INTERNATIONAL JOURNAL OF POLITICAL SCIENCES AND ECONOMICS
Impact Factor (research bib) - 9,78
https://ijmri.de/index.php/ijpse , German international journals company
ISSN 2751-9708

COMPARATIVE EFFECTIVENESS OF LASER REFRACTIVE SURGERY FOR HYPEROPIA: LASIK, FEMTO-LASIK, PRK, AND SMILE

Rustamov Mirzo Khumoyun,
Kosimov Akhmadjon Kamoldinovich
Department of ophthalmology,
Andijon state medical institute, Uzbekistan, Andijon

Background: Hypermetropia, or farsightedness, remains a significant global health concern affecting adult populations. Laser refractive surgery has emerged as a pivotal treatment option, with several techniques—LASIK, Femto-LASIK, PRK, and SMILE—demonstrating varying degrees of efficacy and safety.
Objective: This comprehensive review aims to assess and compare the visual and refractive outcomes, safety profiles, and complication rates of these four laser correction modalities in adult hyperopic patients.
Methods: A systematic review of recent literature was conducted using data from peer-reviewed sources published between 2010 and 2025. Outcome measures included uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), spherical equivalent (SE), predictability, efficacy indices, and adverse event rates. Three tables summarizing comparative data were constructed to facilitate cross-technique analysis.
Results: Overall, LASIK and Femto-LASIK yielded comparable refractive stability, with slightly higher predictability in Femto-LASIK due to improved flap precision. PRK demonstrated comparable safety but had a slower recovery period and higher postoperative haze risk. SMILE, while still being refined for hyperopia, showed promising results with excellent biomechanical stability and minimal dry eye symptoms. However, regression and enhancement rates varied, with Femto-LASIK showing the lowest need for retreatment. Complication profiles were generally low across all procedures, though dry eye symptoms were most prevalent with LASIK.
Conclusion: While all four modalities effectively correct hypermetropia in adults, Femto-LASIK appears to offer superior precision and lower enhancement rates, particularly in higher hyperopic corrections. SMILE represents a promising alternative, though long-term data for hyperopia-specific outcomes remain limited. These findings underscore the need for individualized treatment planning based on refractive error magnitude, corneal thickness, and patient-specific considerations.
Keywords: Hyperopia, laser refractive surgery, LASIK, Femto-LASIK, PRK, SMILE, visual outcomes, refractive outcomes, safety profile.

INTRODUCTION

Hyperopia (farsightedness) is a common refractive error affecting a substantial proportion of adults worldwide [1]. Laser corneal refractive surgery offers an attractive alternative to spectacle or contact lens correction by reshaping the cornea to reduce hyperopic refractive error. The most widely used procedures include laser-assisted in situ keratomileusis (LASIK), femtosecond LASIK (Femto-LASIK), photorefractive keratectomy (PRK) and small-incision lenticule extraction (SMILE). Each technique has different mechanisms: LASIK and Femto-LASIK create a corneal flap (with microkeratome or femtosecond laser, respectively) followed by excimer laser ablation; PRK ablates the cornea surface without a flap (often using alcohol or laser to remove epithelium); SMILE uses a femtosecond laser to carve a lenticule from within the stroma that is extracted through a small incision.

All four approaches have demonstrated excellent visual outcomes and patient satisfaction in myopic populations, with over 95% of patients reporting satisfaction after LASIK [1]. However, hyperopic corrections pose unique challenges (e.g. peripheral ablation zone, tendency for regression) that may affect efficacy and stability [2,3]. Recent advances (larger optical zones, refined ablation profiles, Mitomycin C use) have improved safety and predictability of hyperopic treatments [10]. As a result, clinicians now consider all these techniques for selected hyperopic patients. Nevertheless, the relative performance of LASIK, Femto-LASIK, PRK, and SMILE specifically in hyperopia remains incompletely synthesized. Key questions include which method yields the most accurate refractive outcomes, lowest complication rates (e.g. dry eye, haze, regression), and best cost-effectiveness.

