
INCIDENCE OF ND: YAG CAPSULOTOMY AFTER LENS IMPLANTATION OF AN ACRYLIC IOL IN ONE EYE AND A SILICONE IOL IN THE OTHER EYE OF THE SAME PATIENT: A PRELIMINARY STUDY.

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ABSTRACT

We retrospectively reviewed the charts of 40 patients who underwent an uneventful phacoemulsification in both eyes and had an Acrylic IOL (AcrySof®) implanted in one eye and a Silicone IOL (SI 30 / S 140®) in the other. A subset of 18 patients had a mean follow up of 1 1/2 year.

In the Acrylic group 1 patient (5.5%) underwent a posterior Yag-capsulotomy. In the Silicone group 6 patients (30%) underwent a Yag-capsulotomy. (2 anterior - 4 posterior) (p=0.04)

Acrylic IOL's were associated with a significantly reduced incidence rate of Yag-capsulotomy compared with silicone IOL's after 1 1/2 years.

tients (30%) du groupe silicone (2 capsulotomies antérieures et 4 capsulotomies postérieures) (p=0.04) L' incidence de capsulotomies au laser YAG est réduite de manière significative dans le groupe de lentille intraoculaire en acrylique comparée au groupe de lentille en silicone après 1 1/2 an.

KEY WORDS

Anterior Capsulotomy / Posterior Capsulotomy / Acrylic IOL / Silicone IOL

MOTS CLÉS

Capsulotomie antérieure / Capsulotomie postérieure / Lentille intra-oculaire en acrylique / Lentille intra-oculaire en silicone

RÉSUMÉ

Nous avons revu les données de 40 patients qui ont subi une phacoémulsification aux 2 yeux. Une lentille intra-oculaire en acrylique de type AcrySof® a été implantée dans un oeil et une lentille en silicone de type SI 30 / SI 40® dans l' autre. Dix-huit patients avaient un suivi moyen de 1 1/2 an.

Dans le groupe Acrylique, 1 patient (5.5%) a subi une capsulotomie postérieure au laser YAG tandis que ce traitement a du être appliqué chez 6 pa-

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INTRODUCTION

Many studies examined the biocompatibility of Acrylic versus Silicone IOL's by evaluating the rate of Yag capsulotomies between two groups of patients receiving an Acrylic IOL or a Silicone IOL. ^(1,3,7)

We wanted to compare the biocompatibility of Acrylic versus Silicone IOL's by evaluating the incidence of Yag capsulotomies in the two eyes of the same patient receiving an Acrylic IOL in one eye and a Silicone IOL in the other eye.

MATERIAL AND METHODS

We reviewed the charts of 40 patients who received in one eye an Acrylic IOL (AcrySof®, Alcon) and in the other a Silicone IOL (SI 30 or SI 40®, Allergan).

All patients underwent an uneventful phacoemulsification by the same surgeon.

After retrobulbar anesthesia, a two-step corneal incision of 3.2 mm was made, using a microsurgical knife and a 3.2 mm keratome. The anterior chamber was filled with Healon®. After a circular capsulorhexis was made, the lens was hydrodissected with balanced salt solution (BSS®). Following a 1-millimeter side-port, posterior chamber phacoemulsification was performed, dissecting the nucleus into four quadrants and removing the nucleus with the phaco-tip. Residual peripheral cortex was removed with the irrigation/aspiration (I/A) handpiece. Balanced salt solution (BSS®) was the irrigating solution in all procedures. The incision was then enlarged to 3.5 mm, Healon® was injected into the capsular bag and one of the two selected IOL's (AcrySof® or SI 30 / SI 40®) was implanted. After removal of the Healon® the pupil was constricted with acetylcholine 10 % and the incision closed with a single radial stitch (nylon 10-0). All patients finally received an antibiotic ointment before the eye was patched and

shielded. Topical corticosteroids and antibiotics were administered as postoperative treatment.

A subset of 18 patients had a mean follow up of 1 1/2 year for both eyes (range 1 - 3 years).

Anterior capsulotomy was performed when the patient had anterior capsular fibrosis and was at risk for developing capsular phimosis with lens dislocation. Posterior capsulotomy was performed when it was clinically believed that such a procedure would improve vision. After the capsulotomy, visual acuity improved at least 2 lines in every patient. The two patients who underwent an anterior capsulotomy did not receive a posterior capsulotomy.

Fisher's exact test was used to compare data in a 2x2 contingency table.

RESULTS

After a mean follow-up of 1 1/2 year 1 patient underwent a posterior Yag capsulotomy in the Acrylic group. In the Silicone group 2 patients had an anterior capsulotomy and 4 patients a posterior capsulotomy. (Table 1) The incidence of capsulotomies in the Acrylic group was 5,5% and in the Silicone group 30%. Despite the small number of patients, this difference is statistically significant. (p=0.04)

DISCUSSION

These are preliminary results with a relatively short follow up. Our results might suggest however that Silicone IOL's are less biocompatible than Acrylic IOL's. This is in agreement with Hayashi et al. and Hollick et al. who also showed a higher rate of YAG capsulotomy in eyes with a Silicone IOL compared to eyes with an Acrylic IOL. ^(1,3,7) One explanation for these findings is the histological observation indicating that Acrylic adheres more to the posterior capsule than Silicone. ⁽⁶⁾ This difference seems to play a role in preventing lens epithelial cells from migrating and forming posterior capsule opacification. On the other hand Acrylic shows less adhesiveness to lens epithelial cells compared to Silicone making cell regression possible and leading to less posterior capsule opacification. ⁽²⁾ Another explanation for the lower incidence of posterior capsulotomies is the steep

Table 1: Number of Yag-capsulotomies in both groups after 1 year. (n=18)

	Acrylic	Silicone	p
Ant. capsulotomy	0	2	
Post. capsulotomy	1	4	
Total	1	6	0.04

border of the optic of the Acrylic IOL which also prevents epithelial cell migration.⁽⁵⁾

A "sandwich theory" explains posterior capsular fibrosis by a bioactivity based theory.⁽⁴⁾ If the IOL is made of a bioactive material it would allow a (single) lens epithelial cell layer to bond both to the IOL and the posterior capsule. This would produce a sandwich pattern including the IOL, the cell monolayer and the posterior capsule. The sealed sandwich structure might prevent further epithelial ingrowth and posterior capsule opacification. In theory Acrylic, a bioactive material, would prevent posterior capsule opacification better than Silicone which has a good biocompatibility but is bioinert.

In the Silicone group two patients underwent an anterior capsulotomy to prevent capsular phimosis and IOL-subluxation. The difference in bioactivity and biocompatibility between the two materials used might also explain the difference in rates of anterior Yag capsulotomies.

These results can be important considering the renewed interest for multifocal IOL's made of Silicone.

This is a preliminary study, a longer follow-up with a higher number of patients is necessary to confirm these results. This will be possible when all 40 patients will have reached a follow-up of minimum 2 years.

CONCLUSION

Acrylic IOL's were associated with a significantly reduced rate of Yag capsulotomies compared to Silicone IOL's after a follow-up of 1 1/2 year.⁽⁷⁾

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