



POSTERIOR SEGMENT LASER THERAPY

Game Changer

OD-OS Scores with Navilas® Microsecond Laser Platform

Results from subthreshold approaches in various posterior segment applications

by Hazlin Hassan

It's been nearly 60 years since the first ophthalmic laser was designed, and the technology has come a long way. Today, there are various types of lasers (i.e. argon, diode, multicolor, microsecond pulse and photodynamic), as well as different delivery systems (i.e. contact lens slit-lamp, indirect ophthalmoscope-based photocoagulation and camera-based navigated retinal photocoagulation with eye-tracking), to treat posterior segment conditions.¹

Of course, as any technology progresses, it's improved upon – and for ophthalmic lasers, those improvements result in better patient outcomes. One of those developments is the Navilas® 577s (OD-OS, Teltow, Germany), an all-digital, eye-tracking retinal laser that integrates digital imaging and laser delivery, with live color and infrared imaging for focal and ultra-widefield pan retinal photocoagulation (PRP) as well as peripheral tear and iridotomy treatments.

Key advantages of navigation win big

The Navilas® laser platform has several advantages over conventional or pattern laser systems. One of the

most noted benefits is treatment planning where targeted areas are digitally pre-planned and completed with the help of computer guidance. Meanwhile, the eye-tracking feature minimizes inadvertent laser applications – stopping immediately with eye movement – which significantly improves accuracy.²

Navilas® can integrate images taken with fundus autofluorescence, OCT, OCT-A, fluorescein angiography and indocyanine green angiography images – which helps achieve an effective laser treatment through precise targeting of treatment areas. Patient comfort is also a key advantage with Navilas® as the treatment can be performed in infrared mode and without a contact lens, so pain is significantly lower.^{3,4} For physicians, ease of treatment is another benefit: with a live fundus view, the system helps avoid a loss of orientation from inverted or reversed images. Plus, Navilas® delivers a photographic report of treatment plans and sessions, which provides enhanced control over the treatment especially in subthreshold approaches where the endpoint is invisible. Reports are also useful for follow-up or further treatment.⁵

Tracking the results from subthreshold studies

To investigate these benefits, as well as safety and efficacy for treating retinal conditions using tissue-friendly microsecond pulsing approaches, several experts shared their experience with Navilas® during a satellite meeting at the recently held EURETINA congress in Paris, France.

Case #1: Repeatability and confidence in DME

Dr. Carlos Orduna, (Oftalmologia Orduna, Spain) shared his experience using the Navilas® yellow laser in patients suffering from diabetic macular edema (DME). Twenty-two eyes of 14 patients were included in the study with a follow-up of up to 12 months.

Dr. Orduna reported that laser treatment was effective in more than 55% of the cases based on a subjective evaluation and no rescue anti-VEGF was given; meanwhile 59% of the patients improved more than 5 letters in visual acuity (VA), which was statistically significant. Thirty-six percent showed an early anatomic response with an improvement in retinal thickness.

The laser treatment was repeated in 64% of patients due to worsening or stability; the mean number of re-treatments was 3; the mean time



Transparency of microsecond pulsing treatment with Navilas®

Exact planning Reproducible application Complete documentation

between treatments was 4.3 months. “This platform enables repeatability ... you can change one parameter and you can repeat the same treatment,” he explained.

“The Navilas® could be a valid treatment alternative for low-grade DME, or when using anti-VEGF is controversial,” he said.

Case #2: Safe, painless and effective for CSCR

Next, Dr. Nina-Antonia Striebe (University Hospital Goettingen, Germany) presented findings from a 100-case review of navigated microsecond pulsing treatment for central serous chorioretinopathy (CSC) in 102 eyes from various study sites. She indicated that the Navilas® 577s was used in this study because of the eye-tracking function, which facilitates exact planning to treat foveal hotspots, while digital guidance and documentation allows for easy comparison between sites.

