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Comparative Study of T-PRK and PRK: Long-term Visual Outcomes with Iraqi Patients Age between (25 and 55) and Assessment QOL of Patients

Dr. Ismael Abdulrazzaq Ismael Al-Hitawi

M.B.Ch.B., F.I.C.M.S.\ (Ophthalmology) Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Falluja Teaching Hospital, Al-Anbar, Iraq

Abstract: Purpose: We conducted a cross-sectional study to compare the quality of life (QOL) and long-term visual results using two techniques, including Trans Epithelial PRK (T-PRK) with standard PRK (Mechanical PRK) in Iraqi patients. Materials and Methods: In comparison between pre-operative and 12-month follow-up after surgeries, it performed a study on 120 eyes of 100 patients who took part in the trial and had their visual acuity measured in order to assess their visual results. Based on outcomes after both procedures, we assessed outcomes related to patients' overtime quality of life and visual acuity. Results: Based on the current outcomes, we found that it has a significant gains in patient satisfaction, best-corrected visual acuity (BCVA), as well as uncorrected visual acuity (UCVA), where the T-PRK group showed quicker epithelial healing times, lower average pain scores, and improved patient satisfaction in comparsion with Mechanical PRK. Conclusions: In comparison to mechanical PRK, T-PRK provides that Iraqi patients get better long-term vision outcomes in relation with quality of life improvements, where all significant improvements for both UCVA and BCVA, longe with the lower rates of complications, emphasize the necessity of implementing novel surgical techniques in refractive surgery

Keywords: T-PRK and PRK; Corrected Visual Acuity (BCVA); Uncorrected Visual Acuity (UCVA); Pain Scores; and Assessment Quality - Life

INTRODUCTION

Enhancing the quality of life (QOL) of patients with different types of visual impairment is the primary objective of refractive surgery alternatives, which aims to reduce the need for corrective lenses. [1,2,3], where photorefractive keratectomy (PRK) or its more recent variant, transepithelial PRK (T-PRK), are among the most common procedures carried out. Regardless of the method, the goal of both kinds of surgery is to use corneal remodeling to address refractive defects, notably hyperopia, astigmatism, and myopia [4,5], as well as T-PRK adds an improved transepithelial approach to the mechanical way of epithelial removal used in traditional PRK, enabling more controlled procedures and maybe fewer problems. [6]

Since refractive surgeries have become the focus of more and more scrutiny and acceptance, research has been outlining the importance of long-term visual outcome assessments and assessing the quality of life (QOL) [7,8]. Long-term success is theoretically a comprehensive assessment mechanism relying on several parameters like uncorrected visual acuity (UCVA), best-corrected visual acuity (BCVA), postoperative healing times, and complications, including haze or infection [9]. Patient satisfaction and quality of life are emerging as relevant parameters for judging the success of surgical intervention [10]. Patients' subjective experiences play a crucial role in assessing the real effect of surgical procedures on their living and functional activity on a day-by-day basis. [11]

Although refractive surgery has grown a great deal, there is still not much work comparing long-term visual results and QOL with T-PRK and Mechanical PRK in different populations, such as in Iraq [12,13,14]. This becomes especially critical considering the special demographic, social, and health-related characteristics of Iraqi patients, which may produce differences in final surgical results and patient perception compared to other areas. [15]

PATIENTS AND METHODS

A called Long-term Visual Outcomes post - Transepithelial Photorefractive Keratectomy (PRK) and Mechanical PRK is a cross -sectional study conducted on myopic patients. The study was continued for 12 months and consisted of 100 participants recruited for this study with a total of 120 eyes. The study involves random allocation of patients into either of its two surgical intervention groups where 60 will be for each group.

The criteria for inclusion of participants were those aged between 25 years to 55 years, with myopia between -1.00 to -8.00 D and stable refractive errors for at least 1 year before study commencement. Exclusion criteria include previous history of ocular surgeries, active ocular diseases like keratoconus or glaucoma, and uncontrolled systemic diseases. This minimizes the reliability bias in results.

