Preferred Keratome for the Cataract Incision

BY FABRIZIO I. CAMESASCA, MD; DAVID HENDRICKS, MD; STEVEN DEWEY, MD; JEREMY KIEVAL, MD; CAROL L. KARP, MD; AND TAKAYUKI AKAHOSHI, MD

Surgeons have countless instruments they favor and numerous explanations for their preferences. For this month's column, I asked an international panel of surgeons to identify their surgical blade and to explain why they use it.

—William J. Fishkind, MD, Section Editor

FABRIZIO I. CAMESASCA, MD

One of the most important features of a blade for cataract surgery is its predictable and repeatable behavior. The surgeon repeatedly and reliably needs to create similar tunnels of the proper length.

For cataract surgery, I prefer the 2.8-mm ClearCut HP blade (Alcon Laboratories, Inc., Fort Worth, TX). I use a temporal clear corneal incision. Because I can create incisions with less exertion using the ClearCut HP blade versus a similar 3.2-mm keratome, I have greater control. The instrument's smaller size and dual bevel make it easy for me to create a tunnel rapidly without a pre-incision. The angle between the blade and the handle is calculated to allow the blade to pass easily to the proper corneal stromal depth. I simply lay the blade flat on the scleral plane and advance it in clear cornea.

The tunnel-length mark on the blade helps me to create a tunnel of proper length. Once the mark has reached the tunnel's entrance, I can change the angle of the keratome and enter the anterior chamber.

The ClearCut HP blade represents a useful approach to microincisional cataract surgery, because it allows easy access to phaco MicroTips (Alcon Laboratories, Inc.) as well as for a single-piece, foldable IOL injected with the proper cartridge (eg, the Monarch series; Alcon Laboratories, Inc.).

In my opinion, enhanced surgical control of the corneal tunnel's creation augments the quality of cataract surgery and thus increases patients' satisfaction.

DAVID HENDRICKS, MD

For several years, I have used the 3-D Angled Trapezoid 2.5-3.5mm Blade (No. 05-5086; Rhein Medical Inc., Tampa, FL). This instrument is very expensive but is also magnificent. I make a single-plane temporal corneal incision. One can vary the size of the incision by watching how much of the blade passes into the anterior chamber. The shoulder of the blade is 2.5 mm, and I usually insert it past the shoulder so that I view a rectangular section of the side bevel inside the eye, which corresponds to a 2.7-mm internal dimension. This technique allows a perfect fit for standard phaco handpieces, and I find that the cartridges from Abbott Medical Optics Inc. (Santa Ana, CA) and Alcon Laboratories, Inc. (Monarch C), just fit without stretching the wound.

> "Enhanced surgical control of the corneal tunnel's creation augments the quality of cataract surgery."
> —Fabrizio I. Camesasca, MD

I hold the blade lightly and think of allowing the weight of the instrument to rest on the tissue during the pass (I push ever so lightly posteriorly during the pass) while aiming the blade up toward the apex of the cornea (angled 5º or 10º up from the iris plane). The result is a uniform incision that is long enough to seal without hydration.

I really love this instrument. I have analyzed my degree of induced astigmatism with the Holladay software (HIC.SOAP.PRO; Holladay Consulting, Inc., Bellaire, TX) and have found that my temporal incisions produce 0.34 D of astigmatism on average. I use this value when planning to implant toric IOLs, which have become a big emphasis of my surgical practice.

STEVEN DEWEY, MD

I use a 0.9-mm BD EdgeAhead Safety Knife (BD, Franklin Lakes, NJ) to create the sideport incision. After filling the anterior chamber with a dispersive viscoelastic, I grasp the sideport incision with a 0.12 forceps. I create

the primary incision with a bevel-up BD Xstar crescent knife, with the tip of the blade rotated to be perpendicular to the globe. I create a U-shaped groove of two-thirds to three-quarters thickness. Next, I rotate the blade so that it is parallel to the wall of the globe and "tadpole" it forward to create the tunnel. The bevel-up configuration assists in preventing early penetration into the anterior chamber. I then use a dual-beveled Xstar Safety Slit Knife (BD) to penetrate the anterior chamber at the exact location I place the tip within the tunnel. The dual-beveled configuration prevents the "Chevron" formation at the internal opening of the incision, which can interfere with wound apposition.

