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# LASIK and Dry Eye Disease: A Case Report

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## Abstract

**Background:** Post- Laser- assisted in situ keratomileusis (LASIK) dry eye is one of the most common postoperative dry eyes after ophthalmic surgeries. Clinically, patients have positive vital staining of the ocular surface, decreased tear breakup times, reduced corneal sensitivity, and decreased visual acuity. In majority of patients, symptoms last about one month, but some patients can experience these symptoms for more than a year. **Case presentation:** A 29-year-old female with Dry Eye Disease (DED) secondary to isotretinoin use wanted to undergo LASIK for refractive improvement. Ophthalmologists were thorough in informing the patient of the significant risk of post-operative dry eyes, especially in patients with pre-operative DED. A cautious approach was taken by the ophthalmologist, and the patient's opinion and needs considered. Post-operatively, the patient continues to have DED but reports it is not worse than pre-LASIK and continues to be complaint with dry eye disease treatment. **Conclusions:** In patients with existing DED, clinicians are vigilant in progressing with LASIK, due to post-operative dry eye symptoms. Careful patient selection and preoperative ocular surface management is recommended for such patient groups. This case reports highlights the importance of clinicians allowing patients to come to an informed decision regarding their care. This patient-centered approach is a model of care that respects patients' experiences, values, needs and preferences, whilst improving clinical outcomes, better use of resources and increased satisfaction with care.

**Keywords:** Dry Eye Disease, Corneal Erosion, LASIK, PRK, Patient-Centered Care

## 1. Background

Laser- assisted *in situ* keratomileusis (LASIK) is a commonly performed corneal refractive surgery with excellent refractive outcomes. As with all surgical procedures there are post-operative complications, one of the most common being Dry Eye Disease (DED). Its symptoms range from mild ocular irritation to severe discomfort, photophobia and vision loss. Clinically, there is evidence of decreased aqueous tear production, decreased tear volume on the ocular surface, increased rate of tear evaporation and increased tear osmolarity (Raouf, D., Pineda R. et al., 2014). Evidence notes there can often be a mismatch noted between severity of signs and symptoms in patients with dry eyes. With LASIK, data suggests 95% of patients experience symptoms of dry eyes after corneal refractive surgery (Toda I et al., 2018). Although signs and symptoms of DED are most common in the immediate

postoperative period and are usually only transient, a small number of patients can develop chronic, severe dry eyes that can be resistant to traditional dry eye treatments (Quinto, GG., Camacho, W. et al., 2008). Below is a case, reporting the outcome of a patient who was diagnosed with a recurrent corneal erosion secondary to dry eye and went on to have LASIK surgery.

## 2. Case Presentation

A 29-year-old woman was seen in Ophthalmology clinic for DED. She was diagnosed 24 months previously with a left eye recurrent corneal erosion secondary to DED, induced by isotretinoin use. The recurrent corneal erosion was being treated with Hypromellose eye drops, VitA-POS, tea-tree-based face wash and lid wipes, Omega 3 supplements and heated mask at night. The patient trialed Lymecycline but stopped, as was experiencing unpleasant side effects. Punctal plugs were discussed at follow up, but it was noted the patient had reduced frequency of episodes alongside significant improvement in the ocular surface with improvement in tear film break up time, corneal staining and Meibomian gland function. Although the patient was compliant with treatment, she was finding it tedious to remove her glasses hourly to apply eyedrops. Before developing a recurrent corneal erosion, the patient had considered LASIK for refractive improvement, and now with the added effort of hourly drops for symptomatic DED, the patient felt strongly about undergoing LASIK. Her ophthalmologist advised that LASIK could worsen her current DED, and if proceeding with LASIK, the patient needed to be aware of potential significant DED post-operatively. The patient was verbally advised about the risks versus benefits of LASIK and DED, was provided written leaflets and a follow-up appointment to give her time to come to an informed decision. The patient also sought a second opinion, where she was given similar advice regarding the possibility of worsening DED post-operatively. The patient decided the benefit of refractive improvement outweighed the risks of worsening DED and went ahead with LASIK. It is important to note, in the patient's clinic letter, it is highlighted that the patient had capacity and was adequately informed about the risks and benefits. Furthermore, it emphasizes that the patient is compliant with DED treatment and would be an appropriate candidate to be compliant with DED treatment post-operatively. In the post-operative period, the patient had bandage contact lenses to aid with corneal healing, which were removed one week post operatively. Now, nine months post-LASIK the patient reports infrequent episodes of DED symptoms. At follow-up, there was no change to the punctate erosions in the left eye, improvement in tear film break up time, corneal staining and Meibomian gland function. She has had three episodes of waking with ocular pain in the nine-month period and reports still being compliant with using hourly eye drops and heat masks.

## 3. Discussion

The case is interesting as it highlights the importance of individualized, tailored care. As clinicians, it is our responsibility to inform patients thoroughly of the risks versus benefit, and in non-life-threatening situations, allow the patient to come to an informed decision. Naturally, there are numerous situations in Medicine, where clinicians must take the responsibility of patients' treatment and act in their best interests. Equally, in appropriate circumstances, it is important we value patients' opinions and use their judgement to deliver patient-centered care. This patient was significantly affected by glasses wear, more so than DED, and was willing to take the risks. Fortunately, as the patient is compliant with DED treatment and had bandage contact lenses, she feels her DED symptoms are not worse than pre-LASIK. An alternative for patients with DED considering LASIK, would be photorefractive keratectomy (PRK) treatment. PRK treats scarring and can correct refractive error (Kymionis, GD., Tsiklis, NS. et al., 2006). Studies suggest that fewer dryness symptoms are seen after PRK compared to LASIK and has a similar patient satisfaction to LASIK (Bower, KS., Sia, RK., Ryan, DS. Et al., 2015). Some ophthalmologists argue it is a safer modality as surface ablation does not require a stromal corneal flap created during LASIK, thus fewer collagen fibers are altered, reducing the risk of biomechanical instability (Stein, R., 2000).

## 4. Conclusion

LASIK in patient with DED remains a watchful topic. Here, the patient's quality of life was significantly affected by glasses use, thus the possibility of worsening DED was accepted by the patient. This case reports exemplifies the benefits of clinicians using careful patient selection, transparency of information, clear communication and

regular follow up, to deliver individualized tailored care. This enhances the doctor-patient relationship, respects patients' experiences, needs and preferences, and improves clinical outcomes, with better use of resources and increased satisfaction with care.

**Patient consent:** The patient consented to publication of the case in writing

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**Conflict of interest/ Competing Interests:** None

**Ethical Committee approval:** Not required

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