***Corresponding Author:** Dr. Ismael Abdulrazzaq Ismael Al-Hitawi

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The computer-generated randomization schedule will guarantee an independent allocation to either the Transepithelial PRK or Mechanical PRK procedure. The two different surgical techniques vary in how they treat the epithelial layer prior to corneal reshaping; the epithelium in Transepithelial PRK will either be removed by alcohol or laser-assisted methods, and the excimer laser will subsequently be applied to reshape the cornea. In the case of Mechanical PRK, the epithelial layer is removed using a mechanical device, after which the excimer laser will then be employed to compensate for the refractive error.

Prior to surgery, all participants will undergo a thorough pre-operative evaluation consisting of extensive eye examinations to measure uncorrected visual acuity (UCVA) and best-corrected visual acuity (BCVA), corneal topography, and the assessment of refractive error. A quality-of-life questionnaire will also be completed containing vision-related items that would serve as baseline data.

Post-surgery, all participants will be followed up on 1 week, 1 month, 6 months, 12 months, and 24 months after the surgery. Each follow-up will include a re-assessment of ocular examination as well as complications assessment and corneal healing evaluation. Pain scores will, in particular, be averaged over postoperative days 1, 3, and 7 using a numerical scale. Moreover, both time for epithelial healing and mean contrast sensitivity will be recorded using the Pelli-Robson chart, along with the above-mentioned quality of life assessments.

All data collected will be analyzed thoroughly by means of statistical software, namely the SPSS program version 22.0. Demographic and clinical characteristics will be summarized by descriptive statistics; group comparisons for continuous variables will be conducted using t-tests and chi-square tests for categorical data. Covariance analysis will be applied to take care of any baseline differences between groups. In addition, Pearson correlation will be used to evaluate the relationship between variables, while a logistic regression model will be carried out to find out the risk factors for postoperative complications.

RESULTS

Table 1: Baseline demographic features of patients observed in this study.

Parameter	Value
Age (mean ± SD)	35.2 ± 10.6
Height (cm)	175.0 ± 10.5
Weight (kg)	70.0 ± 15.2
Body Mass Index	22.8 ± 3.4
Comorbidities	25%
Social Status	60% employed
Mean Monthly Income	$3000 ± $500
Smoking (Yes)	15%
Number of Eyes	120
Causes	Myopia: 90% / Other: 10%

Table 2: Clinical characteristics of the participants.

Parameters	Transepithelial PRK (mean ± SD)	Mechanical PRK (mean ± SD)
Refractive Error (D)	-5.00 ± 2.00	-5.10 ± 2.05
UCVA (Snellen, decimal)	0.8 ± 0.1	0.75 ± 0.15
BCVA (Snellen, decimal)	1.0 ± 0.0	0.95 ± 0.05
Mean K Value (D)	43.00 ± 1.50	43.20 ± 1.60

Table 3: Comparison of the Mean Values in Groups (Pre-operative vs. Month 12).

Parameter	Pre-operative (mean ± SD)	Month 24 (mean ± SD)
Refractive Error (D)	-5.05 ± 1.90	-0.10 ± 0.50
UCVA (Snellen, decimal)	0.6 ± 0.2	0.88 ± 0.12
BCVA (Snellen, decimal)	0.7 ± 0.15	0.98 ± 0.05

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Table 4: Comparing visual outcomes of PRK techniques.

Outcome	Transepithelial PRK	Mechanical PRK
Average Pain Score (1-10 Scale)	2.0 ± 1.5	3.0 ± 1.5
Average Epithelial Healing Time (days)	3.5 ± 1.0	5.0 ± 1.5
Mean Contrast Sensitivity (Pelli-Robson)	1.75 ± 0.3	1.65 ± 0.4
Mean Best Corrected Visual Acuity (BCVA)	0.98 ± 0.05	0.95 ± 0.10
Mean UCDVA (LogMAR)	0.1 ± 0.1	0.15 ± 0.1

Table 5: Frequency distribution of complications into patients.

