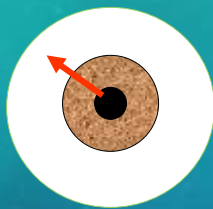


UBM IN GLAUCOMA

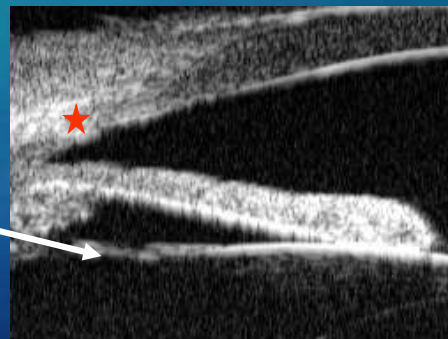
PRESENTED BY

PROF. DR. HALA EL CHEWEIKH
PROFESSOR OF OPHTHALMOLOGY
CAIRO UNIVERSITY



UBM Image of
a normal eye

Anterior lens
zonule

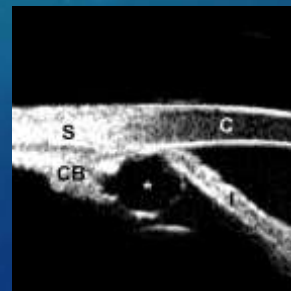


UBM INTRODUCTION

- The first UBM was designed and introduced to the market by Dr. Chuck Pavlin and Stuart Foster on the early 90's
 - It was a 50 MHz probe, bringing a very good detailed image of a 5x5 mm. area.
 - The hardware was uncomfortable to handle and the software was limited.
- Due to the area covered it found applications only on the anterior chamber angle.

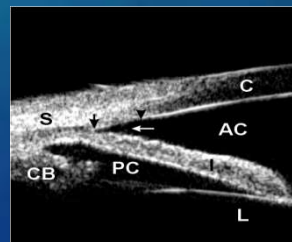
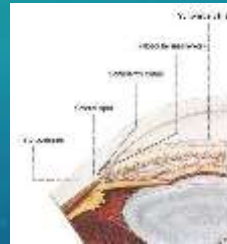
TECHNOLOGY

- The higher the frequency, the shorter the penetration.
- It required a strong counter balanced arm, but was the first and only way to “see” behind the iris.

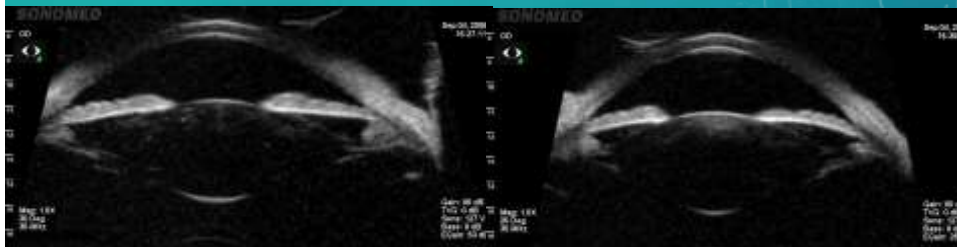


TECHNOLOGY

- The UBM provides 256 axial A Scan traces at up of 8 frames/p/s.
- A receiver processes each of the A Scans and generates a bi-dimensional image

