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Ophthal Focus

Dear Doctor,
Greetings from Micro Labs Limited. We are happy to bring you 'Ophthal Focus' which contains latest and interesting news in the field of Ophthalmology.

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Best Regards,
Medical Team, Micro Labs Limited

A non-randomized controlled trial to assess meibomian gland dysfunction in type 2 diabetes patients with dry eye disease.

INTRODUCTION:

Meibomian gland dysfunction (MGD), a persistent and widespread anomaly of the meibomian glands, is commonly characterised by blockage of the terminal duct and/or qualitative/quantitative alterations in glandular secretion. The leading cause of chronic disease mortality is diabetes. Patients with diabetes frequently experience ocular conditions like retinopathy, corneal epithelial erosions, and dry eye [(1)]. DED (dry eye disease) is reported to affect 54% of patients with diabetes. Meibomian glands may potentially be targeted in T2DM patients, a systemic metabolic disorder linked to hyperlipidaemia and lipid overload. Diabetes was identified as a possible risk factor for asymptomatic meibomian gland dysfunction (MGD). Loss of tear film equilibrium carried on by the abnormal expression of meibum lipids results in DED. The objective of the study is to better understand the association between DED and MGD in T2DM by examining the anatomy and physiological function of the meibomian gland in T2DM patients with DED [(2)].

METHODS:

A cross-sectional study included 90 participants and were allocated into the four groups listed below: The DM-DED group consisted of 30 T2DM patients with DED; the DM control group, 18 DM patients without DED; the DED group, 26 DED patients without DM; and the normal control group, 16 healthy individuals. The Schirmer I test, the non-invasive Keratograph tear film break-up time, the ocular surface disease index (OSDI) questionnaire, the corneal fluorescein staining (CFS), the eyelid margin abnormality examinations, the meibum quality and meibomian gland (MG) dropout evaluations were used to find the association between DED and MGD in T2DM.

RESULTS:

The DM-DED group significantly exceeded the DED group in terms of the percentage of MG dropout in both the upper and lower lids ($P<0.05$ or $P<0.01$). Other MG parameters, however, did not significantly change between these two groups. On the other hand, when comparing the DM group with the normal controls, a significant difference was seen in all MG parameters

except MG dropout in the lower lids (P<0.05 or P<0.01). The mean values of upper and lower meibomian gland loss in the DM-DED group were considerably greater than in the DED patients and normal controls (P<0.01). In the DM controls both the upper and lower meibomian glands showed greater loss than the normal controls, although only the lower meibomian gland showed a significant difference (table 1). There were no appreciable differences in the values of the other tear parameters, even though the SIT (The Schirmer I test) values in the DM-DED group were lower than those in the DED group (P <0.05).

Table 1:Comparison (P values) of characteristics of tear and meibomian gland among study groups

Characteristics	DM-DED vs DED	DM-DED vs Control	DM control vs Control
OSDI	0.252	0.046*	0.147
TMH(mm)	0.188	0.005*	0.666
SIT(mm)	0.028*	0.011*	0.022*
NIKBUT-1st(s)	0.99	0.001*	0.057
NIKBUT-avg(s)	0.812	0.002*	0.052
CFS	0.663	0.039*	0.336
Lid margin abnormality score			
Upper	0.190	0.001*	0.009*
Lower	0.251	0.002*	0.005*
Meibum score	0.096	0.003*	0.006*
MG dropout(%)			
Upper	0.004*	0.001*	0.214
Lower	0.021*	0.004*	0.016*

OSDI ocular surface disease index, *TMH* tear meniscus height, *NIKBUT* noninvasive tear film breakup time, *MG* meibomian gland, *DED* dry eye disease, *DM* diabetes mellitus

* *P* < 0.05

DISCUSSION:

In comparison to non-diabetics with DED, meibomian gland loss was considerably greater in the upper and lower eyelids of diabetics with DED. In the current study, the loss of MG in the upper and lower eyelids was different between the DM group and the healthy controls. However, a research by Lin et al. indicated that while the upper eyelid did not exhibit any significant abnormalities, the lower eyelid continually deteriorated with the progression of the disease [(3)].

CONCLUSION:

Type 2 diabetics with DED have worse MGD than nondiabetic DED patients, as well as significantly higher MG dropout and non-obvious higher levels of lid margin abnormalities and meibum quality.

Type 2 diabetics with DED (dry eye disease) have worse MGD (Meibomian gland dysfunction) than nondiabetic DED patients, as well as a significantly higher MG dropout rate and non-obviously higher levels of lid margin abnormalities and meibum quality.

