibrin reaction in two eyes and retinal detachment in one eye. Combined cataract and 25G TSV surgery provide a safe and efficient technique that improves patient comfort with minimal complications owing to the sutureless nature of the procedures.

**Key words:** 25 gauge; Sutureless vitrectomy; Combined surgery

### Introduction

Since its introduction in 2002, 25-gauge transconjunctival vitrectomy (25G TSV) has become popular throughout the world<sup>1</sup>. With proper patient selection, this sutureless technique is safe for the surgeon and comfortable for the patient<sup>2,3</sup>. Smaller sutureless incisions in the field of cataract surgery were followed by even smaller sutureless incisions in vitreoretinal surgery. The goal of these procedures is to achieve good surgical outcomes while reducing operative time and inflamma-

tion and, which is of utmost importance, to improve comfort and rapid recovery for the patient<sup>3,4</sup>. Problems related to sutures, i.e. astigmatism and discomfort, are avoided<sup>2,5</sup>. Oblique sclerotomy technique prevents wound leakage<sup>6</sup>. Patient selection is important. Conditions requiring less complex surgery and macular pathology are selected<sup>7</sup>. There is no sense insisting on small incisions when retinal pathology is complicated. Then the result is poor visual acuity even with successful surgery. Combined cataract and vitreoretinal procedures are necessary because cataract often progresses after vitrectomy and cataract is frequently found in patients with vitreoretinal diseases<sup>8</sup>. Sutureless combined procedures are associated with minimal tissue damage<sup>9,10</sup>. Immedi-

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ately after surgery, eyes have less traumatic appearance and significantly less redness<sup>11</sup>. One-act procedure is less traumatic for the patient than two-act procedures<sup>12</sup>.

## Material and Methods

We performed a retrospective, non-comparative case review. Between March 2006 and January 2007, we examined 20 patients (20 eyes) that underwent combined procedures (sutureless phacoemulsification with posterior chamber lens implantation and 25 G TSV) performed by one surgeon (D. K.) for cataract and retinal diseases: diabetic vitreous hemorrhage (12 eyes), vitreous opacities (4 eyes), vitreomacular traction syndrome (2 eyes) and macular edema (2 eyes). Data collected included patient age, sex, Snellen visual acuity, tonometry, slit lamp biomicroscopy for lens status and ophthalmoscopy. Patients diagnosed with macular pathology underwent preoperative fluorescein angiography and those with nonclearing vitreous hemorrhage underwent preoperative ultrasonography to exclude retinal detachment. Postoperative examination included visual acuity and tonometry. Patients were examined on day 1, at one week and then monthly after surgery. Each patient underwent combined surgical procedure under paralytic local anesthesia. Cataract extraction preceded retinal surgery using Accurus 800 (Alcon) system. Before corneal limbal incisions, conjunctiva is displaced and trocar cannulas are inserted supero- and inferotemporally, superonasally at 3 mm from limbus and closed with scleral plugs. This is an important step to overcome difficulty in inserting cannulas after cataract extraction because of reduced globe resistance. Scleral incisions with trocar are created in oblique fashion at an angle of about 30 degree parallel to the limbus. The conjunctiva is displaced over the sclerotomy to cover the entry site after cannula removal. A clear corneal tunnel 2.6 mm wide and 1.5 mm long is created at temporal side with slit knife. Curvilinear capsulorhexis 5.5 mm is made with forceps. Phacoemulsification and cortex removal are performed. Healon 1% is used in all cases to protect endothelium and fill the capsular bag. Foldable intraocular lens (AMO) with optic diameter of 6.0 mm is inserted using injection system through 3.0 mm extended corneal incision. Healon is not removed until the end of the combined procedure to keep the stability of anterior chamber. Corneal wounds were watertight, and no sutures were needed at the end of cataract surgery. The infusion line was started and scleral plugs were re-

moved. 25G TSV was performed with an Accurus 800 combined unit. Vitrectomy and posterior vitreous detachment (when necessary) were performed. Microscissors and forceps were used for membrane peeling and diode laser indirect photocoagulation was used when necessary. Tripan blue was used to better identify epiretinal membranes and triamcinolone acetonide 4 mg/0.1 mL was used when diabetic macular edema was present or when better visualization of the vitreous was necessary. At the end of surgery, scleral canullas were removed without suturing (except when leakage was present). Corneal wound was sutured in one case after removal of viscoelastic because it was not completely watertight. The intra- and postoperative complications are reported. Hypotony was defined as intraocular pressure (IOP) less than 9 mm Hg.