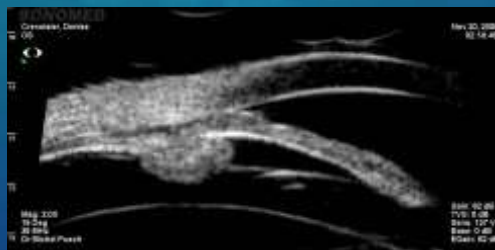


NEW TECHNOLOGY: ALLOWS SULCUS TO SULCUS IMAGES



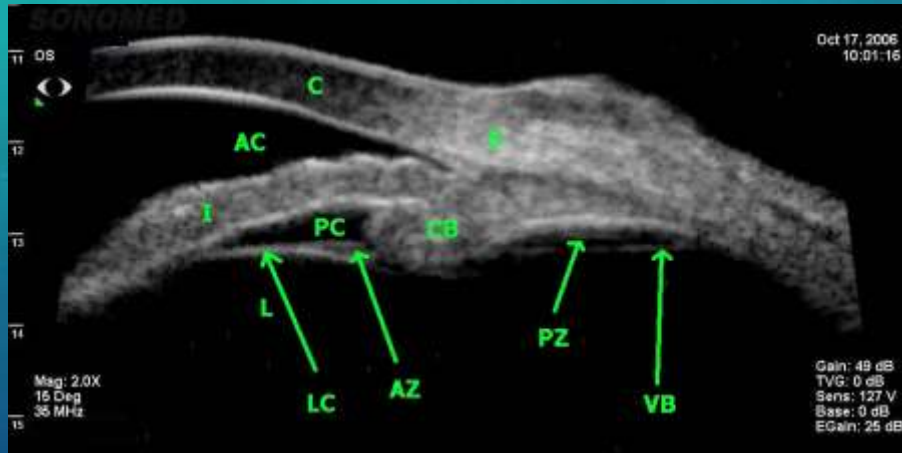
Sulcus to Sulcus

High Resolution

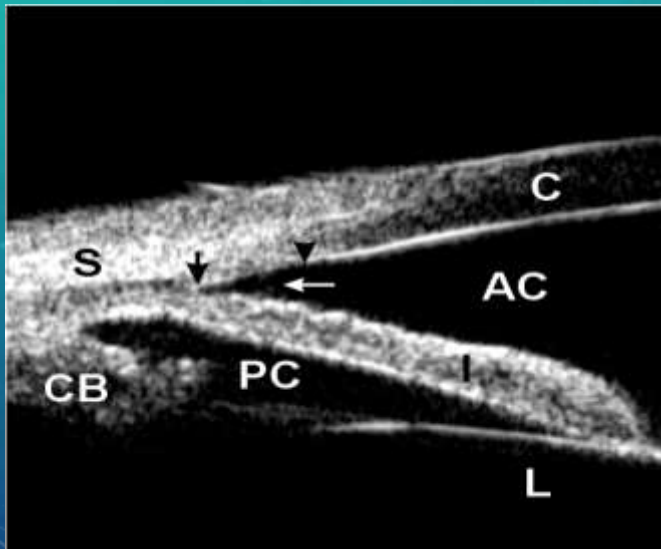


Angle Detail

WHAT TO SEE IN AN ANGLE PICTURE?



QUANTIFICATION OF ANTERIOR CHAMBER ANGLE

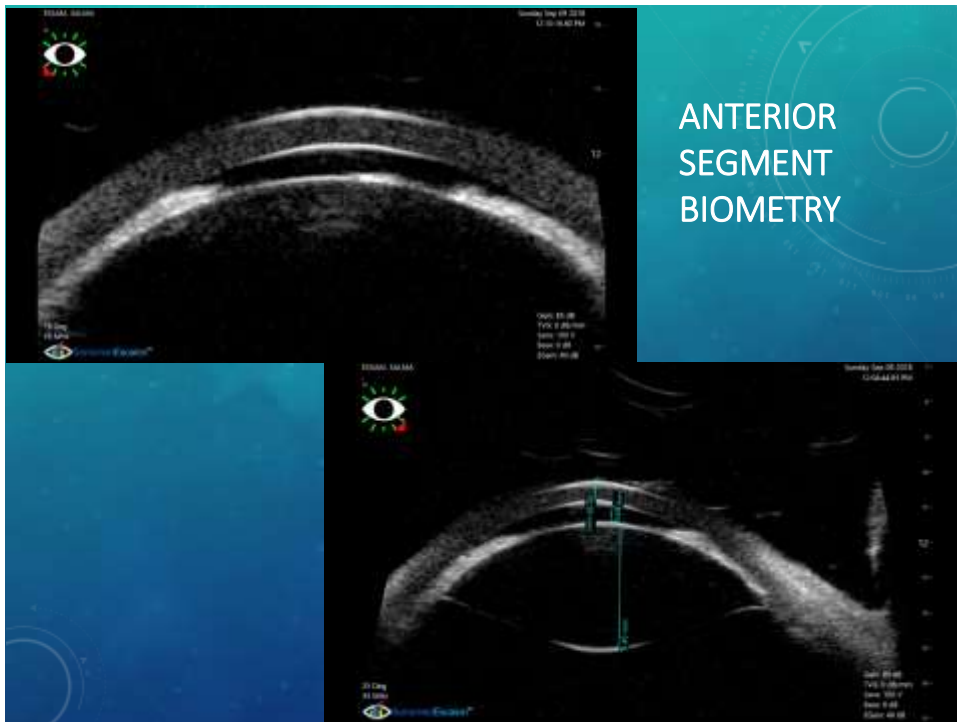


- The Scleral spur is the most important landmark.
- Radio-opaque shadow of the sclera merges with the relatively radiolucent shadow of the cornea.

DETERMINATION OF THE MECHANISM OF PRIMARY GLAUCOMA

- Able to determine the mechanism of elevated IOP (angle-closure vs. open-angle) by showing the relationship between the peripheral iris and the trabecular meshwork.
- Imaging is possible, even in eyes with corneal edema or corneal opacification that precludes gonioscopy.





INDENTATION UBM GONIOSCOPY

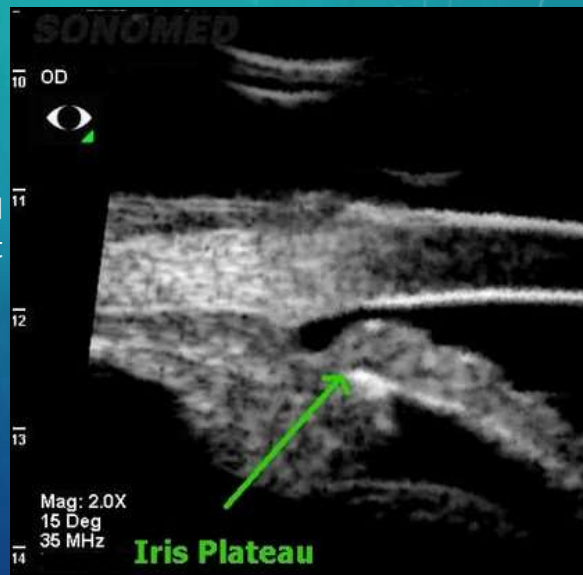
- Angled widened with indentation
- The angle changes in eyes with relative pupillary block where significantly greater than in eyes with peripheral anterior synechie (PAS) or plateau iris configuration (PIC).
- Useful for diagnosing relative pupillary block, PAS, and PIC.

