

## Summary

Ultrasound frequencies used in ophthalmology have generally higher than those used in general medicine because of the requirement for higher resolution and a lesser need for deep penetration. Most ophthalmic diagnostic equipments use frequencies in the 10 MHz the use of ultrasound frequencies in the 50-100 MHz range is a relatively new development in the ultrasound imaging of the eye. The term Ultrasound Biomicroscopy (UBM) has been applied to this new imaging technique because of similarities to optical biomicroscopy, i.e. the observation of living tissue at microscopic resolution. It is a non-specific imaging technique that can be used for any ocular pathology which fall within its penetration limits.

The UBM examination has many similarities to other types of B-scan ultrasound examinations. The technique of placing the transducer opposite the area of interest and using fine manipulations of the probe with reference to the screen image to produce optimal ultrasonic sections is similar to that used with conventional ultrasound. The main differences are the presence of a moving transducer without a covering membrane, the necessity for a water bath technique, the finer movements required, and a relatively short working distance.

It provides a view of subsurface structures in their normal relationships without the distortion that occurs with preparation of histological specimens. It useful to define a series of measurement parameters by UBM that can be used for future comparison between normal and pathological eyes, and define measurement sites in term of fixed anatomical landmarks such as the scleral spur.

UBM provides a new ways of assessing corneal edema, also holds promise as a method of monitoring the results of various types of refractive surgery. It was performed to study the degrees of keratoconus and to determine corneal thickness and keratoconus index. Recently UBM is used in detecting the clinicopathological correlation of congenital corneal opacification.

UBM provides a new tool for examination of the sclera and adjacent tissue. Conjunctival and limbal pathology is well imaged by UBM. Information on internal structure and degree of involvement of underlying tissue can aid in the clinical assessment of these lesions. UBM used to visualize the pre saccular lacrimal passages and valuable in detecting chronic canaliculitis and lacrimal passage disorders.

The glaucoma constitutes a wide variety of disease entities. UBM was used as an adding method in detecting the different etiologies of glaucoma. Plateau iris syndrome, suprachoroidal effusion, malignant glaucoma, and pigmentary glaucoma are just examples in which useful information has been gained by using this tool. In addition to its value in postoperative secondary glaucoma. For example, after vitreoretinal surgery or congenital cataract surgery. Also its value after different glaucoma surgeries.

UBM adds new information of imaging the anterior segment tumors. Morphological and internal reflectivity patterns aid differential diagnoses. UBM is diagnostic in differentiating cysts from solid tumors. It is also useful in detecting tumors changes and borders that aid in the treatment planning.

UBM allows in vivo imaging of the zonules at microscopic resolution allowing determination of the degree and the extent of zonular

abnormalities that could be of value in planning the surgical approach to cataract removal.

Intraocular lenses (IOLs) are easily outlined with UBM because of the high reflectivity of the IOL material. UBM presents the unique ability to image and locate the position of the haptics and its relation to the surrounding structures. The surgeon can use this knowledge to monitor and refine surgical techniques. UBM also allows analysis of surgical complications and provides new insight into their etiology.

UBM is an interesting instrument for the assessment of patients with intermediate uveities. Longitudinal follow up by UBM will have to show the indication for vitreoretinal procedures or initiation of therapy with anti-inflammatory agents.

UBM can accurately determine the distances of insertion of EOM from the limbus when applied both to un-operated horizontal muscles and to horizontal muscles that had undergone prior surgery.

UBM is a helpful tool in assessing trauma, especially in those cases in which structural changes or opacity obscure relevant pathology. UBM provides a new method the extent of cyclodialysis prior to therapeutic intervention. The presence of pathology behind opaque corneas can be determined prior to surgery. Foreign bodies have a typical appearance on UBM and can be imaged in the angle and behind the iris.