



Comparison of Micropulse Cyclophotocoagulation Probe Settings and Effectiveness: Preliminary Data

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Purpose

Micropulse transscleral cyclophotocoagulation (mTSCPC) features pulsed energy which is thought to allow time for heat dissipation therefore limiting damage to surrounding tissues when compared to continuous wave transscleral cyclophotocoagulation (cwTSCPC). There is currently no consensus on the optimal treatment parameters for mTSCPC. In 2020, Iridex released a revised probe with an intent to promote more effective energy delivery and ease of use. The goal of this retrospective study is to determine if there is a difference in efficacy between the probes.

Methods

Epic Slicer Dicer was used to search for charts with the procedure code for CPC performed between January 2018 and September 2021. Inclusion criteria included patients who underwent mTSCPC with the original P3 probe or revised P3 probe with the newly recommended settings. Exclusion criteria included patients receiving additional surgical or laser intervention before 3 months. Data on the settings of the preop and postop intraocular pressure (IOP) as well as medications was collected. The power, duty cycle, and duration of each procedure was recorded and were used to calculate the total energy delivered where Energy (E) = Power (W) x Duration (s) x Duty Cycle (31.3%).

Data was then analyzed with the help of the Department of Public Health.

Bibliography

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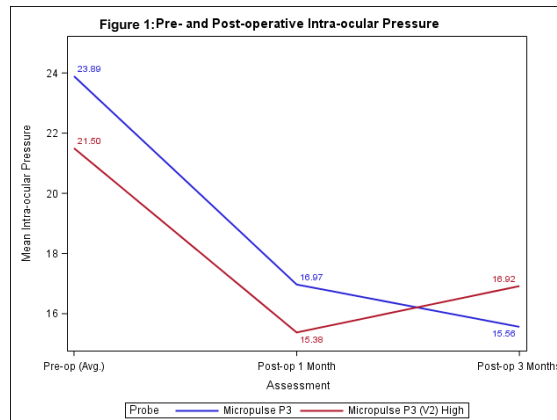


Results

Table 1. Descriptive Properties of the Sample

	All Participants		Micropulse P3		Micropulse P3 (V2) High		p-value
Sex – N (%)							
Female	30	(53.6)	18	(60.0)	12	(40.0)	.643
Male	26	(46.4)	14	(53.8)	12	(46.2)	
Age – Mean (SD)	66	(16.4)	63	(16.4)	70	(15.9)	.123
Power – Mean (SD)	2228	(244.4)	2023	(74.0)	2500	(0.0)	<.0001
Total Duration – Mean (SD)	195	(40.9)	179	(5.3)	217	(55.8)	<.0001
Energy – Mean (SD)	137	(40.0)	113	(5.5)	170	(43.7)	<.0001
TOTAL – N (%)	56	(100.0)	32	(57.1)	24	(42.9)	

p-values represent comparisons between probe types (Micropulse P3 v. Micropulse P3 (V2) High).



Average IOP reduction at 1 month (p-value = 0.451) and 3 months (p-value = 0.392)

Table 2. Responder Analysis

	All Participants		Micropulse P3		Micropulse P3 (V2) High		p-value
	N	Percent of Total	N	Percent of Total	N	Percent of Total	
20% or More Decrease in IOP at 1 Month	30	(53.6)	16	(50.0)	14	(58.3)	.536
20% or More Decrease in IOP at 3 Months	35	(62.5)	23	(71.9)	12	(50.0)	.094

Discussion

The revised probe was introduced with improvements including “scleral-matching” contour to help maintain a consistent angle of application, “limbal-matching” to help maintain the appropriate distance from the limbus, and a recessed laser fiber to promote tissue coupling and decrease damage to the conjunctiva.¹

The ideal parameters for the revised probe for mTSCPC are not clearly defined. Treatment parameters for the original probe were proposed to be between 112 and 150 J which is obtained with around 180 seconds of treatment with 2000-2500 W of energy and the set duty cycle of 31.3%. These settings resulted in a pressure reduction of about 30% with little to no side effects, while higher energy settings of greater than 200 J could result in side effects in over 40% of cases.² The most recent recommendations for parameters in the revised probe are between 125 to 156 J by 2000-2500 mW with 50 seconds per quadrant delivered in five 10 second sweeps.¹

The data from this study shows that despite increase in energy delivered there is no significant difference in IOP lowering effect. Limitations of this study include a small population, retrospective nature, and shorter follow up.

Conclusions

There is no difference between the original probe and the revised settings with higher settings.

This study adds real world clinical experience with the revised probe for mTSCPC and emphasizes the importance of more studies on power delivery, efficacy, retreatment rates, and side effect rates with the revised probe in order to help further optimize treatment parameters to deliver optimal pressure lowering and minimal side effects.