> "I prefer [steel blades], because I want the faces of the incision to approximate and seal."
>
> —Steven Dewey, MD

Steel blades have been criticized for a certain roughness to the surfaces they create when compared with diamond blades. This roughness provides a greater surface area that I prefer, because I want the faces of the incision to approximate and seal. The BD blades I have mentioned are reusable up to 10 times without a significant loss of sharpness. I prefer the shielded configuration of both blades to help avoid accidental injury and protect the finish of the knife's edge. Unfortunately, I have found that the safety shield on the crescent blade can interfere with the creation of the groove, so I use an unshielded crescent blade.

JEREMY KIEVAL, MD, AND CAROL L. KARP, MD

At present, there are two types of blades for creating a clear corneal cataract incision, diamond and metal. There is clear evidence that a diamond keratome causes minimal distortion of corneal tissue, creates a more accurate and reproducible incision, and is much sharper than metal blades.[1] Despite these advantages, we favor a dual-beveled, angled, stainless steel blade (2.5-mm Xstar Safety Slit Knife) for several reasons.

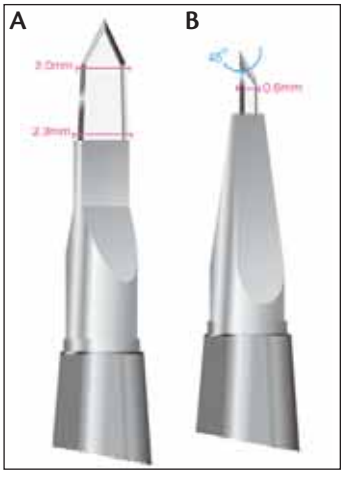
The cost of purchasing and maintaining a diamond blade is quite high. Furthermore, prions that are the cause of Creutzfeldt-Jacob disease and that have been found in high concentrations in the eye are highly resistant to conventional sterilization techniques. Although this is a minimal and theoretical risk during cataract surgery, the use of disposable instruments such as steel blades obviates any risk at all.

In addition, with a diamond blade, creating a short tunnel is likely if the initial cut is incorrect, because the surgeon has little ability to change direction. We prefer the tactile feel that a metal blade provides; it allows us to construct an incision with a better sense of corneal resistance so that we may incise the tissue with greater control.

Finally, a steel blade allows surgical flexibility. As the size of the cataract incision decreases, we can adapt without having to incur the cost of purchasing a new diamond blade.

TAKAYUKI AKAHOSHI, MD

I prefer the Akahoshi Ultra Diamond Knife (AE-8190; ASICO LLC, Westmont, IL) for the main incision and the Akahoshi Sideport Diamond Knife (AE-8131; ASICO LLC) for the sideport (Figure 1). The former has a trapezoid design, is 2.0 mm wide at its shoulder, and measures 2.3 mm at its base. The incision's size can be controlled according to the depth of the blade's insertion. This keratome is suitable for standard microcoaxial phaco surgery with the commercially available Micro Smooth Ultra Sleeve (Alcon Laboratories, Inc., Fort Worth, TX). I am then easily able to inject an AcrySof SN60WF lens (Alcon Laboratories, Inc.) by means of a counter-traction technique with a D-cartridge and the Royale III injector (AE-9036SP; Alcon Laboratories, Inc.).



(Courtesy of ASICO LLC.)

Figure 1. The Akahoshi Ultra Diamond Knife (A) and the Akahoshi Sideport Diamond Knife (B).

To maintain control over the cataract incision, I keep the blade's insertion shallow when implanting a thin, low-powered lens. I create a larger incision when implanting a thick, high-powered IOL or when the cataract is dense and may require high amounts of ultrasonic energy. If it becomes necessary to enlarge the incision to implant an MA60MA lens with a B-cartridge or an MA50BM lens with an A-cartridge (all from Alcon Laboratories, Inc.), for example, I can use both sides of the Akahoshi Ultra Diamond Knife for the extension. The diamond blade's thickness is only 100 µm, and the keratome is very sharp and durable. Its cost, of course, is much higher than that of a disposable metal keratome.

For sub-2-mm microcoaxial surgery with the Nano Sleeve that Alcon Laboratories, Inc., is developing, the Akahoshi Nano Diamond Knife (AE-8192; ASICO LLC) will be my choice.

For success with the counter-traction implantation technique, it is important to maintain a high IOP while inserting the IOL. The 0.6-mm width of the Akahoshi Sideport Diamond Knife can prevent the OVD from leaking through the sideport incision while I employ the Nucleus Sustainer (AE-2530; ASICO LLC) to provide a counter force to the cartridge. ■

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