Viscodissection technique may speed visual recovery after LASEK

Roibeard O'hEineachain in Barcelona

Magda Rau

AN innovative viscodissection technique for lifting the epithelial flap in LASEK procedures can accelerate postoperative visual recovery and may also improve long-term visual outcomes, according to Magda Rau MD who presented her findings at the 8th ESCRS Winter Refractive Surgery Meeting.

The technique was first developed by Drs Richard C. Rashid and David Lagerman in the US and involves injection of viscoelastic material beneath an epithelial flap to separate it from the Bowman's membrane, said Dr Rau.

"The epithelial flap created in this way is very elastic and more stable. It also slides more easily off the surface of the cornea and leaves an extremely smooth surface for the laser ablation, without epithelial islands and without dents from the instruments," she added.

Dr Rau's study involved 40 eyes of 25 patients with -2.0D to –11.0 D of myopia who underwent LASEK with the Wavelight Allegretto laser using either conventional flap lifting technique or the viscodissection method.

Visual recovery was better in the viscodissection group at every follow-up visit during the first six post-operative months, Dr Rau noted. The mean UCVA after the first day, first week and six months postoperative was 0.67, 0.82, and 0.96, respectively, in the viscodissection group, compared to 0.4, 0.67, and 0.82, respectively, in the conventional LASEK group.

On the first postoperative day, all of those in the viscodissection group achieved a UCVA of 20/40 or better and 60% achieved a UCVA of 20/32 or better. By comparison, only 50% of those in the conventional LASEK group achieved 20/40 on the first postoperative day and only 5.0% achieved 20/32.

After the first postoperative week, all eyes in the viscodissection group had a UCVA of 20/32 or better compared to only 65% in the conventional LASEK group. Moreover, 60% in the viscodissection group had a first-week postoperative UCVA of 20/20 or better, compared to only 30% in the conventional LASEK group.

At six months follow-up, similar proportions achieved a UCVA of 20/20 or better in the viscodissection group (55%) and the conventional LASEK group (45%), although 20% in the viscodissection group achieved a UCVA of 20/16 or better, compared to only 5.0% in the conventional LASEK group.

All eyes achieved a postoperative visual acuity of 20/32 or better at six months except for one eye in the conventional treatment group which achieved a UCVA of 20/40.

The viscodissection technique also appeared to have some advantages as regards long-term BCVA, Dr Rau noted. At six months follow-up, none of the eyes in the viscodissection group lost lines of BCVA while 15% gained at least one line and 15% gained two lines.

By comparison, after the same follow-up in the conventional LASEK group one eye lost one line of BCVA, while 15% gained one or more lines and 10% gained two lines.

The patients in the study included 19 women and six men with a mean age of 33 years. Those undergoing conventional LASEK had a mean preoperative refraction of -5.5 D (range: -2 D to -9 D) and underwent surgery July 1999 to November 2000. Those undergoing LASEK with the viscodissection technique had a mean preoperative refraction of -6.25 D (range: -2.0 D to -11.0 D) and underwent surgery from August 2002 to February 2003.

In both treatment groups Dr Rau used ethanol placed in a special micro-trephine, with a 70 micron depth calibrated blade to loosen the epithelium. The trephine is designed to leave a hinge at the 12 o-clock position. After instilling the 20% ethanol solution inside the trephine for 35 seconds the area is then dried and thoroughly washed with water and dried again.

In eyes undergoing conventional LASEK Dr Rau used a spatula to lift the flap. In those undergoing the viscodissection technique she first lifted the pre-cut margin and then elevated the corneal epithelium using Laservis® (0.25% sodium hyaluronate, TRB Chemedica AG, Haar/München, Germany)".). This was injected using a syringe with a specially modified LASEK cannula. The needle was designed by Dr Rau and has one central hole and two lateral holes at the tip.

"Flap creation using the viscodissection technique is gentler, and the flap is more easily lifted and is re-positioned with greater stability. The high transparency of the flap is the cause for the faster optical recovery in comparison to the classic method."

