

# Intraocular Lens Subluxation following Micropulse Transscleral Cyclophotocoagulation

Basma Alqaseer, Muneera Abunajma

## Access this article online

Quick Response Code:



## Website:

www.saudijophthalmol.org

## DOI:

10.4103/1319-4534.310401

## Abstract:

We present a case of intraocular lens (IOL) subluxation following micropulse transscleral cyclophotocoagulation (MP-TSCPC) procedure for glaucoma that is resistant to medical therapy. A 71-year-old male presented to his routine glaucoma follow-up appointment and was found to have medically uncontrolled intraocular pressure (IOP) in the right eye. Throughout his visits, the IOP ranged between 26 and 35 mmHg. The IOL was in position without the presence of pseudoexfoliation, and the cup–disc ratio was 0.8 in the right eye. The patient was treated with MP-TSCPC and no immediate complaints or complications were noted post-procedure. However, 5 weeks postoperatively, he presented with IOL subluxation. MP-TSCPC is becoming a popular choice of treatment in lowering IOP. To the best of our knowledge, IOL subluxation has not been reported as a complication. Since the procedure is relatively new, further long-term research is warranted to determine the possible effects and complications.

## Keywords:

Complication, cyclophotocoagulation, glaucoma, lens subluxation, micropulse

## INTRODUCTION

Glaucoma is one of the leading causes of irreversible blindness worldwide.<sup>[1,2]</sup> The increase in intraocular pressure (IOP) results in death of retinal ganglion cells, and ultimately loss of the optic nerve fibers.<sup>[3]</sup> It is managed by reducing the IOP, either by increasing the outflow or decreasing the inflow of aqueous humor.<sup>[1,4]</sup> Options include include medical therapy, surgical intervention, and laser procedures.<sup>[5]</sup>

Traditional transscleral cyclophotocoagulation (TSCPC) is a type of cyclodestructive procedure that uses nonselective continuous-wave diode laser. It targets the ciliary body, resulting in the reduction of aqueous humor production, and ultimately reduction of the IOP. Despite its effectiveness in most types of glaucoma, it is reserved for refractory glaucoma. This is because nonselective and continuous targeting features are associated with collateral damage and increased risk of morbidity.<sup>[1,4,6]</sup> Complications include hypotony, phthisis bulbi, pupillary

distortion, hyphema, scleral perforation, and lens subluxation.<sup>[7-10]</sup>

A more recent procedure however, known as micropulse TSCPC (MP-TSCPC), has a more selective targeting feature and delivers repetitive pulses of energy. This is associated with less collateral damage and hence less complications.<sup>[1,4,6]</sup> Only a few complications were reported in studies, these include scleral thinning and prolonged anterior-chamber inflammation.<sup>[6]</sup>

We present a case of intraocular lens (IOL) subluxation following MP-TSCPC procedure for open angle glaucoma resistant to medical therapy.

## CASE REPORT

A 71-year-old male presented to the eye clinic for glaucoma follow-up. The patient was diagnosed with glaucoma 24 years ago, compliant with his treatment and regularly attends follow-up appointments. Medical therapy for both eyes (BE) included brinzolamide/timolol and brimonidine tartrate. A variety of different eye drops were previously prescribed during the course of his management; however,

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Alqaseer B, Abunajma M. Intraocular lens subluxation following micropulse transscleral cyclophotocoagulation. Saudi J Ophthalmol 2020;34:233-5.

Eye and Laser Center, Bahrain  
Defence Force Hospital, Royal  
Medical Services,  
Kingdom of Bahrain

## Address for correspondence:

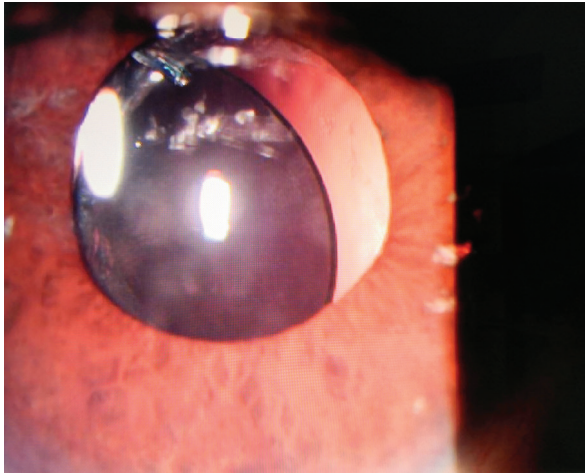
Dr. Basma Alqaseer,  
Eye and Laser Center, Bahrain  
Defence Force Hospital Royal  
Medical Services,  
Kingdom of Bahrain.  
E-mail: basma.alqaseer@  
gmail.com

Submitted: 30-Sep-2018

Revised: 06-Nov-2019

Accepted: 06-Apr-2020

Published: 27-Feb-2021



**Figure 1:** Image showing IOL subluxation 5 weeks post MP-TSCPC procedure

the patient could not tolerate their side effects. The only ocular intervention undergone was phacoemulsification with posterior-chamber IOL implantation for BE. No history of diabetes mellitus, pseudoexfoliation syndrome or ocular trauma was reported.

On examination, the visual acuity was 20/25 in BE, and the IOP was 26 mmHg in the right eye (RE) and 16 mmHg in the left eye (LE). The patient was pseudophakic with a posterior-chamber IOL in stable position in BE and had no pseudoexfoliation. A flat retina and a cup disc ratio (CDR) of 0.8 in the RE and 0.5 in the LE were noted.

