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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Medical Team, Micro Labs Limited

Nd:YAG laser treatment for visual axis opacification and secondary membranes following paediatric cataract surgery with intranasal sedation

Introduction

Children as young as 5 months old can safely undergo a Nd:YAG laser membranectomy procedure while being sedated with intranasal dexmedetomidine.

Visual axis opacification (VAO) after cataract surgery and intraocular lens implantation (IOL) affects up to 40% of paediatric patients. The visual axis is obscured by opacification in both the toddler and adult groups [(1)]. Secondary membranes develop when the inflammatory fibrous membranes, whether in the aphakic eyes or the intraocular lens (IOL) eyes, are not fully absorbed in the early postoperative period [(2)]. The Neodymium:yttrium-aluminium-garnet(Nd:YAG) capsulotomies must only be carried out for the appropriate clinical purpose. To ensure that Nd:YAG capsulotomy was appropriately advised, it should be necessary to record the degree of fibrosis in posterior capsular opacification(PCO) investigations[(3)].This study demonstrated the viability of treating children of various ages with Nd: YAG lasers while they are sitting and sedated with intranasal dexmedetomidine.

Methods

In this study, 20 eyes from 17 patients who had secondary membrane formation following cataract surgery were included. The patients were divided into"aphakic group" and the "pseudophakic group". The Teller or best-corrected visual acuity test, as well as a slit-lamp examination, were performed on all patients. Children were seated with their chin resting on a laser delivery slit lamp while Nd:YAG laser procedures were carried out while they were under the intranasal sedation of dexmedetomidine (3 ug/kg) and under anaesthesia. Seventeen patients were reviewed, who received a topical suspension of loteprednol etabonate 0.5% four times a day for 7 days after surgery. The Follow-up examination was performed within 7 days of procedure which include slit-lamp examination, Teller visual acuity test or best-corrected visual acuity test, and intraocular pressure (IOP) measurement using a rebound tonometer. The duration of follow-up ranged from 7 to 18 months.

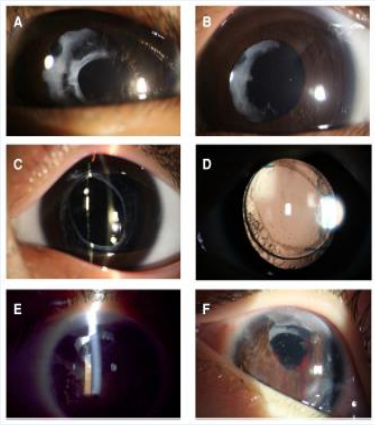

Figure 1 The preoperative (A, C,E) and postoperative (B,D,G) anterior segment configuration of patients. (A, B) Nd: YAG laser treatment of pupillary membranes along with anterior capsule remnants. (C, D) Nd:YAG laser posterior membranectomy was performed in a patient with posterior capsule capturing IOL implantation. (E, F,G) Nd:YAG laser treatment of anterior capsule contraction was performed in a patient with intracapsular IOL implantation, and iris hemorrhage occurred during treatment.

Results

The study was conducted on 17 children, aged 5 months to 83 months. One (5.0%) traumatic cataract and 19 (95.0%) congenital cataracts were present in the 20 eyes of the 17 children. Eight children's right eyes, six children's left eyes, and three children's bilateral eyes each received laser treatment. After removing the cataract and implanting an IOL, two (10.0%) pupillary membranes and five (25.0%) eyes showed VAO. VAO was present in six (30.0%) cortical proliferative eyes and five aphakic (25.0%) eyes. 17 (85.0%) eyes underwent lensectomy, posterior capsulotomy, and limited anterior vitrectomy, and stage II IOLs were implanted in five of those eyes. In 3 (15.0%) eyes, cataract phacoaspiration, posterior capsulorhexis, partial anterior vitrectomy, and IOL implantation were carried out. Six eyes (30.0%) remained unchanged after laser treatment, whereas five (25.0%) eyes showed improvement. Preoperative and postoperative visual acuity had a significant positive linear association. Nd:YAG laser membranectomies were performed more than twice on four (20%) eyes, three of which were pseudophakic. During laser therapy, Patient 10 experienced iris haemorrhage, which quickly led to relapses (Figure 1F). Due to severe inflammatory exudation, patients 12 and 17 had operations to remove the posterior membrane after receiving laser treatment.