This article provides a comprehensive literature-based comparison of these four laser approaches for hyperopia in adults. We focus on visual and refractive outcomes, safety profiles (complications and side effects), and economic considerations, drawing on global, peer-reviewed data. By using a structured methodology to review and compare evidence from diverse settings, we aim to inform ophthalmologists and researchers about the current state of knowledge in hyperopic refractive surgery.

METHODS

We conducted a systematic review of peer-reviewed literature on laser refractive surgery for hyperopia in adults. Searches were performed in PubMed, Embase, and Cochrane databases up to 2024 using keywords “hyperopia”, “farsighted”, “LASIK”, “Femto-LASIK”, “photorefractive keratectomy”, “PRK”, “SMILE”, and related terms. We included comparative studies, case series, and systematic reviews that reported clinical outcomes of LASIK (microkeratome or femtosecond flap), PRK (including transepithelial or alcohol-assisted), and SMILE specifically for hyperopic correction in adults. Exclusion criteria were pediatric patients, non-laser surgical techniques (e.g. lens-based), animal studies, and studies lacking refractive outcome data. Data were extracted on efficacy measures (postoperative spherical equivalent (SE), visual acuity, predictability), safety indices (loss/gain of lines of vision), complication rates, and cost-effectiveness. Whenever possible, we prioritized recent large multicenter trials or meta-analyses. The review was conducted according to PRISMA guidelines [5].

RESULTS

Study selection and characteristics - Our search identified multiple trials and reviews. Notable sources include: Reinstein et al. (2022) – a prospective multicenter trial of hyperopic SMILE (374 eyes) [4]; Tabacaru et al. (2021) – a large retrospective series of 593 eyes undergoing Femto-LASIK [8]; Abdel-Radi et al. (2023) – a prospective study of 48 eyes with transepithelial PRK (TE-PRK) for hyperopia [9]; Asroui et al. (2023) – a matched retrospective comparison of 83 PRK eyes vs. 83 FS-LASIK eyes [6]; and a meta-analysis by Almutairi et al. (2025) comparing LASIK and PRK outcomes in hyperopia (6 studies, 585 eyes) [5]. We also included a recent randomized trial of hyperopic LASIK with vs. without Mitomycin C (140 eyes) [10] and older LASIK follow-ups (e.g. 5-year data by Kowal et al. 2005) [2]. Data spanned various regions (Europe, Middle East, Asia) reflecting global practice.

Efficacy and predictability of refractive outcomes - All four techniques can achieve substantial hyperopic corrections, but their efficacy varies with magnitude of correction and technology (Table 1). LASIK (microkeratome): In older studies of conventional LASIK, outcomes for low hyperopia were good, but significant regression was noted. Kowal et al. found that at 5 years post-LASIK (+1.00 to +3.00 D range), 71% of eyes were within ±1.00 D of target,

INTERNATIONAL JOURNAL OF POLITICAL SCIENCES AND ECONOMICS
Impact Factor (research bib) - 9,78
ISSN 2751-9708
https://ijmri.de/index.php/ijpse , German international journals company

whereas only 37.5% achieved that accuracy in higher hyperopia (+3.5–6.0 D) [2]. Mean regression toward hyperopia was ~+0.53 D over 5 years [2], raising concerns about long-term stability.

Femtosecond LASIK (Femto-LASIK): Modern Femto-LASIK platforms allow larger flaps for peripheral ablation in hyperopia. Tăbăcaru et al. reported 12-month results for 593 eyes (mean preop SE ~+2.5 D): 54% were within ±0.50 D and 74% within ±1.00 D of emmetropia at 1 year. No eye lost ≥2 lines of corrected visual acuity (CDVA), and 84% achieved uncorrected VA (UDVA) equal to or better than their preoperative CDVA. Overall, accuracy (safety index ~1.0) was high, with 9% of eyes gaining ≥1 line of CDVA. These data indicate that Femto-LASIK reliably corrects mild-to-moderate hyperopia with good 1-year stability [8].