Despite compliance with medical therapy, the IOP in the RE measured between 26 mmHg and 35 mmHg. Considering the persistently raised IOP and advanced CDR in the RE, MP-TSCPC procedure was performed.

During the procedure, the patient received a peribulbar block (1500 I/U of hyaluronidase diluted in 50 ml of 2% lignocaine) and sedation. The IQ810 Iridex Laser settings were programmed with the standard: power – 2000 mW, micropulse “on” time – 0.5 ms, micropulse “off” time – 1.1 ms, and duty cycle – 31.3%. The laser probe was applied in a sliding motion across the superior and inferior hemispheres. The 3 and 9 o’clock areas were avoided to prevent damage to the ciliary neovascular structures. The laser was administered over 360° – with 60 s in the superior and 60 s in the inferior hemisphere (total duration total duration of). No blood or pigment was noted during the procedure.

The first day following the procedure, the RE visual acuity was 20/40 and the IOP was 10 mmHg. The anterior-segment examination of the RE was relatively unremarkable; quiet

conjunctiva, clear cornea, deep and quiet anterior chamber, mid-dilated pupil and the IOL was in stable position. One week following the procedure, there were no complaints and the IOP was 13 mmHg without any notable changes on examination. However, 5 weeks following the procedure, the patient was complaining of seeing a “shadow” in the RE. On examination, IOL subluxation and a persistent mid-dilated pupil were noted [Figure 1].

In addition to the anti-glaucoma medications, the patient was started on pilocarpine eye drops two times a day for the RE. After nearly 2 weeks, the patient improved without any complaints, despite the subluxated IOL.

## DISCUSSION

MP-TSCPC is becoming a more popular choice of treatment, owing to its more predictable effect in lowering IOP and having fewer ocular complications, when compared to traditional TSCPC.<sup>[4,6]</sup> This overall profile of efficacy and fewer ocular complications makes this a reasonable early choice of treatment in glaucoma.<sup>[1]</sup>

The mechanism behind the MP-TSCPC is administration of repetitive, short pulses of energy with rest intervals, involving “on” and “off” cycles.<sup>[1,6]</sup> During the “on” cycle, energy builds up within the targeted pigmented tissues until it reaches the coagulative threshold. The nonpigmented tissues are spared and cooled off during the “off” cycle. This ultimately minimizes collateral tissue damage that is seen in traditional TSCPC.<sup>[1]</sup>

Only a few recognized complications of MP-TSCPC were recorded to the best of our knowledge. These include prolonged anterior-chamber inflammation and scleral thinning.<sup>[6]</sup> Lens subluxation is a complication of traditional TSCPC and was documented in two case reports.<sup>[8,10]</sup> A case report suggested that laser-induced zonular and ciliary body damage resulted in zonular dialysis and subsequently lens subluxation.<sup>[8]</sup>

However, to the best of our knowledge, lens subluxation has not been reported as a complication of MP-TSCPC. Zonular dialysis and subsequent posterior-chamber IOL subluxation may have occurred due to laser-induced damage to the zonules and ciliary processes. MP-TSCPC is a fairly new procedure. There are only a limited number of studies regarding the use of MP-TSCPC and lacking studies in evaluating long-term efficacy and complications.

In conclusion, MP-TSCPC is becoming a popular choice of treatment in lowering IOP.<sup>[4,6]</sup> However, since the procedure is relatively new, there is limited research available on its complications and long-term efficacy. Therefore, patients should be informed of the possibility of lens subluxation

as a complication of the procedure, as well as secondary complications of lens subluxation.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### REFERENCES

1. Kuchar S, Moster MR, Reamer CB, Waisbourd M. Treatment outcomes of micropulse transscleral cyclophotocoagulation in advanced glaucoma. *Lasers Med Sci* 2016;31:393-6.
2. Wójcik-Gryciuk A, Skupb M, Waleszczykb WJ. Glaucoma – State of the art and perspectives on treatment. *Restor Neurol Neurosci* 2016;34:107-23.
3. Weinreb RN, Aung T, Medeiros FA. The pathophysiology and treatment of glaucoma: A review. *JAMA* 2014;311:1901-11.
4. Amoozgar B, Phan EN, Lin SC, Han Y. Update on ciliary body laser procedures. *Curr Opin Ophthalmol* 2017;28:181-6.
5. Bleisch D, Furrer S, Funk J. Rates of glaucomatous visual field change before and after transscleral cyclophotocoagulation: A retrospective case series. *BMC Ophthalmol* 2015;15:179.
6. Aquino MC, Barton K, Tan AM, Sng C, Li X, Loon SC, *et al.* Micropulse versus continuous wave transscleral diode cyclophotocoagulation in refractory glaucoma: A randomized exploratory study. *Clin Exp Ophthalmol* 2015;43:40-6.
7. Manna A, Foster P, Papadopoulos M, Nolan W. Cyclodiode laser in the treatment of acute angle closure. *Eye (Lond)* 2012;26:742-5.
8. Rao VJ, Dayan M. Lens subluxation following contact transscleral cyclodiode. *Arch Ophthalmol* 2002;120:1393-4.
9. Ishida K. Update on results and complications of cyclophotocoagulation. *Curr Opin Ophthalmol* 2013;24:102-10.
10. Hadid OH, Ellerton CR. Late-onset crystalline lens subluxation after diode laser cyclophotocoagulation. *Clin Exp Ophthalmol* 2008;36:694-5.