

Transrectal Ultrasonography of a Small Rectal Carcinoid Tumor with Lymph Node Metastasis: A Case Report

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A 27-year-old woman with a small rectal carcinoid tumor was examined by transrectal ultrasonography (TRUS) for preoperative staging. TRUS revealed regional lymph node involvement, in addition to a 10-mm hypoechoic tumor invading into, but not through, the submucosa. The lymph node involvement was confirmed preoperatively by TRUS-guided needle biopsy. Although the digital examination findings indicated local excision was appropriate, in accordance with TRUS and TRUS-guided biopsy findings, the patient underwent radical surgery. The TRUS findings of lymph node involvement and depth of invasion were confirmed histologically. The patient is alive and disease-free 35 months postoperatively. These observations suggest that TRUS reveals the regional lymph node involvement and the depth of invasion of rectal carcinoid tumors accurately and, therefore, helps in selecting appropriate treatment.

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Key words: Carcinoid—Rectal neoplasms—Ultrasonography

Introduction

When managing patients with rectal carcinoid tumors, accurate preoperative evaluation of lymph node involvement is essential to select the appropriate surgical treatment, such as endoscopic resection, local excision or radical surgery. Tumor size has been reported to be a good marker of rectal carcinoid tumor metastasis and the reported incidence of such metastases with diameters of <1, 1 to 2 and >2 cm are 2-3, 10-11 and 74-82%, respectively.^{1,2} Therefore, although tumor size correlates to some extent with the metastatic incidence of these tumors, accurate prediction of metastasis in individual cases is difficult, especially when the tumor diameter is 1 cm or larger. Meanwhile, recent advances in transrectal ultrasonography (TRUS) have made accurate preoperative staging of rectal cancer possible.^{3,4}

We report a case of small rectal carcinoid tumor with regional lymph node involvement, which was diagnosed correctly by TRUS. The diagnosis was confirmed by TRUS-guided needle biopsy and the patient was treated successfully with radical surgery.

Case Report

A 27-year-old woman presented with a small rectal tumor, which was detected incidentally during a barium enema study in another hospital during a workup for constipation. The barium enema study revealed a broad-based polypoid lesion in the lower rectum. Digital examination detected a small spherical tumor, which was firm and freely-mobile, but the perirectal lymph node was not palpable. Sigmoidoscopy showed a yellowish submucosal tumor, 8 cm from the anal verge. These findings were compatible with carcinoid tumor of the rectum and this diagnosis was confirmed by the histological findings of the biopsy specimen.

For preoperative staging, TRUS was performed using an Olympus echoendoscope GF-UM3 with a switchable 7.5- and 12-MHz radial scanning transducer (Olympus, Tokyo). TRUS revealed a 10-mm hypoechoic submucosal tumor and pararectal lymph node involvement (Fig. 1). The tumor was spherical and confined to the submucosa and a part of it was connected to the mucosa with a slight depression. Furthermore, the tumor was firm under balloon pressure. These findings were compatible with pathological findings of small carcinoid tumors of the rectum. A 10-mm hypoechoic spherical pararectal lymph node was detected and, in view of its size and shape, was suspected to be metastatic. In order to confirm lymph node involvement,

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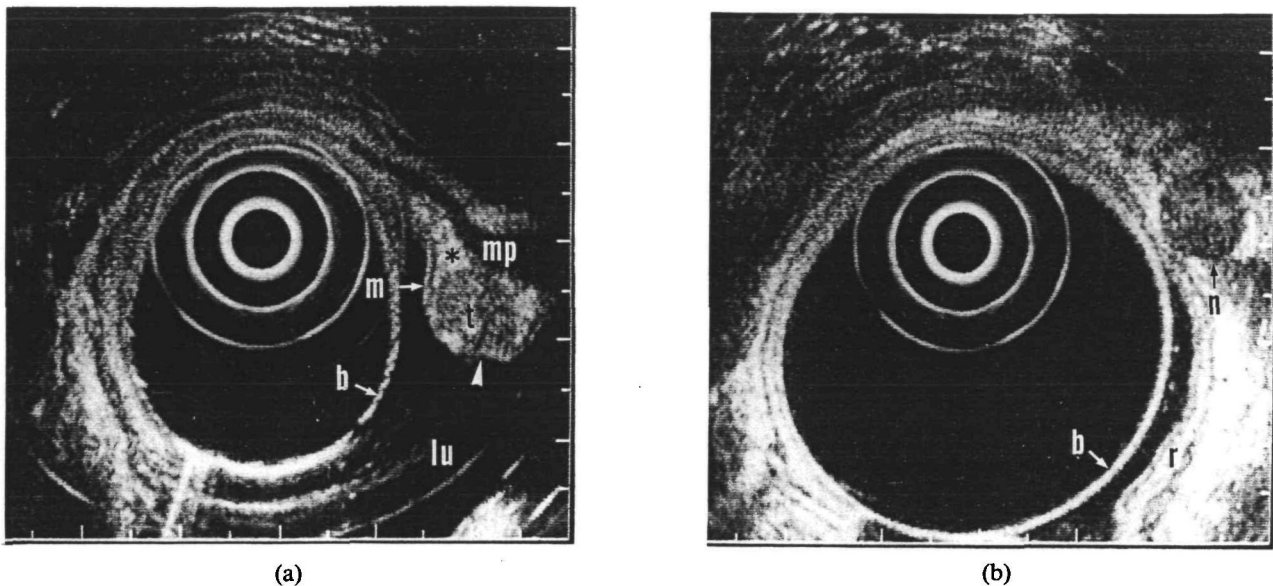