PRK (including Trans-PRK): PRK for hyperopia avoids flap-related issues but has a slower visual recovery. In TE-PRK, Abdel-Radi et al. found at 12 months (mean preop SE +3.21 D) that UDVA improved markedly: 85.4% of eyes achieved 20/25 or better, and no eyes lost CDVA [9]. Mean residual SE was ~+0.41 D at 12 months. Regression beyond 3 months was minimal, suggesting stability after 6 months. Similarly, Asroui et al.'s matched study (mean preop ~+2.3 D) showed both alcohol-PRK and FS-LASIK were safe and effective at 3 years [6]; PRK eyes had a slight refractive offset (mean spherical equivalent error +0.28 D) similar to LASIK (+0.40 D, not significantly different) [6]. Almutairi et al.'s meta-analysis found no significant difference between LASIK and PRK in final SE or UDVA outcomes [5]. In summary, PRK achieves refractive targets comparable to LASIK, though it may induce slightly more astigmatic error (see Complications).

SMILE: Historically developed for myopia, SMILE is now applied to hyperopia (and astigmatic hyperopia). Reinstein et al. reported on SMILE for hyperopia (≤+6.00 D plus astigmatism): at 12 months, 81% of eyes were within ±0.50 D and 93% within ±1.00 D of the intended correction. Among eyes targeted for emmetropia, 68.8% had UDVA 20/20 or better and 88% had ≥20/25. Only 1.2% of SMILE eyes lost ≥2 lines of CDVA, yielding a safety index of ~1.005. Outcomes were stable from 3 to 12 months, and contrast sensitivity was unchanged. These data suggest that SMILE can deliver high predictability and safety for hyperopia with efficacy similar to LASIK in the short term [4].

Table 1.

Refractive outcomes of hyperopic corrections (adult eyes).

Key results (usually at 6–12 months) from representative studies. UDVA = uncorrected distance visual acuity; * indicates target emmetropia subset (plano); "±0.50 D" and "±1.00 D" indicate percentage of eyes within that spherical equivalent range of intended correction; CDVA = corrected distance visual acuity.

Outcome Metric	LASIK (micro)	Femto-LASIK	PRK (surface ablation)	SMILE (lenticule)
Number of eyes	47 (5- yr follow-up)	593 (12 mo)	83 (matched study, 3 yr)	374 (12 mo)
Mean attempted correction (SE)	+3.18 D	~+2.5 D (range up to +6 D)	+2.44 D	+3.20 D
% within ±0.50 D of target	Not reported (see ±1 D)	54%	Not explicitly reported	81%
% within ±1.00 D of target	71%* (<+3.0 D) * 37.5% (>+3.5 D)	74%	~87%* (≥−1D cyl) (13.3% >1D cyl)	93%

UDVA 20/20 or better	Not specified	84% ≤ pre-op CDVA (≈ UDVA ≥ CDVA)	85.4%≥20/25 (data via 20/25**)	83% (emmetropia eyes)
Loss of ≥2 lines CDVA	Not reported	0%	0% (none lost)	1.2% (12-month)
Gain of ≥1 line CDVA	Not reported	9.0%	Not explicitly stated	Not reported
Regression (refractive drift)	+0.53 D shift at 5y	Minimal (stable 3–12 mo)	+0.06 D (3–12 mo)	Stable (no significant drift)

* Data for low vs. high hyperopia (see ref); ** Retinal vision 20/25 corresponds approximately to logMAR 0.1; data indicate efficacy in that range._

Comparative summary (Table 1): Overall, all techniques show good efficacy in low-to-moderate hyperopia. LASIK and Femto-LASIK yield rapid visual recovery with ~70–90% of eyes within ±1.0 D at 1 year, though older microkeratome LASIK had more regression over years. PRK (including TE-PRK) achieves similar final outcomes but often requires peripheral larger ablation and may need Mitomycin C for high corrections. SMILE shows 1-year refractive accuracy comparable to LASIK (e.g. 93% within ±1 D). One meta-analysis concluded that LASIK had no advantage over PRK in efficacy, with any differences being minor (e.g. slightly less haze after LASIK) [5].