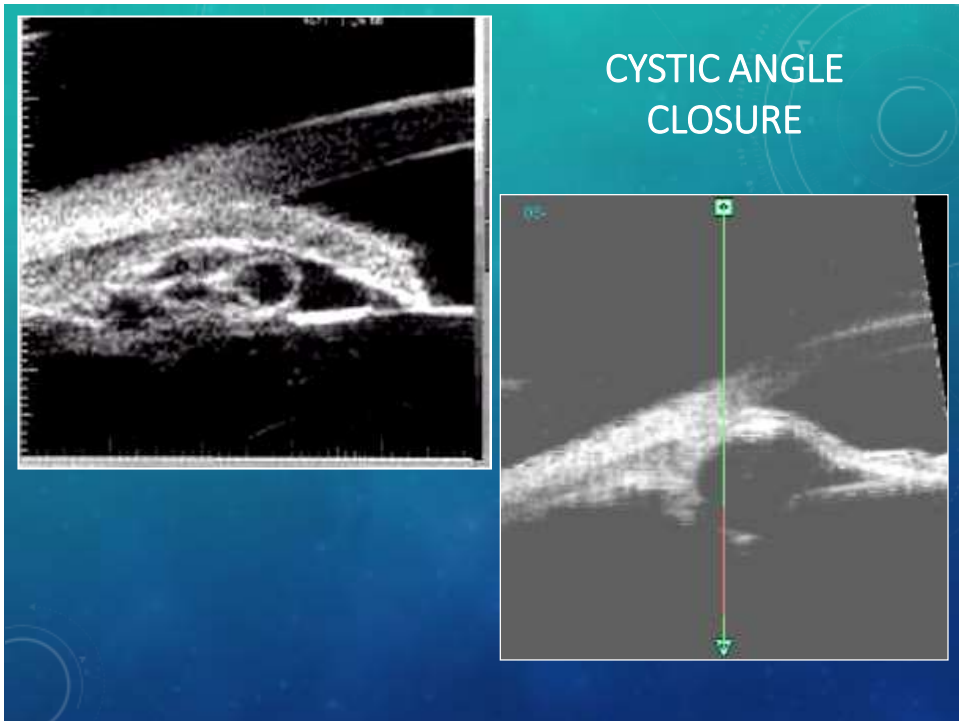
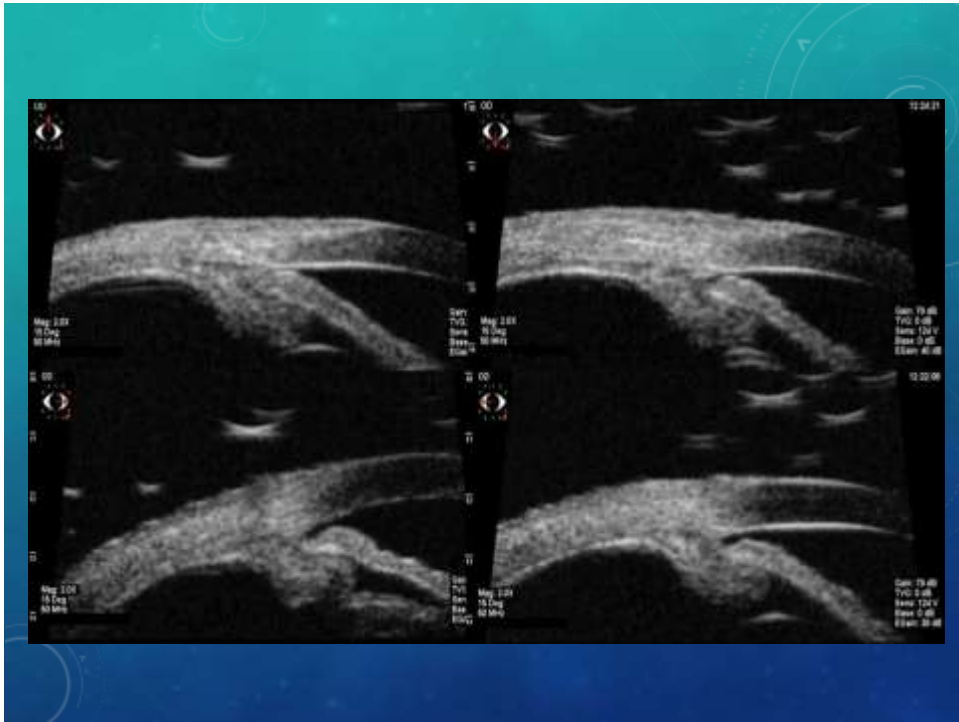
UBM VS. OTHER MODALITIES IN ANTERIOR SEGMENT IMAGING

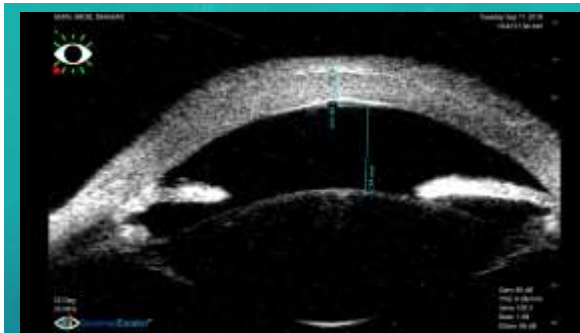
- Slit lamp biomicroscopy and gonioscopy can be used to visualize the anterior segment, but structures posterior to the iris cannot be viewed using such conventional methods.
- New modality as anterior segment OCT provides excellent views of anterior chamber but cannot acquire images behind the heavily pigmented posterior surface of the iris, as the coherent light is absorbed by the iris pigment epithelium.

