

# Combined Procedure of Phacoemulsification and Implantation of Ex-PRESS Miniature Glaucoma Shunt

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## ABSTRACT

*Glaucoma patients not responding to maximum medical therapy with coexistent cataract are candidates for combined cataract and glaucoma therapy. There are different therapy models. The choice of therapy depends on numerous patient and surgeon related factors. Ex-PRESS mini glaucoma shunt is a modified trabeculectomy and can be combined with cataract surgery when indicated. In this paper we presented our experience with this combined procedure. Our results showed good intraocular pressure control and visual acuity improvement, comparable to other therapy choices.*

**Key words:** *glaucoma, cataract, combined procedure, filtering surgery, ExPRESS miniature glaucoma shunt*

## Introduction

The modern goal of glaucoma management is to avoid glaucomatous damage and to preserve visual field and total quality of life for patients with minimal side effects. Although intraocular pressure is only one of the major risk factors for glaucoma, lowering it via various pharmaceuticals and/or surgical techniques is currently the mainstay of glaucoma treatment<sup>1</sup>. Combined surgery has become the most commonly used surgical treatment for medically uncontrolled primary glaucoma with coexisting cataract. In those patients combined phacoemulsification and trabeculectomy offer profit over a sequential approach. New devices are being developed to allow surgeons increased control with more predictable postoperative results. Ex-PRESS miniature glaucoma shunt device shunts aqueous from the anterior chamber to a subconjunctival space in a similar way as trabeculectomy<sup>2,3</sup>. It is a non valved 3 mm long device, external diameter approx. 400 microns<sup>4</sup>. It is implanted under a scleral flap<sup>5</sup>. The advantages of Ex-PRESS miniature glaucoma shunt are atraumatic implantation, less complications and inflammation, low diffuse blebs and high success rate. Among others indication for Ex-PRESS miniature glaucoma shunt implantation are primary open angle glaucomas, candidates for filtering surgery and combined glaucoma and cataract surgery. In

this paper we report a group of patients with pseudoexfoliative glaucoma, with high, uncontrolled intraocular pressure on maximum medical therapy with coexisting cataract. Patients underwent combined cataract and glaucoma surgery using Ex-PRESS miniature glaucoma shunt implant. Postoperative findings showed visual acuity improvement and good intraocular pressure control with no additional glaucoma therapy. We had no unexpected complications or adverse effects.

## Methods

Six eyes in 6 patients, with pseudoexfoliative glaucoma, on maximum antiglaucomatous medical therapy, underwent combined two-site surgery PHACO with implantation of acrylic IOL followed by filtering surgery- Ex-PRESS miniature glaucoma shunt implantation was performed. We used 0.025% MMC. The standard procedure was performed without complications, implants were well positioned. We used parabolbar anesthesia with supplemental intracameral lidocaine injection. All surgery was performed by the same surgeon, in Department of Ophthalmology, General Hospital Zadar. Postoperatively we recommended combined antibiotic and steroid drops every four hours in the first week followed by taper. Eval-

**TABLE 1**  
PATIENTS AND PREOPERATIVE AND POSTOPERATIVE FINDINGS

	CAT.	Preop.		1st post op day			7th post op day			1 month post op			3 months post op		
		IOP baseline	VA baseline	IOP	VA	Ant. segm.	IOP	VA	Ant. segm.	IOP	VA	Ant. segm.	IOP	VA	Ant. segm.
Pex1	Yes	40	0.01	14	0.08		16	0.1		12	0.4		16	0.5	
Pex2	Yes	36	0.02	12	0.03		14	0.03		16	0.1		16	0.3	
Pex3	Yes	38	0.001	8	0.02	Flat AC	18	0.05	Shall AC	18	0.08		18	0.1	
Pex4.	Yes	32	0.05	10	0.05	Shall AC	14	0.07		14	0.07		16	0.08	
Pex5	Yes	40	0.05	14	0.07		12	0.08		16	0.1		16	0.3	
Pex6	Yes	32	0.08	10	0.08	Shall AC	10	0.10		14	0.3		16	0.4	

Neo – neovascular; Pex – pseudoexpholiative; SEC – secondary; TTC – trabeculectomy; CAT – cataract; IOP – intraocular pressure; VA – visual acuity; LP – light perception

**TABLE 2**  
RESULTS: IOP AND VA

	CAT.	Preop.		1st post op day		7th post op day		1 month post op		3 months post op	
		IOP baseline	VA Baseline	IOP	VA	IOP	VA	IOP	VA	IOP	VA
Pex1	Yes	40	0.01	14	0.08	16	0.1	12	0.4	16	0.5
Pex2	Yes	36	0.02	12	0.03	14	0.03	16	0.1	16	0.3
Pex3	Yes	38	0.001	8	0.02	18	0.05	18	0.08	18	0.1
Pex4.	Yes	32	0.05	10	0.05	14	0.07	14	0.07	16	0.08
Pex5	Yes	40	0.05	14	0.07	12	0.08	16	0.1	16	0.3
Pex6	Yes	32	0.08	10	0.08	10	0.10	14	0.3	16	0.4
M		36.33	0.042	11.33	0.055	14	0.071	15	0.175	16.33	0.28
$\sigma$		3.67	0.03	2.42	0.03	2.83	0.03	2.10	0.14	0.82	0.16

M – arithmetic mean;  $\sigma$  – standard deviation; Neo – neovascular; Pex – pseudoexpholiative; SEC – secondary; TTC – trabeculectomy; CAT – cataract; IOP – intraocular pressure; VA – visual acuity; LP – light perception; HM – hand motion

uated parameters were visual acuity, intraocular pressure, slit lamp control on 1st, 7th postoperative day, 1 and 3 month after.

