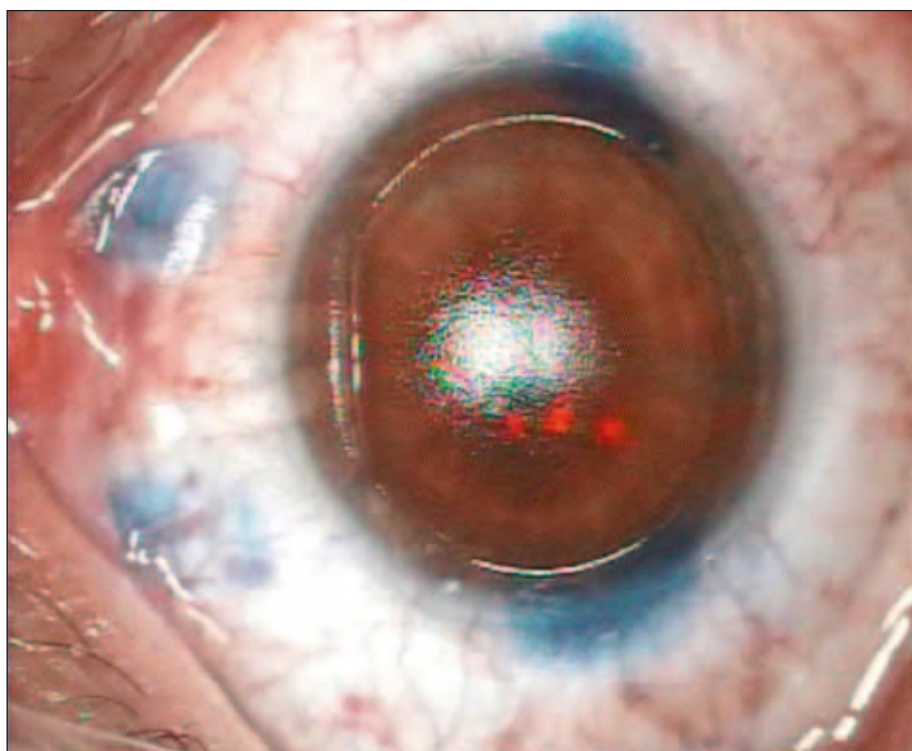


# REFRACTIVE LASER

## LASIK SURGERY

Clear advantages in using the mechanical microkeratome compared to the femtosecond laser

by Dermot McGrath in Paris



Corneal bed in LASIK procedure with Femto LDV with rough appearance on the place of tissue bridges

Using a mechanical microkeratome offers surgeons a safe and efficient means of flap creation in LASIK procedures and produces residual stromal beds of excellent smoothness and quality that compare favourably with those created by femtosecond laser, according to Maja Bohac MD.

“Our comparative study showed that the One Use-Plus SBK (Moria SA) is simple, easy to use, safe and effective. The flaps created by this microkeratome are highly predictable and consistent in terms of thickness, shape and size and produce high-quality stromal beds,” she told delegates attending the XXVIII Congress of the ESCRS.

The One Use-Plus SBK is a fully automated microkeratome with two independent motors, one for blade oscillation at 15,000 rpm and one for blade advancement with a faster or slower forward speed. The heads and plastic rings are single patient-use, greatly reducing sterilisation requirements and routine wear and tear.

Dr Bohac presented the results of a prospective study of 60 LASIK patients comparing flap thickness, flap and stromal bed quality, visual and refractive outcomes and patient satisfaction using either the One Use-Plus SBK mechanical microkeratome or Ziemer Femto LDV laser (Ziemer Ophthalmic Systems AG).

“Both methods produced excellent results in myopic cases. The One Use-Plus SBK showed slightly better results in flap and stromal bed quality, provided easier handling and showed less patient discomfort during the surgery,” said Dr Bohac, Svjetlost Eye Clinic, Zagreb, Croatia.

The femtosecond laser, however, delivered better results in hyperopic cases due to the wider corneal bed and an ablation zone independent of K values, she added.

Looking at the results in more detail, Dr Bohac said that mean flap thickness for One Use-Plus SBK was 93  $\mu\text{m}$  ( $\pm 11\mu\text{m}$ ) and 95  $\mu\text{m}$  ( $\pm 5\mu\text{m}$ ) for femtosecond laser, and all flaps were aligned perfectly to the corneal bed.

All three surgeons involved in the study agreed that the quality of the flaps and stromal beds were marginally better in the traditional microkeratome group compared to those in the femtosecond laser group.

“When looking at the stromal beds of One Use-Plus at high magnification under the microscope one can see a surface of even smoothness with no interruptions caused by tissue bridges,” Dr Bohac told *EuroTimes*. “However, while looking at the stromal beds of the femtosecond laser, which were also of good quality and smoothness, it was possible to see a difference in areas where tissue bridges were situated,” she said.

She added that the microkeratome-created flaps were much easier to lift and manipulate compared to those created by femtosecond laser.

“Unfortunately we could not do scanning electron microscopy so we cannot give any real scientific proof except our impression and final results,” she said.

No serious intraoperative or postoperative complications were reported in either group, said Dr Bohac, although she noted that patient discomfort was greater in the femtosecond laser group.

“Much of the discomfort during LASIK surgery with the Femto LDV is related to the system’s large handpiece which is placed above the patient’s eye but is also aligned on the nose and almost half of the cheek. Since alignment of the handpiece and the actual flap creation takes about one minute, the patient experiences slight to moderate pressure on the eye and around the eye during that time. The handpiece is also placed under the excimer laser construction so some patients claim to feel somewhat claustrophobic and anxious during that time,” she said.

Another issue with the femtosecond laser is the longer ‘blackout phenomenon’ experienced by the patient, said Dr Bohac.

“The term blackout phenomenon refers to the length of time needed for flap creation after vacuum is applied on the eye to achieve proper suction. The suction for flap creation with the Femto LDV takes about 15-18 seconds depending on the parameters, but the process of aligning the laser handpiece on the patient’s eye takes about 35-40 seconds. During the entire period of about one minute, patients cannot see the lights from the excimer laser, which



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Maja Bohac MD

makes them nervous, and then there is complete darkness as the vacuum is applied, which adds to their anxiety. The difference between mechanical microkeratome and femtosecond laser is quite significant since the whole process of aligning the One Use-Plus and flap creation takes only about 10-15 seconds,” she said.

In terms of maintaining work flow in a busy practice, Dr Bohac said that there is a clear advantage in using the mechanical microkeratome compared to the femtosecond laser.

“Looking at the whole process, including preparation of the operating room for each patient and the operation itself, we need almost half an hour for each patient when using LDV compared to about 15 minutes with the One Use-Plus. It is much more complicated to preassemble the Femto LDV for each patient than to put the new blade onto the mechanical microkeratome. We also need more time to align the laser handpiece onto the patient’s eye and more time is also lost for flap lifting. For routine surgery with One Use-Plus SBK we typically need about 8.5 to 10 minutes for both eyes, while with LDV we have not managed to perform surgery in less than 15 minutes,” she said.

While the concept of ‘all-laser LASIK’ is definitely appealing to some patients, the higher cost of femtosecond treatment must also be taken on board, noted Dr Bohac.

“We are currently performing about 20 per cent of femtosecond laser surgeries compared to 80 per cent with mechanical microkeratomes. The cost is an issue but the primary concern of most patients is to obtain a good result and a safe procedure,” she concluded.