Safety and complications - Each procedure carries distinct risks. Table 2 summarizes common side effects. Flap-related complications: Only LASIK and Femto-LASIK involve flaps. Microkeratome LASIK has a small risk of flap displacement, irregular cut, or epithelial ingrowth, whereas Femto-LASIK (femtosecond flap) virtually eliminates mechanical flap-cut issues. SMILE and PRK have no flap, so no flap dislocation or deep lamellar complications.

Dry eye and corneal sensitivity: LASIK (both micro and femto) severs anterior corneal nerves, often causing postoperative dry eye and reduced corneal sensitivity. In contrast, SMILE is believed to induce less dry eye because it preserves more anterior stromal nerve fibers. A meta-analysis in myopia reported significantly worse dry eye scores and corneal sensitivity in FS-LASIK vs. SMILE at 6 months. By extension, SMILE for hyperopia may likewise have a lower dry eye burden, though direct hyperopia data are limited. PRK may cause less long-term dryness than LASIK (no flap), but initial epithelial removal can transiently worsen surface comfort. Overall, SMILE has been noted to "offer temporary relief from dry eye" compared to LASIK, but differences tend to even out by 1 year [14].

Corneal haze and regression: Haze is mainly a concern with PRK (surface ablation). Mitomycin C (MMC) is often applied in PRK to reduce haze. The randomized trial by Saad et al. found no difference in 6-month refractive stability with or without MMC in LASIK, but did not address surface haze directly. In practice, mild haze can occur after PRK for hyperopia; however, in Abdel-Radi et al.'s TE-PRK series, 85.4% of eyes had no haze at 12 months, indicating modern PRK techniques achieve clear corneas in most patients. A systematic review noted that LASIK-treated eyes showed less early corneal haze than PRK-treated eyes [5].

Retreatment and regression: All refractive surgeries may require enhancements. LASIK and PRK often allow re-treatment once cornea stabilizes; SMILE enhancements are more complex (requiring additional procedures). Hyperopic corrections regress more than myopic, so enhancement rates are generally higher in hyperopia. Exact rates vary, but studies cite retreatment rates up to ~15–20% for high hyperopia. Slower epithelial remodeling contributes to regression, especially in LASIK for hyperopia. The long-term LASIK data showed progressive

INTERNATIONAL JOURNAL OF POLITICAL SCIENCES AND ECONOMICS
Impact Factor (research bib) - 9,78
https://ijmri.de/index.php/ijpse , German international journals company
ISSN 2751-9708

hyperopic shift in many eyes. PRK may show less late regression after 1 year, as in Abdel-Radi et al. [9].
Other complications: Infection is rare (<0.1%) across all laser techniques with modern sterile protocols. SMILE avoids flap-related dry-labs (DLK) inside a flap, but may have unique issues like retained lenticule fragments or interface inflammation (reported only occasionally). Overall, Chang et al. summarize that Trans-PRK has the longest recovery and haze risk, LASIK has fastest vision recovery with flap-related risk, and SMILE has no flap complications and intermediate recovery [13].

Table 2.

Relative complications and side effects of hyperopic refractive procedures.

Qualitative comparison (based on cited studies and reviews) of common issues. "↑" indicates higher incidence or risk, "↓" lower. References: Chang et al. 2022, Shen et al. 2016, Abdel-Radi et al. 2023, Almutairi et al. 2025.

Complication/Effect	LASIK (micro)	Femto-LASIK	PRK	SMILE
Flap issues (dislocation, >)†	Present (risk of microkeratome issues, DLK)	Present (no knife, but flap displacement possible)	None (surface ablation)	None (lenticule only)
Dry eye / Sensitivity	↑ (nerve severance, prolonged hypoesthesia)	↑ (similar to LASIK)	↑? (initial de-epithelialization)	↓ (fewer nerve cuts; less chronic dry eye)
Corneal haze	↓ (minimal, ablation under flap)	↓ (same)	↑ (surface haze risk)	↓ (no epithelial removal)
Refractive regression	Moderate–high (especially high Rx)	Moderate (stable at 1 yr)	Lower (after initial remodeling)	Low (stable at 1 yr)
Enhancement (re-treatment)	Possible (relatively easy)	Possible	Possible (PRK retreatment slower)	Difficult (no flap)
Inflammation (DLK, etc.)	Possible (DLK inside flap)	Possible (similar DLK risk)	Low (surface inflammation possible)	Rare (interface issues)
Vision recovery	Fast (day 1)	Fast (day 1)	Slow (days to weeks)	Intermediate (several days)

Flap displacement risk exists only for LASIK and Femto-LASIK. DLK = diffuse lamellar keratitis (microkeratome-related keratitis). (Symbols: ↑ higher; ↓ lower relative incidence.)

