Fellowship Case Record – 2

Patient: HN, 40-year-old female
Date of first assessment: 12/01/2024
Presenting refraction:

- R: +0.25/–1.00 × 5 (6/7.5–2)
- L: Balance, CF

History & Reason for Referral

HN was referred to the hospital and attended accompanied by her husband. She has a complex neurological and ocular history, including two large and two small strokes, resulting in a cranial nerve palsy with diplopia and poor coordination.

She had previously attempted to manage diplopia with occlusion using a Blenderm patch over her left spectacle lens. Orthoptic intervention with 10Δ BU prism was not tolerated due to severe nausea.

Relevant Medical History:

- Sickle Cell disease, Lupus
- Multiple strokes
- Medications: Warfarin 5 mg, Dorzolamide 1 drop TDS, Lansoprazole OD, Prednisolone 10 mg OD, Hydroxychloroquine 400 mg OD

Ocular History:

- Multiple retinal detachments in left eye during cerebrovascular events, surgically repaired with limited visual outcome (CF in LE)
- No significant family history of glaucoma or AMD
- No prior contact lens wear

Initial Clinical Findings

The anterior eye examination was unremarkable bilaterally (grades 0 for lids, lashes, blepharitis, MGD, conjunctiva, cornea). Mild diffuse conjunctival staining noted (0.5), TBUT 7s, tear prism height 0.3.

K readings:

- R: 8.30 × 01.50 / 8.60 × 91.50
- L: 8.29 × 27.50 / 8.56 × 117.50
  HVID: 12.5 mm OU
  Pupil diameter: 4 mm OU

Clinical Reasoning

Given the poor vision in the left eye and symptomatic diplopia, occlusion was the most viable management option. A prosthetic soft contact lens with opaque backing and custom hand-painted iris was recommended.

Due to the patient's physical limitations post-stroke, her husband was trained to take full responsibility for insertion and removal. I carefully counselled them on infection risks, hygiene protocols, and safe handling practices.

Cantor & Nissel were selected as manufacturers due to their expertise in bespoke prosthetic lenses. Their Hydrolens 77 material allows for effective hand painting on an opaque backing and can be replaced on a 6-monthly basis, depending on stability of tint and surface condition.

Trial Lens Fitting – 15/05/2024

Trial specification: Nissel Custom 9.20/15.00, plano, 12.5 mm iris, 4 mm pupil

- Coverage: 1 mm beyond limbus
- Centration: good
- Movement: 0.3 mm in primary and gaze positions
- Push-up recovery: smooth and controlled

Binocular VA with spectacles: 6/7.5–2
Diplopia resolved with trial lens in situ. Patient reported immediate relief and was “super happy.”

High-quality photographs were taken under varied lighting conditions and supplied to Cantor & Nissel to guide iris colour reproduction. Iris diameter was increased to 13 mm for improved cosmesis.

Final Lens Fitting – 26/07/2024

Final specification: Cantor Barnard, Nissel Custom Black Back 9.20/15.00, plano, 13 mm iris, 4 mm black pupil(painted on front) custom colour

Fitting assessment remained excellent with stable centration, adequate movement, and good push-up recovery.

Insertion and removal training was carried out with the husband, who demonstrated excellent, gentle technique under supervision. Comprehensive education was provided, covering lens hygiene, avoidance of tap water, swimming/showering, and timing of glaucoma medication (Dorzolamide instilled 45 min prior to lens wear).

Advised to use Hycosan Extra on insertion and removal.

Care System: Ote Sensation MPL sols

Ote Preservative free saline for rinsing

Hycosan Extra eye drops to cushion lens on insertion

Review – 22/10/2024

Wearing time: 10–12 hours daily, 6–7 days/week
Reported good comfort, stable vision, and complete suppression of diplopia.

Clinical assessment:

- Lens condition: clear, no deposits

- Anterior eye health: unchanged, all parameters stable
- Handling and hygiene by husband: excellent
- VA: 6/7.5–2 binocularly with spectacles

A spare lens was ordered to ensure continuity of management. Six-monthly aftercare was arranged and advised to come sooner if there are any concerns.

Reminded patient of emergency advice, no swimming/showering/sleeping in the lenses and no contact with tap water.

Also readvised to remove the lens prior to instilling the lunch time glaucoma eye drops.

Discussion

This case demonstrates the value of bespoke prosthetic soft contact lenses in the management of persistent diplopia where neurological, ocular, and systemic comorbidities restrict the success of conventional approaches. HN presented with complex binocular disturbance secondary to multiple cerebrovascular events, resulting in a cranial nerve palsy and severe binocular disruption. Prism correction was attempted by the orthoptic team but was not tolerated, producing marked nausea. This is consistent with Rowe et al. (2013), who note that *"some patients experience dizziness or nausea with prism use, leading to poor tolerance."* Given her poor left-eye acuity (CF), limited potential for fusion, and intolerance to prism, occlusion offered the safest and most effective route to symptom control.