According to Dr. Striebe, 65% of eyes received one laser treatment, which was sufficient for the resolution of the subretinal fluid, while 23% received two treatments and 4% received three. Only ten percent of patients required additional treatment, like anti-VEGF.

Following treatment, there was a reduction in macular thickness, an improvement in best corrected visual acuity (BCVA), and there were no side effects or scars. She concluded: “We have a safe navigated laser treatment . . . and without pain, as we don’t need to use a contact glass as with many other laser systems.”

Case #3: Significant VA improvements in BRVO

To assess the efficacy and safety of navigated microsecond pulsing laser treatment in patients with macular edema after branch retinal vein occlusion (BRVO), Dr. Emiliano Di Carlo (Staedtisches Klinikum Karlsruhe, Germany) and colleagues evaluated morphological and functional early outcomes of 18 eyes of 17 patients.

Following treatment, there was a statistically significant improvement of VA at month 3, as well as an improvement of retinal photoreceptor structures at months 1 and 3, with a mild effect on the reduction of central retinal thickness. There was also a strong correlation between the restoration of foveal integrity and post-laser VA improvements.

The investigators observed no postoperative complications, no worsening of macular edema, no deterioration of VA, no worsening of vascular perfusion or presence of retinal hemorrhages, and no pain reported by patients during the procedure.

Based on these results, Dr. Di Carlo concluded: “The Navilas® microsecond pulsing laser treatment represents an effective, safe and valuable tool to treat patients with macular edema due to BRVO in particular conditions, such as glaucomatous eyes and in patients with a high cardiovascular risk and who cannot undergo anti-VEGF therapy.”

Case #4: Avoiding complications in PRP

Conventional pattern laser treatment isn’t without complications – in focal as well as peripheral applications. This can include loss of VA, increased intraocular pressure, risk of inadvertent laser to the macula, or patient discomfort leading to abortion of procedure and thus resulting in limited outcome. Therefore, Dr. Jay Chhablani (University of Pittsburgh Medical Center, USA) investigated whether microsecond PRP could be an alternative to conventional CW (continuous wave) PRP.

References:

- 1 Kozak I, Luttrull JK. Modern retinal laser therapy. *Saudi J Ophthalmol.* 2015; 29(2): 137–146.
- 2 Kozak I, Oster SF, Cortes MA, et al. Clinical Evaluation and Treatment Accuracy in Diabetic Macular Edema Using Navigated Laser Photocoagulator NAVILAS. *Ophthalmology.* 2011; 118(6): 1119–1124.
- 3 Inan UU, Polat O, Inan S, et al. Comparison of pain scores between patients undergoing panretinal photocoagulation using navigated or pattern scan laser systems. *Arq Bras Oftalmol.* 2016;79(1):15-18.
- 4 Chhablani J, Mathai A, Rani P, et al. Comparison of conventional pattern and novel navigated panretinal photocoagulation in proliferative diabetic retinopathy. *Invest Ophthalmol Vis Sci.* 2014;55(6):3432-3438.
- 5 Chhablani J, Kozak I, Barteselli G, El-Emam S. A novel navigated laser system brings new efficacy to the treatment of retinovascular disorders. *Oman J Ophthalmol.* 2013; 6(1): 18–22.



With the primary outcome of disease progression between the groups, Dr. Chhablani found that the results were comparable between both laser treatments. This led the investigators to propose that microsecond PRP could be a viable alternative to help avoid complications associated with conventional CW treatment.

He continued: “Navilas® with its pre-planning, documentation and eye-tracking provides a valuable tool to standardize treatment with an invisible endpoint.”

“It provides a comfortable position in terms of ergonomics – and it provides a true confluency while everything is being documented: You can go back and look at a previous plan and see the areas where treatment is required... that is where Navilas® makes a difference,” concluded Dr. Chhablani. 🌐

Editor’s Note: The EURETINA 2019 congress was held in Paris, France, on September 5 to 8, 2019. Reporting for this story also took place at EURETINA 2019.