Endoscopic ultrasound-guided portal pressure gradient measurement: improving safety and overcoming technical difficulties

The hepatic venous pressure gradient obtained by interventional radiology is the current gold-standard, indirect method for quantifying the degree of portal hypertension [1]. Direct measurement of the portal pressure gradient (PPG) under endoscopic ultrasound (EUS) guidance using 25-gauge [2, 3] and 22-gauge needles has been reported [4].

We here report on EUS-guided PPG in 21 patients, with successful assessment in 19 (90%) of these patients, using a dedicated 25-gauge needle (EchoTip Insight; Cook, Limerick, Ireland). Mean procedure time was 24 ± 12 minutes. In 4 patients anticoagulants were withdrawn before the procedure. One patient had transient epigastric pain 3 days after the procedure, which had been combined with bilobar liver biopsy; hospital admission was not required. No other adverse events were registered either immediately or 1 month later.

Technical difficulties encountered are demonstrated in ▶Video 1. In 2 cases (10%), EUS-guided measurement of PPG failed because of exacerbated breathing movements and to unreliability of the pressure measurements, probably due to excessive bending of the echoendoscope and needle (▶Fig. 1) and to use of the elevator and the up-and-down wheel. Thinner 25-gauge needles offer more flexibility and penetration ability than 22-gauge needles [5]. Occasionally, when puncturing the portal vein, even with a dedicated 25-gauge needle, the liver parenchyma is pushed away and the ultrasonographic window is momentarily lost. In such a case, the needle could puncture the hepatic artery. In 1 patient the 25-gauge needle passed close to the hepatic artery (▶Fig. 2). We experienced difficulty in puncturing the wall of the hepatic vein in 1 case and the portal vein in 2 cases, having to traverse these vessels (▶Fig. 3, ▶Fig. 4) and retrieve the needle.

▶Table 1 shows the theoretical advantages of 25-gauge needles over 22-gauge needles in EUS-guided PPG measurement. To obtain reliable readings, forcing the elevator and the up-and-down wheel of the echoendoscope should be avoided. In reporting our experience here, our aim is to help make the procedure of EUS-guided PPG measurement as safe and accurate as possible.

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Competing interests

Rafael Romero-Castro has received speaker’s fees from Cook Medical since May 31, 2023. The remaining authors declare that they have no conflict of interest.

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References

Table 1  Possible pros and cons of dedicated 25-gauge needles vs. 22-gauge needles in endoscopic ultrasound-guided portal pressure gradient measurement

<table>
<thead>
<tr>
<th>25-Gauge needles</th>
<th>22-Gauge needles</th>
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<tr>
<td>More flexibility and penetration ability</td>
<td>Less flexibility and penetration ability</td>
</tr>
<tr>
<td>Lower probability of adverse events</td>
<td>Higher probability of adverse events</td>
</tr>
<tr>
<td>Puncture of vessels easier</td>
<td>Puncture of vessels more cumbersome</td>
</tr>
<tr>
<td>Pressure measurement in narrow vessels</td>
<td>Pressure measurement in narrow vessels</td>
</tr>
<tr>
<td>more reliable</td>
<td>less reliable with the needle in contact</td>
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<td>with the wall</td>
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Bibliography

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