WELCOME TO THE FUTURE OF VITRECTOMY

TAKE A GLANCE AT THE FUTURE.

Opti-Vit Twedge
MAXIMUM EFFICIENCY DURING VITREOUS AND TISSUES REMOVAL AT EVERY CUTTING RATE.

The chart shows the differences in aspiration flow [balanced salt solution, Vacuum 650 mmHg, Venturi pump, Optikon Revolution CR] which are obtained using the Opti-Vit Twedge vitreous cutter (solid line) compared to a single blade vitreous cutter (dashed line), as the cutting rate changes.

In particular, the solid line shows how the flow remains constant up to 12,000 cuts/min with the Opti-Vit Twedge vitreous cutter; contrarily, the flow decreases as cutting rate increases using the single-port cutter.

PULSE-FREE AND THE UTMOST SAFETY CLOSE TO THE RETINA.

The chart shows the accelerations (porcine vitreous, 3,000 cuts/min, 300 mmHg vacuum, Venturi pump, Optikon Revolution CR) induced by the vitreous cutter (solid line) and single-port vitreous cutter (dashed line), as a function of time.

At every blade work cycle the reduction of stress value, using the vitreous cutter Opti-Vit Twedge, generates a pulse-free action and the utmost safety close to the retina.

The advantages obtainable in surgical practice through the use of this instrument have been identified and proven by scientific studies carried out by Tommaso Rossi* in collaboration with Giorgio Querzoli**.

References:

* Tommaso Rossi, MD, IRCCS San Martino Hospital, Genoa
** Professor of Engineering Giorgio Querzoli, University of Cagliari, Faculty of Engineering
MRC (MATERIAL REMOVAL CAPABILITY)
DUTY CYCLE ADJUSTMENT.

The chart shows the aspiration flow differences (porcine vitreous, 650 mmHg vacuum, Venturi pump, Optikon \textsc{revolution} CR) that can be obtained thanks to the duty cycle adjustment feature available on the \textsc{revolution} CR and the characteristics of the vitreous cutter Opti-Vit, as cutting rate varies.

Aspiration flow is maximized when setting the duty cycle to \textsc{high} (dashed line). This advantage is appreciable starting at low cutting rates (<1,000 cuts/min) and the curve, after insisting on a maximum value between 1,000 and 2,500 cuts/min, assumes a decreasing trend until reaching up to 5,000 cuts/min and then remains steady up to 6,000 cuts/min.

By setting the duty cycle to \textsc{medium} (dotted line), flow has a characteristic trend: it increases almost linearly with the cutting rate and, after reaching a maximum value between 1,000 and 1,500 cuts/min, assumes a decreasing trend up to about 5,000 cuts/min to then remain almost steady up to 6,000 cuts/min.

By selecting the duty cycle to \textsc{low} (solid line), the aspiration flow is reduced by approximately 50% compared to the \textsc{high} curve; this case also exhibits an increasing trend, almost linear with the cutting rate, until reaching a maximum value between 1,000 and 1,500 cuts/min.

The curve continues with a decreasing trend up to 5,000 cuts/min, then tends to remain steady at about 6,000 cuts/min.

DSR (DYNAMIC SETTING REGULATION)

The DSR function (Optikon \textsc{revolution}) makes it possible to adjust the main parameters within a range in which surgeons can set the start \textsc{start} and stop \textsc{stop} values to suit their needs.
The MAP (Mean Arterial Pressure) in a supine patient can be calculated from the systolic and diastolic blood pressure and the ocular pressure according to various equations proposed in literature.

Knowing the arterial systolic and diastolic blood pressure and the intraocular pressure makes possible to determine the level of perfusion of the optic nerve (MOPP).

Literature states that values of ocular perfusion pressure of the ophthalmic artery higher than 30 mmHg are safe, and therefore desirable, whilst ideal 50 mmHg is deemed ideal.