PLATEAU IRIS CONFIGURATION & SYNDROME

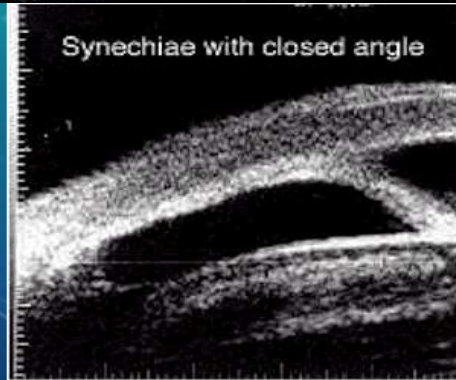
- Abnormalities in ciliary body position can occur in plateau iris configuration and syndrome, malignant glaucoma, and anteriorly located annular choroidal effusions.





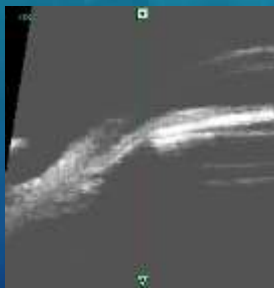
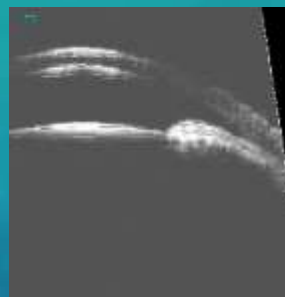
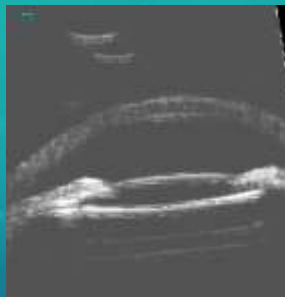


ANTERIOR SYNECHIAE

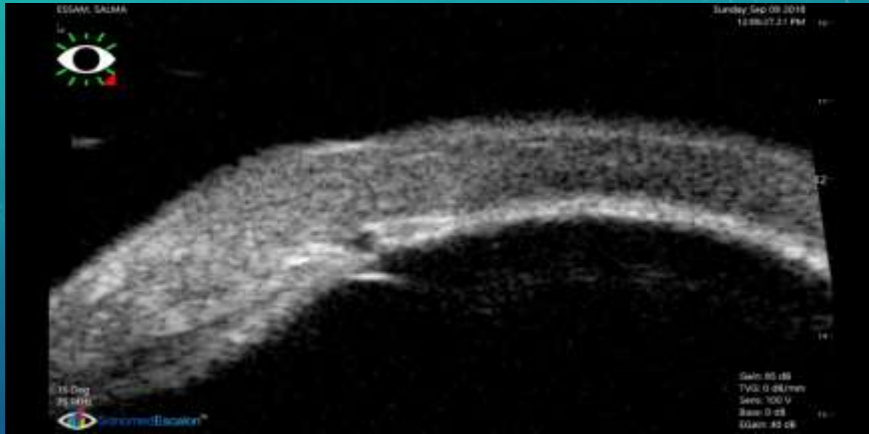


- The iris profile is generally different when angle closure is due to Synechiae. The iris has an angled appearance as opposed to a smooth curvature of pupillary block. It is also possible to tell if there is any open angle behind the Synechiae

