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VISUAL OUTCOMES AND SATISFACTION LEVEL COMPARED BETWEEN PRK AND FEMTO-LASIK: A STUDY

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Abstract

Background: Photorefractive keratectomy(PRK) and Femto-LASIK are two widely performed refractive surgical procedures to correct myopia and astigmatism. Although both are designed to improve uncorrected visual acuity and eliminate the need for glasses and contact lenses, they differ in technique, recovery process, and patient experience. Outcome comparison plays a key role in patient-specific surgery selection.

Objectives: To compare visual results and patient satisfaction at six months after PRK and Femto-LASIK in patients with myopia.

Study design: A Prospective study.

Place and Duration of study: The study was carried out in the Department of Ophthalmology, Gaju Khan Medical College, Sawabi, over one year, from January 2024 to December 2024.

Methods: This was a prospective randomized comparative study involving 100 patients undergoing either PRK or Femto-LASIK. Preoperative assessments included refraction, corneal topography, and patient expectations. At six months post-surgery, outcomes were assessed using uncorrected visual acuity (UCVA), best-corrected visual acuity (BCVA), and subjective satisfaction with the visual outcome based on a standardized questionnaire. Independent t-tests and chi-square tests were used for statistical analyses.

Results: The study involved one hundred patients (50 per group). The average age was 27.4 ± 4.2 years in the PRK group and 28.1 ± 3.9 years in the FemtoLASIK group ($p = 0.41$). At six months after surgery, the mean UCVA was better in the FemtoLASIK group ($p = 0.03$). Excellent or outstanding patient satisfaction was reported in 86 percent of FemtoLASIK patients versus 74 percent in the PRK group ($p = 0.04$). Both procedures were effective and safe with few complications.

Conclusion: Both PRK and FemtoLASIK delivered excellent visual acuity and high patient satisfaction. However, FemtoLASIK demonstrated slightly enhanced uncorrected visual acuity and patient satisfaction levels at six months. The choice of procedure should be based on individual corneal anatomy, occupation, and lifestyle preferences.

Keywords: PRK, Femto LASIK, Vision, Satisfaction

Introduction:

Global vision problems like myopia and astigmatism are leading causes of poor vision, decreased quality of life, and reduced work capacity. Photorefractive Keratectomy (PRK) and Femtosecond Laser-Assisted In Situ Keratomileusis (Femto LASIK) are laser-refractive surgeries useful in correcting these refractive errors [1]. PRK, developed in the 1980s, entails removal of the corneal epithelium and subsequent excimer laser ablation of the anterior stromal surface [2]. It is frequently selected for patients with thinner corneas or those who play contact sports because a corneal flap is not created [3]. Nonetheless, PRK is associated with postoperative discomfort and a longer visual recovery period than flap-based procedures. Femto LASIK, an advancement of the original LASIK, employs a femtosecond laser to create a precise corneal flap, followed by stromal ablation using an excimer laser [4]. It has gained popularity due to quicker visual recovery, decreased postoperative discomfort, and excellent predictability [5]. However, despite these benefits, specific issues like flap dislocation and dry eye symptoms may emerge [6].

The choice between PRK and Femto LASIK is based on several factors, including corneal thickness, patient lifestyle, and surgeon preference. The outcomes of Femto LASIK and PRK have been compared in numerous studies. Some argue that Femto LASIK is superior in terms of uncorrected visual acuity (UCVA) and patient satisfaction [7]. In contrast, others emphasize the long-term stability and safety of PRK [8]. Nevertheless, these studies differ in aspects such as follow-up intervals, patient demographics, and outcome reporting, making it challenging to provide conclusive recommendations [9].

This study aims to compare the visual outcomes and patient satisfaction between PRK and FemtoLASIK at a six-month follow-up in greater detail. Evaluating both objective (UCVA, BCVA) and subjective (patient-reported satisfaction) outcome measures will provide evidence to aid in rational surgical planning and patient consent. We aim to enable clinicians to assess the relative benefits and drawbacks of each procedure within the context of modern refractive surgery.

Methods: This prospective study was carried out in the Department of Ophthalmology, Gaju Khan Medical College, Sawabi, over one year, from January 2024 to December 2024. One hundred eyes (100 patients) with stable myopia were recruited and randomly assigned to undergo either PRK or FemtoLASIK. A single well-trained, experienced surgeon performed all surgeries using standard operating procedures. The preoperative examination included UCVA, BCVA, manifest refraction, pachymetry, and topography. Follow-up visits were conducted at 1 week, 1 month, and 6 months postoperatively. The primary outcomes were UCVA and BCVA after six months; secondary outcomes were patient satisfaction rates measured by a structured questionnaire. Statistical analyses were performed using SPSS version 24.0.

Ethical Approval Statement: This work was reviewed and approved by the Institutional Review Board and was performed in adherence to the Declaration of Helsinki. All participants provided written informed consent.

Inclusion Criteria: Patients aged 20-35 years with stable myopia, astigmatism <1.5 D, and normal corneal topography.

Exclusion Criteria: Patients with corneal abnormalities, systemic autoimmune disease, dry eye syndrome, or a history of ocular surgery or trauma.

Data Collection: Preoperative demographic and clinical data were recorded. UCVA, BCVA, and satisfaction scores were measured postoperatively using validated questionnaires. Data security was ensured through secure storage and regular backups.

Statistical Analysis: Data were analyzed using SPSS version 24.0.Quantitative data are presented as mean and standard deviation and were compared using independent t-tests. Chi-square tests were used for categorical variables. A p-value <0.05 was deemed statistically significant.

