3-D B SCAN WITH OCULAR BLOOD CIRCULATION: A NEW DIMENSION IN OPHTHALMOLOGY

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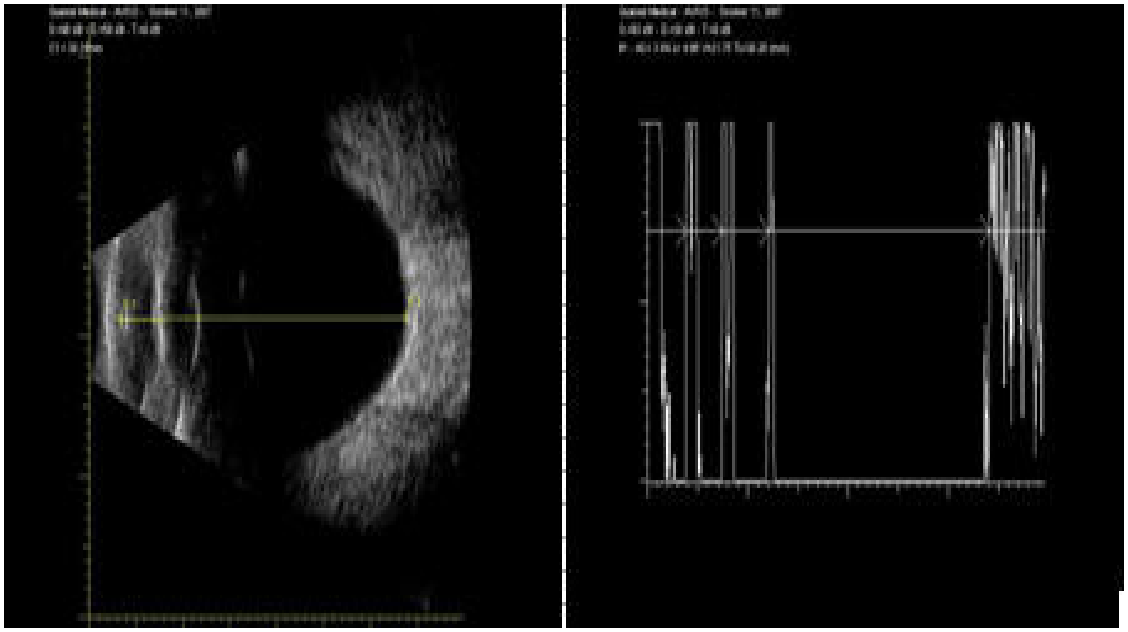
OPHTHALMIC ULTRASONOGRAPHY

- Acoustic wave
- Tissue –acoustic impedance mismatch

  pulse-echo technology

  A-scan

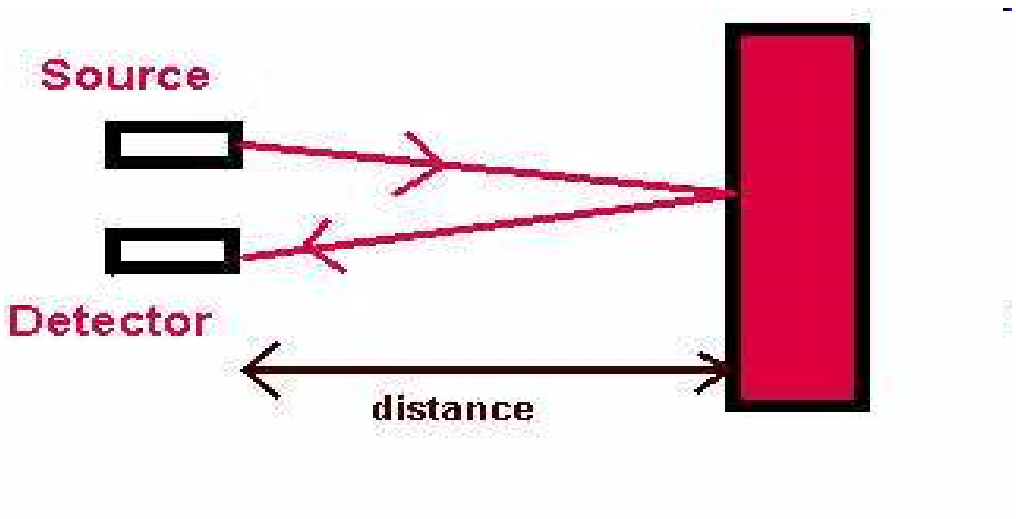
  B-scan



“ECHO”

- Based on “reflective sound - echo”