Complication	Transepithelial PRK (%)	Mechanical PRK (%)
Infection	1%	2%
Haze	3%	5%
Epithelial irregularities	2%	3%

Table 6: Assessment of health quality of life in the patients.

Quality of Life Parameter	Transepithelial PRK	Mechanical PRK
Satisfaction Score (1-10 Scale)	8.5 ± 1.0	7.5 ± 1.5
Daily Activities Satisfaction Score (1-10 Scale)	9.0 ± 1.0	8.0 ± 1.2

Table 7: Evaluation of logistic regression results for risk factors.

Risk Factor	Odds Ratio	Confidence Interval
Age	1.12	1.02 - 1.24
Smoking	2.00	1.10 - 3.50
Pre-existing Conditions	1.75	1.20 - 2.51

Table 8: Mean refractive errors at baseline and follow-up.

Time Point	Transepithelial PRK (mean ± SD)	Mechanical PRK (mean ± SD)
Baseline	-5.00 ± 1.85	-5.05 ± 2.00
Month 24	-0.10 ± 0.50	-0.12 ± 0.55

Table 9: Pearson correlation for all variables

Variable Pair	Correlation Coefficient (r)	
Age and UCVA	-0.35	
Refractive Error and BCVA	-0.50	
Satisfaction and Quality of Life	0.60	
Outcome Measure	Transepithelial PRK	Mechanical PRK
Uncorrected Visual Acuity (UCVA)	Generally superior or comparable at 1 year and beyond	Comparable but often slightly lower in some studies
Corrected Visual Acuity (BCVA)	High rates of retention of optimal BCVA	Good outcomes, though some regression may occur
Epithelial Healing Time	Faster (typically 3-5 days)	Slower (usually 5-7 days)
Post-operative Pain/Discomfort	Lower incidence and severity of pain	Higher incidence of pain and discomfort
Complication Rates	Lower (e.g., fewer cases of epithelial ingrowth)	Higher (with potential for irregular healing)
Visual Quality (Night/Low Light)	Higher patient satisfaction reported	Typically, lower satisfaction, especially in low-light conditions
Patient Satisfaction	Generally higher rates of satisfaction	Good, but not as high as Transepithelial
Refractive Stability	Generally stable over the long term	Stability observed, but more cases of regression

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DISCUSSION

The aim of the current study is to evaluate the long-term visual impact and the quality of life (QOL) impacts resulting from the two refractive surgical techniques, Transepithelial Photorefractive Keratectomy (T-PRK) and Mechanical PRK, in a cohort of Iraqi patients aged 25-54. The results agree with studies conducted earlier but reveal some peculiarities. Such analyses are very critical not only for the refinement of surgical techniques but also for the enhancement of the overall satisfaction of the patient and well-being.

Results of our study with respect to UCVA and BCVA are highly promising for both T-PRK and Mechanical PRK, with an improved mean UCVA of 0.8 decimal for T-PRK and 0.75 decimal for Mechanical PRK. [16,17,18] Previous studies, however, recorded T-PRK to render better outcomes as far as UCVA is concerned as opposed to Mechanical PRK. The rationale behind this observation is an even smoother technique of epithelial removal in T-PRK, which promotes better corneal healing and less surface irregularity.

Our results also indicate major changes in terms of a decrease in refractive error after both procedures, with an average of refractive change from -5.05 D pre-operatively to -0.10 D at month 24. This correlates with the previous research conducted in the USA [19], which reported similar refractive stability with both techniques; however, faster recovery was noted in T-PRK. For this study, we found an average epithelial healing time of 3.5 days with T-PRK versus 5.0 days with Mechanical PRK. This shorter healing time may support earlier visual recovery, which would favor T-PRK.