Fig. 1. (a) Transrectal ultrasonography (TRUS) showing a 10-mm hypoechoic spherical tumor (t) covered by the mucosa (m) and invading into, but not through, the submucosa (*). Part of the tumor is connected to the mucosa with slight depression (arrowhead). (b) TRUS of another section showing an involved pararectal lymph node (n). 1u, water-filled rectal lumen; b, water-filled balloon; mp, muscularis propria; r, normal rectal wall.

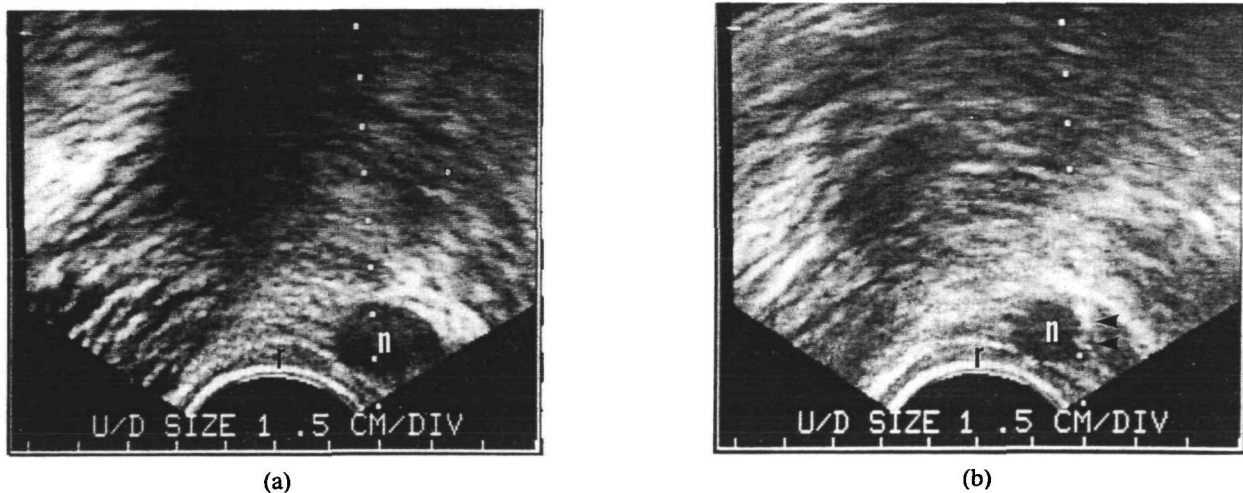


Fig. 2. TRUS-guided needle biopsy. (a) The dotted line represents the planned needle tract. (b) The hyperechoic needle (arrowheads) during puncture can be seen. n, lymph node; r, rectal wall.

TRUS-guided needle biopsy was preformed using a transducer Type 8551 (7 MHz) and Real-Time Endosonic Scanning System Type 1846 (Brüel and Kjaer, Naerum, Denmark) and an 18-gauge Biopsy-Cut needle (C.R. Bard, Covington, GA) (Fig. 2). No complications associated with this procedure occurred and histological examination of the biopsy specimen revealed a carcinoid tumor (Fig. 3).

Consequently, although the digital examination findings indicated local excision was suitable, in ac-

cordance with the TRUS and TRUS-guided biopsy findings, the patient underwent low anterior resection with pararectal lymph node dissection. No hematogenous metastasis to the liver or any other organs was observed intraoperatively. Lymph node involvement was confined to the pararectal region and no needle tract seeding or peritoneal dissemination occurred. The postoperative course was uneventful. She is alive and disease-free 35 months postoperatively.

