

THE NEW OCULUS CBC LENS



An intuitive, free-floating lens that can improve surgical outcomes.

BY JEFFREY D. BENNER, MD, AND STEVEN COHEN, MD, FACS

Since the invention of closed vitrectomy surgery in 1971 by Robert Machemer, MD, techniques that optimize visualization of the posterior pole during surgery have evolved. Initially, surgeons used the Machemer handheld irrigating lenses. These lenses require a skilled assistant to provide excellent visualization of the macula. Later, the sutured Landers lens systems enabled visualization of the posterior pole through lenses that sat in a ring sutured to the eye. In the 21st century, several sutureless contact lenses have become available. These sutureless lenses do not require an assistant, nor do they necessitate suturing a ring to the eye. However, these lenses suffer from two significant drawbacks: 1) They are not firmly attached to the eye and may shift during surgery; and 2) they extend beyond the cornea limbus and may wick blood and air between the lens and the cornea, which degrades surgical visualization.

Enter the OCULUS CBC Lens, the newest addition to the OCULUS Surgical family of intuitive lenses that are designed to make surgery easier for vitreoretinal surgeons. In 2016, we collaborated to create a better contact lens, one that would solve the problems of stability and obstructed view. After developing many prototypes with 3D printing and obtaining several patents, we teamed up with OCULUS Surgical, Inc., to produce a new type of sutureless surgical contact lens. We wanted a lens that would stay centered on the cornea and provide a clear and stable view of the macula. Today, we are excited to introduce the CBC Lens (Figure 1).

A NEW FAMILY OF INTUITIVE SURGICAL LENSES

The CBC Lens is part of a new family of intuitive surgical contact lenses produced by OCULUS Surgical, Inc. The CBC Lens contains proprietary technology that is an improvement over the previous generation of disposable contact lenses. In our hands, the CBC Lens is intuitive, resists sliding, and remains stable because of its unique design.

Most sutureless surgical contact lenses float on the viscous tear film and rely on lateral extensions to re-center the lens by pushing against the cannulas and eyelid speculum.

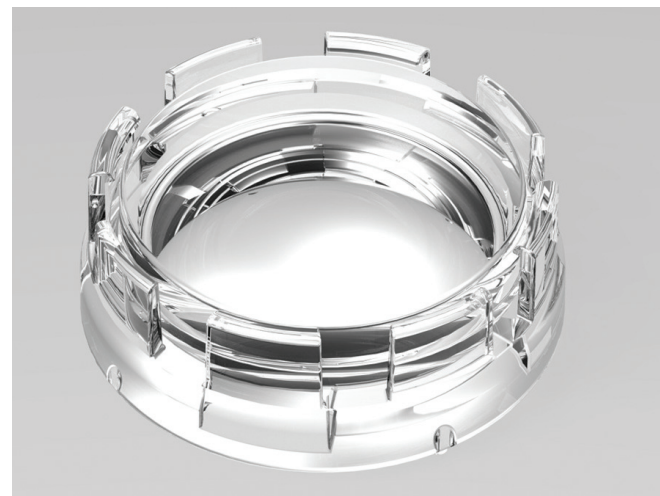


Figure 1. The CBC macular contact lens by OCULUS Surgical, Inc., is part of a family of new, intuitive surgical lenses.

These lenses frequently slide, causing the surgeon to lose his or her view during the most critical part of the surgery. The CBC Lens adopts the familiar two-piece design, but it is the first surgical contact lens to be stabilized by micronized studs, or *microstuds*, that increase the coefficient of friction, thereby minimizing the sliding of the lens during macular surgery. These four microstuds—blunt pieces of polymethyl methacrylate molded to the outer ring—penetrate the viscous tear film to make direct contact with the cornea (Figures 2 and 3). This stabilizing system makes the CBC Lens a “set-it-and-forget-it” contact lens.

To prevent the aspiration of air, blood, and debris beneath the CBC Lens, we used a proprietary two-piece design that ensures that the free-floating central optical lens always remains in contact with the tear film. Additionally, the CBC Lens has a smaller profile than other surgical lenses (10 mm vs 13 mm) that helps it to remain centered. Because the outer diameter of the lens’ ring does not extend to the conjunctiva, it does not impact the vitrectomy cannulas or eyelid speculum.



Images courtesy of Steven Cohen, MD, FACS.

Figures 2 and 3. Four molded microstuds of polymethyl methacrylate enable the CBC macular contact lens to contact the cornea directly and prevent it from shifting during surgery. The lens grips the edge of the cornea, whereas all other surgical contact lenses grip the limbus. This corneal fixation keeps the CBC lens in place and prevents the wicking of air, blood, and other debris from the eye's surface.

In our hands, these two design features—the anti-slip microstuds and the smaller, free-floating contact lens—enable the CBC Lens to achieve our goals of stability and visibility within the surgical field.

TECHNIQUE: EASY ON, EASY OFF

Using the CBC Lens for high resolution macular surgery has been easy and fast in our experience. Prior to draping the eye, we verify that the patient's eye is level. A wide-lid speculum is helpful to avoid the lid hindering the performance of the contact lens. After applying a viscoelastic agent to the cornea, we place the lens on the cornea. We use a Weck-Cel sponge (Beaver-Visitec International) to push the lens down onto the center of the cornea, causing the four microstuds to engage with the cornea. In our experience, the lens remains stable and centered, even when we manipulate the globe during the procedure.

Removing the CBC Lens at the conclusion of surgery is also simple: We gently lift it off the cornea with our fingers. The lens leaves no visible marks or indentations on the cornea. In our patients, the lens is comfortable and well tolerated.

PERFORMANCE

The CBC Lens has the same refractive index of an ocular instruments lens and a field of view of 36°. Its polymethyl methacrylate material provides surgeons with a clear, high-resolution view of the macula. Dr. Benner reports that, "The CBC Lens has been transformative for my macular pucker and hole surgeries. The stability and high optical quality of this lens in my hands has knocked 5 to 10 minutes off of each case because the procedure is no longer interrupted by the need to reposition or clean the contact lens." Our colleagues who have tried the lens appreciate its stability and the clarity of the view.

I, Dr. Cohen, feel that the CBC Lens increases the safety of macular procedures. If a contact lens destabilizes at a critical point during surgery—say, for subretinal surgery or macular pucker surgery—having to exit the eye to clean and reposition a contact lens and then re-enter the surgical space may increase the procedure's duration and also the potential for unwanted variables. The opportunity to reduce any extra steps during surgery is, to me, one of this lens' greatest advantages. I am now using this lens for all of my macular surgeries.

CONCLUSION

The CBC Lens became available for use in the United States on October 1, 2021, at a price point similar to other surgical contact lenses. We anticipate that this lens' surgical advantages—what we personally consider to be its greater stability and excellent view—will make it a welcome tool in any surgery, but especially those for macular holes or diabetic retinopathy where visibility is often difficult. ■

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