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# Seeing the Whole Picture

With 20-MHz ultrasound and 5-ring annular technology, Lumibird Medical's latest ultrasound probe uncovers ocular pathology like never before.

BY GILBERTO ISLAS DE LA VEGA, MD

## B20 MHz Annular Probe



Lumibird Medical has upgraded its ophthalmic ultrasound technology with the introduction of the B20 MHz Probe, a 5-ring annular technology on a 20-MHz ultrasound probe (Figure 1). Featured exclusively on the ABSolu ultrasound platform, the probe features five concentric transducers that emit ultrasonic waves in an alternating pattern. This pattern increases the focus area while simultaneously

reducing the lateral resolution from 250 to 200  $\mu\text{m}$  (25%). The transducers extend the probe's depth of field by 70% (Figure 2), yet the probe maintains a high axial resolution, thus enabling physicians to examine pathologies of the vitreous, the retina, and beyond with superb detail.

I have been working with ultrasound technology since 1985, when I first applied it clinically during my training at the University of Iowa. For the past 4 years, I have been using Lumibird Medical's B20 MHz Annular Probe with 5 rings in my clinic in Mexico City, and I find that it provides the best imaging I've ever experienced, by far. I am using this device in almost every patient, except those with silicone in their eyes (in those eyes, I use the 15-MHz A/B probe). It reveals ocular structures that I was not able to see previously, as the following cases illustrate. At the XXIX SIDUO Congress in Cartagena, Colombia, September 18th – 21st, 2024, I presented several cases in which the B20 MHz Annular Probe was critical to making the diagnosis. Herein are three of those cases, one on vitreous pathology, one on membranes, and one with a retinal tumor.

### Case 1: Vitreous Membrane With Retinal Traction

A 55-year-old male with a 20-year history of diabetic retinopathy was referred to me for ultrasound imaging after he experienced a sudden loss of vision OS. He had only light perception in that eye.

With the B20 MHz Annular Probe, I could easily see all the pathology in the eye, including the membranes, the vitreous tractions on his retina, and the insertion of the hyaloid on the optic nerve (Figure 3). Also, the lens of the eye was cataractous.

The excellent view afforded by the B20 MHz Annular Probe made it very easy to remove all the membranes attached to the retina, as well as the vitreous tractions. Then, my team and I performed cataract removal on the same eye using a femtosecond laser.

Postoperatively, the patient's refraction was 20/70 uncorrected visual acuity (UCVA) in that eye. Compared to the patient's preoperative level of vision, he was extremely pleased. I most recently saw him for follow-up in November 2024; he continues to be happy with his vision, and he is managing his blood sugar.



Figure 1. Lumibird Medical's B20 MHz Probe with 5-ring annular technology.

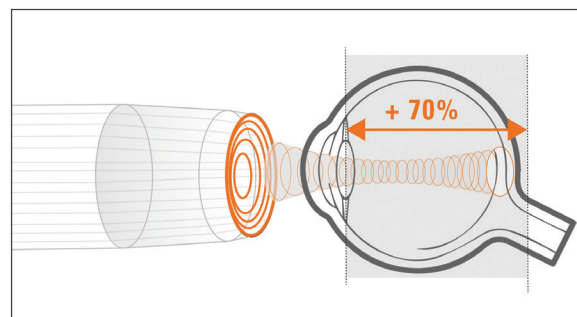


Figure 2. The B20 MHz Annular Probe increases depth of field by 70%.



Figure 3. Vitreal tractions with insertion of the hyaloid in the optic nerve.

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A-Scan Std Probe +B20 MHz Annular Probe

**Case 2: Mild Vitreous Opacities Despite a Normal A-Scan**  
A retired attorney, 80 years old, had undergone uncomplicated cataract surgery OS by another surgeon.

His preoperative visual acuity had been 20/100. Yet, 3 days postoperatively, he was referred to me with mild loss of vision OS and a UCVA of 20/200.

His referring physician had taken an A-scan of the eye, which looked completely normal (Figure 4). The B20 MHz Annular Probe, however, revealed a lot of cells, vitreous opacities, and other “noise” inside the anterior chamber (Figure 5). I also noted inflammation, but not enough to qualify as endophthalmitis. I diagnosed the eye as having inflammatory disease and prescribed a treatment of antibiotics and steroidal drops QID for 3 weeks. I sent him back to his referring physician for follow-up, and this physician told me the eye had completely resolved and achieved 20/20 UCVA.

