

# Ultrasonographic assessment of the lens

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## DESCRIPTION

B scan ultrasonography is the most commonly used modality for the assessment of posterior segment pathologies.<sup>1–3</sup> On placing the probe along the lateral longitudinal axis, the nasal aspect of the retina, ciliary body, the lens in its entirety, iris, angle and peripheral cornea can be appreciated easily. Using this technique, the anatomy of the lens can be studied in terms of its width along the horizontal and anteroposterior extent; similarly, by placing the probe along the inferior longitudinal axis, the vertical width of the lens can be defined, along with the anteroposterior thickness. This technique helps in the assessment of lens in its entirety, from the anterior capsule to the posterior capsule. Herein few pathologies of the lens and its capsule are illustrated using B scan ultrasound (Sonomed, New York, USA).

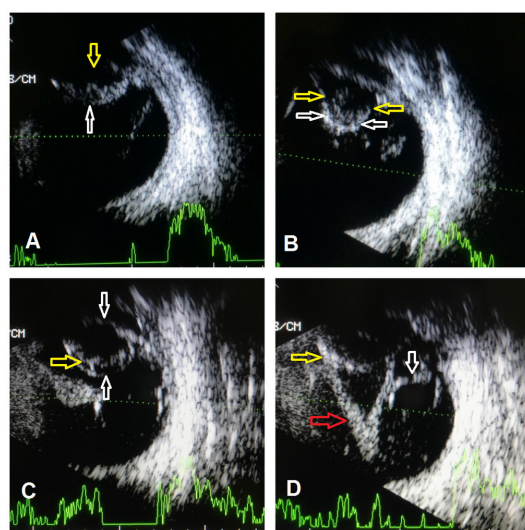
After making the patient lie down in a comfortable supine position, a coupling agent is placed over the closed eyelids and the ultrasound probe is placed along the lateral longitudinal plane.

The patient is asked to adduct the eye as much as he/she can, and the probe is adjusted slowly to look for the lens and the nasal ocular structures.

Dense posterior subcapsular cataract along with posterior cortical opacity gave rise to hyper-reflective echoes from the posterior capsule, extending anteriorly within the substance of the lens, whereas the anterior clear cortical region remained echolucent (figure 1A). In a patient with traumatic cataract, lens evaluation with ultrasound showed disruption of the posterior lens capsule, along with herniation of the lens matter in the anterior vitreous cavity (figure 1B).

A 20-year-old male patient, after sustaining blunt trauma, experienced gradual painless loss of vision, and based on clinical examination a diagnosis of total cataract was made. Ultrasonography showed an anteroposteriorly thickened lens, with opacification of the posterior cortical matter mainly; however, the posterior capsular integrity was undisturbed (figure 1C). In another example, in a middle-aged patient who denied perception of light, B scan ultrasonography revealed a closed funnel retinal detachment. The funnel of the detached retina was abutting the posterior surface of the lens, causing a localised opacification of the posterior lens matter. The nasal retina showed two cystic cavities suggestive of intraretinal cysts, usually seen in cases of long-standing retinal detachment (figure 1D).

To conclude, judicious use of B scan ultrasound in routine clinical practice enables better understanding of the lens anatomy and pathology, especially when media haze precludes the visualisation of the lens with conventional examination techniques. However, no technique is without procedural difficulties or limitations. The experience of the ultrasonologist, time devoted to perform the scan and patient cooperation are some of the factors which may affect the information obtained by this technique. On



**Figure 1** (A) Predominantly posterior cortical cataract with an intact posterior capsule (white arrow) and anterior clear matter indicated by echolucent areas (yellow arrow). (B) A case of post-traumatic posterior capsular breach (yellow arrows) with herniation of the cortical matter (white arrows) into the anterior vitreous. (C) A case of the post-traumatic intumescent lens (indicated by the white arrows) with minimal opacification of the posterior cortical fibres (yellow arrow). (D) Closed funnel retinal detachment (red arrow) with anterior retina abutting the posterior surface of the lens, leading to posterior subcapsular and cortical opacities (yellow arrow) along with retinal cyst (white arrow).



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## Learning points

- ▶ B scan ultrasonography provides valuable information about the lens from the anterior capsule through its matter up to the posterior capsule in a single setting.
- ▶ Meticulous usage of this valuable tool, especially in traumatic cases, will enhance understanding regarding the lens and the posterior segment, thus helping in planning a better treatment strategy.

the contrary ultrasound biomicroscopy (UBM) may be a better technique for lens evaluation; however, it is expensive, it always requires a water bath and less people are trained in UBM. Also, with a UBM, we may not be able to get information about the anterior and posterior segments simultaneously.

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