

When Nothing But UBM Will Do

Utilizing a powerful tool in the diagnosis and management of ocular disease of the anterior segment.

BY ROXANA URSEA, MD

Ocular pathology affecting the anterior segment can involve structures that are not easily directly visualized by routine examination methods such as the slit lamp exam. That's where imaging technologies play a big role.

My colleagues and I use three instruments – high-resolution ultrasonography, anterior segment OCT and high frequency ultrasound, or UBM – to evaluate the anterior segment. The UBM provides advantages in many applications.

UBM Advantages

The greater depth of penetration that the UBM allows makes an enormous difference when viewed alongside other technologies. It enables us to visualize the normal anatomy, including anterior chamber structures, and the posterior iris or ciliary body (a unique capability of UBM technology). We can also use it to assess IOL position, and assist us in preoperative assessments and planning in eyes with hypotony or trauma, avoiding surprises in the operating room.

UBM can visualize the whole cornea, iris and iridocorneal angle. We can perform angle-to-angle and

sulcus-to-sulcus measurement, essential when placing ICLs. It is the finest instrument for accurate planning for those types of lenses.

UBM is key in diagnosing the mechanism of a patient's glaucoma. In fact, I think the UBM is the gold standard for several pathological conditions, such as plateau iris, as well as the retroiridal processes. When assessing the iridocorneal angle, the UBM offers a more objective view than gonioscopy. Visualizing the ciliary body is a major advantage as well. The UBM's capabilities help us diagnose and follow various ocular pathology cases.

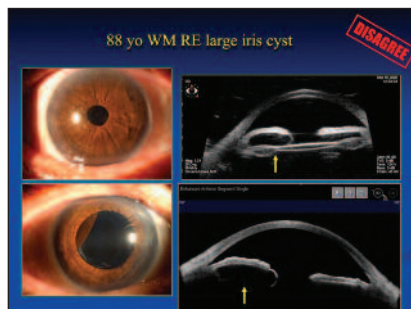


Figure 1. This 88-year-old patient has a large iris cyst. The dilated exam shows a bulging of the iris. The anterior segment OCT image does not give us the diagnosis. However, the UBM's depth of penetration allows imaging of this large iris cyst, as well as the intraocular lens and haptic placement.

Anterior Chamber Pathologies

The UBM delineates anatomic relationships and pathology in the anterior segment, even in eyes with opaque media. We can scan 360°, visualizing, for example, the positioning and sizes of different cysts in the anterior chamber, and then assess the angle affected by these cysts.

One patient was referred to us with an almost imperceptible iris bulging on the slit lamp exam in the left eye. The UBM showed an iris cyst, but because many patients have multiple cysts, we scanned both eyes. Although the slit lamp didn't show any iris bowing, we did find a few cysts in the right eye as well, which were not evident on the slit lamp.

An older gentleman showed nothing striking on the slit lamp exam, but a dilated exam showed an iris pigmented epithelium bulging that turned out to be an iris cyst on the UBM. However, an anterior segment OCT image did not give us the diagnosis. The resolution of the cornea and the visualization of the angle were very good, but the OCT didn't allow complete visualization. The posterior wall of the cyst was not visible. So we couldn't tell exactly how big it was or what was

behind it. The UBM's depth of penetration offers complete visualization of different iris pathologic conditions, as well as the IOL and haptics placement (Figure 1).

When a young patient presented with an iris-pigmented lesion, we wondered if it was a nevus. It looked flat on the slit lamp, and we needed to see what was behind it. The UBM showed that the ciliary body was involved and enlarged in one quadrant. OCT could not diagnose this type of lesion.

If your practice involves numerous cases of anterior segment and especially iris pathology, the UBM is a better choice than other imaging technologies because of its deeper penetration.

Trauma

Many times, when my colleagues and I have trauma cases, we find UBM to be very useful. Before we had the UBM and the ClearScan cover, we used a rubber glove in which we placed balanced saline solution and the transducer to avoid any pressure and to be gentle on the eye. Now it's much easier to assess trauma cases due to the new technology, with no pressure on the eye.

For example, one trauma patient with a persistent rise in IOP had clogged blood in the angle on the UBM. We proceeded with anterior chamber washout which normalized the pressure.

The UBM was also helpful in a trauma patient with iris bowing and induced traumatic cataract, pushed quite far anteriorly almost touching the endothelium. The UBM allowed a 360° visualization, which identified the cataract location in every single position before the patient was taken to the OR. We knew exactly what to expect, and the surgery was

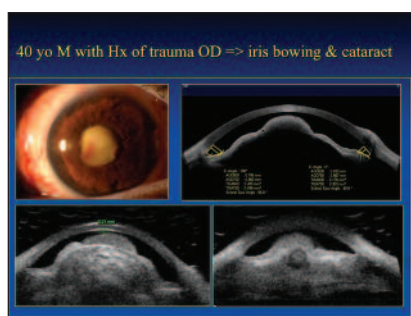


Figure 2. This 40-year-old patient has iris bowing and induced traumatic cataract. The anterior segment OCT provides limited information for surgery, but the UBM offers 360° visualization, which identified the location and extent of the cataract.

successful (Figure 2).

Masses

Masses are a very important part of the ocular pathology cases encountered. It's important to communicate an accurate diagnosis and prognosis to the patient. If these lesions are limited to the iris, then the prognosis is better than when lesions affect the ciliary body.

One older man came in with a pigmented iris lesion at the 5 o'clock position that could have been missed quite easily on slit lamp examination. We detected it on dilation, and then UBM and gonioscopy confirmed our suspicion of angle involvement. We used the UBM to image posterior to the iris and to image the ciliary body, and measure the lesion using calipers. The UBM allowed us to rescan the exact same angle and quadrant, and to watch for any progression over the course of 3 or 4 months.

Finally, a patient with a very subtle, easily missed iris lesion on the slit lamp exam was imaged with the UBM. The iris was not quite involved and the angle was open, but the ciliary body was enlarged in that particular quadrant. The patient had some

intralesional cysts in the ciliary body, and an iris and ciliary body melanoma.

Transformational Imaging

UBM technology helps us visualize a number of other problems. For example, the UBM is the test of choice to visualize a posterior chamber intraocular lens. Why? The emitted ultrasound waves readily pass through the iris in such a way that it can show you both the optic and the haptics.

The UBM helps us visualize anterior segment IOLs as well, including one patient's ACIOL whose haptic was pushed against the iris and into the angle. Convex iris and pupillary block are clearly identified with the UBM. Other pathologies suitable for UBM diagnosis include cyclodialysis clefts and anterior suprachoroidal effusions. Gonioscopy cannot always diagnose the clefts, but UBM can confirm the diagnosis and show the extent of the involvement.

The UBM has made a tremendous difference in my practice. It enables us to manage anterior segment pathology for diagnosis and treatment purposes. Imaging is simple and safe, and it gives us opportunities for understanding and planning that just weren't possible in the past.

Dr. Ursea is Assistant Professor of Ophthalmology and Director of the Cornea and Refractive surgery Division in the Department of



Ophthalmology and Vision Science College of Medicine, University of Arizona, Tucson.