Short pulse
High frequencies
Travel deep without absorption



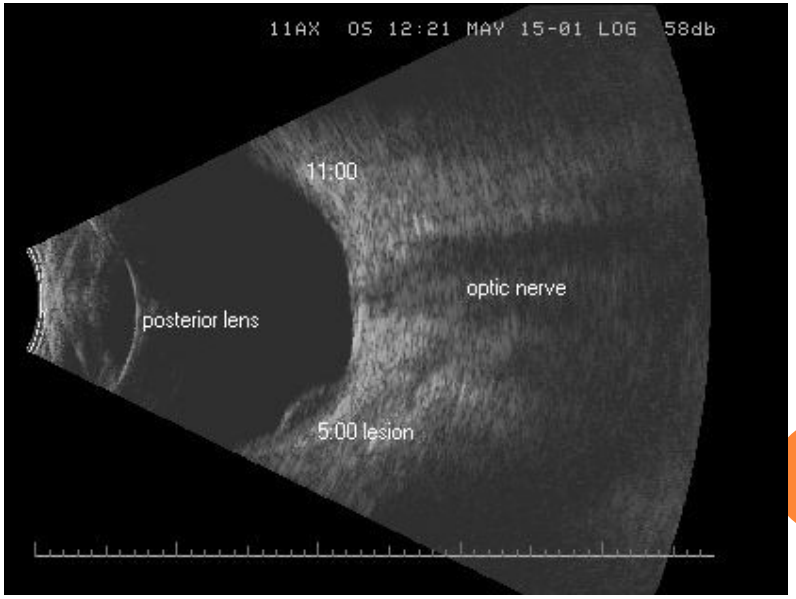
DISTANCE= SPEED x TIME

HOW THE ULTRASOUND PRODUCED?

- Piezoelectric crystals
  - natural crystals including quartz
  - synthetic ceramic, lead zirconate titanate
- contracts or expands in an electric field
- Rapidly alternating electric field produces vibration
- Vibrations are passed through any adjacent materials as a longitudinal wave i.e. a “sound wave”

B-SCAN

- Two dimensional cross sectional display of the globe and orbit-architectural
- B=brightness
- Signal brightness- white to black
- Gray shade-differ according to echo strength
- Internal reflectivity
- Sound attenuation
- Aftermovement
- Vascularity within lesion

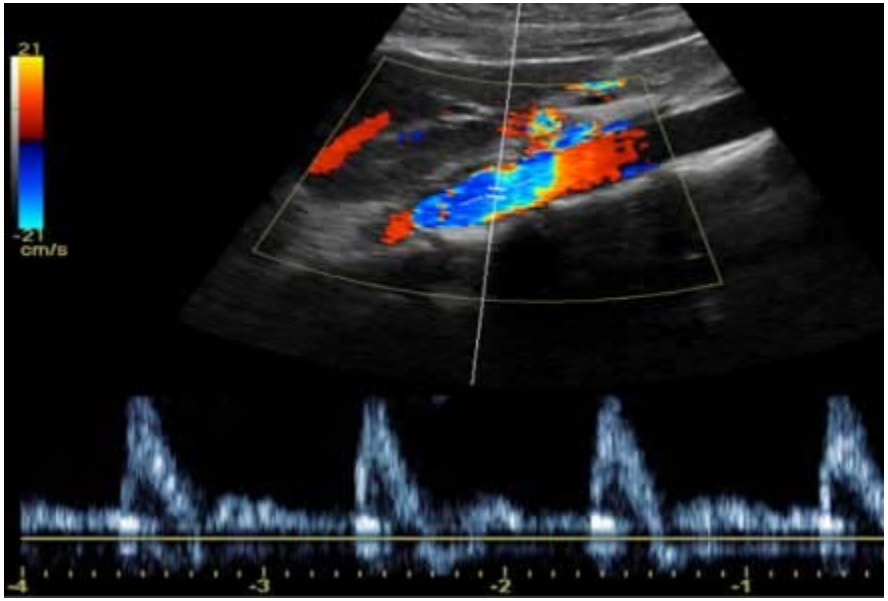


RECENT TECHNOLOGY IN OPHTHALMIC ULTRASONOGRAPHY

- Ultrasound biomicroscopy
  -higher frequencies 50-100MHz
  -deep penetration 5-7mm
- Color-Doppler ultrasonography
  ocular blood flow

B-SCAN

- Improvement 3-D as in cardiology and gynaecology ultrasonography
- Incorporated the color-Doppler ultrasonography



PLAN

- Phase 1

  -prototype 3D B-scan
- Phase 2

  - colour Doppler
- Phase 3

  - animal experimental study
- Phase 4

  - clinical trial
- Phase 5

  - commercialization

THANK YOU