PSEUDOPHAKIC PUPILLARY BLOCK GLAUCOMA

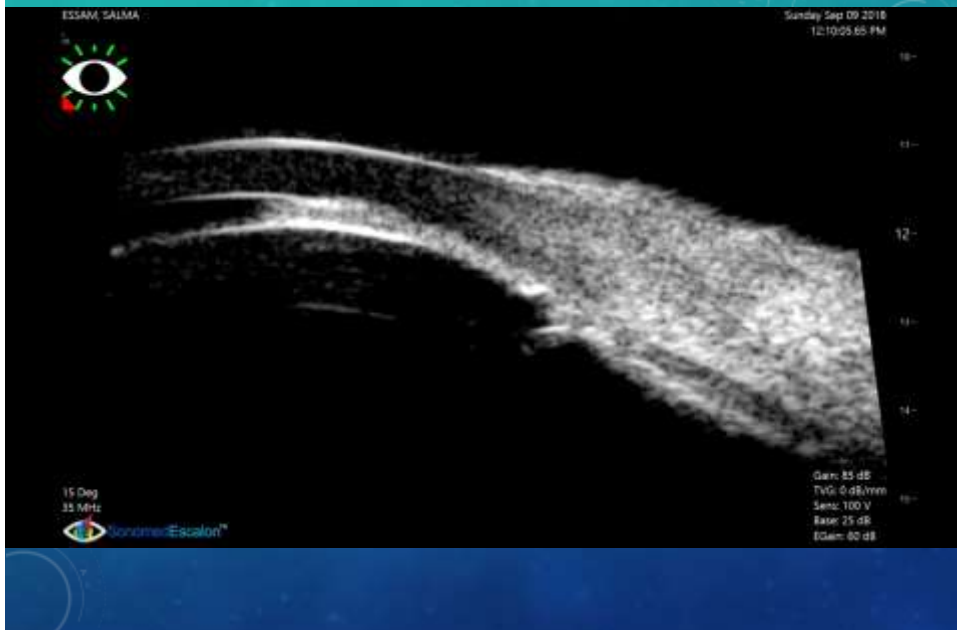


SUPRACILIARY EFFUSION & MALIGNANT GLAUCOMA



- Supraciliary effusion that cannot be detected by conventional ultrasound could be detected UBM.
- They produce rotation of ciliary processes and iris around the scleral spur.

MALIGNANT GLAUCOMA



SUPRACILIARY EFFUSIONS

- The area of effusion is crossed by fine lines representing cross sections of the connective tissue septa that attaches the ciliary body to the sclera.
- The iris and ciliary body both rotate forward producing various degrees of angle closure depending on the amount of effusion, and the degree of angle opening prior to effusion development.

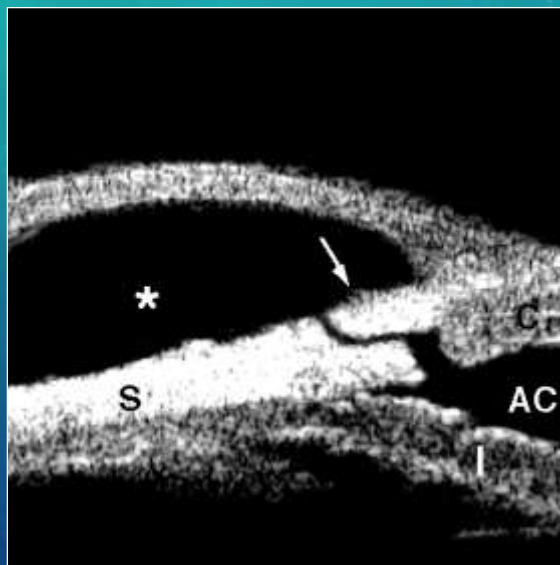
SUPRACILIARY EFFUSIONS



FILTERING SURGERY

- UBM is able to analyze the state of filtering procedures
- The internal surgical opening can be visualized and the state of filtering bleb assessed
- Filtering blebs show variable internal reflectivity depending on fluid distribution in the episcleral tissue.

