

Investigators recommend the 140 micron head when using the Amadeus microkeratome

Stefanie Petrou-Binder MD
in Berlin

CHOOSING the thinner 140 micron Amadeus microkeratome for primary LASIK yields improved visual results, according to a study presented at the 103rd annual conference of the German Ophthalmology Society (DOG).

D Langner MD presented data from a trial involving 62 eyes of 31 patients with myopia or myopic astigmatism that underwent LASIK with an ESIRIS excimer laser (Schwind) and Amadeus microkeratome (AMO/VISX) with either a 140 or 160 micron microkeratome head.

"The consensus is that in order to prevent corneal keratectasia after LASIK, surgeons must allow a minimum residual corneal tissue bed of greater than 250 microns, as well as a recommended primary corneal thickness of greater than 500 microns. Our results show a trend of advantages in favour of the 140 micron plate thickness, in terms of efficiency and refractive outcome," Dr Langner reported.

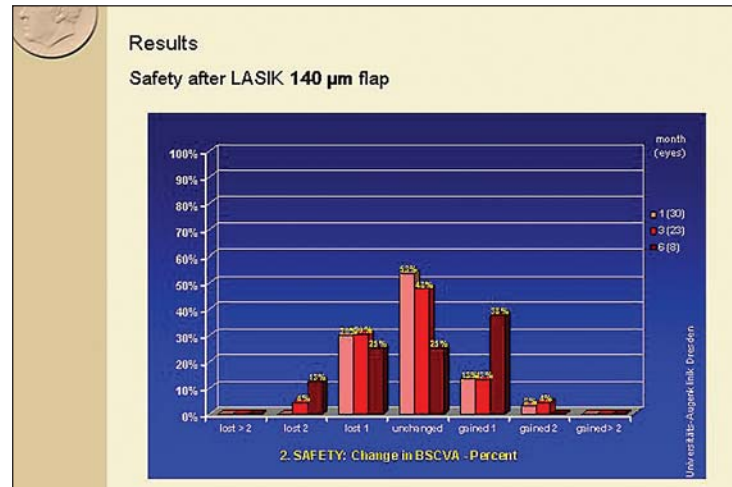
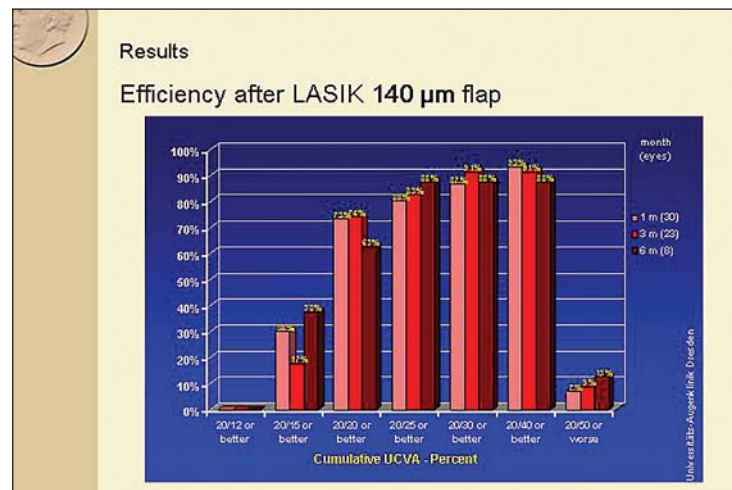
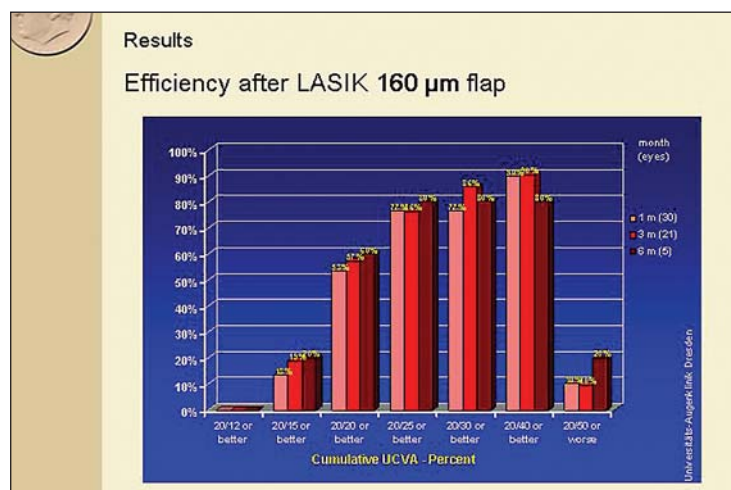
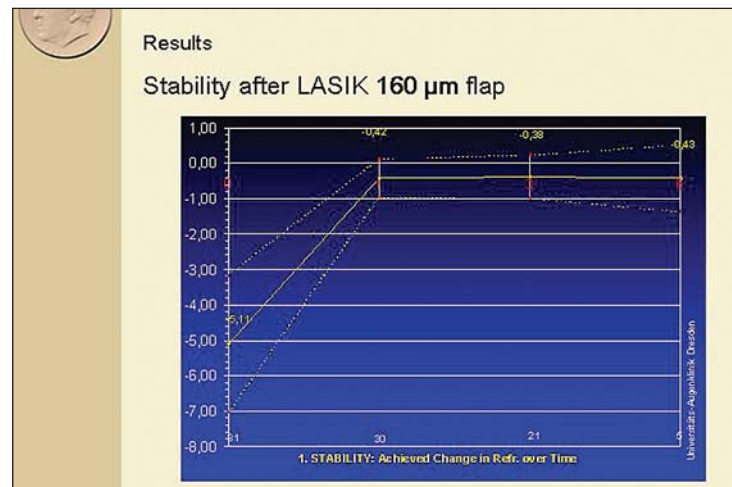
The trial compared the functional and refractive outcome of LASIK surgery with the Esiris laser using a 140 micron Amadeus microkeratome plate on one eye and a standard Amadeus 160 micron plate on the fellow eye. The mean patient age was 31 years, ranging from 18 to 43 years. The same surgeon performed all surgeries. There was a three day interval between the surgeries performed on the first and second eye.