A-scan ultrasound remains one of the best tools we have for measuring the eye’s length (see the sidebar, *The ABSolu Ultrasound Platform With Standardized Probe*), but B-scan ultrasound has become the first tool I use to see inside the eye.

THE ABSOLU ULTRASOUND PLATFORM WITH STANDARDIZED PROBE

Featuring numerous enhancements that have increased its ease of use, the ABSolu remains the only ultrasound platform that meets Professor Karl Ossoinig’s criteria for standardized echography (Figure).

The S mode enables physicians to:

- ▶ diagnose tumor lesions,
- ▶ diagnose retinal/vitreous membrane detachment, and
- ▶ diagnose Graves’ disease.



Figure. The A-scan Standardized probe.

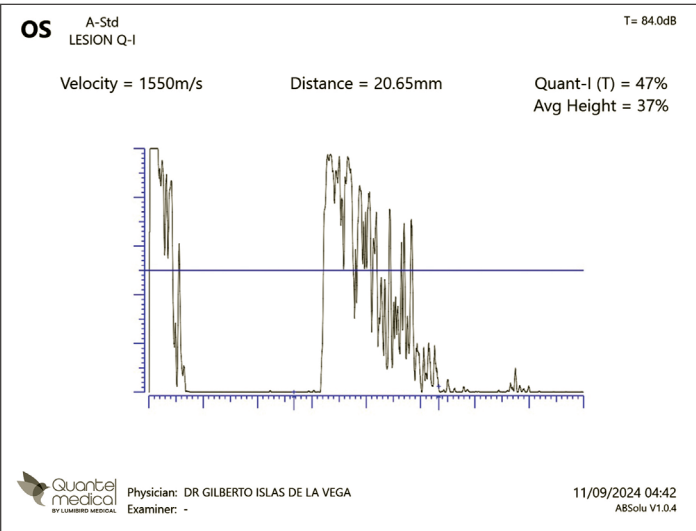


Figure 4. A-scan Std probe of the eye performed 3 days after cataract surgery.

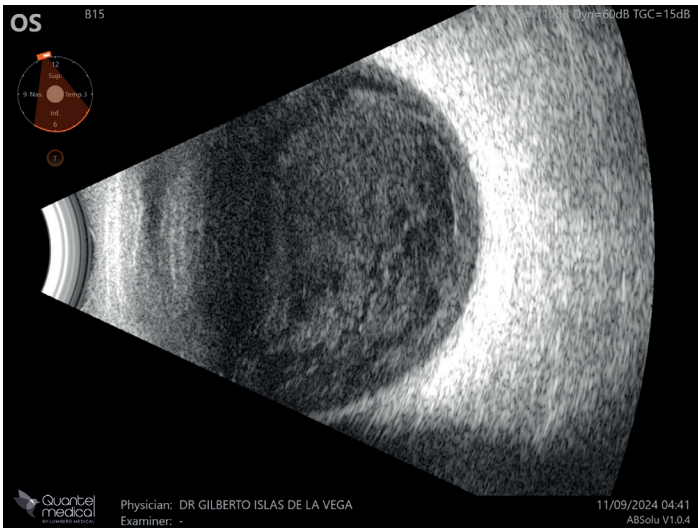


Figure 5. A B-scan taken of the eye with the B20 MHz Annular Probe showed myriad cells, vitreous opacities, and other “noise” inside the anterior chamber.

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A-Scan Std Probe +B20 MHz Annular Probe

Case 3: Dome-Shaped Lesion in Child’s Eye

A 12-year-old native Mexican girl (with no Spanish ancestry) presented to me with a lesion in the right eye that was detected during visual acuity screening performed at her school. She had no vision in that eye.

An A-scan revealed the outline of a choroidal melanoma (Figure 6). B-scan imaging with the B20 MHz Annular Probe produced a clear image of the dome-shaped melanoma, homogeneous in formation, without metastasis, located at the posterior pole (Figure 7). It had regular internal structure, medium reflectivity with no shadowing, and no signs of sound attenuation. The lesion was coming from the choroidal layer and was highly vascularized.

A week later, my team and I operated to remove the lesion and implant a prosthetic eye. We sent the tumor to the oncology department at the University of Mexico, and technicians there confirmed the diagnosis of choroidal melanoma that was not metastatic. This was good news, despite the patient’s regret at losing her natural eye.