GLAUCOMA FILTERING SURGERY

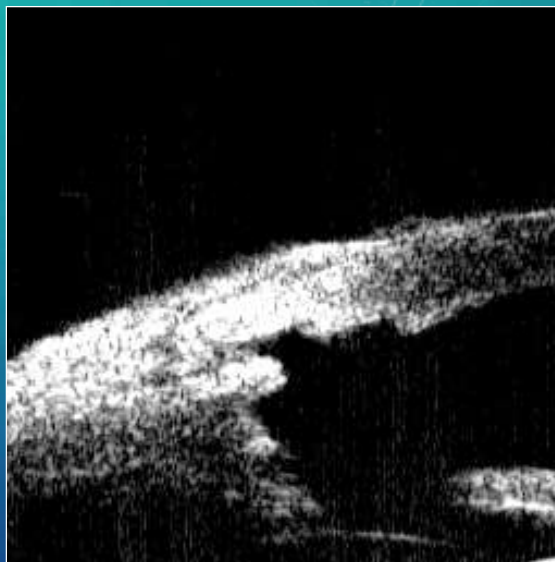


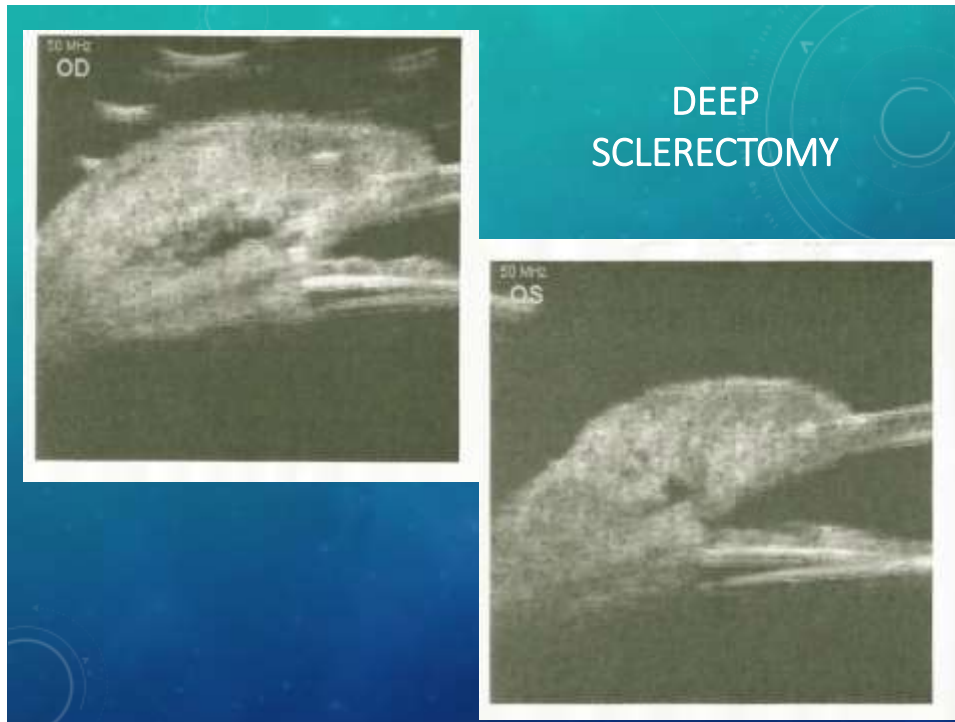
TRABECULECTOMY WITH MITOMYCIN



BLEB GRADING

- Low Reflective (L)
- High Reflective (H)
- Encapsulated (E)
- Flat (F)





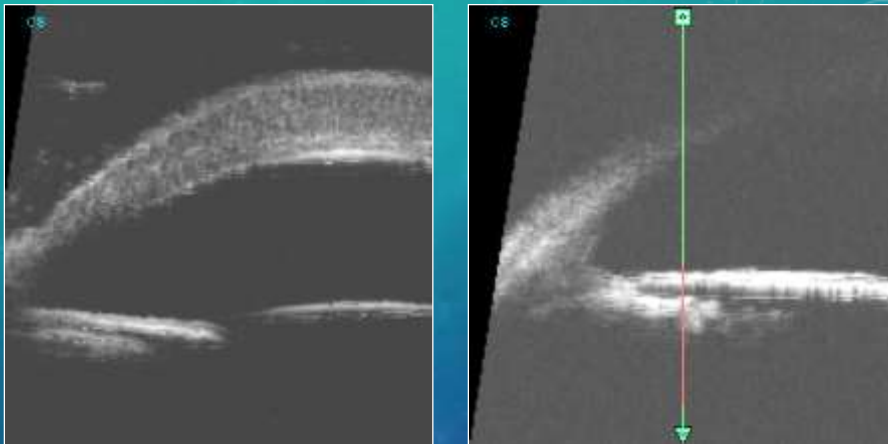
AQUEOUS DRAINAGE TUBES

- UBM is instrumental in diagnosing the presence and cause of occlusion of aqueous drainage device.
- UBM can demonstrate peritubular filtration as a cause of ocular hypotony after glaucoma shunt device implant.

CONGENITAL GLAUCOMA

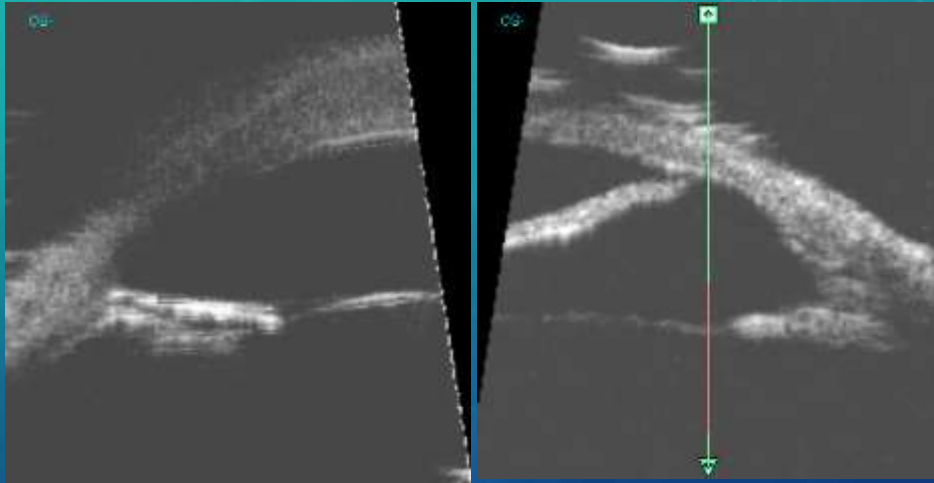
- UBM can detect the cases of 1ry congenital glaucoma with trabeculo dysgenesis.
- In cases of multiple glaucoma surgeries with opaque cornea it identifies previous surgical procedures.