After the repositioning the flap using a specially modified spatula, Dr Rau applies a soft contact lens for three to four days during which time patients receive topical antibiotics and cortisone. Both the spatula and cannula are commercially available from Geuder AG, she said.

Dr Rau noted that the viscodissection technique did not appear to reduce the amount of postoperative discomfort patients experienced. That is, 15% of the viscodissection group complained about strong pain, compared to only 5% of the conventional LASEK group.

The difference in pain reported by the two groups may have been due to higher proportion in the viscodissection group undergoing bilateral procedures (nine of 11 patients) compared to the conventional LASEK group (three of 14 patients), Dr Rau speculated.

Dr Rau noted that so far she hasn't observed any haze in any eyes of either group. She suggested furthermore that in light of her findings the indications for LASEK could be expanded to include patients with up to -9.0 D of myopia.

"The small number of our patients makes it difficult to draw conclusions on haze, but epithelial protection should considerably reduce the risk of necrosis of underlying cells, which is the main cause of the problem," she added.

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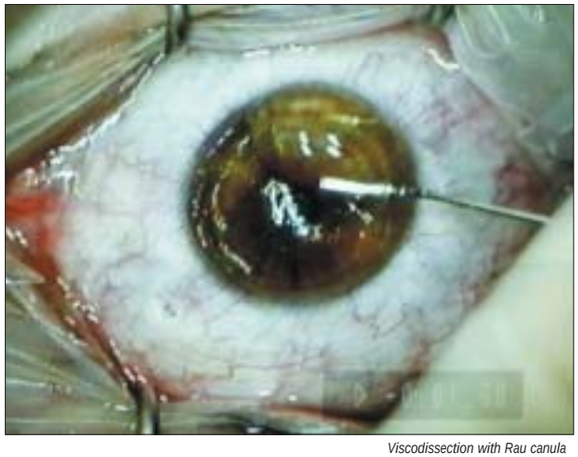
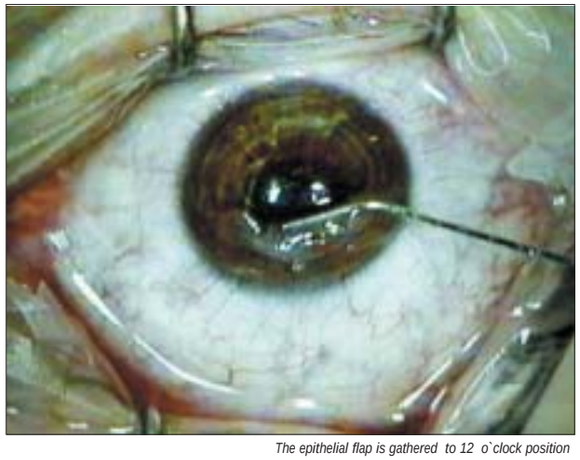
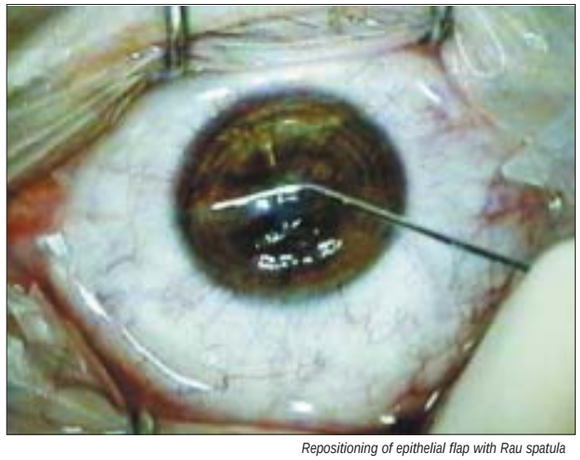


Viscodissection with Rau canula



The epithelial flap is gathered to 12 o`clock position



Repositioning of epithelial flap with Rau spatula

Courtesy Magda Rau MD