Although ocular tumors are of course detectable on X-rays and some magnetic resonance devices, ultrasound is the only accepted medium with which to confirm the diagnosis. ■

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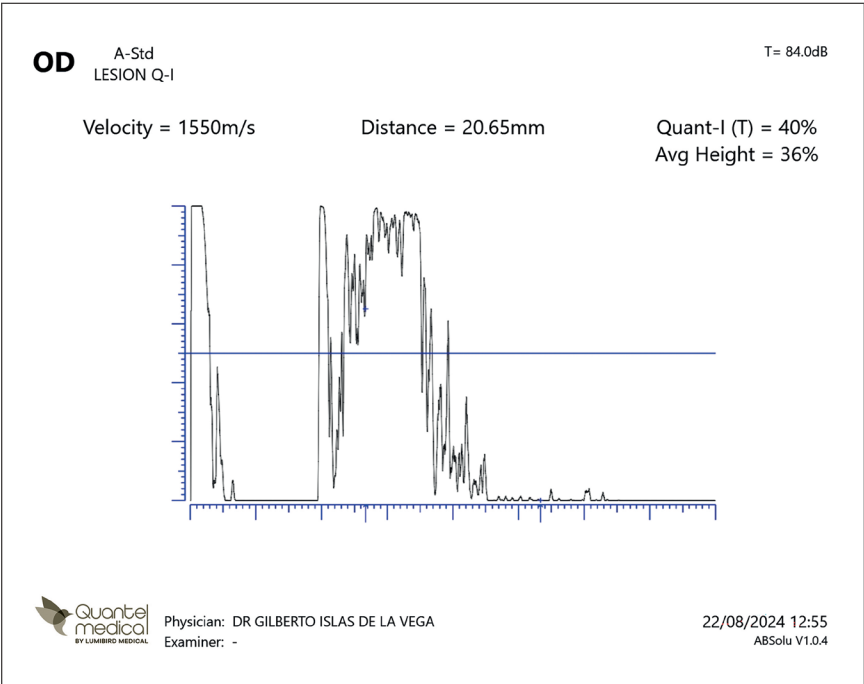


Figure 6. A-scan Std probe imaging showed the outline of a choroidal melanoma.

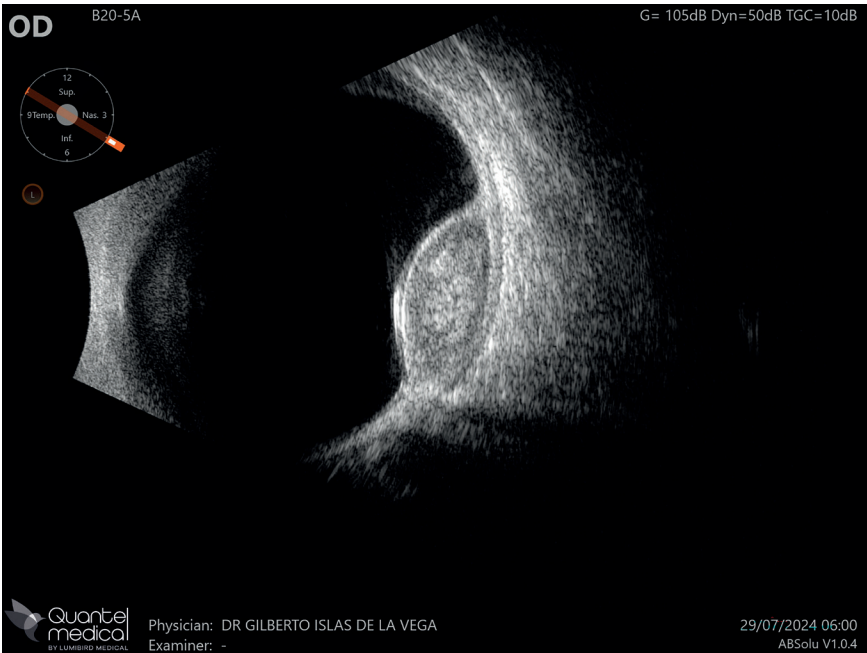


Figure 7. B-scan imaging with the B20 MHz Annular Probe clearly showed the dome-shaped, vascularized melanoma located at the choroidal layer of the posterior pole.