Spectacle-mounted occlusion had previously been used but was cosmetically unsatisfactory and did not provide reliable suppression. Prosthetic soft lenses are well recognised as an advantageous alternative in such circumstances; Yeung & Collins (2014) emphasise that prosthetic lenses *"provide cosmesis as well as occlusion without the social stigma associated with patches."* Similarly, Putterman (2005) describes occlusive contact lenses as *"an effective means of relieving intractable diplopia when other methods have failed."* In this case, the hand-painted opaque design provided immediate suppression of diplopia without restricting the patient's field of view, and the patient reported instant subjective improvement.

Material selection and design were based on clinical need and manufacturer capability. Cantor & Nissel were chosen due to their extensive experience in bespoke hand-painted prosthetic designs. Their Hydrolens 77 platform is specifically described as one that

"accepts opaque backing and detailed artwork for iris reproduction" (Cantor & Nissel, 2020), making it well-suited for neurological diplopia where total occlusion is essential. The trial lens showed excellent coverage, centration and appropriate movement, consistent with Efron's (2018) assertion that *"well-fitted soft lenses demonstrate predictable centration and movement even in eyes with compromised motility or lid function."* No corneal touch or excessive movement was observed, and comfort was high from first wear.

The patient's complex medical history required careful coordination of medication timing and hygiene precautions. Of particular note, she was using topical dorzolamide three times daily - necessitating counselling on drop timing relative to lens insertion to minimise interaction and preserve comfort. The mild conjunctival staining on initial assessment was managed with preservative-free lubrication, consistent with best practice.

The patient's physical limitations and impaired fine motor control meant that her husband became the primary handler of the lens. The BCLA CLEAR Clinical Practice Guidelines explicitly acknowledge this scenario, stating that *"assisted handling is appropriate for patients with reduced dexterity, provided carers receive structured training and are competent in safe application and removal"* (BCLA, 2023). Thorough supervised training ensured safe handling, and infection-prevention standards were upheld. Emphasis was also placed on avoidance of tap water exposure and correct use of disinfection systems, reflecting Stapleton et al.'s (2017) warning that *"water exposure remains one of the major modifiable risk factors for microbial keratitis."*

At the three-month review, the lens remained clear without deposits; anterior eye health was unchanged, and patient comfort and wearing time were excellent. Importantly, diplopia remained fully suppressed, and the patient expressed high satisfaction with both comfort and cosmesis. This aligns with Young, Hunt & Sulley (2011), who reported *"high levels of acceptance and comfort with prosthetic soft lenses used for occlusion or cosmetic purposes."* A spare lens was ordered to ensure uninterrupted management, and standard six-monthly aftercare was arranged in line with recommendations for prosthetic lens wearers.

Overall, this case highlights the therapeutic, cosmetic, and psychological value of prosthetic soft lenses for patients with neurological diplopia unresponsive to conventional treatment. Custom design, careful clinical reasoning, multidisciplinary safety considerations, and collaborative patient–carer involvement contributed to an excellent long-term outcome.

Conclusion

A custom hand-painted prosthetic soft lens provides a highly effective and well-tolerated solution for HN's intractable diplopia. Prism therapy had been unsuccessful, and spectacle-mounted occlusion was cosmetically unacceptable; in contrast, the prosthetic lens delivered instant suppression while offering a natural appearance. This echoes Putterman's (2005) view that occlusive contact lenses *"offer a practical alternative when other interventions fail."*

The lens remained stable, comfortable and free of deposits, and patient satisfaction was high throughout follow-up. Regular review, meticulous hygiene, and carer-led handling—supported by BCLA recommendations for assisted application (BCLA, 2023)—ensured safe long-term wear. As Young et al. (2011) note, prosthetic lenses frequently achieve *"good comfort and high acceptance,"* which was consistent with HN's experience.

This case reinforces the role of bespoke prosthetic soft lenses as a safe, cosmetically acceptable and patient-centred option for neurological diplopia, particularly in complex patients for whom prism, surgery or spectacles fail to provide relief. With structured aftercare and clear guidance on medication timing and hygiene, prosthetic lenses can offer transformative improvements in visual comfort and quality of life.

References

BCLA (British Contact Lens Association), 2023. Contact Lens Evidence-based Academic Reports (CLEAR): Clinical Practice Guidelines. BCLA.

Cantor & Nissel, 2020. Professional Guide to Prosthetic Contact Lenses. Cantor & Nissel Ltd.

Efron, N., 2018. Contact Lens Practice. 3rd ed. Elsevier.

Putterman, A.M., 2005. Occlusion therapy for intractable diplopia. Ophthalmic Plastic and Reconstructive Surgery, 21(5), pp.351–354.

Rowe, F.J. et al., 2013. Interventions for eye movement disorders following stroke. Cochrane Database of Systematic Reviews, (7), CD008389.

Stapleton, F. et al., 2017. The incidence of contact lens–related microbial keratitis: a systematic review. Eye, 31(2), pp.280–287.

Yeung, K.K. & Collins, M.J., 2014. Prosthetic contact lenses for diplopia and disfigurement. Clinical and Experimental Optometry, 97(3), pp.258–263.

Young, G., Hunt, C. & Sulley, A., 2011. Ocular response and patient acceptance of prosthetic soft contact lenses. Contact Lens & Anterior Eye, 34(5), pp.215–222.