Endoscopic Diagnosis and Treatment of Colorectal Carcinoids

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Abstract

Rectal carcinoid tumors smaller than 10 mm in diameter and located within the submucosal layer have a negligible risk of lymph node involvement and distant metastasis and are suitable for endoscopic treatment. Here the authors have shown an endoscopic ultrasonography for evaluating the size and depth of carcinoid tumors and endoscopic submucosal dissection for en bloc resection. This article is part of an expert video encyclopedia.

Keywords

Endoscopic submucosal dissection; Endoscopic ultrasonography; Endoscopic ultrasound; Rectal carcinoid tumors; Standard endoscopy; Video.

Video Related to this Article

Video available to view or download at doi:10.1016/S2212-0971(13)70143-2

Materials

• Endoscope: GIF-Q260J; Olympus Medical Systems, Tokyo, Japan.
• Catheter probe: 12 MHz through-the-scope endoscopic ultrasonography (EUS) catheter probe, UM2R; Olympus Medical Systems, Tokyo, Japan.
• Electrocautery knife: KD-630L (Flex knife); Olympus Medical Systems, Tokyo, Japan.
• Electrocautery current generator: VIO300D; ERBE, Tuebingen, Germany.
• Hemostatic forceps: SDB2422; Pentax Co., Tokyo, Japan.
• Injection solution: 0.4% Sodium hyaluronate solution (Mucoup); Seikagaku Corp., Tokyo, Japan.

Background and Endoscopic Procedures

The gastrointestinal (GI) tract is the most frequent site for carcinoid tumors. Endoscopically, GI carcinoid tumors have an appearance similar to submucosal tumors because they penetrate the muscularis mucosae and invade the submucosal layer at a very early stage.

The rectum is one of the most common GI sites for carcinoid tumors, and many rectal carcinoid tumors are identified at an early stage. Rectal carcinoid tumors smaller than 10 mm in diameter and located within the submucosal layer have a very low incidence of lymph node and distant metastasis, and are therefore an adequate target for endoscopic treatment. Although an accurate diagnosis of tumor size and invasion depth is important before the treatment, it is impossible to precisely determine both the size and the depth of the tumor with conventional endoscopy. Recently, EUS has been reported to be useful for evaluating the size and depth of carcinoid tumors and deciding the treatment options.

Polypectomy for rectal carcinoid tumors sometimes results in margin involvement that requires further treatment because most of the tumors are located within the submucosal layer. Recently, endoscopic submucosal dissection (ESD) has been developed for en bloc resection of mucosal tumors of the GI tract and applied to colorectal tumors, as well as early gastric cancer. Because ESD allows en bloc resection of mucosa and submucosa, the tumors can be resected en bloc with negative vertical and horizontal margins. In addition, undamaged resected specimens are obtained using ESD and accurate assessment of the resected specimens can be performed pathologically.

Key Learning Points/Tips and Tricks

• Rectal carcinoid tumors appear as low echoic masses on EUS.
• If the hyperechoic layer corresponding to the submucosal layer is narrowed on EUS but not completely disrupted, the tumor is judged to invade the submucosal layer but not the muscularis propria, and is considered to be adequate for endoscopic therapy.
• Sodium hyaluronate solution should be used as an injection solution to obtain the lasting bulging area in the submucosal layer and prevent perforation during ESD.
• Blind submucosal dissection should not be performed to obviate perforation.

Complications and Risk Factors

Perforation, which may incur peritonitis or abscess formation, is a severe complication of colorectal ESD. Carbon dioxide

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insufflation may be better than air insufflation for reducing the risk of serious complications.

**Alternatives**

Endoscopic mucosal resection (EMR) is also a less invasive treatment for rectal carcinoid tumors. However, the tumors are sometimes damaged using EMR and complete resection rate is not sufficient for carcinoid tumors in the upper portion of the rectum.

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**Scripted Voiceover**

<table>
<thead>
<tr>
<th>Time (min:sec)</th>
<th>Voiceover text</th>
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<tbody>
<tr>
<td>0:00-0:43</td>
<td>Here we see the case of a 65-year-old male, who was referred with a rectal carcinoid tumor. First, we have to determine the size and infiltration depth of the tumor. To this end we perform endosonography with a 12 MHz through-the-scope EUS catheter probe after filling the rectum with water. On EUS, the tumor is visualized as a low echoic mass with a high echoic spot. As you can see, the submucosa, corresponding to the hyperechoic layer, is narrowed but not completely disrupted. The size of the tumor is about 5 times 4 mm in diameter. Therefore, this tumor is a good candidate for endoscopic resection.</td>
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<td>0:44-1:37</td>
<td>Here we see the macroscopic appearance of the carcinoid tumor: it is a yellowish submucosal tumor, with only a portion projecting above the plane of the mucosal surface. Marking dots for the incision are placed outside the tumor with a flex knife.</td>
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<td>1:38-2:40</td>
<td>A small-caliber-tip transparent hood is fitted onto the tip of the endoscope and we proceed with lifting of the lesion. For submucosal injection we use a sodium hyaluronate solution containing some blue dye. After sufficient injection, mucosal incision is made with the flex knife set to about 2 mm in length. For this procedure, the electrosurgical generator output is set at duration 2 and interval 3 of endocut I, effect 1.</td>
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<tr>
<td>2:41-3:31</td>
<td>Now we can start submucosal dissection with the electrosurgical generator output set at 20W in swift coagulation mode. During ESD in the rectum the flex knife is set to about 1 mm in length. The small-caliber-tip transparent hood attached to the endoscope tip is inserted into the thickened submucosal layer to maintain a satisfactory view. A water-jet system is also useful for obtaining the clear endoscopic view. Remember: always avoid blind submucosal dissection to minimize the risk of perforation.</td>
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<td>3:32-4:08</td>
<td>After completing the mucosal incision of the whole circumference, we repeatedly perform submucosal injection with sodium hyaluronate solution to optimize lifting of the lesion. Using small-caliber transparent hood, we can see the submucosal layer directly and we can safely move the knife in any direction.</td>
</tr>
<tr>
<td>4:09-4:38</td>
<td>Here we can see the vertical margin of the carcinoid tumor, which is seen as a yellowish small mass. We don’t have to cut the submucosal layer with force. All we have to do is to gently touch the submucosal layer with the knife because the submucosal layer is always stretched by the transparent hood.</td>
</tr>
<tr>
<td>4:39-5:26</td>
<td>Now the tumor is completely resected with a total procedural time of 25 min. In the next step we perform closure of the post-ESD wound ground with the so-called zipper. During the closure procedure the transparent cap is useful in narrowing the space between the margins by applying some tension at the margins that were already adapted with clips. This trick facilitates subsequent hemoclip placement for complete closure of the lesion.</td>
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<td>5:27-5:34</td>
<td>Histological work-up of the resection specimen showed the carcinoid tumor with negative lateral and vertical margins.</td>
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**References**