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The Effect of Repeated Low Level Red-Light Therapy on Myopia Control in Children

INTRODUCTION:

Near-sightedness, also known as myopia, is a refractive error caused by excessive axial elongation. Myopia can be optically corrected with glasses, contact lenses, or refractive surgery. Complications such as myopic macular degeneration (MMD), retinal detachment (RD), cataract, and open angle glaucoma (OAG) have been linked to it. These complications can result in permanent visual impairment later in life [(1)]. As a result, myopia is a major public health concern, and an effective and safe method to control myopia progression is highly required. Repeated low-level red-light (RLRL) therapy is a promising new treatment for myopia control that has caused no functional or structural damage. Over a 6-month period, RLRL significantly reduced the rate of myopia progression and axial elongation compared to orthokeratology and single-vision spectacles (SVS). The study's goal is to compare the efficacy of RLRL therapy in myopia control to a sham device with only 10% of the original power [(2)].

METHODS:

A controlled and double-blind and Participants were randomly assigned in a 1:1 ratio to the RLRL group or the sham device control group, with a schedule of 3 minutes per session, twice daily, with at least 4 hours between sessions. The RLRL therapy was delivered at home using a desktop red-light therapy device. The sham device was the same as the original device, but it only had 10% of the power. At baseline and 6 months, cycloplegic refraction and axial length (AL) were measured.

RESULTS:

The study included 111 children ,56 in the RLRL group and 55 in the sham device control group. The mean SER change over 6 months was 0.06 ± 0.30 D in the RLRL group and -0.11 ± 0.33 D in the sham device control group (P =0.003), with mean AL increases of 0.02 ± 0.11 mm and 0.13 ± 0.10 mm (P <0.001) (Table 1). Children in the RLRL group had less myopia progression and axial elongation than those in the sham device control group in the multivariate GEE (generalized estimating equation) models (SER (spherical equivalent refraction): coefficient,

0.167 D; 95% CI, 0.050 - 0.283 D; P = 0.005; AL: coefficient, -0.101 mm; 95% CI, -0.139 to -0.062 mm; P < 0.001). There were no reported treatment-related side effects.

Table 1:Generalized Estimating Equation Model Analysis of Factors and Effects on Changes of Cycloplegic Spherical Equivalent Refraction and Axial

Factors	Coefficient (95% Confidence Interval)	P Value
Primary outcome		
Change of SER, D		
Age, yrs	0.015 (−0.018 to 0.049)	0.377
Sex (female/male)	−0.053 (−0.168 to 0.063)	0.372
Ethnicity (Han/other)	−0.039 (−0.241 to 0.163)	0.703
Baseline SER, D	−0.001 (−0.031 to 0.030)	0.959
Group (RLRL/sham)	0.167 (0.050–0.283)	**0.005**
Laterality (right/left)	−0.021 (−0.072 to 0.030)	0.421
Secondary outcome		
Change of AL, mm		
Age, yrs	−0.019 (−0.030 to −0.008)	**0.001**
Sex (female/male)	0.015 (−0.025 to 0.055)	0.469
Ethnicity (Han/other)	−0.038 (−0.103 to 0.027)	0.257
Baseline AL, mm	−0.009 (−0.030 to 0.011)	0.376
Group (RLRL/sham)	−0.101 (−0.139 to −0.062)	**< 0.001**
Lateral (right/left)	0.009 (−0.007 to 0.025)	0.255

AL = axial length; D = diopter; RLRL = repeated low-level red light; SER = spherical equivalent refraction.
Bold indicates statistically significant.

Discussion:

When compared to sham device treatment, RLRL treatment slowed myopia progression and reduced axial elongation and there were no reported treatment-related adverse events. This study found that RLRL treatment resulted in SER regression of > 0.25 D and AL shortening of > 0.05 mm at the 6-month follow-up in 16.1% and 23.2% of children with myopia, respectively [(2)]. In a similar study Yu Jiang et al found reversal of SER progression and axial shortening and suggested that the observed axial shortening could not be fully explained by choroidal thickening [(3)].

CONCLUSION:

RLRL therapy with 100% power significantly reduced myopia progression in myopic children over 6 months compared to those treated with a sham device with 10% original power. The RLR L treatment was well tolerated and there were no treatment-related side effects.

Over a 6-month period, RLRL therapy with 100% power significantly reduced myopia progression in myopic children compared to those treated with a sham device with 10% original power.