Discussion

In present study, paediatric patients with visual axis opacification and secondary membranes following cataract surgery were included which was treated with Nd:YAG laser[(2)]. Studies have shown that up to 40% of paediatric patients may develop visual axis opacification (VAO) following cataract surgery and intraocular lens implantation (IOL) [(1)]. In individuals with posterior capsular opacification, Nd:YAG laser capsulotomy increased visual acuity[(4)].

Conclusion

Under intranasal dexmedetomidine sedation, Nd:YAG laser membranectomies can be safely carried out on children as young as 5 months old. The procedure is done in a sitting position, offering convenience, expertise, and cost savings. Recurrent cases can be managed by repeating the treatment.

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Evaluation of long-term clinical and safety results of canaloplasty in glaucoma patients of various disease severity levels.

Introduction

iTrack canaloplasty is a valuable addition to the glaucoma treatment options, reducing the reliance on the medication and delaying more invasive surgeries.

Glaucoma is ophthalmic disorder that can cause irreversible loss of vision. With global prevalence, it stands as the second most prevalent cause of blindness, impacting nearly 60 million individuals in 2020[(1)]. Topical medications are the first approach to reduce the intraocular pressure(IOP). When target IOP is not met, surgery is adviced. Trabeculectomy is considered the gold-standard surgery for glaucoma. However, it has high rates of complications, including choroidal hemorrhage, cataract development, hypotony, bleb leakage and infections. Canaloplasty is a new non-penetrating technique for reducing intraocular pressure in glaucoma patients [(2)]. This study investigated the long-term clinical and safety results of canaloplasty in glaucoma patients of various disease severity levels.

Methods

The retrospective study was conducted on POAG patients (18 years of age or older) to evaluate the effectiveness of canaloplasty. The study examined its impact on reducing intraocular pressure(IOP) and medication dependence. The procedure was performed via an ab interno technique using iTrack microcatheter and can be done alone or with cataract surgery. The study compared mild-moderate vs severe primary open-angle glaucoma(POAG) cases, as well as controlled (less than or equal to 18 mmHg) vs. uncontrolled (>18 mmHg) IOP eyes. The primary

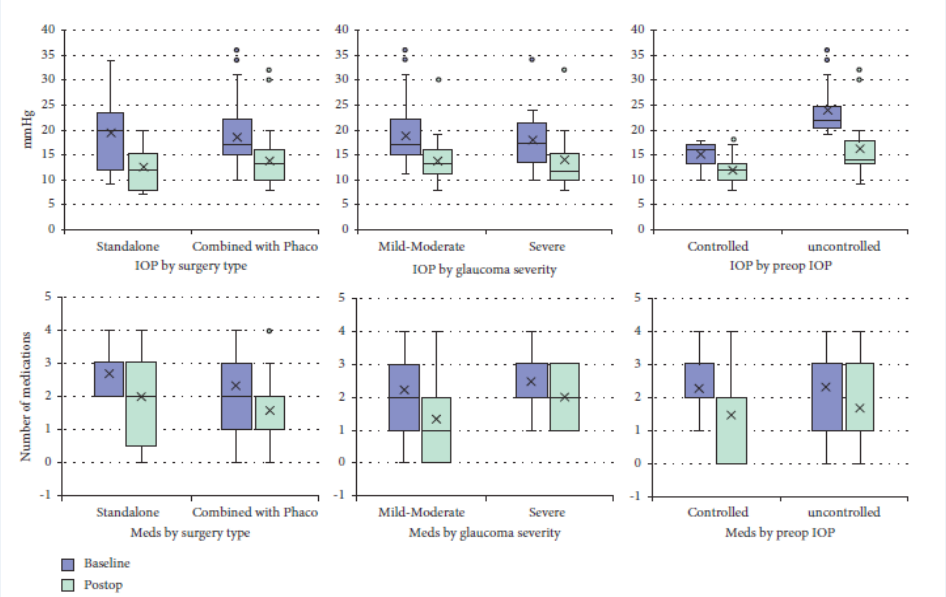

Figure 1 IOP and medications outcomes at baseline and postoperative by surgery type (standalone vs. combined with cataract surgery group), glaucoma severity (mild-moderate vs. severe; only combined with cataract surgery group) and preoperative IOP (controlled vs uncontrolled; only combined with cataract surgery group).

endpoints were mean IOP and mean antiglaucoma drugs used at 36 months, while the secondary endpoints compare standalone and combination procedures, glaucoma severity, and controlled vs uncontrolled IOP eyes. cataract surgery was performed prior to canaloplasty in iTrack + phaco group.