Since the eye is a pressurised region of the body, in order for blood to appropriately perfuse the optic nerve, retina and all ocular tissues, the ophthalmic artery pressure must be at least greater than the hydrostatic pressure inside the bulb.

Intraocular pressure management during vitrectomy is a particularly delicate topic. Damage to the optic nerve, in the form of visual field defects, have been described in up to 14% of all cases, while more severe occurrences such as optic disc edema, hypotonia, and decrease in visual acuity are more rare.

The combination of an altered intraocular pressure and reduced perfusion of the optic nerve during surgery is now considered the most plausible among the pathogenetic mechanisms hypothesized.

To counter this, the regulation REVOLUTION CR’s software, in addition to reading the patient’s MOPP, is able to dynamically stabilise the intraocular pressure during surgery.

For this purpose, the REVOLUTION CR uses a controlled-pressure irrigation system that offers real-time compensation of pressure fluctuations due to variations in aspiration flow.
The CR has a proprietary software and a patented system that shows whether the currently calculated values of MOPP are safe, in order to inform the surgeons in real-time and allow them to take decisions concerning the infusion pressure.

The CR features an arm blood pressure monitor for the autonomous measurement of the patient’s blood pressure, which communicates with the console of the surgical unit, acquiring the systolic and diastolic blood pressure data at intervals chosen by the surgeon. The CR “knows” the patient’s infusion pressure and calculates the ocular perfusion pressure in real-time, providing the output to the surgeon.

Until now, the IOP was the only parameter taken into account by the surgeon. This parameter alone, albeit important, is not sufficient to properly manage the perfusion of the optic nerve and retina with the aim of increasing safety during surgery.

The chart shows the values of intraocular pressure (IOP), mean ocular perfusion pressure (MOPP), systolic blood pressure (SBP) and diastolic blood pressure (DBP). It is interesting to observe how the mean ocular perfusion pressure (MOPP) and the intraocular pressure (IOP) have a specular trend; perfusion improves as intraocular pressure decreases. The extremely high instantaneous pressure peaks during surgery can also be clearly seen.

*Courtesy of Tommaso Rossi, MD, IRCCS San Martino Hospital, Genoa
SAFE LIGHTING LED SYSTEM

CIE 1931 - X, Y CHROMATICITY DIAGRAM.

The REVOLUTION CR is equipped with 3 independent, high-efficiency LED light sources, free of harmful UV and IR emissions.

The user can adjust the output colour choosing from white, yellow and green to improve tissue visualisation during the various stages or needs of surgery, while ensuring increased safety for prolonged exposure.

Lastly, emphasis must be placed on the low running costs thanks to long LED life (approximately 50,000 hours).
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Technical specifications

VITREOUS CUTTERS OPTI-VIT TWEDEGE AND OPTI-VIT

- Availability of double-port (Opti-Vit T wedge) or single port (Opti-Vit) vitreous cutters.
- Maximum cutting rate Opti-Vit T wedge 12,000 cuts/min. Maximum cutting rate Opti-Vit 6,000 cuts/min.
- Maximum flexibility of setting the working parameters thanks to three available duty cycles (Low, Medium, High with Opti-Vit) and the DSR function.
- High-strength steel blades improve cutting during surgical procedures.
- Ergonomic grip enhanced by the quick-fit rear extension.
- Easy in-out through the scleral guides, also valved, thanks to the ultra-smooth blades.
- Suitable also for large eyeballs thanks to the blade length >30mm.

LIGHT SOURCES

- Three independent, high-efficiency LED light sources.
- 20 levels of illumination intensity adjustment.
- 4 filters for optimal tissue visualisation and for maximum protection against phototoxicity.

ASPIRATION SYSTEM

- Responsiveness to the needs of the surgeon due to the availability of two types of pump: peristaltic and Venturi.
- Absolute range accuracy (only with peristaltic pump) from 1 to 65 cc/min, using a system pedal.

OPTIONAL

- Mean Ocular Perfusion Pressure (MOPP) detection system.
- Integrated laser module 532nm.