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Assessment of Surgical Outcomes in Patients undergoing Uncomplicated Primary Retinal Detachment Repair.

INTRODUCTION:

Rhegmatogenous retinal detachment (RRD) is a serious disease that could impair eyesight. Pars plana vitrectomy (PPV) and scleral buckling (SB) are currently used as RRD therapy methods. Because of its minimal invasiveness, PPV with a wide-angle viewing system is becoming more and more common as the first-line therapy. Small, self-sealing incisions reduce surgery stress, postoperative swelling, and postoperative astigmatism, improving patient satisfaction and accelerating vision recovery [(1)]. PPV has surpassed SB as the preferred surgery procedure for treating all patients with uncomplicated RRD as a result of technological advancements in vitrectomy. To optimize the advantages of both operations for phakic patients, SB/PPV surgeries have become more frequently combined. The study compares the results of pars plana vitrectomy (PPV), scleral buckling (SB), and combined pars plana vitrectomy with pars plana vitrectomy (SB/PPV) for the main uncomplicated rhegmatogenous retinal detachment (RRD) repair [(2)].

METHODS:

A retrospective, observational analysis of 179 subjects with initial RRD repaired with SB, PPV, or SB/PPV was conducted. Patients were identified using procedure numbers for scleral buckling (67107) and pars plana vitrectomy with or without extra scleral buckling. (67108). Preoperative patient demographics and traits were collected and evaluated, and primary success rates, final anatomical success rates, functional success rates, and best corrected visual acuity (BCVA) were compared across surgical procedures. BCVA was measured with the Snellen eye chart and transformed to logarithm of minimal angle of resolution (logMAR) for group comparison. As their main intervention, all patients received either SB, PPV, or a combination of SB/PPV. Fisher Exact Test was used for qualitative measurements and the ANOVA test was used to compare surgery treatments.

RESULTS:

Primary anatomical success was obtained in 145 of 179 eyes (81.0%), with SB/PPV achieving a considerably higher success rate (p = 0.046) than SB and PPV. Among the three therapies, functional success varied from 92.7% to 97.1%, with SB doing slightly better than SB/PPV and PPV. SB had the highest final BCVA, however the difference was not statistically significant (p = 0.367) (Table 1). There was a 2.15 odds ratio for main anatomic failure in patients with inferior detachment. None of the main results were substantially impacted by prior pneumatic retinopexy.

Table 1; Outcomes by Surgical Intervention (n = 179)

	SB	PPV	SB/PPV	p-value
1° Anatomical Success	70%	83.7%	90.3%	0.046*
Functional Success	97.1%	92.7%	96.4%	0.552
Final BCVA (logMAR)	0.34	0.41	0.49	0.367

*Indicates significant difference between the designated values in the row. Data was interpreted using ANOVA with a significance level of 0.05.

DISCUSSION:

Among the treatments, the combined surgical strategy (SB/PPV) produced the highest main anatomical success rate (p = 0.046). When compared to SB or PPV alone, the combined treatment was found to be just as effective in terms of main anatomical efficacy. In addition, a study by Echegaray JJ et al. revealed that SB/PPV resulted in better Single-operation anatomic success (SOAS) results for primary RRD repair than PPV alone [(3)].

The primary anatomical success rates observed in this study for SB/PPV (90.3%), PPV (83.7%), and SB (70.0%) were comparable to those reported by Echegaray JJ et al., who found that PPV alone resulted in single-operation anatomic success in 90 of 111 eyes (81.1%) as compared to 345 of 374 eyes (92.2%) with SB+PPV and in phakic eyes, PPV + scleral buckling demonstrated greater anatomic efficacy than PPV alone [(3)].

The proportion of eyes with BCVA higher than or equivalent to 20/200 at six months was used to measure functional success. High effective success rates were demonstrated by all three surgery procedures. The functional success rates in this research were comparable to those of another study by Mohamed YH et al where he finds 96.7% functional success rate following first reattachment surgery [(4)].

CONCLUSION:

In conclusion, of the three surgery procedures examined, combined scleral buckle/pars plana vitrectomy demonstrated the highest anatomical success rate. SB had slightly improved visual results, which may have been caused by patient group variation and cataract development. Excellent clinical outcomes were seen with all three surgical procedures. This study supports the use of SB/PPV because the main anatomical success was significantly higher.

In comparison to the other two surgery procedures, combined scleral buckle/pars plana vitrectomy demonstrated the highest anatomical success rate. Because of the primary anatomical success being noticeably greater, this research supports the use of SB/PPV.

