

### Initial experience with the Viamo

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Over the past years, ultrasound scanners have become smaller and image resolution has become better. This development has been driven by the changing role of ultrasound which is now indispensable and rapidly turning into the clinician's "new stethoscope". Consequently, portable ultrasound systems that can be used bedside and in acute care settings, in the emergency room or in intensive care are in high demand. Ergonomics play an important role in these portable scanners and the Viamo, Toshiba's most recent offering, passes the test with flying colours. The size of a laptop computer, it comes perched on an easily manoeuvrable stand but can also be hand-carried. The stand however is useful as there is rarely ample bedside working space to "park" a laptop. In addition the stand facilitates securing the machine, preventing it from being slipped into a bag and stolen.

The screen clearly is the Viamo's "pièce de résistance"; the manufacturer has revolutionised ultrasound scanners and provided us with an impressive touch-screen panel. This not only simplifies the keyboard but makes this laptop extremely user-friendly. Gone are the times of struggling to find the right key that controls the particular panel on the screen. Now it is "touch and go" (Fig. 1). Moreover, the screen can be rotated 270 degrees, further enhancing the already excellent ergonomics of the scanner.

Image quality however is a crucial consideration for sono-users and Toshiba has to be commended for not compromising on its benchmark grey-scale image quality. The initial version of the Viamo is not yet equipped with all the image quality enhancements the Aplio XG offers, nevertheless resolution and image quality are amazingly good and provide

ample diagnostic capabilities. In the following two case studies, the Viamo was compared to its "big-brother", the Aplio XG, Toshiba's flagship scanner. The grey-scale image quality of the two systems was compared directly using similar settings on both systems. The Doppler capability of the Viamo was also assessed and compared with the Aplio XG. A new feature of the Viamo is directional power Doppler illustrated below.

Case 1: A 38-year-old male patient with known primary sclerosing cholangitis and previous biliary stenosis was becoming increasingly jaundiced with associated severe right upper quadrant (RUQ) pain. An emergency ultrasound scan was requested prior to an ERCP in order to provide the endoscopist with as much information as possible. Ultrasound assessment showed dilated intra- and extrahepatic ducts (Fig. 2) with

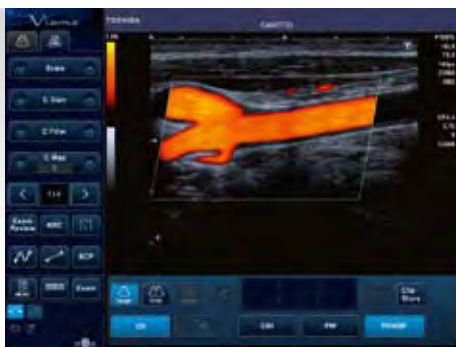


Fig. 1: The "state-of-the-art" touch screen panel which makes the Viamo very user-friendly.



Fig. 2: The left hand image of the Viamo is comparable to that of the Aplio XG (right) where the dilated left lobe intrahepatic ducts are well demonstrated with the "double barrel shotgun" sign (arrows). Note the quality of both images although compounding and differential harmonics were turned off on the Aplio XG for comparison.

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a probable stenosis in the distal common bile duct (CBD). In addition, sonography showed the presence of a small stone in a distended gallbladder as well as moderate wall thickening consistent with cholecystitis which was one likely cause for the RUQ pain (Fig. 3).

Fig. 4 demonstrates Viamo's good Doppler sensitivity which is comparable to that of the Aplio XG and offers the added feature of directional power Doppler. There is very little blooming and the dilated biliary tree can be clearly distinguished from the adjacent vasculature.

The CBD stricture was confirmed at ERCP and stented. An immediate post-procedure ultrasound

confirmed the position and presence of the stent within the CBD (Fig. 5).

Case 2: A 65-year-old woman presented with severe upper abdominal pain and a history of recent travel. She was pyrexial with raised inflammatory markers. An emergency portable ultrasound scan was requested which revealed a large semicyclic mass in segments VII and VIII measuring over 10 cm (Fig. 6). There was increased peripheral vascular flow and indications of a liver abscess. Grey-scale image quality of the Viamo nearly matched the Aplio XG's, and the abscess could have been easily drained using the Viamo to guide the needle puncture. An amoebic abscess was confirmed and the patient fully recovered.