**Results**

Preoperative intraocular pressure values were 32–40 mmHg, visual acuity HM to 0.08. On the 1st postoperative day intraocular pressure values were 10–14 mmHg and hypotonia in one patient, visual acuity 0.02–0.08, slit lamp examination showed shallow anterior chamber in two patients, flat anterior chamber in one patient and normal anterior chamber depth in three patients. Seventh postoperative day IOP values were 12–18 mmHg, visual acuity 0.03–0.1, slit lamp examination showed shallow anterior chamber in 1 patient and in 5 patient normal anterior chamber depth. One month after surgery IOP

values were 12–18 mmHg, visual acuity 0.07–0.4, slit lamp examination showed normal anterior chamber depth in all patients. Three months after surgery IOP values were 16–18 mmHg, visual acuity 0.08–0.5, slit lamp examination showed regular anterior chamber depth. In Table 1 there are all patients presented with their preoperative and postoperative findings. In Table 2 there are results of IOP and VA presented. Figure 1 and 2 present IOP and VA changes in graphic manner. The patients were using no medical antiglaucomatous therapy.

**Discussion and Conclusion**

The coexistence of cataract and glaucoma represents a challenging problem, and a currently available treatment options are cataract extraction alone, cataract followed by glaucoma surgery, glaucoma surgery followed by optional

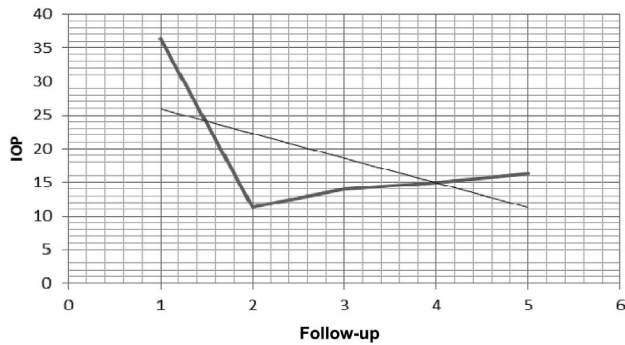


Fig. 1. IOP changes.

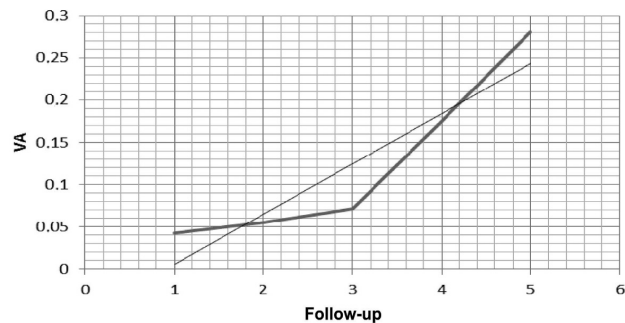


Fig. 2. VA changes.

cataract surgery an combined glaucoma and cataract surgery. The treatment of choice is based both on visual field defect and loss of visual acuity. Combined procedure is the

therapy of choice when glaucoma is prevailing and the IOP spike after cataract surgery may cause significant damage to the optic nerve<sup>6</sup>. Recent studies report that trabeculectomy is no longer the gold standard for combined cataract glaucoma surgery, considering the successful results following cataract surgery combined with trabeculectomy, viscocanalostomy and canaloplasty<sup>7</sup>. Some authors claim that the newer glaucoma procedures appear to be less effective than trabeculectomy but they are also associated with a lower risk of surgical complications<sup>8</sup>. In some glaucoma cases not responding to maximum antiglaucoma therapy combined with senile cataract the implantation of Ex-PRESS miniature glaucoma shunt following cataract surgery could be the therapy of choice. The procedure provides significant and long lasting intraocular pressure lowering after cataract surgery thereby reducing the risk for further glaucomatous visual field damage and avoiding topical antiglaucomatous therapy. The largest published case series of the Ex-PRESS miniature glaucoma shunt was by Kanner et al.<sup>9</sup> reporting that the Ex-PRESS miniature glaucoma shunt was effective for IOP lowering both alone and combined with cataract surgery. Advantages of the combined procedure are patient's convenience – a single operation, avoiding postoperative IOP spikes that can follow cataract surgery, especially dangerous in advanced optic neuropathy. Some authors consider combined procedures, primary phacotrabeculectomy to be indicated in end stage glaucomas<sup>10</sup>. Also the factors are costs of medical therapy and poor compliance with glaucoma medications. The decision should be made in discussion with the patient regarding the potential risks and benefits of the procedure.

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## **KOMBINIRANA POSTUPAK – FAKOEMULZIFIKACIJA I IMPLANTACIJA EX-PRESS MINIATURE GLAUKOMA SHUNTA**

### **SAŽETAK**

Glaukomski pacijenti koji ne reaguju na maksimalnu topičku antiglaukomsku terapiju sa pridruženom kataraktom kandidati su za kombinirano operativno liječenje glaukoma i katarakte. Više je terapijskih mogućnosti. Izbor terapije ovisi o brojnim faktorima vezanim kako za pacijenta tako i za operatera. Implantacija Ex-PRESS mini glaukoma shunta je modificirana trabekulektomija I može se kombinirati sa operacijom katarakte. U ovom radu prikazali smo naše iskustvo sa ovim kombiniranim postupkom. Naši su rezultati pokazali dobru kontrolu intraokularnog tlaka i poboljšanje vidne oštine usporedivo sa drugim terapijskim mogućnostima.