Three dimensional ultrasound is becoming popular partly due to its medical advantage but also because of its entertaining added value. However, the examiner may be misled by pitfalls and artifacts; some are derived from those of 2D ultrasound and some others unique to 3D technique.

Some pitfalls and artifacts seen in 3D ultrasound are "imported" from the 2D ultrasound. This category includes acoustic shadowing, acoustic enhancement and enhanced echoes from surfaces perpendicular to the beam. These artifacts may be more misleading in 3D than in 2D ultrasound since the cause of the artifact seen in the 2D image is usually not seen in the 3D image. A common example is a bone causing an acoustic shadow that may hide a deeper structure, i.e. a segment of a limb or portion of the upper lip. In 2D ultrasound both the origin of the shadow and the missing part are seen on one plane. In addition the extension of the shadow may be seen as deep as the furthest point in the image. Thus one can easily interpret the missing part as caused by the shadow. However, the 3D rendered image may be presented without linkage to the original plane and thus does not include the source of the shadow. Furthermore, the source of the shadow (i.e. a hand) may be missing because it was deliberately cut away in order not to hide the deeper structures.

Pitfalls and artifacts that are unique to the 3D technique include motion artifacts, superposition of objects located in various depths, sealing of small gaps by interpolation and “amputation” of organs that were located out of the sampled volume. In most cases 2D ultrasound, if used, could have provided the clue.

Three-dimensional ultrasound should be used cautiously and the examiner should be aware of potential pitfalls and artifacts that may lead to erroneous results. Two-dimensional ultrasound should be used for investigating each abnormal 3D finding.