Evaluation of postoperative corneal astigmatism change with the use of a new tissue adhesive in cataract surgery

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Introduction Background:

- Clear Corneal cataract surgery has become the standard of care worlwide for cataract management. Clear cornea incisions are becoming smaller (depending on Phacoemulsification instrumentation and IOL implantation materials, designs and techniques). There is nevertheless growing concern on how astigmatic change even with small incisions affects visual function in an era were emmetropia is the desired standard postoperatively. We have too, observed for years that although refractive astigmatic changes with clear cornea surgery are mininal, topographic and tomographic changes show significant irregular astigmatism near the incision site, This may affect visual function especially with multifical and accommodating IOLs.

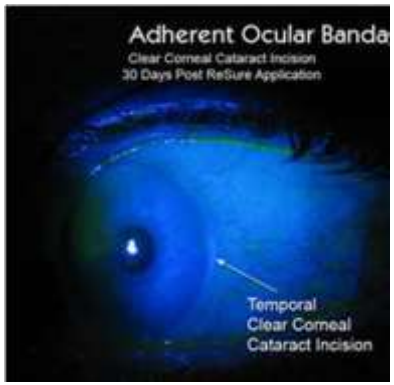
Methods/Video:

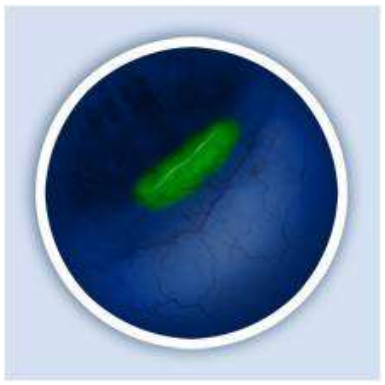
In this study we evaluated the safety and efficacy of a novel tissue adhesive in small incision phacoemulcification cataract surgery. It has been CE marked for a year in the European Union, does not have though FDA approval yet.

- One hundred fifty-five consecutive cases with a 3mm clear cornea incision were randomly assigned in two groups. In Group A, stromal hydration was used to close the wounds, and in Group B, the tissue adhesive was additionally applied. CylD was evaluated with cornea tomography a mean follow-up time of 6.5 months.

Links for on-line video technique using hydrogel bantage in different cases

1. Cataract: http://www.youtube.com/watch?v=aeuD8ZmCVAQ
2. DSAEK : http://www.youtube.com/watch?v=1ztyrSHg9O4
3. Cataract in Fuchs' combined with DSAEK: http://www.youtube.com/watch?v=MpxJciH8guc





Surgical Methods:

We used our routine clear cornea incision cataract surgery, with a 3mm incision and the implantation of a hydrophobic acrylic foldable IOL. In 25% of the cases a toric such IOL was used, this affecting the refractive post-op cylinder, but not the topographic cylinder. At the termination of the procedure the cornea incision was slightly hydrated only when not spontaneously watertight, and the tissue adhesive mixed on the operating instrument stand, and applied (painted) on the incision borders with a special spear sponge. Within seconds the material was stable and excess removed with a dry spear sponge.

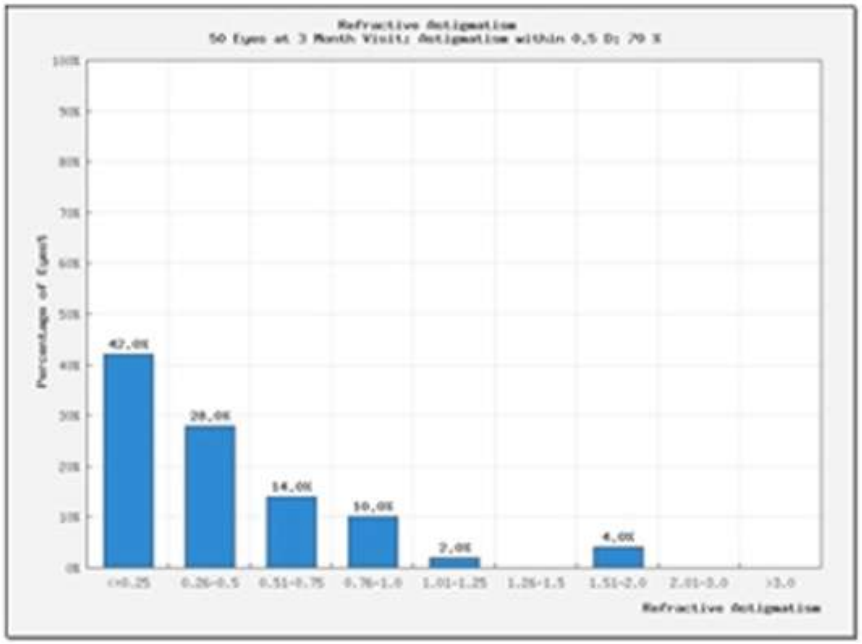
surgical video available at http://www.youtube.com/watch?v=aeuD8ZmCVAQ