Results

The total of 72 eyes were monitored for an average duration of 3.4 years. The mean pre-operative IOP for 72 eyes was 18.6 mmHg. At the last follow-up, there was a significant 25% reduction to 13.5 mmHg. The mean number of medication also significantly decreased by 29%, from mean 2.4 pre-operatively to 1.6 at the last follow-up. In the standalone group(n=9), the mean preoperative IOP was 19.3 mmHg, while in the combined group(n=63) it was 18.5 mmHg. At the last follow-up, there was a 36% reduction in mean IOP from 19.3mmHg to 12.4mmHg in the standalone group and 26% reduction from 18.5mmHg to 13.7mmHg in the combined group. In the severe group(n=24), the mean pre-operative IOP was 18.6 mmHg and in mild-moderate group (n=48), it was 18.6 mmHg. At the last follow-up, the mean IOP decreased to 14.1mmHg in the severe group and 13.3mmHg in the mild-moderate group. The average use of glaucoma medication decreased from 2.5 to 2.1 in the severe group and from 2.3 to 1.4 in the mild-moderate group. Only one localized descemets membrane detachment occurred in the moderate group. The results are revealed in FIGURE 1.

Discussion

In present study iTrack canaloplasty helped in reducing the IOP and dependence on the medication [(1)]. Khaimi MA study showed iTrack ab-interno canaloplasty reduced medication dependency and maintained targeted intraocular pressure in patients with mild or moderate primary open-angle glaucoma. It has a good safety profile as a standalone procedure or combined with cataract surgery [(3)].

Conclusion

iTrack canaloplasty is an emerging option for glaucoma patients. It is minimally invasive, tissue-sparing and doesnot require implants. It is effective as a standalone procedure or with phacoemulsification for mild-moderate and severe glaucoma. It can also benefit patients with a history of previous treatment like selective laser trabeculoplasty(SLT). Overall, iTrack canaloplasty is a valuable addition to the glaucoma treatment options, reducing the reliance on the medication and delaying more invasive surgeries.

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The Impact of Sleep-Related Breathing Problems on Age-Related Macular Degeneration.

Introduction

Patients with officially diagnosed OSA had a greater risk of developing AMD with RPD but not overall AMD, when compared to individuals who are not receiving therapy.

Age-related macular degeneration(AMD) is the main reason for permanent loss of central vision in elderly population (over 55 years) in developing nations. Early detection and treatment can delay AMD progression and preserve vision [(1)]. Sleep-disordered breathing(SDB) is a condition with apnea and/or hypopnea, insomnia and sleep disturbances. SDB is believed to be linked to AMD due to chronic hypoxia [(2)]. Hypoxia may have a significant role in AMD development, as the oxygen demanding retinal pigment epithelium and photoreceptors, are highly metabolically active and consume oxygen extensively [(3)]. This study investigated the relationship between age-related macular degeneration(AMD), the subphenotype of AMD with reticular pseudodrusen(RPD) and obstructive sleep apnea(OSA).

Methods

The case-control study was conducted on participants of 50 years of age or older with age-related macular degeneration. Participants completed the Epworth Sleepiness Scale (ESS) and STOP-BANG

Questionnaire (SBQ) questionnaires to assess their risk of sleep-disordered breathing(SDB). Spectral domain OCT (SD-OCT) scans were performed on all participants, with some control participants underwent cirrus HD-OCT scans. Additional retinal imaging was conducted on participants with age-related macular degeneration(AMD) to determine AMD staging and reticular pseudodrusen(RPD) status. Presence of RPD was confirmed through SD-OCT and en face imaging. The retinal imaging was conducted within 6 months of sleep questionnaires. Two different risk scales were used for analysis: a binary scale combining ESS and SBQ results and an ordinary scale based on SBQ results alone. Logistic regression analysis was used to assess the association between AMD and risk of

