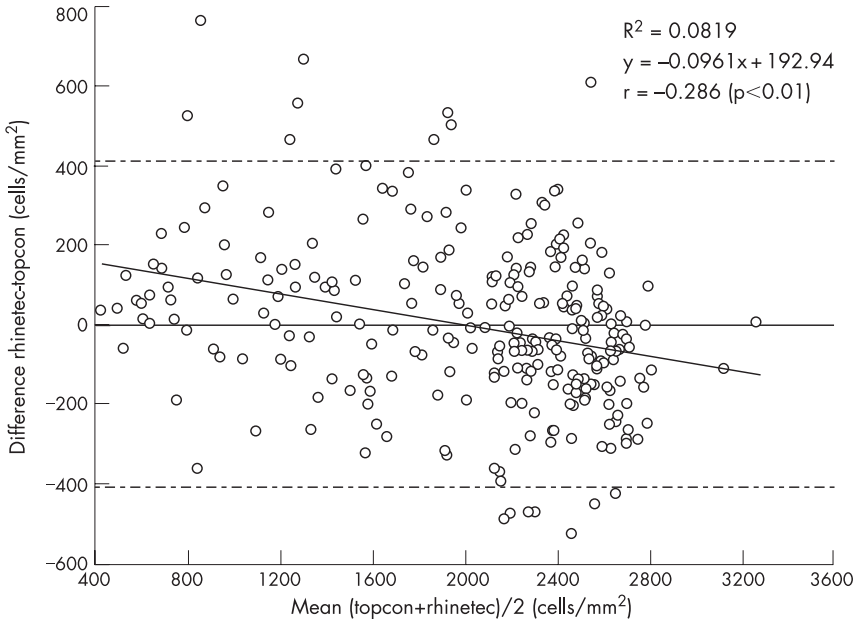

Figure 2 Difference against mean graph showing the agreement between the endothelial cell densities (ECDs) obtained with the Topcon and Rhine-Tec touched-up modes. The solid horizontal line indicated the mean difference between Rhine-Tec and Topcon (2 cells/mm^2). The agreement was considered acceptable, with 95% limits of agreement set between −412 and +408 cells/mm^2 (dashed lines). The feeble slope of the linear regression line (bold) showed that the drift in counting (low to high) according to the ECD was reduced compared with figure 1.

of low ECDs and underestimation of high ones ($p<0.001$) was observed with the Rhine-Tec automated mode, with maximal effects of this drift visible for low (<1800) and high (>2500 cells/mm^2) ECDs. Correlation between the either touched-up modes was good ($y = 0.82x+377$, $r = 0.93$ $p<0.001$) and agreement was far better with a mean difference of 2 cells/mm^2 95% CI (−27 to 23) and narrower bounds of agreements (fig 2). Although the tendency to overestimate low and underestimate high ECDs persisted, it was significantly lower. Mean (SD) percentage hexagonality (calculated in touched-up modes) was 58 (12) (range 14–100, median 59) and 41 (8) range 14–69, median 41) for Topcon and Rhine-Tec, respectively ($p<0.001$).

Comments

Both non-contact specular microscopes assess ECD on small cell samples. As observed with Topcon,[1 2 4] the Rhine-Tec automated mode is also not reliable. However, after manual corrections, Rhine-Tec shows an acceptable agreement with Topcon. Regarding the two bounds of agreement on this sample size, a consistent individual variation remains. The reliability of hexagonality assessment using Topcon was already dealt with.[1] The difference observed with Rhine-Tec remains unexplained and is probably linked to a different image analysis algorithm (proprietary data not available). Information regarding the coefficient of variation of the cell area would be helpful to further evaluate this device.

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Comparison of IOP measurement using GAT and DCT in patients with penetrating keratoplasties

Recent studies evaluating intraocular pressure (IOP) measurements by dynamic contour tonometry (DCT) have shown that they are more comparable to true manometric IOP than Goldmann applanation tonometry (GAT),[1] and less affected by changes in naturally occurring central corneal thickness (CCT)[2 3] as well as surgically induced thinning of the cornea following laser in situ keratomileusis.[4] Following penetrating keratoplasty, further errors in the measurement of IOP by GAT may also occur due to irregular astigmatism, and technical difficulties in aligning distorted mires on the tonometer head.

Study

We prospectively studied 10 patients with unilateral keratoplasty to detect a significant difference between the measurement of IOP by GAT and by DCT. Contralateral eyes served as paired controls. six horizontal and six vertical GAT readings were averaged for each study eye and each control eye. Six DCT readings were also taken. Keratometry and corneal topography was performed by the Baush & Lomb Orbscan IIz, and CCT was measured ultrasonically with the Tomey Corporation Pachymeter SP-3000.

Demographic data of the study population are summarised in table 1.

IOP measurement in both grafts and controls were found to be significantly higher using DCT than GAT ($p = 0.004$ and $p<0.001$ respectively). The mean difference in IOP measured by DCT against GAT was +2.67 mm Hg (95% C.I. 0.86–4.47) in grafted eyes, compared to a mean difference of +3.26 mm Hg (95% C.I. 2.16–4.35) in controls. An underreading of true IOP by GAT has also been shown against manometry in cadaver eyes,[1] as well as in vivo.[5]

In grafted eyes, there appeared to be no correlation between CCT and DCT-GAT difference (Pearson's correlation coefficient −0.202, $p = 0.122$), but in controls there was a significant correlation (Pearson's correlation coefficient −0.262, $p = 0.043$). The effect of CCT on IOP measurement by GAT in 56 post-keratoplasty eyes has been previously studied, and again no statistically significant relationship was found.[6] This unexpected finding could possibly be explained by the alteration in biomechanical forces following keratoplasty such as compliance forces present in the host eye, as well as variable graft-host interface mechanics.