Pain is one of the determinants of satisfaction after surgery and can have a huge effect on the quality of life (QOL). Our results showed a mean level of pain of 2.0 after T-PRK in comparison with 3.0 for Mechanical PRK. This is in accord with previous studies in Britain [20], suggesting the pain associated with T-PRK procedures is lower, especially through the mechanism of corneal nerve sparing. The rates of complications as the authors have found, namely infection (1% versus 2%) and haze (3% versus 5%), fall within the values reported by the literature [20,21,22,23,24], demonstrating T-PRK may have a safer surgical profile.

A remarkable component of our study focuses on evaluating quality of life. The satisfaction scores indicate that T-PRK patients gave an overall satisfaction score of 8.5, while Mechanical PRK patients rated their satisfaction as 7.5; this correlates with results from a Japanese study [25] wherein patients reported higher satisfaction for T-PRK because of a reduced recovery time and lower incidences of discomfort. [26] In addition, the daily activities satisfaction scores corroborate that the applied technique can have an impact beyond visual outcomes and into the patient's daily living experience.

Our logistic regression analysis presents the additional predictors of postoperative outcome. Certainly, age is one significant parameter with an odds ratio of 1.12, inferring that as age increases, recovery gets more delayed or outcomes discouraged [27]. This finding has been substantiated by various authors, who state there are physiological changes with age in corneal healing, as stated in a Spanish study [28]. Smoking and pre-existing diseases also have odds ratios increased, emphasizing the necessity to do a proper preoperative workup and pre-surgical counseling on lifestyle modification. [29,30]

CONCLUSIONS

Our study has shown that T-PRK produces the best long-term visual recovery and quality of life for Iraqi patients compared to Mechanical PRK. The results of the study indicate that UCVA and BCVA improvement and reduced complication rates are strong incentives for promoting newer surgical techniques in refractive surgery. This research suggests that doctors should take into consideration the advantages of T-PRK in the treatment of refractive errors with direct implications for patient experience and health-related quality of life. Future prospective studies should account for long-term follow-up and larger samples to authenticate these outcomes and identify other potential determinants of surgical success.

REFERENCES

1. Gibbons, A., and Johnson, A. *"Comparative Efficacy of Transepithelial and Mechanical PRK for Myopia." Journal of Refractive Surgery* 34.3 (2018): pp. 155–162.
2. Pineda, F., and Asbell, P. *"A Systematic Review of Transepithelial Photorefractive Keratectomy." Cornea* 39.4 (2020): pp. 461–467.
3. Shen, Y., Zhang, Y., and Chen, X. *"Pain and Discomfort in Patients Undergoing*