PARAMETERS	AMD	P-value	RPD coexistent with AMD	P-value
OSA risk (SBQ+ESS; binary)				
Non-high risk(n=279)	Ref	0.698	Ref	0.885
High risk(n=63)	1.13		1.05	
OSA risk(SBQ ordinal)				
Low risk(n=169)	Ref	0.519	Ref	0.551
Intermediate risk(n=142)	1.35		1.36	
High risk (n=26)	1.39		1.55	
SBQ score(continuous)				
Per point increase	1.09	0.441	1.16	0.252
ESS score(continuous)				
Per point increase	1.04	0.353	1.02	0.679

Figure 1 Relationship between the chance of having age-related macular degeneration (AMD) or reticular pseudodrusen (RPD) coexisting with AMD and the risk of obstructive sleep apnoea (OSA) as measured by the STOP-BANG questionnaire (SBQ) and Epworth Sleepiness Scale (ESS) (n=337)

moderate-to-severe obstructive sleep apnea(OSA), as well as the association between AMD with RPD phenotype and risk of moderate-to-severe OSA.

Results

A total of 351 patients participated in the study, of whom 211 had AMD and 140 were control participants with normal maculae. Based on the evaluation of all 351 individuals, it was found that 22 (6.3%) had previously received a formal diagnosis of OSA, 15 (68%) had AMD, and 7 (32%) were controls. There was no correlation between AMD and those who received therapy for their OSA using an assisted breathing equipment. However, there was a strong correlation between having an official OSA diagnosis and receiving therapy with an assisted breathing equipment and an increased risk of RPD coexisting with AMD. Logistic regression analysis for the assessment of OSA risk using the binary scale in a group of 337 participants with complete data on the SBQ and ESS showed no association between high-risk of moderate-to-severe OSA and the presence of AMD or with RPD coexisting with AMD (FIGURE 1). According to the ordinal scale used to assess OSA risk, Neither the presence of AMD nor RPD coexisting with AMD was associated with having a moderate-to-severe OSA risk of intermediate or above. Additionally, there was no correlation between an increase in SBQ score per point and the existence of AMD or RPD in conjunction with AMD. Additionally, there was no correlation between per-point increases in the ESS score and AMD or RPD coexisting with AMD.

Discussion

In present study, the use of 2 validated sleep questionnaires and 2 distinct risk scoring algorithms together offered complementary methods for evaluating OSA risk. A persistent trend in the results suggested a relationship between AMD and RPD coexisting with AMD, but the study may not have had enough statistical power to identify significant results (3). Other research using bigger sample sizes was successful in finding a significant association (4).

Conclusion

In comparison to individuals who are not receiving therapy, patients with officially diagnosed OSA had a greater risk of developing AMD with RPD but not overall AMD. Risk-based OSA questionnaires did not show a difference in risk for all AMD or AMD with RPD. Further studies using formal sleep studies could investigate the potential impact of nocturnal hypoxia on AMD.

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Case Report: Paracentral acute middle Maculopathy as an indicator of impending central retinal artery occlusion

Introduction

Paracentral acute middle maculopathy(PAMM) warns of an imminent complete Central retinal artery occlusion(CRAO)

Central retinal artery occlusion(CRAO) is an ocular thrombo-embolic event, resulting in irreversible vision loss. Identifying patients at risk before the occlusion is challenging, despite certain clinical findings. Spectral domain optical coherence tomography(SD-OCT) is gaining attention for early detection of retinal vascular disease before the onset of vision loss [(1)]. Paracentral acute middle maculopathy(PAMM) is a new finding on SD-OCT. It shows a hyper-reflective band in the inner nuclear layer(INL) and later progresses to INL atropy[(2)]. This study presents a patient, who developed sudden central scotoma with PAMM, later which it progressed to complete CRAO.