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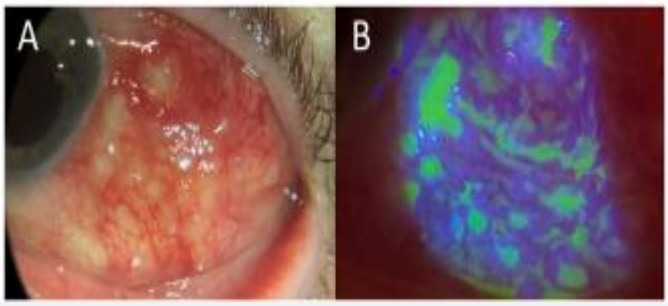
A case report of Nocardia arthritidis scleritis

INTRODUCTION:

Non-infectious scleritis is a group of conditions characterised by eye inflammation that begins in the sclera and spreads to adjacent ocular structures. It can affect people of all ages. In contrast to episcleritis, which is a common condition that typically causes mild discomfort with no risk of blindness. It causes chronic eye pain that radiates to the face and scalp and worsens at night, as well as decreased visual acuity and red eye. Although both the anterior and posterior sclera can be involved, anterior scleritis is more common and can be classified as diffuse, nodular, necrotizing with inflammation, or necrotizing without inflammation [(1)]. Nocardia is a genus of saprophytic bacteria that can be found in organic-rich soil. It is known to contain more than 85 species. Nocardia infection complications can be harmful to the eye. Scleritis, keratitis, and endophthalmitis are examples of ocular sight-threatening manifestations. This report describes the treatment of a 69-year-old female with infectious scleritis caused by the Nocardia arthritidis species [(2)].

CASE REPORT:

A 69-year-old female was referred for severe constant pain in the left eye due to glaucoma, dry eye syndrome, laser-assisted in-situ keratomileusis (LASIK), and recent cataract surgery (1 month prior). Despite starting oral ciprofloxacin, ofloxacin ophthalmic solution every 2 hours, and difluprednate twice daily, the surgeon noticed temporal conjunctival/scleral injection that gradually worsened over the next few weeks. Our OS slit lamp exam (1 month after cataract surgery) revealed 3+ injections, scleral thickening, and multiloculated abscesses with purulent drainage from small conjunctival erosions (Fig.A and B). As the referring physician's



Slit lamp photograph at presentation demonstrates left eye conjunctival/scleral injection temporally accompanied by multiloculated abscesses with purulent drainage (A). Fluorescein demonstrates multiple small conjunctival erosions in the area (B).

initial gram stain revealed gram-positive, branching rods, the initial management plan included topical amphotericin, vancomycin, and amikacin every 2 hours, cyclopentolate 1% three times a day, and oral trimethoprim-sulfamethoxazole 800 mg-160 mg twice a day. Because there was a positive response to therapy, 3 days later, subconjunctival injections of vancomycin, gentamicin, and ceftazidime were given again. The culture specimens were determined to be Nocardia arthritidis at the one-month follow-up. The patient reported itchiness, redness, and yellow discharge in the morning OS with no associated pain at the 5-week follow-up. A serpentine border surrounded the conjunctival defect, which also had mild fibrosis and pseudomembranes. After 4 months of treatment, there were no more conjunctival defects. The conjunctiva appeared quiet with no signs of infection at the six-month follow-up. The patient responded well to early repeat subconjunctival injections in addition to the prescribed regimen, and was disease-free at the last follow-up.

Discussion:

Because Nocardia is not part of the normal flora of the eye, it can cause opportunistic infections in immunocompromised patients if introduced through ocular trauma or surgery. Since their discovery in 2004, N. arthritidis and N. asteroides have been regarded as significant aetiologies of ocular nocardiosis. Nocardia scleritis leads to severe ocular discomfort, photophobia, blepharospasm, and eyelid swelling.

In a similar study, Laura Pires da Cunha et al found that recent ocular surgery, solid organ transplantation, and/or corticosteroid use are common risk factors for Nocardia infections [(3)].

Conclusion:

This case shows infectious scleritis caused by an uncommon Nocardia species that was successfully treated with strategies similar to those used for other Nocardia species. Because Nocardia scleritis can have serious consequences if not treated immediately and properly, it should be considered in an immunocompromised patient who presents with acute ocular symptoms following any recent ocular surgery.

In this case, an uncommon Nocardia species (N. arthritidis) caused infectious scleritis, which was successfully treated with strategies similar to those used for other Nocardia species. If not treated promptly and properly, Nocardia scleritis can have serious consequences.

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