

VITRA – QUANTEL MEDICAL - France

CLINICAL EXPERIENCE OF A NOVEL OPHTHALMIC PHOTOCOAGULATOR

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Vitra is a new device for ophthalmic photocoagulation which allows **traditional laser treatments in daily clinical practice**, as well as **subthreshold therapy for macular edema**. We have been using Vitra for more than one year and our preliminary data show **results comparable to those achieved with classical argon-green laser systems** in terms of reliability and clinical outcomes on target tissues. Moreover, it provides appreciable advantages in terms of handling, ergonomy and maintenance.

Vitra offers a broad range of **delivery options**, such as **slit lamp adaptor, indirect ophthalmoscope adaptor, and operating microscope adaptor** with straight and curved **endocular probes**. Vitra dimensions and weight (4.8kg) allow convenient portability from the office to the operating room. Our clinical experience is limited to the slit lamp delivery system.

The solid state Vitra laser source is a frequency-doubled diode pumped ND Yag emitting at 532 nanometers (nm). This green wavelength, well absorbed by melanin, has a negligible absorbance by xanthophyll pigment. It is therefore ideal radiation for both peripheral, mid-peripheral retinal photocoagulation, macular photocoagulation, and trabeculoplasty for open-angle glaucoma diseases.

A convenient display screen allows the user to select and modify the laser parameters required during the laser session: **power between 50 and 1200 milliwatts (mw), exposure time adjustably from 0.01 to 60 seconds**. A select mode button allows the surgeon to choose either single mode, repetition mode, painting mode or continuous mode. Time interval between two consecutive shots in the repeat mode can vary from 0.1 to 0.7 sec. The spot diameter is **flexibly adjusted from 50 μ and 500 μ** . The aiming beam intensity can be increased and decreased as well as turned off if necessary the "gentlefoot" footswitch is included with the Vitra. Three modes are available from the Vitra's menu: basic, basic + and advanced. When available. The "gentlefoot" footswitch allows the surgeon to select the different treatment parameters by the foot.

PHOTOCOAGULATION FOR POSTERIOR SEGMENT DISEASES

Panretinal photocoagulation (PRP).

After having treated more than 50 patients with either severe non-proliferative, proliferative diabetic retinopathy, or ischemic retinal vein occlusion, we can attest that the **clinical outcomes of Vitra laser are equivalent to those achieved with argon laser systems**. We chose parameters sufficient to achieve mild gray white burns: a spot size of 200 or 400 microns depending of the contact lens, - Quadraspheric wide angle lens or three mirrors Goldman lens – a pulse duration of 0.10 sec, and an average power of 150 to 200 mw. Patients experiencing both laser systems – Argon green or Vitra – report that Vitra laser is "softer", less bright, and more comfortable than the argon one. Nevertheless, like other green radiation laser systems, Vitra Laser has two disadvantages: poor transmission through nuclear sclerotic cataracts and, due to absorption within hemoglobin, impeded photocoagulation through vitreous hemorrhages.

Peripheral retinopexy.

Our experience in this field confirms our conviction that Vitra laser is similar to conventional argon laser systems.

Focal grid treatments for diabetic macular edema.

Diabetic macular edema is still a controversial topic, and the best **management** of this frequent and sight-threatening clinical condition remains a matter of concern. Laser therapy is still **the gold standard reference**, provided that very mild laser burns are applied on this central retinal area.

Vitra allows **subthreshold grid therapy** when choosing specific parameters: spot size of 75 to 100 microns, pulse duration 0.01 sec and low power of 50 mw. The laser burns applied over the thickened macular areas are **not visible at treatment time** and **barely visible after the session**. This new technique aims to spare the adjacent neuroretina by avoiding heat transmission, subsequent scars and paracentral scotomas. Depending on the clinician's choice, it can easily be combined with **focal photocoagulation** applied on microaneurysms, provided that the pulse duration and/or the power are mildly increased.

In our experience, after six to eight months following treatment, most eyes previously presenting clinically significant macular edema, as defined by the ETDRS, exhibit stable or increased visual acuity, stable or decreased foveal thickness as assessed by Optical Coherence Tomography, no visible scar or pigmentary changes over the treated areas, as well as no paracentral scotomas as assessed by automated perimetry.

This ability to perform **minimally invasive laser treatments near the foveolar center appears to be a strong advantage of the Vitra device.**

Central serous chorioretinopathy.

Due to its feasibility in performing mild burns with the pure green 532 nm radiation, Vitra is a tool of choice for treating para-foveal leaks in central serous chorioretinopathy.

Edematous branch vein occlusion.

Mild grid pattern photocoagulation can be safely considered for macular edema in edematous branch vein occlusion.

Focal photocoagulation for microvascular abnormalities.

Due to excellent absorption within haemoglobin, the green radiation of Vitra allows efficient photocoagulation of **microvascular abnormalities** such as **microaneurysms, arterial macroaneurysms** or **vascular ectasias in Coats disease**. We choose 100 to 150 μ spot size (three mirror contact lens), long duration, (0.2sec) and power consistent with blanching joined burns over the lesion.

GLAUCOMA

Open angle glaucoma: trabeculoplasty.

Trabeculoplasty remains useful for numerous clinical conditions, such as pseudo exfoliation glaucoma, pigmentary glaucoma, and as an adjunct to medical therapy. It is also appropriate for patients unable to comply with medical therapy, in cases of psychological or economic limitations.

Trabeculoplasty is easily performed with the green Vitra laser using 50 μ spot size, 0.10sec duration, and power 500 to 700 mw to obtain a burn that is just below the level at which a gas bubble forms. (25 burns per quadrant – using a Trokel contact lens).

Angle closure glaucoma.

Laser iridotomy is the treatment of choice in angle closure glaucoma and **the photodisruption procedure using a ND Yag 1064 nm is the device of choice.**

In patients with **dark brown irides**, the ND Yag iridotomy is sometimes difficult. It is suggested to perform a **combined technique** in these cases: applying a previous treatment with double frequency ND Yag (Vitra) allows the iris stroma to become thinner and more compact, making much easier to perform the perforation with the photodisruptor; even in absence of crypts. For this iridoplasty, we use a 200 μ spot size, 0.2 sec duration and a power of 400 to 500 mw. The iridoplasty is stopped when the white tissue necrosis appears.

In summary, we enjoy using this new device which appears to be as efficient and safe as conventional argon green laser systems, easier to handle, silent, and comfortable for both patient and surgeon.