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**Titel:** Circular Incision for the Correction of Corneal Astigmatism in Human Donor Eyes.

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**Methods:** High corneal astigmatism was induced in 24 human donor eyes by an anterior radial 7-0 silk suture across the corneascleral limbus. With a disposable razor blade vacuum trephine of 6.0, 6.5, 7.0 or 7.5 mm a 0.3 mm deep circular incision was made in 18 donor eyes. In six other donor eyes a circular incision was made with a diamond knife at 0.1, 0.2, 0.3, 0.4 and 0.5 mm depth.

**Results:** The reduction of astigmatism was highest for the 7.5 mm trephine (60%). A 0.1 mm deep incision reduced the astigmatism by 5% and a 0.5 mm, by 88%.

**Conclusion:** A circular incision reduces corneal astigmatism. A larger diameter and a deeper incision have a greater effect.

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ASSESSMENT OF REFRACTIVE SURGERY: INTEREST OF THE REFRACTIVE ERROR INDEX (REI)

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*Purpose:* Although the notions of refractive objectives and results achieved cannot be dissociated from an assessment of the methods used to treat axial and cylindrical ametropia, the large number of mandatory parameters makes it impossible to express the results in a general and informative manner. We felt, therefore, that it was useful to define two index that can be used for the purposes of such analysis.

*Methods:* The axial and toric components of ametropia are such that it can be seen as a point within a three-dimensional reference. The distance between the point and the centre of a reference defines the Refractive Error Index. After treatment, residual ametropia has a similar refractive error index. The distance between the points symbolising the two refractions is then defined as the Refractive Variation Index.

*Results:* The lower the refractive error index, the closer the patient's refraction is to emmetropia. This index is much more powerful than the spherical equivalent since there is no compensation between axis and cylinder when calculating this index.

*Conclusions:* These index seem to be particularly well-suited to the expression of results obtained during the treatment of axial and cylindrical ametropia.

## P 173

**INFLUENCE OF PREPARATION AND STORAGE ON HUMAN CORNEAL THICKNESS**

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***Purpose:*** It was the aim of this study to determine the changes in corneal thickness due to moist-chamber storage preparation and organ-culture.

***Material and Methods:*** Corneal thickness was determined by 5 measurements of the corneal center. For all measurements we used the Pach Pen XY 98 corneas were measured before enucleation of the globe, 27 after storage in a moist chamber, 6 after preparation for organ culture. Corneal thickness was determined after 28 days in organ culture medium and after subsequent incubation for one day in dextran containing medium in 10 specimens each.

***Results:*** According to the literature normal corneal thickness varies between 400 to 600 µm. We found a mean value of 709.25 µm before enucleation. After storage in a moist chamber the mean corneal thickness was 692.84 µm. After preparation for organ culture we found a mean value of 652.50 µm. During organ culture the corneal thickness increased to 1 509.70 µm. After one day in a medium containing 5 % dextran 500 the corneal thickness decreased close to the initial value.

***Conclusions:*** We can draw the conclusion that before enucleation corneas swell in comparison to in vivo measurements because of post mortem changes. Transport in a moist chamber and preparation does not have an influence on the corneal thickness. During organ culture corneas doubled their thickness but one day in medium containing dextran leads to a thinning to the initial value.

## P 174

**Ultrastructure of organ-cultured human cornea after deswelling in Exosol medium.**

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**Purpose: After organ-culture, corneal thickness increases to about 1 mm. For the need of surgery, corneas are incubated in dextran-containing medium before surgery, which decreases corneal thickness to about its normal value. The aim of the study was to evaluate the ultrastructure of organ-cultured human corneas after deswelling in dextran-containing Exosol$^R$ medium (Opsia, Toulouse Labège, France).**
**Methods: Human corneas were organ-cultured in Inosol$^R$ (Opsia) medium at 31°C for two weeks as previously described (Borderie et al, Cornea, 1995, 14, 300). They were then incubated in Exosol$^R$ medium at room temperature for two days. Exosol$^R$ medium differs from Inosol$^R$ medium only by addition of dextran T500 (4%). Transmission electron microscopy was performed at the end of preservation in dextran-containing medium.**
**Results: Endothelial cells were 3-5 µm thick with sinuous lateral plasma membrane and showed some vacuoles. Vacuoles were less numerous than after organ-culture and often contained dextran. Most mitochondria were normal. Stromal keratocytes were 0.5-3 µm thick with normal plasma membrane and light vacuoles. Sloughing of the external and medium epithelial cell layers was observed. The remaining eptithelial cells displayed a flat appearence and showed dextran-containing vacuoles. Normal endoplasmic reticula and nuclei were found in all cornea cells.**
**Conclusion: These results indicate that Exosol$^R$ medium induces moderate preservation injuries.**