Case presentation

A male of 63 years old presented with a new onset central scotoma in the left eye. Symptoms started 36 hours ago with the significant decrease in visual activity. The patient described, a horizontal line which was obstructing his centre of view. Past medical history showed one episode of atrial fibrillation for which he was taking apixaban, as well as third degree atrioventricular heart block that was treated with a pacemaker. Visual acuity was 20/25 in both eyes. Spectral domain optical coherence tomography (SD-OCT) indicated hyper-reflective changes in the inner nuclear layer (INL) and inner plexiform layer (IPL) extending from the fovea (FIGURE 1). CT angiography revealed mild atherosclerotic changes in the left carotid artery without significant stenosis. Four days later, the patient experienced inferior hemifield vision loss. Neurology evaluation ruled out thrombolytic therapy with tissue plasminogen activator (tPA). Aspirin 81mg daily was prescribed. The next day, patient wokeup with a visionloss in the left eye. Hand motion visual acuity. Fundus examination showed diffuse retinal whitening and cherry red spot, but no visual plaques or emboli. SD-OCT revealed inner retinal thickness and hyper-reflectivity consistent with complete central

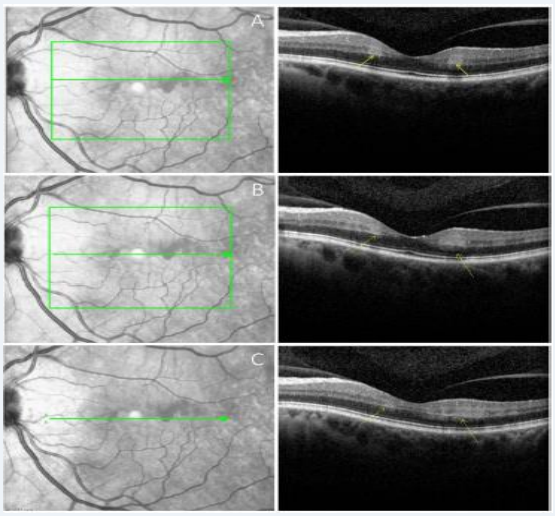

Figure 1 Fig. 1SD-OCT images of the upper (A), central (B), and lower (C) regions of the infarct demonstrating ischemia and hyperreflectivity of the middle and inner retina (yellow arrows) consistent with PAMM. The infrared images (left column) with green arrows indicate the location of the OCT B-scan.

retinal artery occlusion(CRAO) (FIGURE 2). Carotid ultrasound and trans-esophageal echocardiogram showed no abnormalities. Hyper coagulopathy workup with hematology consultation was normal. Warfarin and clopidogrel were started, and apixaban was stopped. The patient was lost to follow-up after the event.

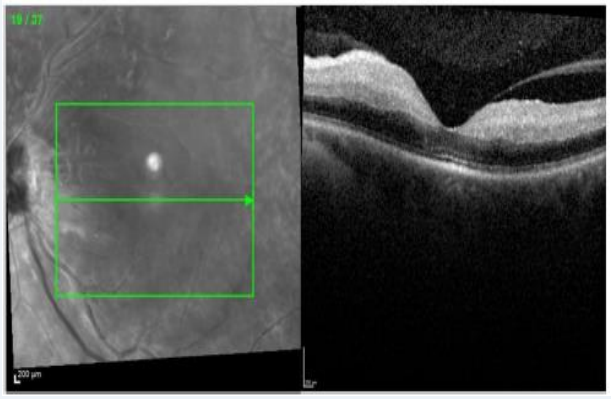

Figure 2 SD-OCT one week later depicting diffuse hyperreflectivity and thickening of the inner retina consistent with complete CRAO. The infrared image with the green arrow indicates the location of the OCT B- scan

Discussion

Here the case of central scotoma with PAMM, later which it progressed to complete CRAO was reported [(1)]. A previous study by Sridhar J et.al. identified PAMM of incomplete CRAO [(3)]. In present case, patient took aspirine 81 mg daily after PAMM diagnosis, but it didn't prevent CRAO onset and Neurology evaluation ruled out thrombolytic therapy with tPA [(1)]. Zhao et.al., observed resolution of PAMM lesions with aspirin therapy [(4)]. It was observed that intra-articular tPA when administered within 12 hours of onset has shown some efficacy in reversible vision loss [(5)].

Conclusion

Paracentral acute middle maculopathy(PAMM) warns of an imminent complete Central retinal artery occlusion(CRAO). To prevent cerebrovascular events or complete blindness in the affected eye, a comprehensive stroke evaluation is necessary.

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