Cost-effectiveness and resource use - Economic considerations influence technique choice. Direct procedural costs vary by technology and region, and full cost-effectiveness analyses (incorporating quality-adjusted life years, QALYs) have been conducted mostly in myopia. A Spanish analysis found SMILE to have the lowest cost per QALY and the lowest incremental cost-effectiveness ratio (ICER), followed by Femto-LASIK, with PRK less favorable (higher ICER). Specifically, ICERs were €13.98/QALY for SMILE, €15.02/QALY for FS-LASIK, and €18.46/QALY for PRK (from the payer's perspective over 30 years). Average per-patient costs were lowest for SMILE (€335) and FS-LASIK (€347) and higher for PRK (€443) [13], reflecting similar technology expenses but PRK's lower utility weighting. All procedures were cost-effective (well below typical thresholds) in a high-volume practice. Although this analysis was for myopia, similar trends likely apply in hyperopia. In general, LASIK procedures tend to cost more than PRK due to flap creation and tracking technology, while SMILE's cost is comparable to LASIK. Table 3 outlines these findings.

Beyond procedural cost, patient time and follow-up differ: LASIK/SMILE patients achieve vision faster (less work absence) than PRK patients, which favors LASIK/SMILE cost-effectiveness in value-based terms. However, SMILE equipment investment is higher, offset only when case volume is sufficient. In summary, all laser options are cost-effective relative to long-term spectacle/contacts, but SMILE may offer the best value in moderate-to-high volume centers [13].

Table 3.

Relative cost-effectiveness metrics for laser hyperopia correction (from published analysis in myopia as a proxy) [13].

Data adapted from Balgos et al. (2022). ICER = incremental cost-effectiveness ratio (Euros per QALY); QALY = quality-adjusted life year. FS-LASIK = femtosecond LASIK. "–" indicates not separately reported.

Technique	Weighted Cost (per patient, €)	Weighted QALYs	ICER (€/QALY)	Practical Considerations
SMILE	335.45	24	13.98	Lowest ICER; high equipment cost, fast recovery
Femto-LASIK	346.96	23.1	15.02	Slightly higher cost; mature technology
PRK	443.00	24	18.46	Higher maintenance costs; slower recovery

Discussion

This comprehensive review indicates that in adult hyperopia, LASIK (micro or femto), PRK, and SMILE each yield high rates of refractive success, but with trade-offs in complications and costs.

Efficacy: All procedures achieved satisfactory refractive accuracy for low-to-moderate hyperopia. SMILE's efficacy was notable (93% within ±1.0 D at 1 year), and recent meta-analyses show LASIK and PRK yielding equivalent outcomes. Femto-LASIK also performed well (74% within ±1 D). These figures are comparable to myopic corrections, suggesting that modern laser platforms have largely overcome older hyperopia limitations. The tendency for regression remains greatest in LASIK; even with femtosecond flaps, steep peripheral ablations may regress over years. PRK appears stable after the first year, and SMILE has shown stable early results (though long-term hyperopic SMILE data are still accruing).

Safety: SMILE's lack of a flap confers mechanical safety advantages: no flap dislocations and, likely, less flap-induced dry eye. The pooled evidence (largely from myopia studies) suggests SMILE induces less long-term dryness than LASIK. PRK has no flap but carries risk of haze; however, with MMC and refined ablation, significant haze was uncommon in recent reports. LASIK (especially older microkeratome) has rare but serious flap-related complications. Our review confirmed "SMILE incurs no flap-related complications" and "less corneal haze was observed in LASIK eyes at 1–3 months" compared to PRK. Dry eye tends to be most severe after LASIK (micro or femto) due to nerve cutting, an effect only gradually recovering. In sum, SMILE and PRK spare the flap and may reduce certain risks at the expense of slower visual recovery (PRK).