Fig. 7 demonstrates the versatility of the Viamo in a biopsy of a chest wall mass; the entire needle is seen clearly. The compact nature and manoeuvrability of the Viamo allows for interventional procedures to be performed in areas where direct access can be limited. These features, combined with the good image quality, are an advantage particularly in the emergency room or in intensive care.

The Viamo offers complete probe compatibility with all the other scanners in the Toshiba high-end range. High-resolution imaging with the 14 MHz linear probe is very good as illustrated in fig. 8 where the finer details of the left lobe of the thyroid gland and adjacent carotid artery can be seen.



Fig. 3: The good image quality clearly demonstrates a gallstone within a moderately thick walled gallbladder.

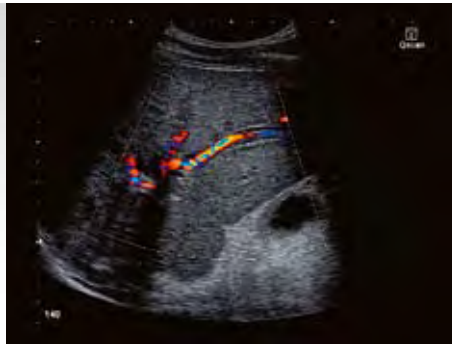


Fig. 4: Colour Doppler sensitivity of the Viamo (left) is nearly as good as the Aplio XG (right). There is little artefact and the dilated intrahepatic ducts are clearly visualized.

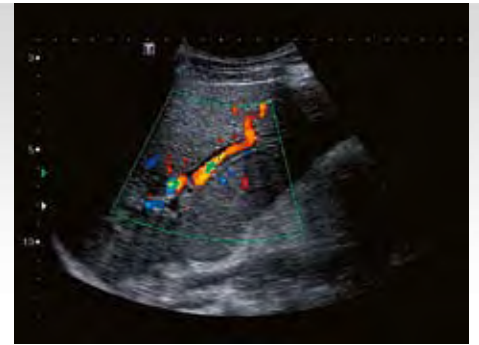


Fig. 5: The stent within the common bile duct post-ERCP as described in case 1 is clearly depicted by the Viamo (left) with the image being of a comparable quality to that shown by the Aplio XG (right).



Fig. 6: The large abscess (arrows) in segments VII and VIII as described in case 2 shows cystic and solid elements of this lesion.

Doppler sensitivity was surprisingly good and again comparable to the Aplio XG. The intimal layer and wall of the carotid artery can be clearly visualised and the power Doppler is a clean image with little artefact (Fig. 9). The high image quality facilitated the accurate diagnosis of a small thrombus on the wall of the popliteal vein in a patient at risk for deep venous thrombosis and mild calf swelling (Fig. 10).

Overall, the Viamo is a well designed portable scanner, with the touch screen panel being a revolutionary feature. Grey-scale imaging and Doppler sensitivity are also extremely good and nearly equivalent to the high-end scanners

in the Toshiba product family. This first release does not yet offer compound imaging or the option of contrast enhanced ultrasound studies. Once these features are available the Viamo will undoubtedly be a leader in its class.



Fig. 7: The whole length of the trucut needle is easily visualised through this chest wall mass. Note the underlying consolidated lung.



Fig. 8: The fine high-resolution image quality of the Viamo of a left lobe thyroid gland and adjacent carotid artery.



Fig. 9: This image of the carotid bulb and arteries illustrates the high-quality Doppler capability of the Viamo.

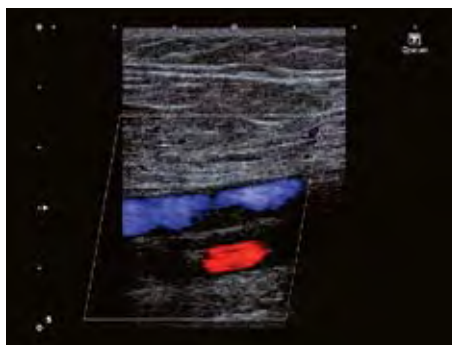


Fig. 10: The image shows a thrombus within the popliteal vein which is partially occluded in a patient with leg swelling.

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