Results:

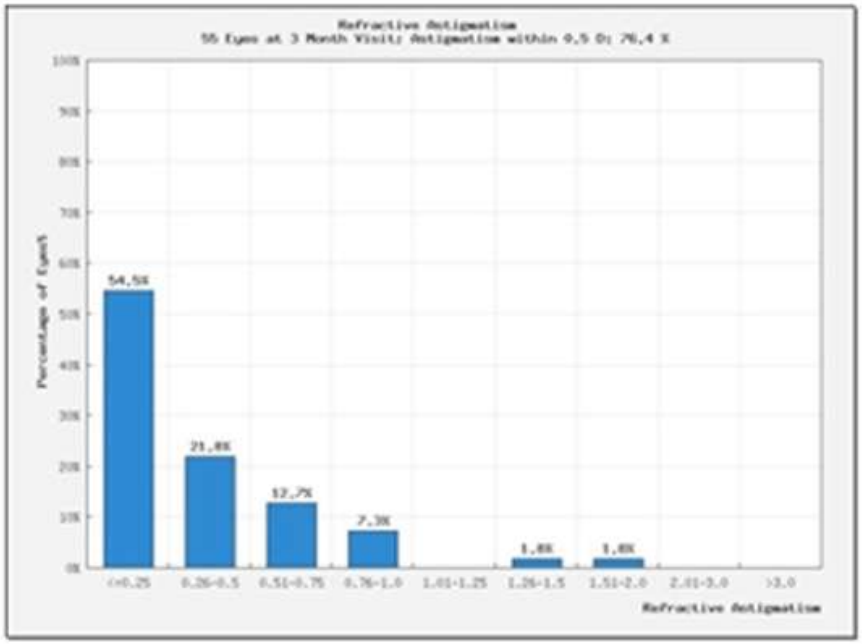
- There was a difference recorded in post-op cylinder change:
- At week one 1.2D for Group A and 0.45D for Group B, month 1: 0.8D and 0.35D respectively and at month3: 0.75D for Group A and 0.37D in Group B. All differences in cylinder were statistically significant. There were no complications observed in this small group including no IOP increase

