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REFRACTIVE

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Comparison Of Residual Refractive Error And Myopic Regression After Small-Incision Lenticule Extraction (Smile) And Femtosecond Laser-Assisted In Situ Keratomileusis (Fs-Lasik): A Retrospective Cohort Study In Taiwan

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Purpose: To compare the residual refractive error one month after operation and the degree of myopic regression over 12 months post-operation between small-incision lenticule extraction (SMILE) and femtosecond laser-assisted in situ keratomileusis (FS-LASIK) in Taiwan.

Setting: retrospective cohort study

Methods: Patients with manifest sphere refraction of -1.00 to -12.00 D myopia in Taiwan were recruited. Total of 530 eyes of 530 patients who received FS-LASIK(mean age of 32.4 ± 7.8 ; mean manifest refraction spherical equivalent (SE) of -7.47 ± 2.67 D) and 530 eyes of 530 patients who received SMILE(mean age of 32.0 ± 7.3 ; mean manifest refraction SE of -7.46 ± 2.29 D) were matched 1:1 based on age and refraction. The refractive outcomes at post-operation one, 3, 6, 9, and 12 months were recorded. The degree of myopic regression was defined as the difference of myopia degree between post-operation one and other months. Predictors affecting residual refractive error and myopic regression were estimated with a Cox proportional hazard (Cox PH) model.

Results: At post-operation one month, the residual refractive error was greater in the SMILE group than in the FS-LASIK group(-0.77 D vs -0.405 D, $p < 0.0001$). The degree of myopic regression was similar between the SMILE group and the FS-LASIK group at post-operation 3 months(increased -0.123 D vs increased -0.126 D, $p = 0.23$) and 6 months(increased -0.176 D vs increased -0.167 D, $p = 0.31$). But it was less in the SMILE group than in the FS-LASIK group at post-operation 9 months(increased -0.191 D vs increased -0.298 D, $p = 0.039$), and 12 months(increased -0.043 D vs increased -0.215 D, $p = 0.004$). Multivariate analysis of the Cox PH model revealed that preoperative manifest SE($P = 0.0008$) and flap diameter($P = 0.012$) were also predictors of myopic regression.

Conclusions: At post-operation one month, the residual refractive error was greater in the SMILE group than in the FS-LASIK group. The degree of myopic regression was similar in both groups from post-operation 3 month to 6 months, but was less in the SMILE group than in the FS-LASIK group from post-operation 9 month to 12 months. Manifest SE and flap diameter were also predictors of myopic regression.