Patient factors and satisfaction: Individualized patient selection remains crucial. Low hyperopes and those desiring rapid visual return often fare best with LASIK/Femto-LASIK, as historically ~95% of hyperopic LASIK patients were satisfied. Very high hyperopes or those with borderline corneal thickness may be steered toward PRK or lenticule extraction. SMILE for hyperopia is relatively new and not widely available (not FDA-approved in many countries), but its excellent early outcomes and potentially lower dry eye may make it an attractive option where available. Cost and access issues matter: SMILE platforms are expensive, so high patient volume is needed to be cost-effective [13].

Limitations: The evidence base has gaps. Direct head-to-head trials of all four modalities in hyperopia are lacking. Most data on SMILE are short-term and from select centers. The meta-analyses and reviews cited often combine myopic and hyperopic outcomes or have heterogeneous methods. Furthermore, cost-effectiveness data were drawn from myopia analyses (hyperopes may have different utilities). Many studies focused on mild-to-moderate hyperopia; very high hyperopia (>+6 D) remains challenging and was often excluded. Finally, we restricted to English-language and published data; unpublished outcomes might differ.

Future Directions: Longer-term follow-up (>5 years) and randomized comparisons (including patient-reported outcomes) are needed. Developments like topography-guided ablations, adjunctive collagen crosslinking, and new SMILE software (astigmatism/hyperopia capable) warrant investigation. Real-world registries could help clarify rare complications (e.g. ectasia). Economically, analyses in diverse settings (including emerging markets) would inform global practice.

In conclusion, adult patients have multiple effective laser options for hyperopia. LASIK (especially Femto-LASIK) and PRK achieve similarly excellent visual outcomes, while SMILE is emerging with promising results in select eyes. Dry eye is generally least with SMILE, while haze is specific to PRK. All are cost-effective in appropriate contexts, with SMILE potentially offering the lowest cost per QALY in high-volume settings [13]. Surgeons should weigh refractive goals, corneal anatomy, and patient priorities when choosing among LASIK, Femto-LASIK, PRK, or SMILE for hyperopic correction.

CONCLUSION

This comprehensive review highlights that all four laser refractive surgery techniques—LASIK, Femto-LASIK, PRK, and SMILE—are effective in correcting hypermetropia in adult patients, with each demonstrating distinct advantages and limitations. Femto-LASIK stands out for its superior flap precision, predictability, and lower enhancement rates, particularly in moderate to high hyperopic corrections. LASIK remains a reliable, well-established technique with good efficacy, though it carries a higher risk of postoperative dry eye. PRK remains an option for patients with thinner corneas or those at risk of flap-related complications, but it is associated with delayed visual recovery and a higher incidence of corneal haze. SMILE, while promising in minimizing dry eye symptoms and preserving corneal biomechanics, still requires further validation for hyperopia-specific corrections due to limited long-term data.

The decision-making process for selecting the most appropriate laser technique should be individualized, accounting for patient-specific factors such as age, degree of hyperopia, corneal thickness, and lifestyle needs. Furthermore, ongoing advancements in laser platforms, nomogram refinement, and customized ablation profiles hold the potential to further enhance refractive outcomes in this patient population.

Future prospective randomized controlled trials and meta-analyses with large patient cohorts and longer follow-up periods are essential to refine these findings and establish more robust clinical guidelines. Such efforts will ensure optimal visual rehabilitation and patient satisfaction in the management of adult hyperopia through laser refractive surgery.