Data: Refractive Cyl

No tissue adhesive



With tissue adhesive



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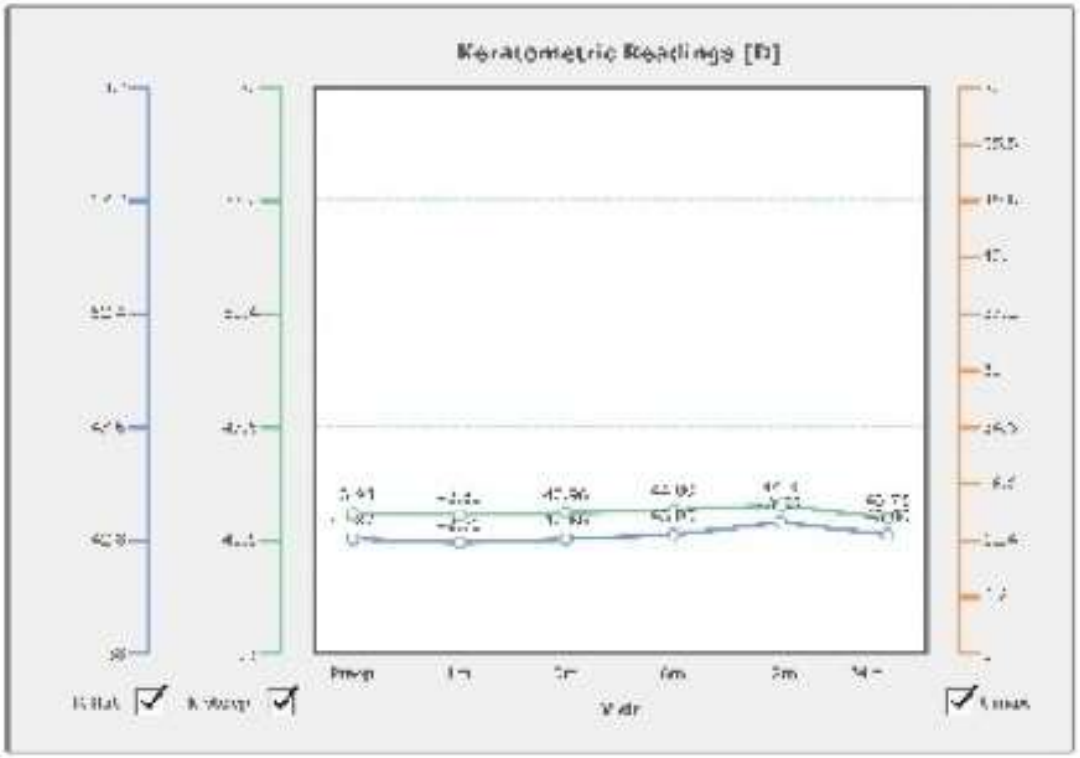
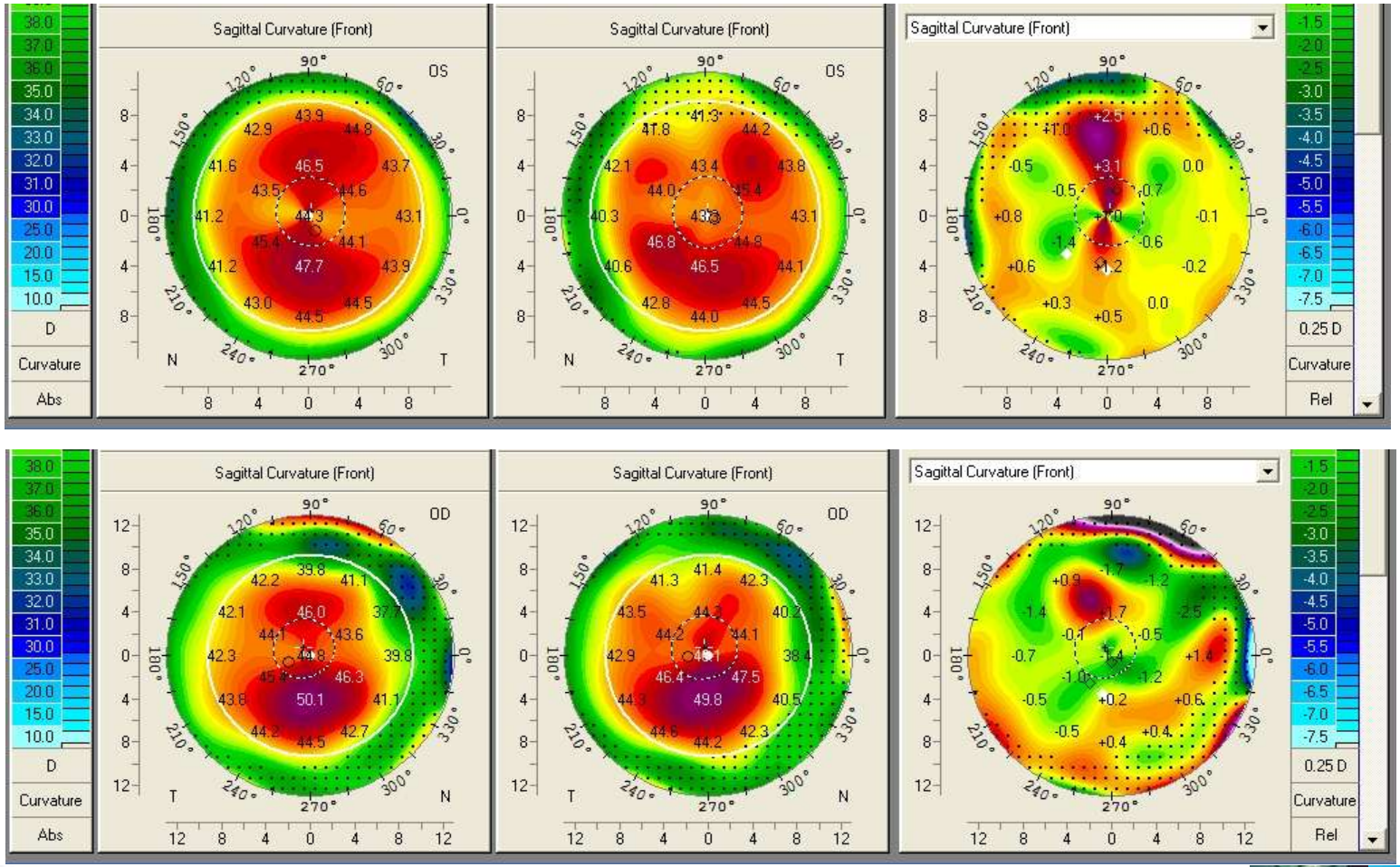
Data:Keratometry