The mean preoperative spherical equivalent was -5.29 D and -5.11 D for eyes in the 140 micron and the 160 micron plate thickness groups, respectively. The average preoperative sphere was -4.95 D and -4.73 D respectively, with an average preoperative cylinder of -0.67 D and -0.75 D.

Higher refractive accuracy with thinner flap

Postoperatively, the mean spherical equivalent was -0.35 D in the 160 micron group, the average sphere was -0.28 D and the average cylinder was -0.15 D. By contrast, somewhat better results were achieved in the 140 micron group, with an average postoperative spherical equivalent of -0.22 D, average sphere of -0.19 D, and an average cylinder of -0.06 D.

Dr Langner noted that both groups achieved good stability, described as the achieved change in refraction over time. She



observed a slight undercorrection of -0.41 D when using the 140 micron microkeratome head and a similar undercorrection of -0.43 D in the eyes when using the larger 160 micron microkeratome head.

Compared to the preoperative values, best-corrected Snellen visual acuity in the 140 micron group remained unchanged in 48%, improved by one line in 13%, and improved by two lines in three percent. Eyes in the 160 micron group remained unchanged in 57%, 14% gained one line, and four percent gained two lines.

Better uncorrected visual acuity

However, the overall efficacy was higher in the 140 micron group. Some 74% of eyes treated with 140 micron keratome achieved uncorrected visual acuity of 20/20 or better, compared with 57% of eyes treated with the 160 micron keratome. The investigators observed no intra- or postoperative complications.

Dr Langner noted that in terms of the overall refractive outcome, 96% of the eyes were within the "happiness zone", that is, within 1.0 dioptre of the intended

correction. Some 83% of eyes treated with the 140 micron plate and 71% of eyes treated with the 160 micron plate were within 0.5 D of the intended correction.

She explained that surgeons have to account for intra-individual fluctuations in primary corneal thickness of between 470 – 630 microns. She said that a myopic correction of 1.0 D was the equivalent of removing 15.0 micron of stroma. She cited a recent study by Solomon et al. indicating that the 160 micron head of the Amadeus microkeratome would render a

mean flap thickness of 180 micron ± SD 35 micron.

Dr Langner recommended, therefore, that surgeons using the Amadeus microkeratome employ a 140 micron head for primary LASIK in order to have the advantage of higher safety. The higher remaining stromal thickness reduces the risk of iatrogenic keratectasia as well as leaving open the option of a possible repeat LASIK.