

Currently Accepted Measurement Parameters in Endoscopic Ultrasound

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Introduction

Measuring is one of the most common functions in diagnostic ultrasound, regardless of which ultrasound modality (diagnostic US, EUS, EBUS, etc). These measurements are essential to an accurate diagnosis. Measurements in ultrasound are often compared to measurements in CT, MRI or other diagnostic imaging tests.

This paper will cover currently accepted measurement parameters of the Common Bile Duct (CBD) in the endoscopic ultrasound setting, as well as outline commonly mismeasured anatomy such as the CBD, organs and masses.

Current accepted parameters for measurement of the CBD are as follows:

- A normal CBD, in an adult, is approximately 3 mm. This diameter increases 1 mm per decade starting around age 40. In a 40 year old, the CBD diameter is 4 mm, 50 year old=5 mm, 60 year old=6 mm and so on.¹ It is considered normal in an elderly adult to have a 10 mm CBD.
- An additional mm can be attributed to post cholecystectomy patients.
- A ductal measurement of more than 11 mm is suggestive of obstruction by a stone or tumor.²
- The accepted place to measure the CBD is at the level of the porta hepatis. At this level, the common bile duct and hepatic artery appear as two small circles anterior to the portal vein which appears as a larger circle. Transversely, in transabdominal scanning, this is called the Mickey Mouse sign.³
- The CBD should always be measured in the longitudinal plane regardless of which ultrasound modality is used.
- The CBD should always be measured from inside wall to inside wall. Measuring the outer lumen will falsely enlarge the measurement.⁴

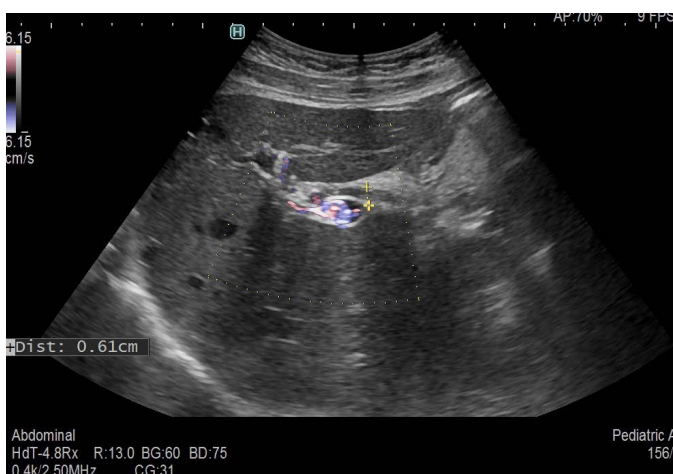


Image 1. Incorrect measurement of CBD
(outside wall to outside wall)

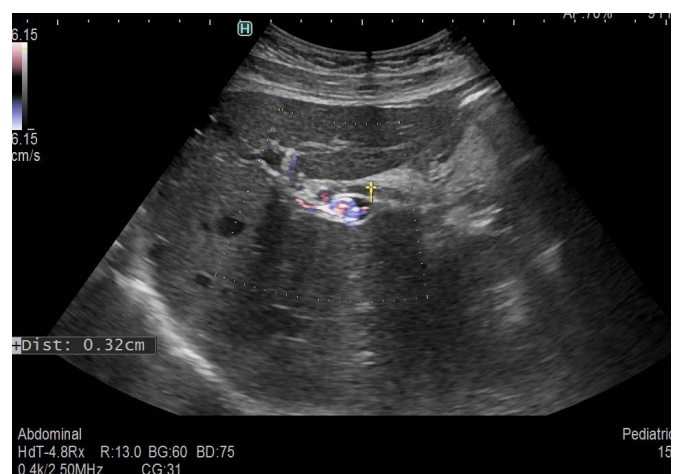


Image 2. Correct measurement of CBD
(inner wall to inner wall)

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Anatomy such as organs, masses/tumors and lymph nodes are also commonly mismeasured with ultrasound.

When measuring any structure, length and width are utilized to get the size of the area of interest. Measuring a structure on ultrasound can be used to distinguish between normal and abnormal or ensure that the anatomy visualized corresponds to any previous imaging tests such as MRI or CT.

When using ultrasound to measure a structure, length and width should be utilized, as mentioned before. It is important to scan all the way through the area of interest to ensure the largest part of the anatomy is visualized. Care should be taken to be perpendicular to the area of interest and not tangential. This can distort the size of what is being examined.

Measurements should be made from the longest and widest point in the area being visualized.

When measuring length and width, it is important that the measurements are made perpendicular to each other. Otherwise, if the measurements are tangential, the measurements would be inaccurate.

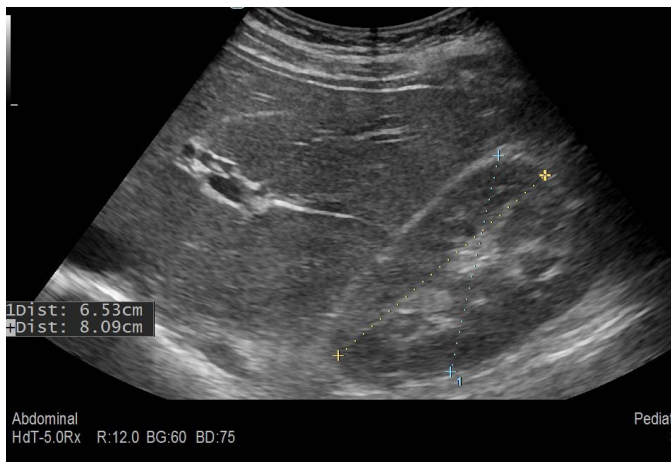


Image 3. Incorrect kidney measurement

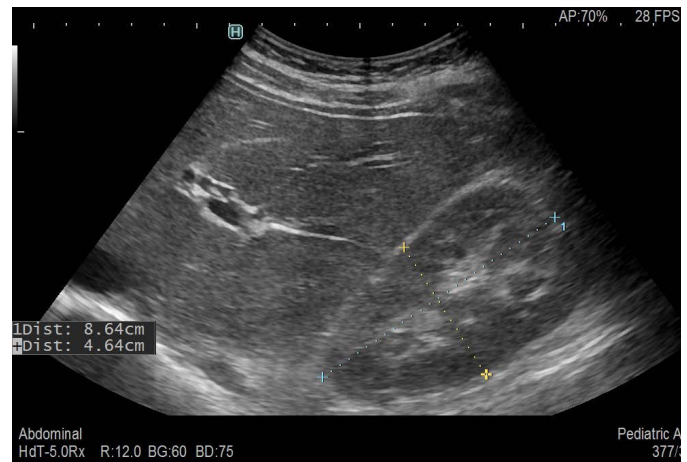


Image 4. Correct kidney measurement

Conclusion

The proper measurement of the CBD, organs and masses is an integral part of surveillance and intervention in ultrasound. Practicing proper technique and identifying the appropriate structures when measuring will ensure better diagnosis and treatment plans. Knowing the most common mismeasured structures will aid the user in practicing proper measurement techniques.

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