Resure



Same patient:
Top: OS: 1 month post-op without,
Bottom: OD 1 month post-op with tissue adhesive



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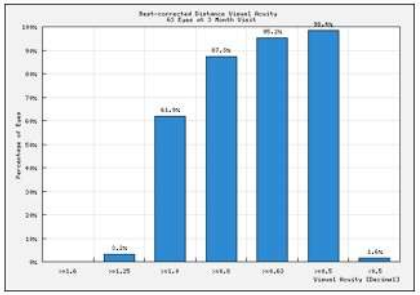
Data: BSCVA

No Resure



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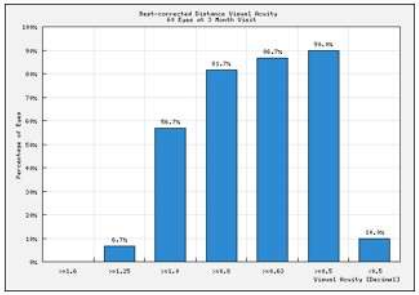
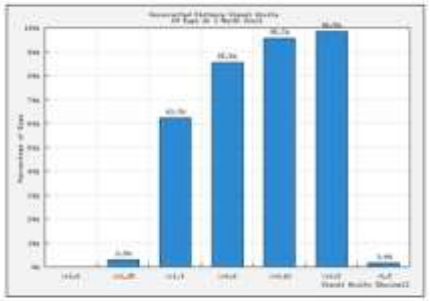


Data: UCVA

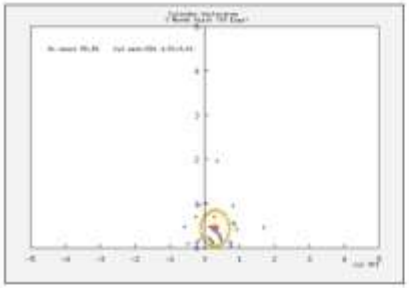
No Resure



Resure

Data: Ref Cyl Vector

No Resure



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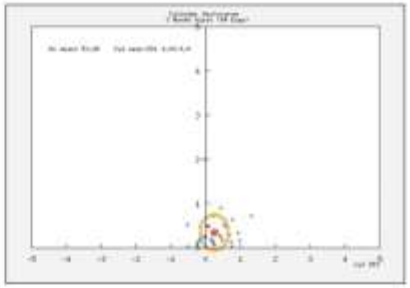
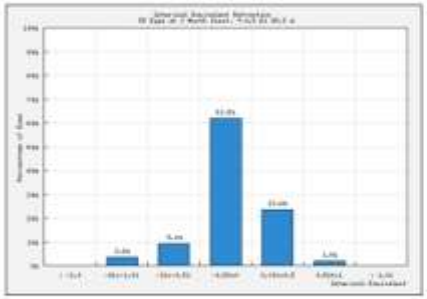


Data: Refraction

No Resure



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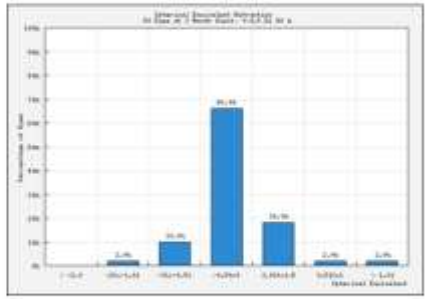

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Conclusions:

•This tissue adhesive may be a valuable adjunct in clear corneal cataract surgery in reducing astigmatic change. We were not able to justify the exact mechanism of action. We theorize that better wound closure is achieved with this adhesive, reflecting in smaller amount of cylinder induction.

•There is a potential added significant benefit with the use of this novel adhesive:

•The potential reduction of the risk of endophthalmitis due to early wound ingress.

•Although no cases of endophthalmitis were encountered in this case series, there is clear evidence that clear cornea cataract surgery carries this increased risk, due to possible wound leak and ingress, allowing surface microbes to enter the anterior chamber.

Our first sutureless DSEAK with the use of the tissue adhesive, 1 week post-op