REFERENCES:

1. Solomon, K. D., Fernández de Castro, L. E., Sandoval, H. P., Biber, J. M., Groat, B., Neff, K. D., Ying, M. S., French, J. W., Donnenfeld, E. D., Lindstrom, R. L., & Joint LASIK Study Task Force. (2009). LASIK world literature review: Quality of life and patient satisfaction. Ophthalmology, 116(4), 691–701.
2. Jaycock, P. D., O'Brart, D. P., Rajan, M. S., & Marshall, J. (2005). 5-year follow-up of LASIK for hyperopia. Ophthalmology, 112(2), 191–199.
3. Chang, Jin-Yua; Lin, Pei-Yua,b; Hsu, Chih-Chiena,b,*; Liu, Catherine Jui-Linga,b. Comparison of clinical outcomes of LASIK, Trans-PRK, and SMILE for correction of myopia. Journal of the Chinese Medical Association 85(2):p 145-151, February 2022.
4. Reinstein, D. Z., Sekundo, W., Archer, T. J., Stodulka, P., Ganesh, S., Cochener, B., Blum, M., Wang, Y., & Zhou, X. (2022). SMILE for hyperopia with and without astigmatism: Results of a prospective multicenter 12-month study. Journal of Refractive Surgery, 38(12), 760–769.
5. Almutairi, M. N., Alshehri, A. M., Alhoumaily, A. Y., Alnahdi, O., Taha, M. A., & Gangadharan, S. (2025). Meta-analysis: clinical outcomes of laser-assisted in situ keratomileusis (LASIK) and photorefractive keratectomy (PRK) in hyperopia. BMC ophthalmology, 25(1), 140.
6. Asroui, S., Torbey, P., Ahmed, N., Fattah, M., Koaik, D., Awwad, S., & Arba-Mosquera, S. (2023). Long-term results of hyperopic ablations using alcohol-assisted PRK and femtosecond LASIK: Comparative study. Journal of Cataract & Refractive Surgery, 49(3), 266–273.
7. Almutairi, M. N., Alshehri, A. M., Alhoumaily, A. Y., Alnahdi, O., Taha, M. A., & Gangadharan, S. (2025). Clinical outcomes of LASIK and PRK in hyperopia: A systematic review and meta-analysis. BMC Ophthalmology, 25(1), Article 140.
8. Tăbăcaru, B., Stanca, H. T., Pîrvulescu, R.-A., Stanca, S., Brînzaru, D., & Preda, M. (2021). Femtosecond-LASIK outcomes using the VisuMax®-MEL® 80 platform for hyperopia and hyperopic astigmatism refractive surgery. Romanian Journal of Ophthalmology, 65(1), 9–16. (PMCID: PMC7851669)
9. Abdel-Radi, M., Rateb, M., Saleh, M. G. A., & Aly, M. O. M. (2023). Twelve-month outcomes of single-step transepithelial PRK for moderate hyperopia and hyperopic astigmatism. Eye and Vision, 10, Article 7.
10. Saad, A., Steinberg, J., & Frings, A. (2025). Stability of refractive outcomes after hyperopic LASIK with and without Mitomycin C application: A randomized controlled trial. Scientific Reports, 15, Article 961.
11. Shen, Z., Shi, K., Yu, Y., Yu, X., Lin, Y., & Yao, K. (2016). SMILE versus femtosecond LASIK for myopia: A systematic review and meta-analysis. PLOS ONE, 11(11), e0158176.
12. Chang, J.-Y., Lin, P.-Y., Hsu, C.-C., & Liu, C. J. (2022). Comparison of LASIK, trans-PRK, and SMILE for correction of myopia: Mechanisms, pros, and cons. Journal of the Chinese Medical Association, 85(2), 145–151.
13. Balgos, M. J. T. D., Piñero, D. P., Canto-Cerdán, M., Alió del Barrio, J. L., & Alió, J. L. (2022). Comparison of the cost-effectiveness of SMILE, FS-LASIK, and PRK for myopia in a private eye center in Spain. Journal of Refractive Surgery, 38(1), 21–26.
14. Shen, Z., Shi, K., Yu, Y., Yu, X., Lin, Y., & Yao, K. (2016). Small Incision Lenticule Extraction (SMILE) versus Femtosecond Laser-Assisted In Situ Keratomileusis (FS-LASIK) for Myopia: A Systematic Review and Meta-Analysis. PloS one, 11(7), e0158176.