

Dear Doctor,

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

This issue contains

- Absent Bell's phenomenon in subjects with thyroid eye disease.
- Improved accuracy of intraocular lens power calculation by preoperative management of dry eye disease.
- Anterior segment optical coherence tomography- A tool which identify retained lens fragments in the anterior chamber

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Looking forward to your valuable feedback

Best Regards,
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Absent Bell's phenomenon in subjects with thyroid eye disease

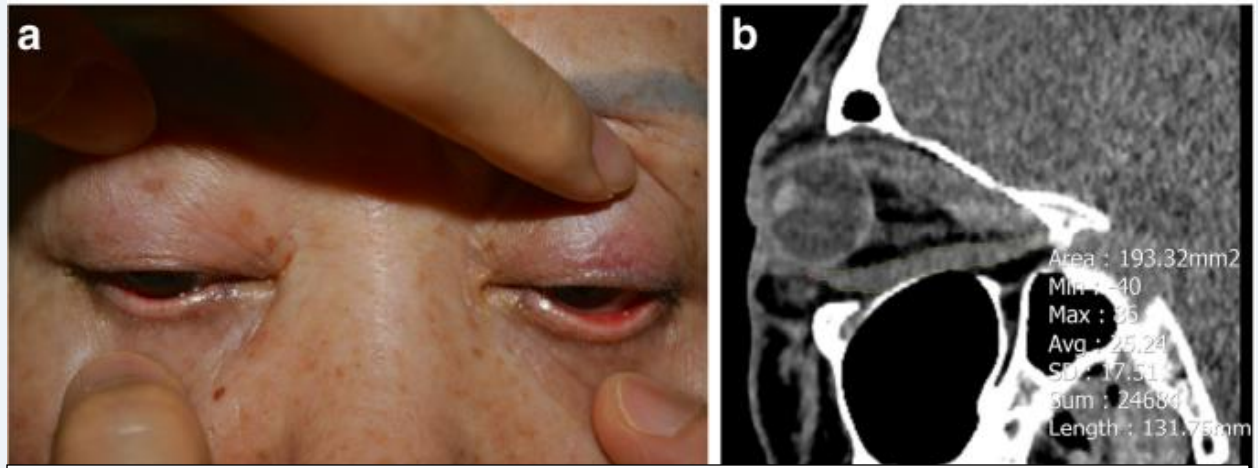
Background: One of the leading causes of ocular surface damage in thyroid eye disease (TED) is dry eye syndrome. Dry eye in TED is caused by a number of factors such as exophthalmos, increasing palpebral fissure height, lagophthalmos, and reduced tear production.

Aim: This study aimed at assessing the incidence of absent Bell's phenomenon (BP) and also the relationship between absent BP and inferior rectus muscle hypertrophy and the clinical features in subjects with thyroid eye disease (TED).

Methods: 104 subjects who were diagnosed with thyroid eye disease (TED) were included in this study. Laboratory measurements were assessed for thyroid Stimulating Hormone, FT4(Free T4), T3, and thyroid specific antibodies and thyroid-stimulating immunoglobulin (TSI). Based on Bahn– Gorman progression symptoms of diplopia was recorded. On a scale of -1 to -4 the degree of elevation limitation as a sign of inferior rectus involvement was graded. Bell's phenomenon (BP) was analysed by gently lifting the upper lid manually. Inferior rectus muscle area and associations with clinical features of thyroid eye disease and thyroid function test including thyroid specific antibodies were compared between subjects with TED with and without Bell's phenomenon. By tracing outlines of each tissue on sagittal CT images the cross-sectional areas of the inferior rectus muscle (IR) was measured.

Results: Out of 104 subjects 14 subjects showed negative BP (13.5%), 12 were bilateral, and two were unilateral. Female predominance with either absent or positive BP was observed. Subjects with absent BP showed Thyroid dysfunction which was 28% and positive TSI was noted in 34% of the patients. In absent BP subjects the mean exophthalmometry values were 14.7/15.8 mm. The Clinical Activity Score (CAS) score was the same at 1.2 in BP absent and positive patients. In absent BP subjects the mean NOSPECS score was 2.0 and 2.6 in positive BP patients. Significant difference was not observed in thyroid function test,

presence of TSIs, exophthalmos, or volume of inferior rectus muscle measured in CT scans.



A Bell's phenomenon is assessed by gently lifting each upper lid manually while the patient's eyes are closed. The examination shows absent BP in both eyes. **B** Measurement of cross-sectional areas of inferior rectus muscle on sagittal CT images

Conclusion: The prevalence (13.5%) of absent Bell's phenomenon in 104 subjects with thyroid eye disease was reported. In these patients Inferior rectus muscle hypertrophy was not the cause of absent BP. Fibrosis and tightening of the inferior rectus muscle, eyelid, and surrounding orbital tissues might be related to absent Bell's phenomenon in subjects with thyroid eye disease.

References: Chung HW, Lee H, Baek S. Absent Bell's phenomenon in patients with thyroid eye disease. BMC ophthalmology. 2021 Oct;21(1):1-6.