1RY CONGENITAL GLAUCOMA

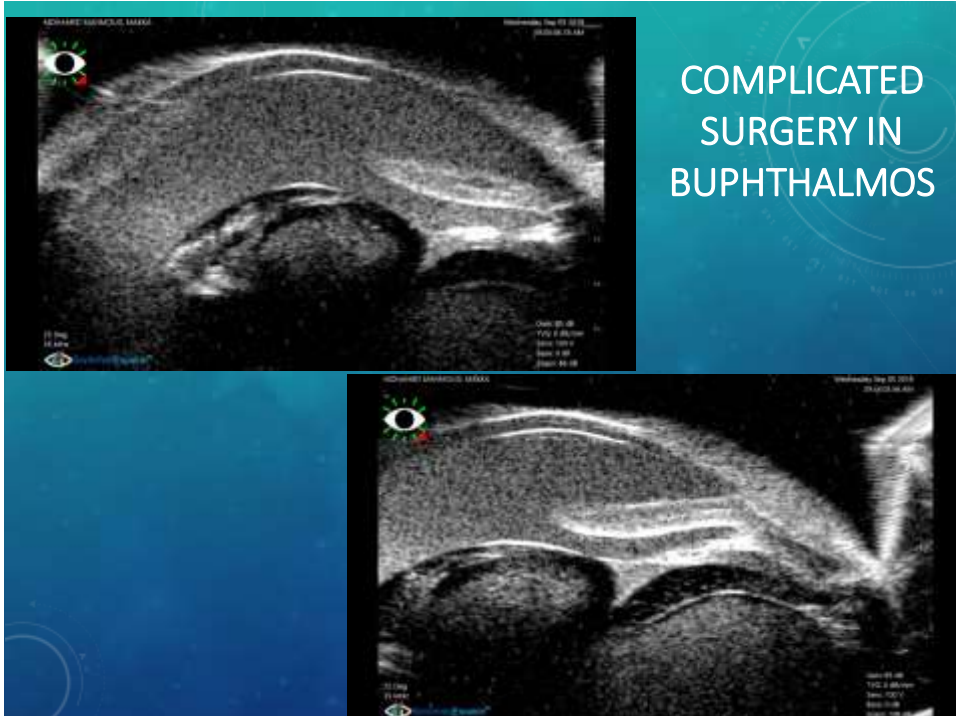


- Thin stretched out ciliary body with elongated ciliary processes
- Abnormal tissue at the angle (trabeculo dysgenesis)
- Abnormal insertion of ciliary body

GONIOTOMY

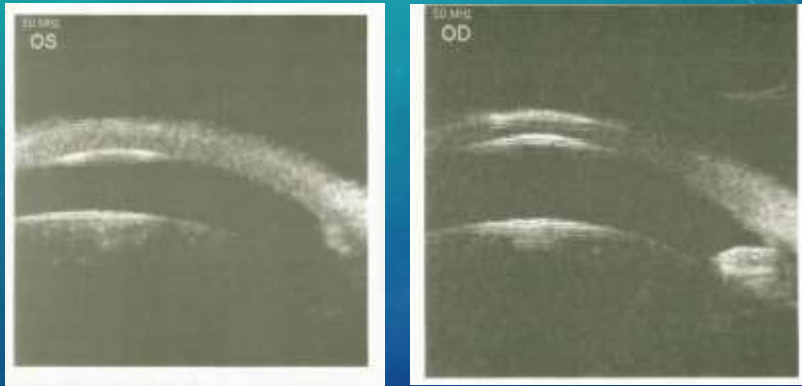


- In cases of cloudy cornea and unknown previous glaucoma surgery, UBM can be used to identify the type and localization of previous surgery in congenital glaucoma, thus assisting surgical planning for subsequent management

