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SAFETY AND EFFICACY OF LASER ASSISTED IN SITU KERATOMILEUSIS (LASIK) IN MYOPIC EYE WITH LATTICE RETINAL DEGENERATION

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ABSTRACT

Aim: To evaluate the safety and efficacy of laser-assisted in situ keratomileusis (LASIK) in myopic patients with pre-existing lattice retinal degeneration. **Method:** A retrospective study was conducted at King Hussein Medical Center (January 2024–January 2025) involving 100 patients (200 eyes) with peripheral lattice degeneration who underwent LASIK. Preoperative assessments included retinal pathology documentation (e.g., lattice degeneration, atrophic holes, vitreoretinal traction) and prophylactic laser retinopexy for high-risk lesions. Postoperative outcomes, including uncorrected visual acuity (UCVA) and retinal changes, were monitored over 1 year and compared to preoperative findings. Statistical analysis evaluated significance of new pathologies. **Results:** Preoperatively, 35% of eyes exhibited lattice degeneration, 18% white without pressure, and 5% retinal breaks. Post-LASIK, all eyes achieved UCVA of 1.0. No retinal detachment occurred during follow-up. New retinal pathologies (e.g., lattice degeneration increased to 39%, white without pressure to 20%) were observed in 10 eyes (5%), but changes were statistically insignificant ($p > 0.05$). Prophylactic laser retinopexy stabilized all treated breaks and atrophic holes. **Conclusion:** LASIK is safe and effective in myopic eyes with lattice degeneration when combined with preoperative retinal screening and targeted prophylaxis. Postoperative retinal changes likely reflect natural myopic progression rather than LASIK-induced complications. Short-term findings align with global studies, though longer follow-up is warranted to assess late-onset risks.

INTRODUCTION

Laser-assisted in situ keratomileusis (LASIK) is one of the most commonly performed refractive surgical procedures in Jordan and worldwide.[1] This procedure is performed variable refractive errors including myopia, hyperopia, and astigmatism. This procedure aims at reshaping the corneal stroma with an excimer laser, LASIK which results in significant improvements in uncorrected visual acuity.[2] However, its application in with pre-existing retinal abnormalities like lattice retinal degeneration, remains a topic of discussion and debate due to the potential safety concerns.[3]

Retinal degenerations in myopic eyes can be broadly categorized into peripheral and central degenerations.[4] Peripheral retinal degenerations, such as lattice degeneration, snail-track degeneration, and white-without-pressure, are particularly common in myopic individuals.[5] These conditions involve localized retinal thinning and vitreoretinal adhesions, which predispose the retina to tears and subsequent detachment.[6] Although often asymptomatic, they are critical findings during routine retinal evaluations in myopic patients.[7]

The potential risks of LASIK in myopic eyes with lattice arise primarily from mechanical and intraocular pressure (IOP) changes during flap creation, which could enhance and results in more vitreoretinal traction with subsequent retinal complications.[8,9] Prophylactic retinal laser photocoagulation plays a major rule in reducing the risk of postoperative retinal detachment by stabilizing areas of retinal weakness.[10]

This study aims to assess the safety and efficacy of LASIK in patients with myopia and lattice retinal degeneration, focusing on patients with retinal breaks and the rule of laser retinopexy in preventing serious post-operative complications like retinal detachment.

METHOD

This retrospective study WAS conducted at King Hussein Medical Center between January 2024 and January 2025. All myopic patients with peripheral lattice degeneration who underwent LASIK were included in the study. The medical records of all patients were reviewed regarding age, gender, degree of myopia and best corrected visual acuity. Lattice degeneration was reported regarding site, degree, associated retinal holes or tears. The outcome of Lasik surgery was evaluated post operatively. The outcome of retinal examination of the lattice was recorded and compared with the pre-operative examination. Any changes in lattice regarding holes, tears and presence of vitreoretinal traction was reported. The results analyzed and compared with global studies.

RESULTS

100 patients (200 eyes) aged between 21 and 39 years (mean 24.5±4.9 years) were enrolled in the study. 58% of them were males. 80 eyes showed retinal findings before performing LASIK. The most common finding was lattice degeneration followed by white without pressure and white with pressure. Laser retinopexy was performed in all patients with retinal breaks and in half of the eyes with atrophic holes because of the presence of vitreal-retinal traction. After three months LASIK was performed among all patients underwent laser retinopexy. Types of retinal pathologies seen among patients before performing LASIK are summarized in tables 1.

Table 1: Types of retinal pathologies found in eyes before performing LASIK procedure.

