

Moving Pediatric Retina Cases to Small-gauge Technology

The CONSTELLATION Vision System represents a significant advance in the application of new technology.

By Antonio Capone Jr., MD



Micro-incision vitrectomy surgery (MIVS) has been at the forefront of vitreoretinal surgery for some time now. One might imagine that, logically, small-gauge surgery would be suitable for pediatrics; if the instruments are smaller, they must be better for smaller eyes. A variety of factors, however, have limited the application of small-gauge technology to pediatric retinal surgery.

One limitation is that small-gauge instruments have not been as efficient at eliminating or removing the vitreous. A more significant limitation to pediatric surgery has been the flex characteristics that

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made it difficult or impossible to work in the far peripheral retina—where most of the pathology, especially in retinopathy of prematurity (ROP) cases, lies.

NEW 25+

The new 25+ vitrectomy probe on the CONSTELLATION Vision System (Alcon Laboratories, Inc.) has a stiffening sleeve around the shaft of the vitrector, addressing much of the flexion limitations of small-gauge instruments. This, combined with the improved fluidics on the CONSTELLATION Vision System lets us choose a



The CONSTELLATION Vision System

small-gauge approach without having to compromise with regard to flexion or efficiency in vitreous removal. Furthermore, the 25+ vitrector has the port closer to the tip, similar to the Alcon 23-gauge vitrector.

RADIOFREQUENCY IDENTIFICATION (RFID)

A major advantage of the new CONSTELLATION System is the radio frequency identification (RFID) feature, which automatically recognizes Alcon devices equipped with this technology when connected to

the CONSTELLATION, Xenon Illuminator, or embedded PUREPOINT Laser (Alcon Laboratories, Inc.). This feature allows for preset settings and reduces surgeon dependence on operating room staff for the procedure set-up.

INTEGRATED LASER

I have been favorably impressed with the PUREPOINT Laser. The theme of greater surgeon control is repeated in the foot pedal design, which allows control of stand-by-to-ready and power settings. The laser itself is well powered and efficient. The embedded system also allows the scrub nurse to access and modify the settings straight from the screen of the CONSTELLATION System, if desired. Voice confirmation for parameter changes is another feature which offers independence and procedure control to the surgeon.

HIGH-SPEED CUTTING AND VARIABLE DUTY CYCLE

The higher cutting rates on the CONSTELLATION Vision System offer the clear advantage of vitreous removal with very little traction. The "shave" setting facilitates work close to the retina with what is, in my opin-

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ion, a lower risk of iatrogenic retinal breaks. The variable duty cycle capabilities on the CONSTELLATION System are smoother and more seamless, enabling easy, intuitive alteration from a core vitrectomy to a peripheral vitrectomy to shaving of mobile retina.

In summary, I am looking forward to using the CONSTELLATION System to transition more of my pediatric surgical cases to small-gauge technology. ■

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Fine Control for Pediatric Retina Surgery

The CONSTELLATION Vision System's features help surgeons optimize outcomes.

By Kimberly Drenser, MD, PhD



The majority of the pediatric retina surgical cases that I see at Associated Retina Consultants in Royal Oak, MI, are retinopathy of prematurity (ROP) that require vitrectomy for retinal detachment. I have recently begun to use the CONSTELLATION Vision System (Alcon Laboratories, Inc.) and have found some important advantages to this system that I can apply to surgical outcomes for my patients.

DIFFERENCES IN OCULAR ANATOMY

When performing a vitrectomy on a child, especially

an infant, there are a few significant differences in anatomy that must be taken into consideration. The most obvious difference is the size of the eye, which will of course be smaller in an infant, providing less room to maneuver surgically. Additionally, the eye is not fully developed in retinopathy of prematurity (ROP); these infants do not have a true pars plana, so the entry site for vitrectomy has to be modified.

Perhaps one of the more significant differences between surgery in pediatric and adult vitreoretinal surgery is the allowable margin of error. In an adult eye, there is a large margin; if a retinal break occurs or

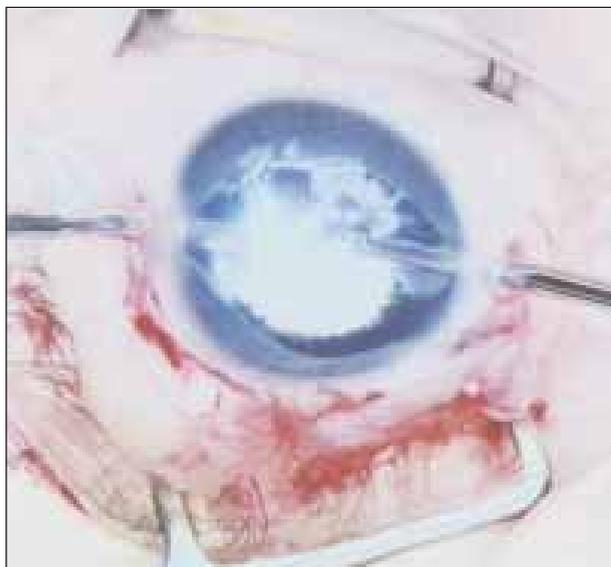


Figure 1. Removal of fibrous white plaque with the CONSTELLATION System. Removal of this type of plaque was not previously possible with other vitrectomy systems.

