New Stellaris optimised for coaxial and biaxial MICS

Cheryl Guttmann

IN INITIAL experience using the new Stellaris Vision Enhancement System (Bausch & Lomb) to perform microincisional phacoemulsification confirms that this new platform based on innovative hardware and software provides excellent fluidics, efficiency and surgical control, said Ann Haustermans MD, at the XXV Congress of the ESCRS.

"Engineers at Bausch & Lomb (B&L) have applied the input of customers around the world to create a more compact and user-friendly system that is customisable to the preference of every surgeon. Development of the new Stellaris system demonstrates how growing interest in microincisional surgery among ophthalmologists has encouraged industry to develop new products for the benefit of our patients," said Dr Haustermans, Brasschaat, Belgium.

Dr Haustermans described the features of the Stellaris Vision Enhancement System and her initial experiences using it for both coaxial and biaxial microincision surgery (MICS).

In designing the Stellaris, B&L reached out to cataract surgeons and OR staff worldwide to gain insight on what features they would desire in a new platform. The primary objective for its development was to specifically design an optimised platform for performing coaxial and biaxial MICS procedures through a sub 2.0mm incision. However, the Stellaris is also perfectly suitable for use in traditional coaxial surgery, noted Dr Haustermans.

Compared with its predecessor, the Millennium Microsurgical System, the Stellaris has a smaller footprint and is even more user-friendly. The Stellaris features a large, 18 inch, high-definition touch-screen display that has an intuitive interface and streaming video inlay capabilities for displaying the surgery simultaneously with the surgical settings.

The hand-piece is also totally new. It contains six crystals and is lightweight and ergonomic. It also operates at a low frequency of 28.5 kHz for optimised cavitation and rapid emulsification with minimal thermal loading.

"The hand-piece is one of my favourite features, and it also has an increased stroke length that results in more efficient cutting of the nucleus to reduce the amount of phaco energy used," Dr Haustermans said.

Maintaining chamber stability

Users can choose between two pump modules – an advanced flow module or a vacuum-based pump. B&L has named the fluidics system EQ Fluidics.

"EQ stands for equalisation that refers to the need to balance inflow and outflow in order to maintain solid chamber stability throughout the procedure. The new system also uses advanced software and sensors for monitoring to help achieve surge suppression and fluidics control," Dr Haustermans said.

Further enhancing anterior chamber stability is the patented StableChamber tubing. This feature consists of an aspiration tubing line with a smaller internal diameter than standard tubing, which results in a significantly lower aspiration flow rate. In addition, to prevent clogging of the line, there is an internal mesh filter in the proximal portion of the tubing that captures nuclear fragments 0.5mm and larger.

"Stability is imperative for safe surgery and I prefer to use this StableChamber tubing for MICS procedures. It also allows surgeons to use significantly higher vacuum levels without markedly increasing the aspiration flow rate, and the anterior chamber remains stable even during occlusion breaks," Dr Haustermans said.

The Stellaris retains the dual linear foot pedal technology of the Millennium with independent linear control of aspiration and phaco power, but the new foot pedal is wireless (Blue Tooth) controlled.

"Coupled with the Custom Control Software, Stellaris also provides surgeons with a complete range of customised power modulations for advanced MICS procedures," Dr Haustermans said.

Dr Haustermans indicated that having used the venturi pump on the Millennium Microsurgical System for years, her preference was to use the vacuum module on the Stellaris when she performed her first coaxial and biaxial microincision procedures. For coaxial MICS, B&L has also introduced a new specially designed phaco needle that is surrounded by a high volume infusion sleeve and can be used through a 1.8mm incision.

Dr Haustermans told attendees that with safety in mind, she used conservative parameters in her first micro-coaxial procedure with maximum phaco power set at 15 per cent and maximum vacuum at 350 mmHg.

"The Stellaris vacuum pump, together with the StableChamber tubing, allows me to raise vacuum sufficiently to hold and chop the nucleus without compromising chamber stability. Nevertheless, because of the small inner diameter of the phaco needle, nucleus evacuation efficiency in segment removal was somewhat slower even when using higher levels of vacuum," she observed.

"Still, this needle and sleeve system provides the opportunity to perform microincisional phaco through a 1.8mm incision for surgeons who do not want to abandon their coaxial technique."

Dr Haustermans stated her preference is for a biaxial technique, which she considers a "more logical approach to cataract removal". Her instruments of choice include a Nagahara side port irrigating chopper and a 15 degree thin tip phaco needle. Her phaco parameters consist of 350 mmHg for vacuum, 15 per cent for maximum phaco power, and six millisecond micropulses with 12 millisecond intervals (equivalent to 55 pulses per second in a 33 per cent duty cycle).

"By separating irrigation from aspiration, the circulation of fluid in the anterior chamber is improved and competing currents around the phaco tip are avoided. In addition, the irrigating chopper can be used to manipulate and mobilise tissue and together with free movement of the bare phaco needle, the efficacy of the phaco procedure can be greatly improved."

In a video, Dr Haustermans showed the procedure was completed safely with excellent followability and uncompromised chamber stability.

"Thanks to the excellent fluidics control of the Stellaris, I can even draw the epinucleus and most of the cortex out safely with the phaco tip without worrying about chamber collapses and a risk of capsular tears," she said.

After implanting the Akreos AO M160 IO L (Bausch & Lomb), the patient in the case had a clear cornea with only minor oedema around the incisions and uncorrected visual acuity of 20/20 on the first day after surgery.

annhaustermans@skynet.be