Pathology	Number of eyes	percentages
Normal retinal exam	90	45.0%
Lattice degeneration	70	35.0%
white without pressure	36	18.0%
white with pressure	24	12.0%
posterior vitreous detachment	12	6.0%
vitreous traction	10	5.0%
Atrophic holes	10	5.0%
Retina breaks	8	4.0%

After surgery all eyes showed best un corrected visual acuity of 1.0. during the first year of follow up no incidence of retinal detachment was reported among all patients. 10 eyes showed new retinal pathology after normal eye exam before LASIK. There was an increase in the rates of lattice degeneration, white without pressure, posterior vitreous detachment, vitreous traction, and atrophic holes but this increase was not statically significant (P value > 0.05)

Retina breaks Types of retinal pathologies encountered among all patients during the first year after surgery are summarized in table 2.

Table 2: Types of retinal pathologies during one year of follow up after surgery.

pathology	Number of eyes	percentages
Normal retinal exam	80	40.0%
Lattice degeneration	78	39.0%
white without pressure	40	20.0%
white with pressure	24	12.0%
posterior vitreous detachment	16	8.0%
vitreous traction	12	6.0%
Atrophic holes	12	6.0%
Retina breaks	9	4.5%

DISCUSSION

Lattice retinal degeneration is a common peripheral retinal pathology characterized by thinning and atrophic changes in the retina. In the general population, the prevalence of lattice degeneration is about 6–10% of individuals.[11] However, in myopic patients, this prevalence was reported to be high ranging from 20% to 33% depending on the degree of myopia and axial length.[12] In this study, the rate of lattice degeneration was comparable to the global rates. It was encountered in 35% of eyes. All patients with retinal breaks and atrophic holes had lattice degenerations.

This study evaluated retinal findings and outcomes in 100 patients (200 eyes) undergoing LASIK, with a focus on pre-operative pathologies, prophylactic laser retinopexy, and post-operative retinal changes. High prevalence of lattice degeneration (35%), white without

pressure (18%), and atrophic holes in (5%) were encountered before performing LASIK. These rates were comparable with other studies on myopic populations, undergoing LASIK. For example, Arevalo et al. (2007) found lattice degeneration in 26% of myopic patients pre-LASIK, slightly lower than this cohort, possibly due to younger age (mean 24.5 years) or higher myopia severity.[13] White without pressure and white with pressure were less consistently reported globally. Wilkinson et al. (2002) noted WWOP in 10–15% of myopic eyes, comparable to this study's 18%.[14]

The 4% prevalence of retinal breaks pre-LASIK is consistent with studies emphasizing the necessity for pre-operative retinal assessment in myopes. successful stabilization of at-risk eyes with laser retinopexy, and no cases of retinal detachment (RD) during the 1-year follow-up. Despite new retinal pathologies emerging post-LASIK (e.g., lattice degeneration increased from 35% to 39%), these changes were not statistically significant ($p > 0.05$).

Prophylactic laser retinopexy was performed on all retinal breaks and half of atrophic holes with vitreoretinal traction. This aligns with AAO guidelines, which recommend treating symptomatic breaks or high-risk lesions (e.g., those with traction). Notably, no retinal detachment was encountered post-LASIK. This was consistent with results obtained from other large-scale studies; for example, Ruiz-Moreno et al. (2016) followed 8,654 LASIK patients and found no RD cases over 5 years, attributing this to effective pre-operative management.[14] In addition, a meta-analysis by Chen et al. (2019) concluded that LASIK does not increase RD risk when pre-existing pathology is addressed.[15] The absence of RD in this study reinforces the importance of pre-LASIK retinal evaluation and targeted prophylaxis.

New pathologies emerged in 10 eyes (5%), including increased lattice degeneration from 35% to 39% and white without pressure from 18% to 20%. However, these changes lacked statistical significance ($p > 0.05$), suggesting LASIK itself may not adversely exacerbate retinal pathology. Also it should be kept in mind that Lattice degeneration and white without pressure are dynamic, particularly in myopes. When compared to global studies; Alió et al. (2003) observed no significant post-LASIK retinal changes in 1,000 eyes over 2 years while Choi et al. (2010) noted new lattice lesions in 8% of patients, attributed to myopic progression rather than LASIK.[16,17]

The limitations of this study is the relatively Short follow-up period which may miss late-onset complications and the sample homogeneity: since patients (mean 24.5 years) may underrepresent age-related risks.

CONCLUSION

This study aligns with global evidence that LASIK is safe in carefully screened patients, with no increased RD risk when pre-operative pathology is managed properly. The non-significant rise in post-op retinal findings likely reflects natural progression rather than LASIK-induced changes. Future studies should extend follow-up durations.

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