Application of Interventional Contrast Enhanced Harmonic Endoscopic Ultrasonography for liver lesions- a Single Community Hospital Experience

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Background
Ultrasound contrast agent is used in the clinic practice for a period of time. Sonazoid® is a second-generation ultrasound contrast agent that has excellent stability and resistance to ultrasound destruction and can stably exert a good contrast effect for a prolonged period. Contrast enhanced harmonic endoscopic ultrasonography (CEH-EUS) is useful for the evaluation of liver disease because it permits the observation of the hemodynamics of masses in real time and the subsequent interventional purpose.

Aims
To investigate the safety and effectiveness of CEH-EUS for histological differentiation of liver tumors and the subsequent appropriate treatment.

Method
A total of 20 consecutive patients are enrolled from 2019-07-01 to 2021-06-30. CEH-EUS was performed for these patients having hepatic lesions. The used echoendoscope is the linear array puncture scope UCT-260, product of Olympus Co., Tokyo, Japan. Sonazoid agent is given according to the patient’s body weight with dosage of 0.015 ml/kg. Contrast enhanced character was classified into two phases, the vascular phase and perfusion phase. The former includes two enhancement patterns (hypo- or iso-enhancement & hyper-enhancement) and the latter is divided into two patterns, homogeneous and heterogeneous. Correlation between vascular patterns and histo-pathology of biopsy or clinical course was ascertained.

Table 1. CEH/EUS pattern of liver lesions

<table>
<thead>
<tr>
<th></th>
<th>Hypo to iso-enhancement</th>
<th>Hyper-enhancement</th>
<th>Homogeneous</th>
<th>Heterogeneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCC (7)</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Metastatic benignity (4)</td>
<td>0</td>
<td>4 (ring enhancement)</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Hepatic dysplastic nodule (1)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<tr>
<td>Liver abscess (4)</td>
<td>4</td>
<td>0</td>
<td>0</td>
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Results
The final diagnoses of 20 examined tumors/lesions were hepatocellular carcinoma (HCC) (n = 7), hepatic dysplastic nodule (n =1), lung cancer with liver metastasis (n = 2), pancreatic cancer with liver metastasis (n = 2), ethanol injection at left lobe and caudate lobe of HCC (n = 4) and aspiration of left lobe/caudate lobe abscess (n = 4). In early phase images, all malignancies reveal early enhancement. In late-phase images, 7 of 8 suspected HCCs had the late washout and heterogeneous perfusion pattern; however, the four hepatic metastatic lesions reveal early enhancement and early washout pattern. The liver abscess showed no enhancement at all.

Conclusion
CEH-EUS could be useful for distinguishing PC from other solid pancreatic lesions.