## Results

Twenty eyes of 20 patients underwent combined cataract and 25 G vitrectomy. There were 12 male and eight female patients. The mean postoperative follow up was 4 months (range, 2-8 months). The mean preoperative visual acuity was finger counting (range, 0.2 to light perception). The mean preoperative IOP was 18.5 mm Hg (range, 13-22 mm Hg). The mean postoperative visual acuity was significantly ( $p < 0.05$ ) improved to 0.3 (range, 1.0 to 0.05). The mean postoperative IOP was lower on postoperative day 1, i.e. 13.5 (range, 10-16 mm Hg), however, the difference was not statistically significant. There was no case of anterior segment neovascularization. Clinically significant capsule opacification was observed in two eyes but the follow up was not longer than 4 months. Two eyes had anterior segment fibrin reaction. Two eyes showed IOP increase in the first week after surgery. No intraoperative complications resulting from this surgical approach were observed. Three patients had recurrent vitreous hemorrhage on postoperative day 2 and resolved spontaneously. One patient developed postoperative retinal detachment and had to be reoperated on. No endophthalmitis or choroidal detachment was recorded.

## Discussion and Conclusion

The TSV system is a minimally invasive approach for vitreoretinal pathology<sup>1</sup>. Less tissue trauma and better wound integrity are achieved. With this combined sutureless procedure it is possible to perform two oper-

ations in one act and with no stitches. This series represents our initial experience using 25G TSV system on combined procedures. Eyes with cataract and less complicated vitreoretinal pathology are best candidates for this type of operation. Eyes with epiretinal membranes, vitreous hemorrhage and macular edema refractory to laser were chosen. They have good postoperative visual and anatomic results<sup>12</sup>. Statistically significant improvement in postoperative visual acuity was seen in the majority of eyes. The anatomic outcomes were comparable to the expected outcomes after 20 gauge vitrectomy. No cases of postoperative hypotony resulting from unsutured sclerotomy were recorded. One of the reasons may be the special oblique construction of scleral tunnels that prevents wound leakage<sup>5</sup>. Another reason is obligate inspection of sclerotomy sites at the end of the procedure for bleb formation under conjunctival site and for shallow anterior chamber. This series demonstrates that combined phaco and 25-gauge vitrectomy are safe for cases with less complicated vitreoretinal pathology. Clear advantages of these combined, minimally invasive sutureless procedures are less postoperative inflammation, damage of conjunctiva and sclera, and fast postoperative recovery<sup>13</sup>. This series represented an uncontrolled, retrospective and non-comparative study which suffered certain limitations. Only eyes with no previous vitrectomy were chosen and silicone oil was not used. Additional larger studies are needed to compare this technique with other combined surgery techniques for better evaluation.

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## Sažetak

KOMBINIRANI BEŠAVNI ZAHVAT: FAKOEMULZIFIKACIJA S UGRADNjom OČNE LEĆE  
I 25-G VITREKTOMIJA*D. Kovačević, T. Mance i T. Mišljenović*

Od otkrića 25-G transkonjuktivne bešavne vitrektomije (25G TSV) u 2002. godini ova metoda je postala popularna u cijelom svijetu. Uz dobar odabir bolesnika ova bešavna tehnika je sigurna za kirurga i minimalno neugodne za bolesnika. Siva mrena razvit će se nakon vitrektomije u svakog bolesnika u dobi iznad 50 godina. Kombinirane operacije sive mreže i vitrektomije treba uzeti u obzir ako se razmišlja o samo jednom kirurškom bešavnom zahvatu koji je za bolesnika jednostavniji i manje bolan. Dvadeset očiju u 20 bolesnika sa sivom mrenom i različitom retinalnom patologijom operirali smo tehnikom fakoemulzifikacije uz primjenu 25G TSV. Indikacije za kiruršku intervenciju su bila krvarenja u staklovini, zamućenje staklovine, vitrealni trakcijski sindrom te makularni edem uza sivu mrenu. Procjenjivali smo komplikacije kirurške tehnike, vidnu oštrinu i očni tlak. Srednje vrijeme praćenja je bilo 4 mjeseca, vidna oštrina prijeoperacijski je bila brojenje prstiju, a poslijeoperacijski 0,3. Srednji očni tlak je bio 18,5 mm Hg prijeoperacijski, a 13,5 mm Hg poslijeoperacijski. Kod dva oka je nastupio porast očnog tlaka, tri su dobila recidiv krvarenja u staklovinu, dva zamućenje stražnje kapsule leće, dva fibrinsku reakciju u prednjoj očnoj sobici, a jedno odignuće mrežnice. Zaključeno je kako su kombinirane operacije sive mreže i bešavnom tehnikom 25G TSV sigurne i učinkovite te poboljšavaju udobnost bolesnika uz minimalne komplikacije.

Ključne riječi: 25 G; Bešavna vitrektomija; Kombinirana kirurgija