

# Comparison of the Effect of Two Viscoelastic Agents on an Early Postoperative Intraocular Pressure

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## ABSTRACT

*This prospective study compares the effect of two viscoelastic agents (Viscoat and Provisc) on an early postoperative intraocular pressure after phacoemulsification and intraocular lens implantation. The study compares 36 patients with senile cataract. Intraocular pressure (IOP) was measured by standard Goldmann aplanation tonometry preoperatively as well as on the first postoperative day, after 24 hours and 1 week postoperatively. The mean postoperative IOP at first postoperative day in the Viscoat group was 24.2 mmHg and in the Provisc group was 21.2 mmHg. The increase was significantly higher in the Viscoat group than in the Provisc group but after 24 hours and 1 week postoperatively the mean IOP was not statistically different. The two viscoelastic agents cause equivalent pressure elevation postoperatively.*

**Key words:** senile cataract, intraocular pressure, viscoelastic

## Introduction

Viscoelastics are indicated for use as a surgical aid in anterior segment procedures, including cataract extraction and intraocular lens implantation. Viscoelastics maintain in a deep chamber during anterior segments surgeries, enhance visualization during the surgical procedures, and protect the corneal endothelium and other delicate intraocular tissues<sup>1–6</sup>. Although viscoelastics have many benefits, complications can occur. Acute intraocular pressure (IOP) elevation is the most common cataract surgery complication, and can be compounded by viscoelastic use<sup>7,8</sup>. This study compared the effect of two viscoelastics agents on an early postoperative intraocular pressure: Viscoat (chondroitin sulphate-sodium Hyaluronate) and Provisc (1% sodium hyaluronate), Alcon Laboratories, Fort Worth, TX.

## Subjects and methods

This prospective study compared patients with senile cataract. Cataract surgery was performed with a clear cornea incision phacoemulsification and implantation of a foldable acrysoft intraocular lens. The IOP was

measured preoperatively as well as on the first postoperative day, after 24 hours and 1 week postoperatively. Differences between groups were tested by Mann Whitney U test. The changes in IOP (at first postoperative day, after 24 hours and 1 week postoperatively) were tested by Friedman's test.

## Results

Investigators enrolled 36 patients. Table 1 lists the other patients demographics. There were no significant statistical differences between the Provisc and Viscoat groups. In patients receiving Viscoat four patients had diabetic retinopathy and two macular degeneration. The Provisc group had two patients with diabetic re-

TABLE 1  
PREOPERATIVE PATHOLOGY IN 36 PATIENTS WITH  
SENILE CATARACT

Preoperative pathology	Provisc	Viscoat
Diabetic retinopathy	2	4
Macular degeneration	2	2

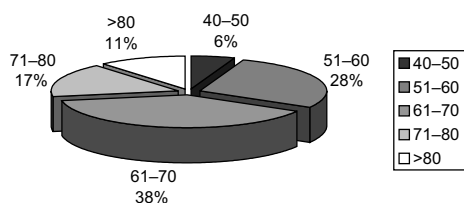


Fig. 1. Distribution of patients according to age.

tinopathy and two with macular degeneration. The mean postoperative IOP at first postoperative day in the Viscoat group was 24.2 mmHg and in the Provisc group was 21.2 mmHg. The increase was significantly higher in the Viscoat group than in the Provisc group, but after 24 hours and 1 week after operation the mean IOP was not statistically different.

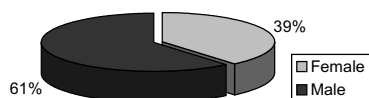


Fig. 2. Distribution of patients according to sex.

## Discussion

The viscoelastics were first used in ophthalmic surgery in 1972, when they were introduced as a replacement for vitreous and aqueous humor. Their first application in anterior segment surgery was in 1977 as a surgical aid to maintain the anterior chamber in rabbits that had cataract surgery with IOL implantation. Since then, viscoelastics have been used widely to increase the ease and safety of cataract surgery. They have proved valuable for coating and preserving the corneal endothelium during entry into anterior chamber, capsulorhexis, emulsification of nucleus, cortex extraction, open

capsular bag and for inflating the capsular bag to facilitate posterior chamber IOL implantation<sup>3–13</sup>.

Although viscoelastics clearly improve the safety and ease to cataract surgery, their use can lead to complications. Acute IOP, the most common complication of cataract surgery, can arise even in the absence of viscoelastics. IOP can be enhanced by viscoelastic use.

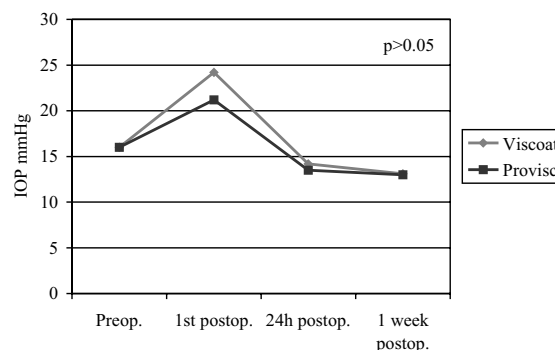


Fig. 3. Mean Intraocular Pressure (mmHg) in 36 operated patients.

Thus, careful and thorough irrigation of the viscoelastic from the anterior segment is recommended following IOL implantation<sup>14</sup>.

Several viscoelastic agents are currently approved for ophthalmic use. We evaluated and compared two: Viscoat and Provisc. Viscoat is dispersive viscoelastic, obtained by bacterial fermentation, guaranteeing a high grade of purity with a reduction in associated proteins.

Provisc is cohesive viscoelastic manufactured by bacterial fermentation<sup>15</sup>. The two viscoelastic agents caused similar pressure elevation postoperatively. We recommended that chamber and capsular bag should be aspirated following the routine phacoemulsification of the senile cataract.

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## **USPOREDBA UČINKA DVA VISKOELASTIČNA SREDSTVA NA RANI POSTOPERATIVNI INTRAOKULARNI TLAK**

### **S A Ž E T A K**

Ova prospektivna studija uspoređuje djelotvornost dvaju viskoelastična sredstva (Viscoat i Provisc) na rani postoperativni intraokularni tlak nakon phakoemulzifikacije i intraokularne implantacije leće. Studija je uključivala 36 bolesnika sa senilnom kataraktom. Intraokularni tlak je mjereno standardno Goldmann aplancijskom tonometrijom preoperativno kao i prvi dan postoperativno, nakon 24 sata i nakon jednog tjedna. Srednja vrijednost postoperativnog intraokularnog tlaka u prvom postoperativnom danu u Viscot grupi je bila 24,2 mm Hg, a u Provisc grupi 21,2 mm Hg. Signifikantno povišenje intraokularnog tlaka je bilo u Viscoat grupi, ali nakon 24 sata i jednog tjedna nije bilo statistički značajne razlike u srednjoj vrijednosti intraokularnog tlaka. Dva viskoelastična sredstva postoperativno izazivaju jednako povišenje intraokularnog tlaka.