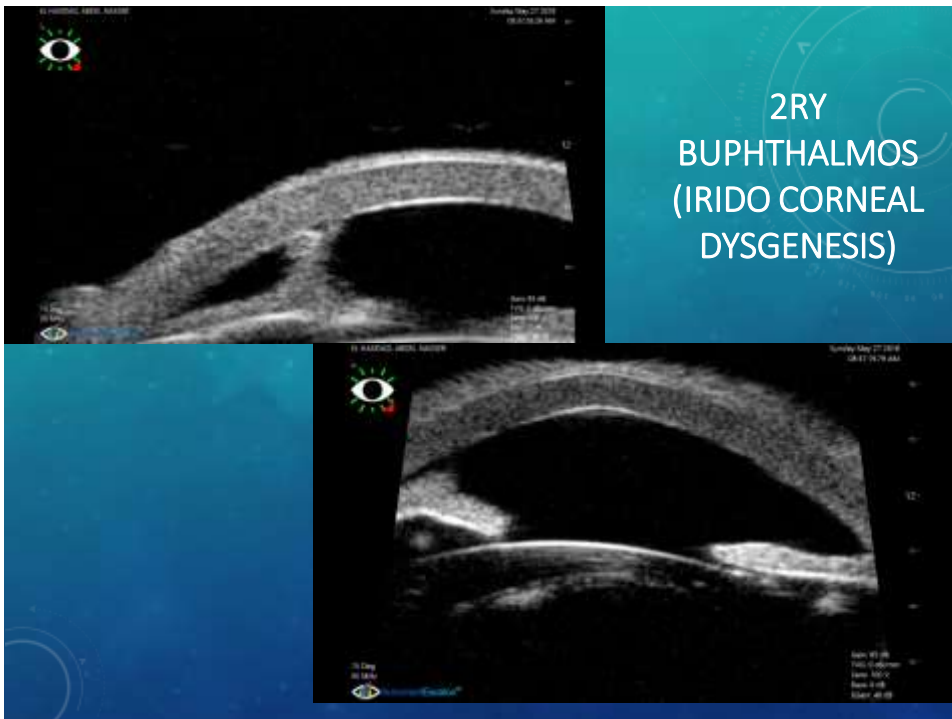


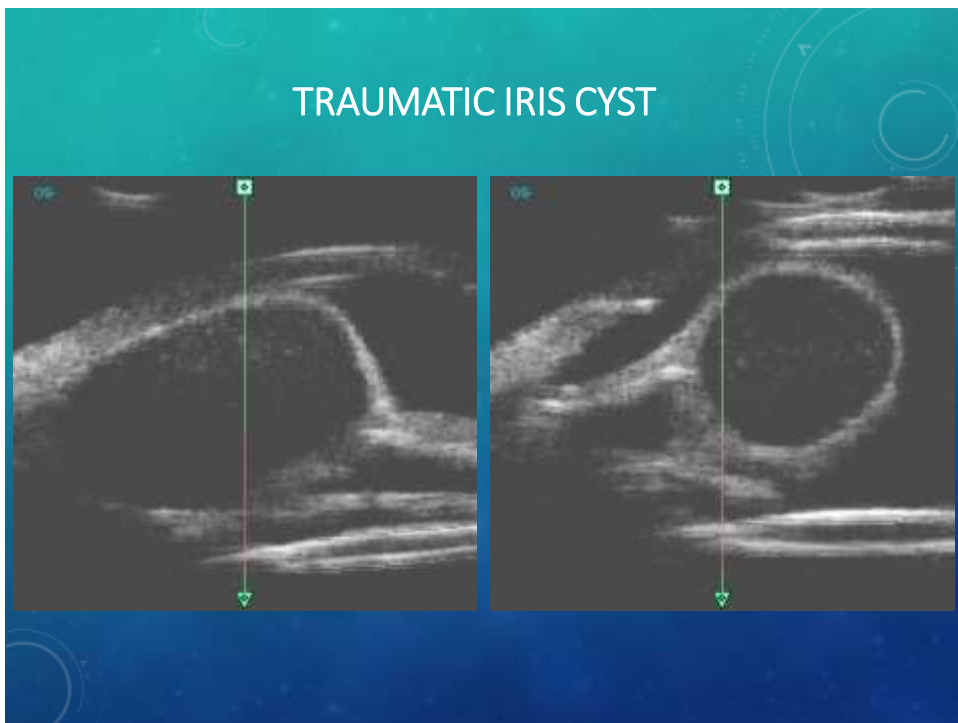
COMPLICATED SURGERY IN BUPHTHALMOS

2RY BUPHTHALMOS (ANIRIDIA)

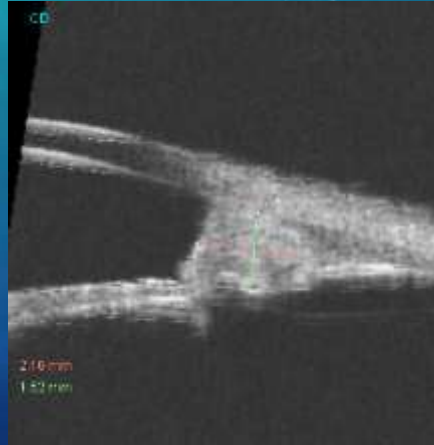


2RY BUPHTHALMOS (IRIDO CORNEAL DYSGENESIS)

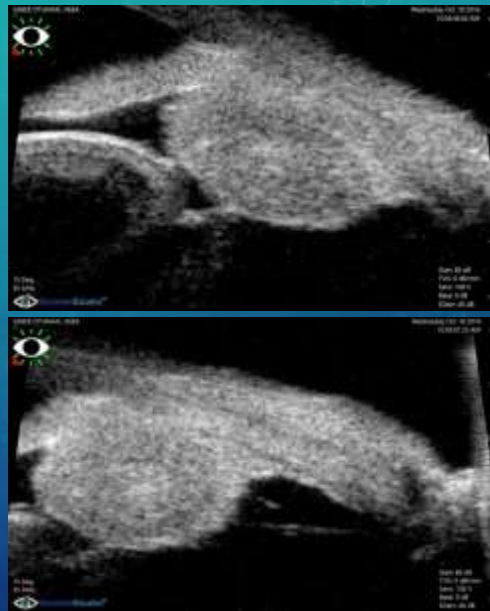
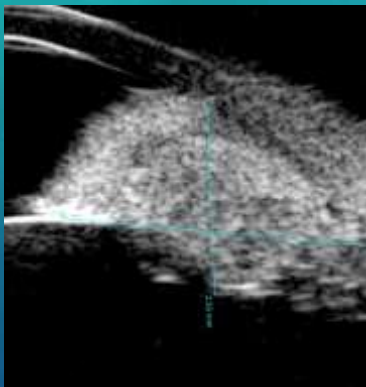




2RY ANGLE CLOSURE DUE TO MALIGNANT LESION (MELANO CYTOMA OF IRIS & CILIARY BODY)



2RY ANGLE CLOSURE DUE TO MALIGNANT LESION



TAKE HOME MESSAGE

- UBM is an indispensable tool in qualitative and quantitative assessment of anterior segment
- An excellent view of the pathology occurring in the anterior and posterior chambers of the eye and thereby providing a clear insight into the cause of aqueous obstruction.

THANK YOU