In grafted eyes, there was a significant correlation between amount of astigmatism and DCT-GAT difference (Pearson's correlation coefficient −0.398, $p = 0.002$), but not in controls (Pearson's correlation coefficient 0.142, $p = 0.278$). Corneal curvature has previously been shown to have no significant effect on DCT or GAT measurements in non-PK eyes.[7] The correlation found in keratoplasty

Table 1 Demographic data of study population

Data	Mean	SD	Range
Graft Eye (Control) (number)	10 (10)		
Age (years)	63.14	23.48	19–84
Male gender (number)	3		
Time after PK (months)	46.9	89.99	16–276
Size of graft (mm)	8.00	0.13	7.75–8.25
CCT (Control) (microns)	525 (557)	101 (122)	473–804 (432–870)
Astig (Control) (Dioptres)	4.38 (2.39)	2.33 (2.97)	1.80–10.30 (0.20–9.60)
GAT (Control) (mm Hg)	11.71 (11.51)	4.95 (2.06)	4.0–21.5 (9.0–16.5)
DCT (Control) (mm Hg)	13.92 (14.67)	5.26 (3.02)	8.0–27.9 (7.0–20.1)

eyes in this study may possibly be explained by the fact that these eyes had higher degrees of astigmatism than the control eyes (means = 4.38D vs 2.33D).

Comment

Previous studies have assessed other tonometers (Tono-pen, Pro-Ton and ocular blood flow tonometer) in the measurement of IOP following keratoplasty,[8–10] but none have shown an advantage over GAT. This study suggests that DCT may be closer to providing the true IOP in these eyes, and may allow it to challenge GAT as the new gold standard in IOP measurement in this setting.

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Presumed ocular tuberculosis presenting as a branch retinal vein occlusion in the absence of retinal vasculitis or uveitis

A 38-year-old Hispanic man presented with painless decreased vision in his right eye for 7 days. He had had no light perception with his left eye for 7 years, for which he was unable to provide a history. Visual acuity was 20/70 in the right eye (OD) and no light perception in the left eye (OS), with normal pressures in both eyes (OU). Slit-lamp examination showed an unremarkable OD, but disclosed a glaucoma-implant tube in a formed anterior chamber in the left eye, with posterior synechiae of the iris and a white cataract. Ophthalmoscopy of the right eye showed a superotemporal branch retinal vein occlusion with an associated serous retinal detachment involving the macula, without vitreous cell. The optic nerve and the remaining vessels and periphery were unremarkable. There was no view to the fundus in the left eye.

Echography of the right eye did not show choroidal thickening, and in the left eye, revealed a funnel retinal detachment. Fluorescein angiogram of the right eye showed blockage corresponding to areas of haemorrhage and exudation and late leakage, with no evidence of vasculitis.

Serological and medical examination showed no evidence of diabetes mellitus, systemic hypertension, sarcoidosis or toxoplasma, toxocara, HIV or syphilis infection. Chest *x* ray was normal, but the purified protein derivative test for tuberculosis was positive at 10 mm of induration. *Bartonella henselae* titres were equivocal at 1:128 IgG, IgM negative, a level at which 13% of uninfected individuals can have titres.[1] At this point, the patient refused an anterior chamber

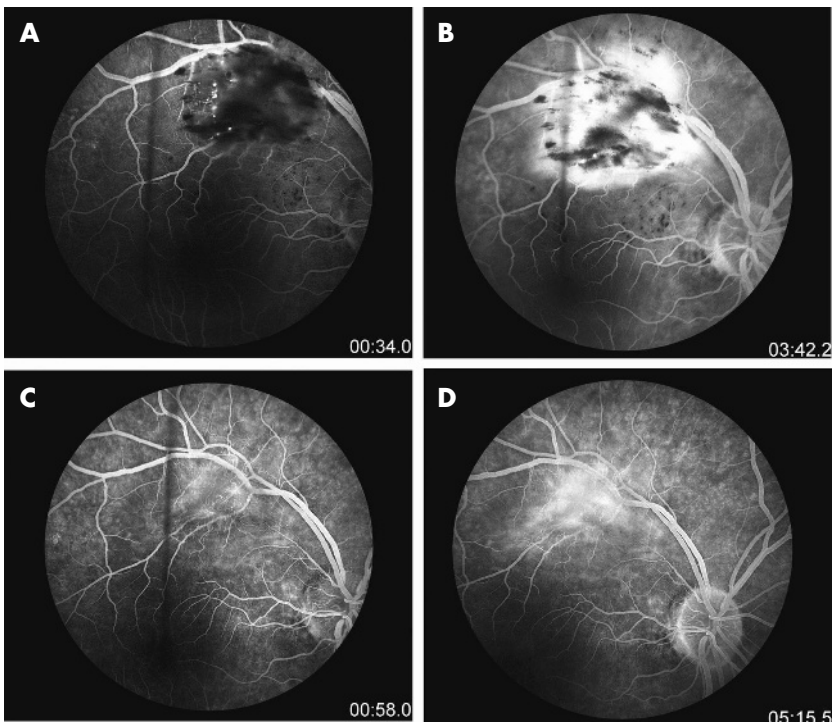

Figure 1 (A,B) Early and late phase fluorescein angiograms (FA) of the right eye before treatment. Note the lack of staining of vessel walls and diffuse leakage only on late FA. (C,D) Early and late phase FA after 4 weeks of isoniazid treatment. No staining of vessel walls is observed. Mild diffuse late leakage is still present.