

Myopia, Treatment Through Lasik and Smile

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Key Points

- Myopia, mostly common disorder
- Factors that can be the cause
- Inconvenience with glasses
- Treatment through Lasik and SMILE

Myopia has been a major global health problem, especially in children under 12 years of age. Genetic and environmental factors that contribute to refractive error are being studied. A large number of people are needed for the research, which may will involve genetic and environmental interactions.

For the assessment of refractive status we need time and also require the costly equipment .It is not easy to categories the glasses for individuals having mild refractive error and also people without glasses are not easy to diagnose .People usually hesitate in having a quality checkup of their sight because of less visual needs. Mild error in refractive index is not usually detected. Early onset of myopia should be detected, as it can lead to be severe problem of sight as one grows old.¹

Glasses with appropriate lenses can correct nearsightedness. Glasses not only just correct but also induce optic distortion. This has caused inconvenience for the people to use glasses. Errors and dissatisfaction of the patients has caused the ophthalmologists' professionals to detect the errors and to improve and reduce errors. Thus, using glasses proves much inconvenient for a person.²

It has been studied that if one spends more time outdoor, it reduces the risk of myopia .Nowadays; children are spending more time indoor so the ratio of myopia has drastically increased in present generation. Other than contact lenses and glasses several other treatments are used to for the

treatment. The treatments make a person get rid of spectacles, and a refractive surgery is in use nowadays.

To correct myopic astigmatism different procedures are being used. Photorefractive keratectomy, laser-assisted in situ keratomileusis (LASIK), and the most recent small-incision lenticular extraction (SMILE) are being used to correct myopia.

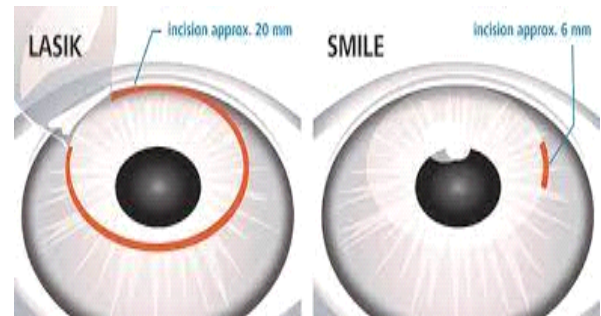


Figure 1: Comparison of LASIK and SMILE²

The procedure of both LASIK and SMILE are similar. A part of the cornea of eye is removed first. This makes a flatter corneal curvature, the corneal thickness lessens, and as a result refractive power of cornea lowers.

LASIK corrects myopia up to -8.00 D and astigmatism up to 5.00 D. A microkeratome or femtosecond laser is used to create a corneal flap. The hinged flap is lifted and folds, then using an excimer laser, abrasions on the central part of the exposed stromal bed are produced. Repositioning of flap is done. Physiologic

salt solution is then used for irrigation. It is claimed that flap based LASIK surgery reduces biomechanical properties of cornea.

A less manipulating technique has been developed. In this procedure, a stromal lenticule is produced and femtosecond laser is used. The lenticule is extracted from stroma by using small incision.

Both LASIK and SMILE are found to be safe and efficient and provide surgical correction. When corneal volume and thickness after both surgeries was compared and 104 eyes of 52 patients were matched, on the basis of refractive error, either they were treated with LASIK or SMILE. There was no significant difference when 3-12 months values were compared after operation. The flapless SMILE procedure was resulting a greater loss of corneal volume and central corneal thickness than LASIK. However, none of these studies compares corneal thickness and corneal volume between LASIK and SMILE.

The flap thickness differ, in LASIK thickness is 110 micrometer and SMILE cap thickness is 120 micrometer. Generally, with SMILE, the excess tissue is removed from deeper corneal stroma. For LASIK if flap thickness is increased it will cause the cornea to be less stable, this will intensify wound healing process at the margins and stromal bed thickness will reduce. In this the cap and flap thickness are not internationally set.

For study medical record of 26 patients (52 eye) with LASIK corrections and 26(52eyes) with SMILE were evaluated. Both groups had comparable refractive values. All the eyes were meeting up the following criteria: age over 18, preoperative and postoperative data, stable refraction, no corneal abnormalities and no ocular diseases, no corneal surgery before, and there were no kind of active infections.

The examination process was standardized and was done in a windowless clinical assessment room. Following instructions were given to the patients; blink eyes repeatedly, then focus and don't blink eyes while examination. It was noted that if everything is OK and there are no kind of blinking errors.

Same techniques were used for all patients, in the same group. In LASIK a corneal flap was created, with thickness of 110 micrometer and diameter 8.4 to 8.5 millimeter with the help of VisuMax femtosecond laser(Carl Zeiss Meditec, Jena, Germany).The Mel 80 excimer laser (Carl Zeiss Meditec, Jena, Germany)within a 6.5-6.75 treatment area was used, which was having iris recognition software.

In SMILE flap was not made. The patient was asked to fixate on a blinking target. On achievement of appropriate centration, the eye was fixated by using a curved suction contact glass. By using VisuMax femtosecond laser system (Carl Zeiss Meditec, Jena, Germany) a lenticule was produced. VisuMax was set at intended cap thickness of 120 micrometer and optical zone of 6.25-6.5 mm. By a small incision lenticule was grasped and removed. All of the surgeries were done no severe postoperative complications.³

Postoperatively, patients of both groups were prescribed polyamine eye-drops 4 times daily for 5 days. Artificial tear supplements were also given, starting hourly the first week and then reduced as needed.³

Reference

1. Cumberland PM, Peckham CS, Rahi JS. Capturing myopia and hypermetropia 'phenotypes' without formal refraction. *Eye*. 2008 Jul;22(7):939-43.
2. Schot WD, Brenner E, Sousa R, Smeets JB. Are people adapted to their own glasses?. *Perception*. 2012 Aug;41(8):991-3.
3. Schuh A, Kolb CM, Mayer WJ, Vounotrypidis E, Kreutzer T, Kohnen T, Priglinger S, Shajari M, Kook D. Comparison of changes in corneal volume and corneal thickness after myopia correction between LASIK and SMILE. *Plos one*. 2021 May 4;16(5):e0250700.