

Ultrasound Evaluation of Esophageal Varices

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To prospectively evaluate the clinical usefulness of transabdominal ultrasound in the detection of esophageal varices. Trans abdominal ultrasound was performed in 50 known patients of cirrhosis or idiopathic portal hypertension. The intraabdominal esophagus was demonstrated satisfactorily. Ultrasound evaluation of esophagus was also done in 50 patients who presented with problems not related to hepatic portal system. The thickness of the anterior wall of the intraabdominal esophagus was measured and the irregularity of the wall surface also noted. The mean thickness of the esophageal wall was $5.7\text{mm} \pm 1.7$ (standard deviation) in patients with portal hypertension and $3.6\text{mm} \pm 0.96$ in the control group. The difference was statistically significant ($P < .001$) there was also irregularity of the wall surface in patients of portal hypertension. Transabdominal ultrasound can play a role in screening for esophageal varices. The intraabdominal esophagus should be observed during standard abdominal ultrasound in patients with chronic liver disease.

Key Words: Ultrasound, esophagus, varices, portal hypertension.

The ability to depict the intraabdominal esophagus with transabdominal ultrasound has been previously recognized. Esophageal varices caused by portal hypertension are usually more prominent at the distal portion of the esophagus. This region is expected to be satisfactorily examined with transabdominal ultrasound. Although some authors reported the demonstration of gastroesophageal varices as tortuous anechoic structures around the gastroesophageal junction at transabdominal ultrasound, these veins do not present the varices within the esophageal wall that cause bleeding. We tried to specify the imaging characteristics of the esophagus caused by the existence of varices. We performed this study to evaluate the clinical usefulness of transabdominal ultrasound in the detection of esophageal varices within the wall.

Material and methods

Fifty patients with liver cirrhosis or idiopathic portal hypertension and fifty patients (control group) who presented with problems not related to hepatic or portal system were included in this study. The transabdominal esophagus in all patients was demonstrated satisfactorily with transabdominal ultrasound. The intraabdominal esophagus was identified as a curving tubular structure with inner hyperechoic and outer hypoechoic layers. The outer hypoechoic layer represents the muscular layers of the anterior and posterior walls of the esophagus, and the inner hyperechoic layer represents the mucosal layer and gas. The thickness of the wall was defined as the thickness of anterior hypoechoic layer, because the thickness of the posterior wall was not always demonstrated clearly owing to interference of the echo transmission by gas within the lumen. The thickness of the wall was compared with the wall thickness in the control group. Additional assessments of the esophagus also were made to evaluate any irregularity of the wall surface.

We used Toshiba (38-B) Japan scanner with a convex array transducer of 3.5 MHz frequency. Statistical analysis of difference in the findings was done.

Results

In the patients of cirrhosis or idiopathic portal hypertension, the thickness of the wall was 3.0-11.0mm (mean \pm standard deviation 5.7 ± 1.7). In the control group the thickness of the wall was 2.0-6.0mm (mean $3.6\text{mm} \pm 0.96$). This difference was statistically significant ($P < .001$).

Discussion

Esophageal varices develop most commonly in patients of liver cirrhosis and portal hypertension. Of these patients 30-70% develop esophageal varices. Bleeding from ruptured varices is a very serious complication, with a reported mortality rate of 20-50%. Therefore early detection of esophageal varices is important. Most frequently, the diagnosis of varices is established with endoscopy. Significant complications occur in about 0.1% of examinations with mortality rate approximately 0.03%.^{1,2} Endoscopy offers an advantage to patients who will undergo subsequent sclerotherapy. However endoscopic examination is an invasive and expensive procedure for screening esophageal varices in all patients with chronic liver disease, another drawback of endoscopy is that only inner surface of the esophageal wall can be evaluated. Varices identified at endoscopy are in only the superficial portions of the intrinsic veins. Varices can also be diagnosed on barium esophagogram and CT scan. Barium esophagogram detects about 80% of endoscopically proved varices. A similar rate has been reported for CT.⁽³⁾ Various barium techniques to optimize demonstration of varices have been used. These include various respiratory maneuvers, pharmacological aids and

the alike^{4,5}. Endoscopic ultrasound demonstrates not only superficial veins but also the perforating and extrinsic veins that cannot be detected at endoscopic examination. Transabdominal ultrasound also has the ability to demonstrate deep veins. The transabdominal ultrasound finding of an irregular esophageal wall surface is thought to represent the protrusion of intrinsic or extrinsic varices. The finding of irregularity and thickening of the wall is not believed to be a specific finding for esophageal varices and may also be seen in cases of esophageal carcinoma or esophagitis⁶. Esophageal cancer may produce a more focal lesion, whereas varices demonstrate a more diffuse thickening of the wall.

The esophageal wall thickness in patients with liver cirrhosis and without varices on endoscopy proved to be statistically significantly greater than control group in a study⁷. We suspect that these patients have small or deep varices that have not reached the inner surface of the wall. It is concluded that patients of portal hypertension undergo repeated ultrasound examinations and intraabdominal

esophagus should be observed during this. This can help us in selecting patients for endoscopy.

References

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