Annular Array Ultrasound (AAU): Enhanced Imaging of the Optic Nerve and Orbit

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Purpose:
Marked improvement of image and resolution for the optic nerve and orbit.

Methods:
Moveable focus and higher frequencies (18-20 MHZ AAU) provide marked image improvement with finer axial and lateral resolution for orbital ultrasonography. Six ring element transducer, contact B-Scan device with relatively narrow and moveable focus maximizes optic nerve, nerve head and orbital detail for common, unusual and rare pathology.

Results:
AAU with capability of changing focal depth has been available for decades in general ultrasonography but cost and technological limitations prevented development in ophthalmology until recently. Need for advanced imaging with variable focus for specific areas of interest triggered AAU for ophthalmic contact scanning. Several commercial devices are now available providing control of beam focal distance and increased frequencies to optimize resolution as well as image quality. The optic nerve and orbit are typical subjects of interest for this technology. Surface, subsurface, excavation, infiltration, fluid accumulation, vascular emboli as well as real time cardiovascular induced motion are possible. Stored loop video permits rapid comparison between eyes and longitudinal review.

Conclusions:
AAU in ophthalmology is an important "next step" in resolution and image quality for specific areas of interest such as the optic nerve and orbit. Real time provides additional diagnostic capability.