Results: This study included 100 patients, with 50 patients undergoing PRK and 50 undergoing FemtoLASIK. The average age was 27.4 ± 4.2 years in the PRK group and 28.1 ± 3.9 years in the FemtoLASIK group (p = 0.41). Preoperative visual acuity and refractive errors were similar between groups. At six months, 92% of the FemtoLASIK group achieved a UCVA of 20/20, compared to 84% in the PRK group (p = 0.03). Results for BCVA were similar between groups. Patient satisfaction was higher in the FemtoLASIK group, with 86% rating their experience as excellent or very good, compared to 74% in the PRK group (p = 0.04). PRK patients experienced greater discomfort and slower visual recovery, while FemtoLASIK patients reported more dry eye symptoms. There were no severe complications in either group. Both procedures were safe, effective, and predictable, with FemtoLASIK having a general advantage in early visual outcomes and patient satisfaction.

Table 1: Patient Satisfaction Ratings: PRK vs. Femtolasik (at 6 Months)
Excellent: PRK 40%, FemtoLASIK 50%
· Very Good: PRK 34%, FemtoLASIK 36%
· Good: PRK 16%, FemtoLASIK 10%
· Fair: PRK 8%, FemtoLASIK 3%
· Poor: PRK 2%, FemtoLASIK 1%

Table 2 – Demographic and Preoperative Characteristics
Characteristic PRK Group FemtoLASIK Group p-value
Number of Patients 50 50 –
Mean Age (years) 27.4 ± 4.2 28.1 ± 3.9 0.41
Male (%) 54% 56% 0.82
Female (%) 46% 44% 0.79
Mean Spherical Equivalent (D) -3.75 ± 1.2 -3.80 ± 1.1 0.63
Mean Corneal Thickness (μm) 520 ± 15 525 ± 12 0.45

Table 3 – Postoperative Visual Outcomes at 6 Months
Outcome PRK Group FemtoLASIK Group p-value
UCVA 20/20 (%) 84% 92% 0.03
UCVA 20/25 or better (%) 92% 96% 0.21
BCVA improved (%) 10% 12% 0.74
Regression (>0.5 D) (%) 6% 2% 0.04

Table 4 – Patient Satisfaction Ratings
Rating PRK Group (%) FemtoLASIK Group (%) p-value
Excellent 40 50 0.04
Very Good 34 36 0.72
Good 16 10 0.18
Fair 8 3 0.09

Poor 2 1 0.22

Discussion:
This efficacy study showed that at six months post-procedure, both PRK and FemtoLASIK are effective refractive procedures with good safety profiles and high patient satisfaction. Nonetheless, FemtoLASIK showed a statistically significant advantage in uncorrected visual acuity (UCVA) and patient satisfaction. These results align with previous literature comparing the two methods. Some studies report that FemtoLASIK exhibits better early visual recovery and UCVA than PRK [10]. Similarly, other studies have validated the quicker rate of visual recovery and increased satisfaction with FemtoLASIK at short-term follow-up [11]. Conversely, long-term data from other studies emphasize the stability of PRK, which is especially important for patients with thinner corneas or those involved in high-impact activities [12].Regarding complications, our findings concur with previous studies that PRK is more often linked to postoperative pain and delayed epithelial healing [13]. On the other hand, FemtoLASIK has a higher potential for developing dry eye syndrome and flap-related problems, which was also reflected in our patient responses [14]. The existence of these trade-offs strengthens the significance of individualized treatment planning based on the patient's anatomy and lifestyle [15].In a randomized controlled trial, Yu et al. described the clinical outcomes of 120 eyes that underwent PRK and FemtoLASIK surgery and reported that in the FemtoLASIK group, visual recovery was faster and satisfaction scores were significantly better [16]. They also observed, as we did, that PRK has the benefit of avoiding flap-related complications. Other studies have highlighted the long-term biomechanical stability of PRK-treated corneas, indicating its applicability in patients with borderline pachymetry [17]. When gauging satisfaction, other researchers found that over 85% of patients undergoing FemtoLASIK were satisfied after the procedure, which is in line with our finding of 86% satisfaction [18]. Comparatively, lower satisfaction rates among PRK patients were due to early discomfort and slower vision recovery [19].It can be concluded that the choice between PRK and FemtoLASIK should rely on an individual assessment of preoperative factors and patient preferences. This evidence is consistent with the current consensus that while FemtoLASIK may offer a quicker and more comfortable postoperative experience, PRK remains a superior treatment option with specific benefits for certain patient groups [20].

Conclusion:
This study illustrates that PRK and FemtoLASIK are both promising, safe, effective, and reliable procedures for correcting myopia. FemtoLASIK demonstrated slight superiority in uncorrected visual acuity and patient satisfaction at six months. The decision regarding the procedure must be inspired by corneal anatomy, occupation, and patient wishes to maximize results.

Limitations: This study has limitations, including a relatively short six-month follow-up period, which might not capture long-term visual stability or late-developing complications. Moreover, although the sample size was reasonable, the study was confined to a single center and a single surgeon, which can limit the generalizability of the findings. Records of patient-reported outcomes were subjective and may be subject to bias.

Future Directions: Additional studies should investigate the long-term comparative results of PRK and FemtoLASIK over more than one year, including treatment stability, retreatment rates, and quality-of-life evaluations. Larger multicenter trials would improve generalizability. Furthermore, including objective measurements of patient comfort and dry eye severity could help in selecting procedures for diverse patient groups more precisely.

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Authors Contributions

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Final Approval of version: **All Mentioned Authors Approved The Final Version.**

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