

Pseudo-Subdural Collection on Ultrasound: A Mirror Image Artefact

Aniket Verma¹, Khalaf Saba^{2*}, Syed Yusuf Masood², Saifullah Khalid³

¹Department of Radiodiagnosis, Jawaharlal Nehru Medical College and Hospital, Aligarh Muslim University, Aligarh 202002.

²Department of Radiodiagnosis, JNMCH, AMU, Aligarh 202002.

*Corresponding Author: Md. Khalaf Saba, Department of Radiodiagnosis, JNMCH, AMU, Aligarh 202002.

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Abstract: -

Teaching point: -Extra-calvarial subcutaneous or subgaleal collection can mimic as subdural collection on ultrasound due to mirror image artefacts.

Key Words: contrast enhanced computer tomography (CECT); radio-diagnosis; low frequency; high frequency

Case History: -

A 2 months old female infant was referred by paediatrician to radiodiagnosis department for ultrasonography of a left sided retro-auricular swelling for past 5 days. This was associated with mild off and fever. There was no significant clinical history apart from this.

High frequency and low frequency ultrasound probe image (Figure 1 and 2) show a well-defined heterogeneous predominantly hypoechoic extracalvarial collection in layers of scalp in left retroauricular region with

no internal vascularity. Also noted similar subdural collection underlying this extracalvarial collection. But the infant had no neurological symptoms present.

To confirm the presence of subdural collection, further evaluation was done by contrast enhanced computer tomography (CECT) of the brain. Axial CECT image at the level of interest shows extracalvarial peripherally enhancing collection without any underlying bony erosions or intracalvarial extension of extra axial collection. Abscess was aspirated under USG guidance and culture revealed staphylococcus aureus.



Figure 1: Low frequency ultrasound image of collection.



Figure 2: High frequency ultrasound image of the collection

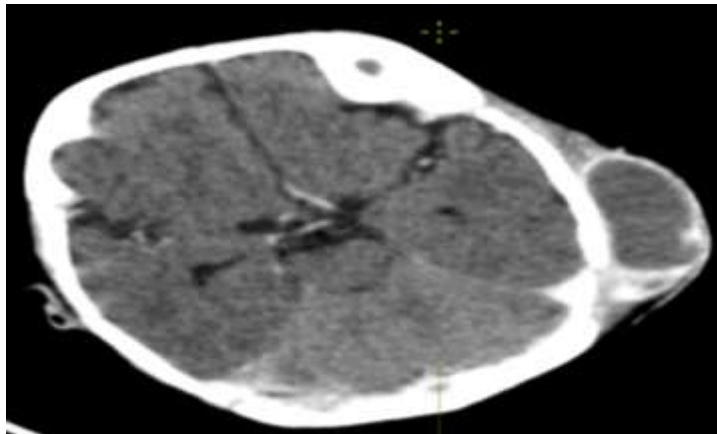
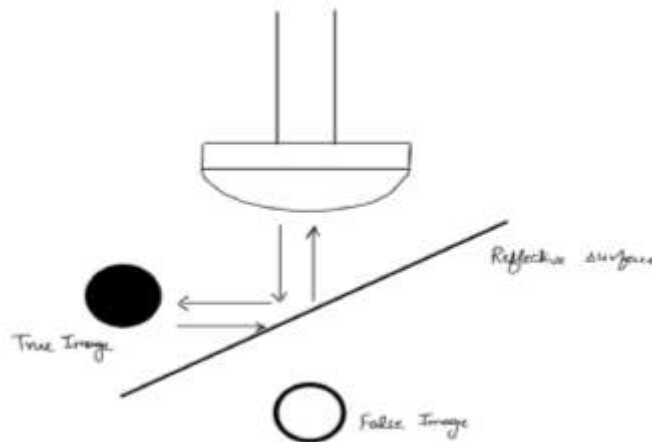


Figure3: CEC Taxial section

The ultrasonographic findings of subdural collection was due to the phenomenon of a mirror-image artifact.

Discussion: -

Mirror-image artefacts happen when the primary beam hits a highly reflective surface that is obliquely oriented, is reflected by that surface, but then runs into another structure on the way to the transducer. The mirror-image artefact is produced on the opposite side of the reflective surface when the transducer interprets the delayed echo as reflecting from a structure deeper down (Figure 4).



In this instance, the skull bone reflects the ultrasound beam, creating an artefact that resembles an epidural/subdural collection on the side opposite the extracalvarial collection.

Other typical mirror-image aberrations include reflections of the amniotic sac and ascites across the diaphragm that simulate heterotopic pregnancy and pleural effusion respectively.

The mirror-image artefact may closely resemble the original structure, but it also has the potential to be weaker, to distort the original structure's picture, or to appear on photos when the original structure is not simultaneously visible.

In order to avoid needless further investigations and patient worry, this is crucial to distinguish such mirror-image abnormalities and not consider them as pathology.

By adjusting the primary beam's angle or, in the instance of an

extracalvarial collection, by application of graded compression, which demonstrates compression of the false mirror picture simultaneously with the graded compression of genuine image, so it is possible to assess the presence of mirror-image artefacts. It is also possible to utilise doppler ultrasound to demonstrate the normal cerebral blood flow within the area of misleading mirror image [1].

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