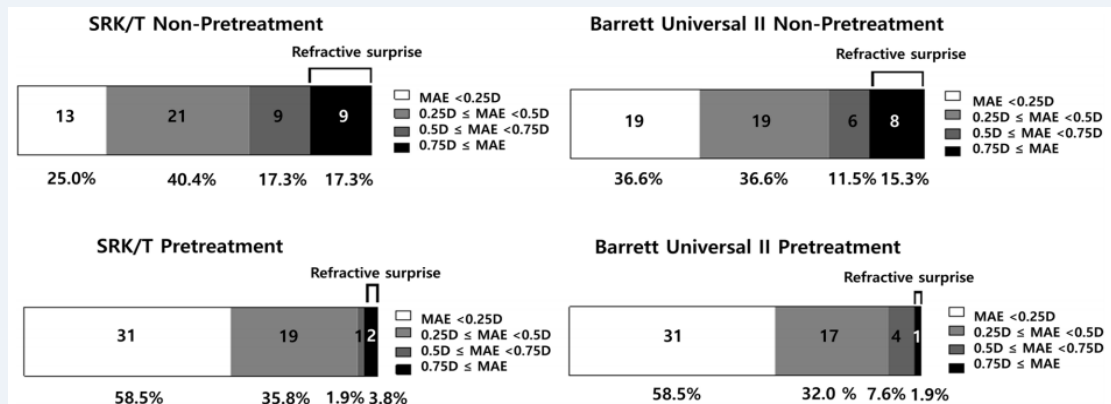
Improved accuracy of intraocular lens power calculation by preoperative management of dry eye disease

Background: In the recent years the number of cataract surgeries has grown significantly. One of the most common ocular diseases affecting millions of people worldwide is dry eye disease (DED). It is associated with tear film instability, tear hyperosmolarity, and inflammation of the ocular surface. Dry eye disease is also linked with occasional pain, foreign body sensation and a decrease the quality of the patient.

Aim: The objective of this study was to investigate the effects of pretreatment for dry eye disease (DED) on the accuracy of intraocular lens (IOL) power calculation.

Methods: In this retrospective study subjects who underwent uneventful cataract surgery were included in the study. The ocular biometry was measured once with IOLMaster500 when the SNR value was greater than 2 and the standard deviation of the K value was less than 0.01D. Subjects in the pretreatment group were administered 0.5% loteprednol etabonate (LE) four times a day and 0.05% cyclosporin A (CsA) twice a day for 2 weeks prior to surgery to manage preoperative dry eye disease. For preoperative DED management Eyelid scrub and warm compression were also recommended. according to the Lens Opacities Classification System III standards cataract grading was assessed using slit lamp examination. Under topical anesthesia all cataract surgeries were performed with a superior corneal incision of 2.2 mm. In both the non-pretreatment and pretreatment groups optimized A-constant was applied. Within 2 days before surgery ocular biometry was performed in all groups. The accuracy of intraocular power calculation compared between the non-pretreatment and pretreatment groups at 1 month postoperatively.

Results: A total of 105 eyes of 105 subjects were analysed in this study out of which 53 had received pretreatment for dry eye disease and 52 (52 eyes) did not receive pretreatment for dry eye disease. Between the non-pretreatment and pretreatment groups there was no differences in the axial length (AL), average K value, anterior chamber depth, tear film breakup time, ocular surface staining score, and tear secretion with the Schirmer test. In the non pretreatment group the mean error (ME) at 1month after surgery was $0.10 \pm 0.53D$ and $0.09 \pm 0.28D$, $-0.01 \pm 0.30D$ in the pretreatment group. No significant difference was observed between the two groups. In the non-pre-treatment group mean absolute error (MAE) at 1month after surgery was $0.42 \pm 0.33D$ and $0.38 \pm 0.34D$ in the pretreatment group. In the pretreatment group the number of refractive surprises was also significantly smaller. Pre-treatment of dry eye disease was related to a reduction in postoperative refractive surprise.



Stacked histogram comparing the percentage of cases within a given diopter range of predicted spherical equivalent refraction outcome between the DED non-pretreatment and pretreatment groups.

SRK/T			
ME (D)	0.10 ± 0.53	0.09 ± 0.28	0.828
MAE (D)	0.42 ± 0.33	0.23 ± 0.19	< 0.001*
Refractive surprise (+)	9 (17.3%)	2 (3.8%)	0.024 ^{†*}
Refractive surprise (—)	43 (82.7%)	51 (96.2%)	
Barrett Universal II			
ME (D)	−0.06 ± 0.51	−0.01 ± 0.30	0.529
MAE (D)	0.38 ± 0.34	0.24 ± 0.19	0.008*
Refractive surprise (+)	8 (15.4%)	1 (1.9%)	0.016 ^{†*}
Refractive surprise (—)	44 (84.6%)	52 (98.1%)	

Comparison of the accuracy of intraocular power calculation between the non-pretreatment and pretreatment group for DED before cataract surgery

