Laser Vision Correction 101

Eye to Eye Clinical Notes for Healthcare Providers - Vol 1.7

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The cornea is the window at the front of the eye which helps focus light rays to provide a clear visual image. The idea of correcting spectacle prescription through reshaping of the cornea was first proposed in 1949. Early efforts to manually reshape the cornea were attempted around that time, but yielded inconsistent results. Excimer lasers later revolutionized the field of ophthalmology due to their ability to precisely remove corneal tissue and the era of laser vision correction was born.

Photorefractive keratectomy (PRK) was the first widely-adopted form of laser vision correction. The first PRK procedure was performed in 1988. In this procedure, the de-epithelialized cornea is reshaped by removing surface tissue with an excimer laser. The results and safety profile are excellent, but postoperative pain and a relatively slow visual recovery are common due to the resulting abrasion of the cornea.

Laser in-situ keratomileusis (LASIK) is now the most common form of laser vision correction due to the excellent outcomes, safety, and rapid recovery. The first LASIK procedure was performed in 1990. In this procedure, a thin flap of corneal tissue is created using a femtosecond laser and this flap is lifted to allow reshaping of the inner cornea with an excimer laser. The flap is then placed back into position, which results in a shorter duration of discomfort and faster visual recovery compared to PRK. Utilizing modern lasers and treatment profiles, over 90% of treatments result in visual acuity that is 20/20 or better.

LASIK may be used to correct myopia, hyperopia, and astigmatism. Presbyopia, the age-related need for reading glasses, cannot be directly corrected with a laser. However, monovision may be utilized to reduce dependency on reading glasses. With monovision, the dominant eye is targeted for distance vision and the non-dominant eye is placed in focus at near. Using both eyes together, the individual experiences a blend of distance and near vision.

As techniques and lasers have advanced, the safety of LASIK has improved significantly. In fact, it has been suggested that the risk of significant vision loss following LASIK is approximately 10 times lower than contact lens wear[1]. While most individuals can safely undergo LASIK, some may be at a higher risk for problems. Preoperative screening evaluations are important to identify these higher risk individuals prior to surgery.

As physicians, we often focus on objective outcomes measurements, but patient satisfaction is also important. Studies have repeatedly demonstrated very high patient satisfaction with LASIK. For instance, an FDA-sponsored study found that 98% of patients were satisfied with their outcomes three months after surgery[2].

Laser vision correction has advanced significantly over the past 30 years. Modern techniques result in excellent outcomes and patient satisfaction. With proper screening, the majority of individuals can safely undergo these procedures to reduce reliance on glasses and contact lenses.

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