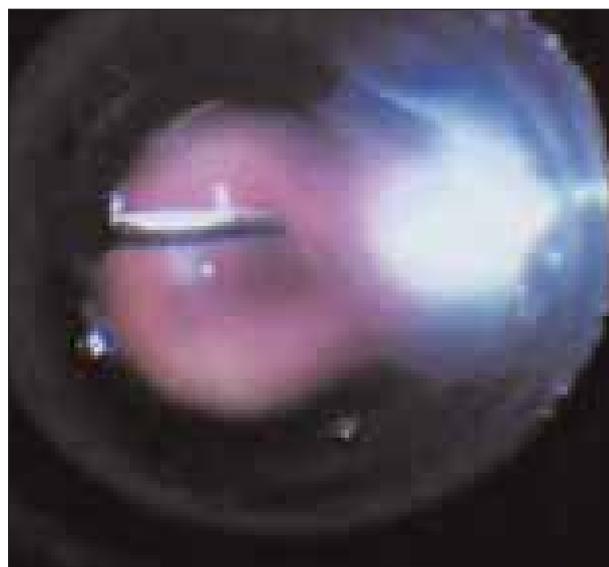


Figure 2. The retina after vitrecomizing dense retrolental plaque.

the surgeon inadvertently takes a bite out of the retina, it may extend the case, but the situation is not irreparable. In a pediatric case, similar situations often are case-enders. As a result, surgeons tend to be less aggressive in pediatric cases; for instance, one might not shave as close or dissect as aggressively.

FINE CONTROL IMPROVEMENTS

The control that I have over fluid dynamics represents one of the areas where I find the biggest advantage with the CONSTELLATION Vision System over other systems that I have used. It offers me fine fluidic control when working over the retina. With reduction of the surge into the port I can be more aggressive in these pediatric cases, while maintaining what I consider to be a safer procedure.

Other features on the CONSTELLATION System that provide a higher degree of fine control are duty cycles, higher ranges of cut rates to vacuum, and intraocular pressure (IOP) control.

I also find a nice benefit to having the fluid-air exchange on the machine rather than on the stopcock. This feature reduces the margin for error because it is more intuitive to be able to switch from one to the other directly on the machine. Additionally, both the air and fluid chambers internal to the machine maintain pressure independent of one another, allowing independent control of fluid and air pressure.

Illumination is more important in pediatric surgery.

We use a two-port vitrectomy system with illuminated infusion, which greatly decreases the amount of illumination coming through. Having the xenon light source is helpful to sharpen duller visualization in these cases.

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CLINICAL CASES

Recently, I had a patient with persistent fetal vascular syndrome on whom I performed a vitrectomy for ROP detachment. Because of the duty cycle control and the fluidics on the CONSTELLATION System, I was able to vitrectomize a very dense plaque (Figures 1 and 2) that in ordinary situations, we would never be able to remove with a vitrector. In my opinion, duty cycle made a tremendous difference. Another case in which I used the CONSTELLATION System was an infant with a total retinal detachment with a great deal of bullous retina and an abnormal vitreous insertion. Because of the duty cycle control, fluidics and higher cut speeds, we were able to closely shave the vitreous base and dissect some of the areas of attachments safely—without having the bullous retina hinder the procedure. In this case, we did not have to use

Early Experience with the CONSTELLATION Vision System

By Michael Trese, MD



I have used the CONSTELLATION Vision System for approximately 10 cases and overall, I have found it to be a sophisticated vitrectomy system. We have found that the setup and interaction between the scrub nurses and the machine is more efficient than with previous vitrectomy systems that we have used.

The small-gauge instrumentation on the CONSTELLATION System may have a role for pediatric population due to the smaller working spaces in child eyes. The improved suction and manipulation are helpful for surgeries in both adults and children. In the pediatric cases that I perform, I am usually dealing with heavy and opaque tissue, so I prefer to take individual bites of tissue rather than use the high cutting rates. I do use higher cutting rates, however, when I am dealing with clear vitreous.

The duty cycles on the CONSTELLATION System are helpful for working on a mobile retina, but in pediatric retinal detachments the retina is often stiff. I am more likely to use the duty cycle feature on adult cases.

The illumination on the CONSTELLATION System is good. The light is clean and bright, the instruments are simple to hook up, and the light intensities can be easily monitored by the scrub technicians.

I have limited experience with this system, but look forward to this small-gauge vitrectomy system for more of my patients. ■

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any perfluorocarbon to flatten or control the eye; rather, we were able to perform the entire procedure under fluid, which is a testament to the IOP Control and the fluidic stability of the system.

SUMMARY

I am still becoming accustomed to features on the CONSTELLATION System as I gain more experience with

it. The features mentioned here have impressed me the most and I am looking forward to working with this machine for more of my patients. ■

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