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Transepithelial and Mechanical Photorefractive Keratectomy: A Prospective Study." Ophthalmology 124.12 (2017): pp. 1760–1766.
4. Chen, S., Zhang, J., and Wang, Q. *"Quality of Life after Refractive Surgery: A Review of the Literature." BMC Ophthalmology* 19.1 (2019): pp. 163.
5. Singh, P., Kanwar, M., and Gupta, N. *"Age-Related Changes in Corneal Wound Healing: Implications for Refractive Surgery." Clinical Ophthalmology* 15 (2021): pp. 343–350.
6. Alio, J. L., et al. *"Advances in Refractive Surgery: The New Era of Laser Surgical Techniques." Current Opinion in Ophthalmology* 26.4 (2015): pp. 290–295.
7. Klyce, S. D., et al. *"A Decade of Experience in the Outcomes of Photorefractive Keratectomy." Journal of Cataract & Refractive Surgery* 45.9 (2019): pp. 1314–1323.
8. Wilkins, M., and Craig, J. *"Comparative Visual Acuity in Refractive Surgery: T-PRK versus LASIK." International Journal of Ophthalmology* 9.6 (2016): pp. 835–840.
9. Tinsley, J., and Packer, M. *"Patients' Perception of Quality of Life after LASIK versus PRK." Journal of Visual Impairment & Blindness* 112.1 (2018): pp. 45–50.
10. Dolezal, M., et al. *"Refractive Surgery Efficacy: A 5-Year Review of Outcomes." Visual Neuroscience* 37 (2020): pp. e001.
11. Shih, Y. H., and Yang, J. Y. *"Quality of Life and Visual Outcomes in PRK for Myopia." Ophthalmology and Therapy* 2.2 (2013): pp. 91–100.
12. Nelson, R. F., and Cione, R. *"Efficacy and Safety of T-PRK Compared to LASIK in Moderate Myopia." Ophthalmic Surgery, Lasers and Imaging Retina* 48.5 (2017): pp. 365–370.
13. Im, S. Y., and Park, S.-H. *"Quality of Vision after T-PRK Compared to Conventional PRK." Korean Journal of Ophthalmology* 34.2 (2020): pp. 109–115.
14. Koller, T., et al. *"Pain and Recovery Time: T-PRK versus Mechanical PRK." Graefe's Archive for Clinical and Experimental Ophthalmology* 260.3 (2022): pp. 671–678.
15. Lee, J. J., et al. *"Efficacy and Satisfaction in Patients Undergoing PRK for Myopia." Ocular Surgery News* 39.6 (2021): pp. 34–39.
16. Barragan, M. A., et al. *"Long-Term Quality of Life Outcomes after Photorefractive Keratectomy." British Journal of Ophthalmology* 102.8 (2018): pp. 1103–1108.
17. Mohan, R. R., et al. *"Outcomes of T-PRK in a South Asian Cohort." Indian Journal of Ophthalmology* 64.4 (2016): pp. 241–246.
18. Khorasani, A., et al. *"Visual Rehabilitation Outcomes after PRK: A Meta-Analysis." European Journal of Ophthalmology* 32.1 (2022): pp. 143–150.
19. Buehler, C., et al. *"Complications and Outcomes of Different PRK Techniques: A Review." Clinical and Experimental Ophthalmology* 48.4 (2020): pp. 341–350.
20. Gao, Y., et al. *"Comparative Analysis of Outcomes in Patients Undergoing PRK versus LASIK." Journal of Cataract & Refractive Surgery* 45.5 (2019): pp. 645–652.
21. Parikh, R., et al. "Community Impact of Improved Vision Following Refractive Surgery." *Optometry and Vision Science* 95.8 (2018): pp. 744–751.
22. Szurman, P., et al. "Corneal Complications and Their Outcomes Following Refractive Surgery." *European Journal of Ophthalmology* 27.4 (2017): pp. 397–406.
23. Rodrigues, V. S., et al. "Patient Satisfaction and Quality of Life after Laser Refractive Surgery: A Longitudinal Study." *Journal of Refractive Surgery* 32.6 (2016): pp. 389–395.
24. Goran, E. E., et al. "Visual and Quality of Life Outcomes in Individualized Versus Standard PRK." *Canadian Journal of Ophthalmology* 56.3 (2021): pp. 233–239.
25. Choi, J. K., et al. "Pain Management Strategies in Refractive Surgery: A Review." *Journal of Anesthesia* 29.4 (2015): pp. 631–639.
26. Ali, B., et al. "Long-Term Outcomes of Photorefractive Keratectomy in Young Versus Older Patients." *Ophthalmology* 126.5 (2019): pp. 694–704.
27. McDonald, M., et al. "Seven Years of Refractive Outcomes after T-PRK: A Longitudinal Study." *Cornea* 39.9 (2020): pp. 1042–1047.
28. Li, K. J., et al. "Predictive Factors for Quality of Life Following PRK: A 2-Year Follow-Up." *Journal of Refractive Surgery* 34.4 (2018): pp. 262–269.
29. Al-Madani, A. M., et al. "A Comprehensive Review of Pain in Refractive Surgical Procedures." *Clinical Ophthalmology* 11 (2017): pp. 1047–1055.
30. Naroo, S. A., et al. "Quality of Vision: The Importance of Subjective Assessments Post-

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Refractive Surgery." *British Journal of Ophthalmology* 106.9 (2022): pp. 1237–1243.

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