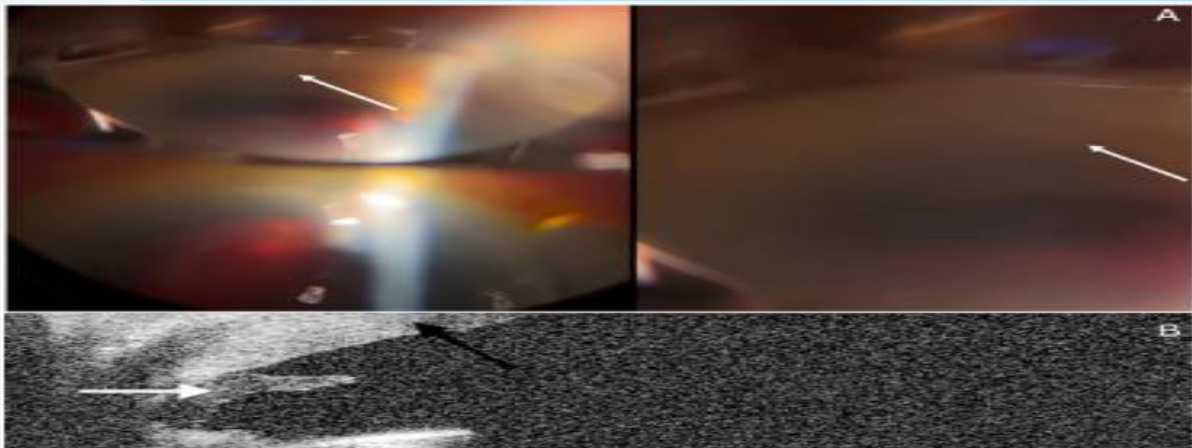
Conclusion: The accuracy of IOL power calculation can be improved by short-term preoperative management of DED using topical LE, CsA and eyelid scrubs with warm compression. The probability of refractive surprise can be reduced with this pretreatment protocol for DED before cataract surgery. This protocol will be helpful before cataract surgery, as it is easily applicable and safe, with no adverse effects.

References: Kim J, Kim MK, Ha Y, Paik HJ, Kim DH. Improved accuracy of intraocular lens power calculation by preoperative management of dry eye disease. BMC ophthalmology. 2021 Dec;21(1):1-7.

Anterior segment optical coherence tomography- A tool which identify retained lens fragments in the anterior chamber

Patient description: A 79 year old man underwent routine phacoemulsification in the right eye with Infiniti Vision System under topical anaesthesia. Intraocular lens (IOL) was placed in the capsular bag and the surgery was uncomplicated. An axial length of 26.78mm and anterior chamber depth of 3.22mm was found on Preoperative biometry with IOL Master 500. There was no history of corneal pathology other than arcus senilis. On preoperative examination endothelium was unremarkable in both eyes. He presented to the clinic with Pseudophakic bullous keratopathy two weeks postoperatively. In the right eye uncorrected visual acuity was 6/36. Stromal oedema was observed on examination. Anterior chamber examination was unremarkable and intraocular pressure (IOP) was 14.

The patient was started on his initial management by increasing his postoperative treatment of topical dexamethasone 0.1% to six times/day. Visual acuity was 6/60 with ongoing PBK at 1month after surgery. He was referred to the corneal service for consideration of endothelial keratoplasty at 2 months after surgery. Optical coherence tomography (OCT) macula was unremarkable. Retained lens fragment (RLF) could not be found on conventional slit lamp examination or gonioscopy, although view of the angle was obscured by severe corneal oedema. With high suspicion of RLF, an Anterior Segment OCT was performed. 2days later anterior chamber washout was performed. The most recent follow-up was 3 months postwashout. In the affected eye Visual acuity is 6/60 unaided (6/24 pinhole). Corneal decompensation and cystoid macular oedema was developed



A) Suspected retained lens fragment, however gross corneal oedema obscuring view B) Anterior OCT image showing retained lens fragment in the inferior iridocorneal angle, measuring 1244 µm, White arrow indicates retained lens fragment in iridocorneal angle and black arrow indicates cornea. OCT, optical coherence tomography.

Retained lens fragment (RLF) is a rare complication of uneventful cataract surgery and appears more frequently in complicated cases. This was the first report describing using anterior segment optical coherence tomography AS-OCT to identify RLF.

Conclusion: AS-OCT is a versatile, simple, effective and quick imaging technique with a plethora of applications. After cataract surgery if the patient develops corneal oedema, high suspicion for RLF is warranted. Better clinical outcome via less endothelial cell loss and less risk of cystoid macular oedema (CMO) may be observed by early anterior chamber washout and removal. Prompt investigation using AS-OCT can prevent delay in intervention.

Reference: Haseeb Akram , Chrishan Duminda Gunasekera, Harry Roberts, James Myerscough. Anterior segment optical coherence tomography (AS -OCT) as a useful tool to identify retained lens fragments in the anterior chamber BMJ Case Rep 2021;14:e244817. doi:10.1136/bcr-2021- 244817



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