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The Morphologic Assessment of Rectal Neuroendocrine Tumors ☆☆

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Abstract

Background and aims: The histopathologic features of rectal neuroendocrine tumors (NETs), including size, lymphovascular invasion, invasion of proper muscle, and mitotic rate, have a limited role to play in determining a treatment plan preoperatively. We aimed to investigate the morphologic parameters associated with metastasis, and to evaluate their predictive value.

Methods: Between January 2000 and May 2011, the medical records and endoscopic findings of 468 patients presenting with rectal NETs at the Samsung Medical Center were analyzed retrospectively. All tumors were classified according to size and endoscopic features such as color, shape, contour, and surface change.

Results: Twenty-one of the 468 patients (4.5%) with rectal NETs had lymph node (LN) metastasis and 11 patients (2.4%) had distant metastasis. Risk factors for metastasis included tumor size ($\geq$10 mm in diameter), hyperemic change, polypoid lesions, irregular contours, and surface ulceration (p=0.000). Independent risk factors that were predictive of metastasis on multivariate analysis included tumor size ($\geq$10 mm in diameter), hyperemic change, and surface ulceration. As the number of independent risk factors for metastasis increased, the risk of metastasis rose.

Conclusions: Endoscopic features such as hyperemic change, polypoid lesions, irregular contours, and surface ulcers with tumor size $\geq$10 mm in diameter are associated with metastasis in rectal NETs. In particular, atypical endoscopic features including hyperemic

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change, and surface ulcer with tumor size ≥ 10 mm in diameter may help to predict the risk of metastasis of rectal NETs.

Video related to this article

Video related to this article can be found online at 10.1016/j.vjgien.2013.03.001.

1. Background

- Rectal neuroendocrine tumors (NETs) comprise 12.6% of all NETs [1]. A recent epidemiologic study showed that the incidence of rectal NETs has increased about tenfold over the last 35 years, and nowadays 50% or more rectal NETs are diagnosed as “incidentally” identified lesions due to the rapid development of screening sigmoidoscopy and colonoscopy [2,3].
- While the prognosis of patients with metastatic rectal NETs is no better than that of patients with metastatic rectal adenocarcinoma, rectal NETs without metastasis generally have an excellent five-year survival rate of 98.9–100% [3–5]. Small rectal NETs without infiltration to the proper muscle layer or lymph node (LN) metastasis can be treated effectively and safely through endoscopic resection. Hence, when deciding on the management of rectal NETs, the disease stage should be taken into consideration [3].
- Previous studies have reported several parameters that can be used to predict the metastatic spread of rectal NETs, including tumor size, histologic differentiation, muscular invasion, and lymphovascular invasion [6–9]. However, these parameters cannot play a role in determining strategies for treating rectal NETs preoperatively.
- Tumor size has long been regarded as a reliable and easily obtained parameter [3,9]. However, several studies have reported that rectal NETs smaller than 10 mm have metastasis ranging from 1.7% to 9.7%, illustrating that the risk of metastasis is not governed by primary tumor size alone [5,7,10–12].

2. Aims of the study

- To investigate the morphologic parameters associated with metastasis in patients with rectal NETs.
- To assess the risk of metastasis according to the morphologic parameters that assist in determining treatment plans for rectal NETs preoperatively.

3. Study design

- Between January 2000 and May 2011, the medical records and endoscopic findings of 468 patients presenting with rectal NETs at Samsung Medical Center were analyzed retrospectively. Specific data extracted from the medical records included patients' age and sex, tumor size, tumor site, method of resection, and the presence of LN or distant metastasis.
- Diagnosis of NETs was confirmed by pathology. Tumor size was measured using open biopsy forceps (8 mm in width, FB-24Q-1; Olympus, Tokyo, Japan) during endoscopy. LN or distant metastasis was diagnosed based on the results of a biopsy or surgical resection, or radiologic findings consistent with metastasis.
- All endoscopic features were reviewed by the authors using photographs of each tumor. All tumors were classified according to size and endoscopic features such as color, shape, contour, and surface change.

4. Materials

- Colonoscope: CF-Q260AI, Olympus Corporation, Tokyo, Japan.
- Single band ligator: Stiegmann-goff Clearvue Endoscopic Ligator, ConMed, New York, USA.
- Knives.
  - Needle knife: KD-10Q-1, Olympus Corporation, Tokyo, Japan.
  - Hook knife: KD-620LR, Olympus Corporation, Tokyo, Japan.
  - Flex knife: KD-630L, Olympus Corporation, Tokyo, Japan
- Electrosurgical unit: ERBE VIO 300 D, ERBE Elektromedizin GmbH, Tubingen, Germany.

5. Endoscopic procedure

- A total of 369 patients were treated with endoscopic resection (ER) including conventional endoscopic