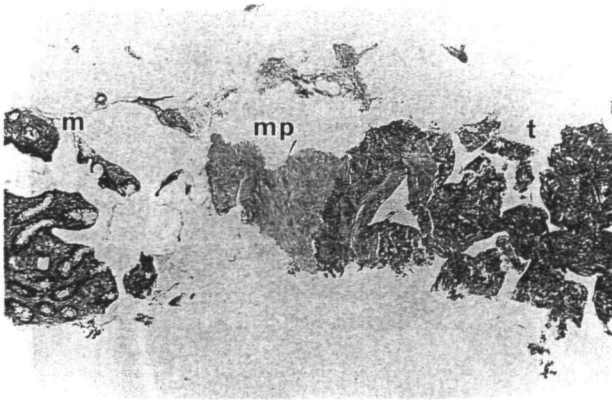


Fig. 3. Needle-biopsy specimen showing a carcinoid tumor outside the rectal wall. m, mucosa; mp, muscularis propria; t, tumor.

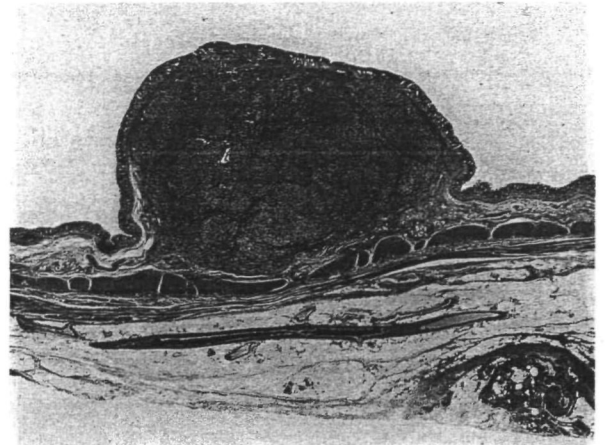
Pathology

Macroscopic examination of the resected specimen showed a 10-mm yellowish submucosal tumor. Microscopic examination revealed a carcinoid tumor composed of multiple nests of tumor cells showing trabecular growth and containing argyrophil-positive/argentaffin-negative granules. The tumor invaded into, but not through, the submucosa (Fig. 4a). Examination of 30 pararectal lymph nodes revealed metastasis in two nodes measuring 10 and 5 mm. The larger node (Fig. 4b) was detected by TRUS, but the smaller one was not. Serial 3-mm slicing of the metastatic node and the surrounding tissues showed that no needle tract seeding of tumor cells had occurred.

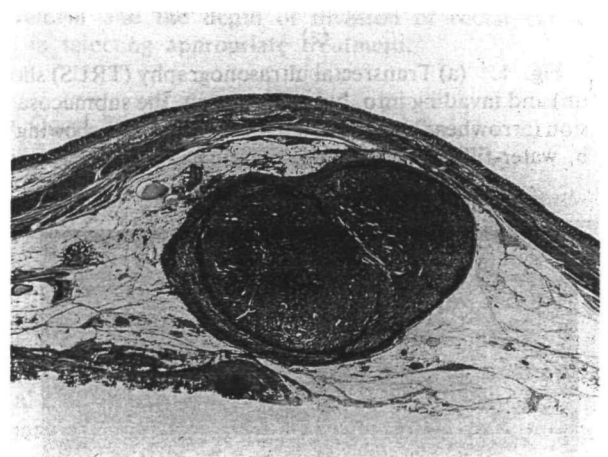
Discussion

Carcinoid tumor of the rectum is comparatively rare and usually less aggressive. Most of such tumors can be cured by endoscopic resection or local excision. However, 15% of the tumors metastasize, which necessitates further treatment.¹⁾ The most common single site of metastasis is the regional lymph node.⁵⁾ Although the effectiveness of radical surgery for tumors with lymph node involvement is controversial,^{6,7)} the standard treatment for such tumors is radical surgery.^{1,8,9)} Therefore, accurate preoperative evaluation of lymph node involvement is necessary for selection of the most appropriate treatment.

The incidence of rectal carcinoid tumor metastasis has been reported to correlate with the tumor size,^{1,2,6-9)} presence of ulceration,⁶⁾ presence of symptoms,^{6,7)} histological invasion of the mus-



(a)



(b)

Fig. 4. (a) Histology of resected specimen showing a 10-mm carcinoid tumor confined to the submucosa. (b) Histology of the involved lymph node detected by TRUS.

cularis propria,^{1,6,8)} growth pattern,¹⁰⁾ mitosis rate¹¹⁾ and DNA ploidy.¹²⁾ Tumors which are less than 1 cm in diameter rarely metastasize, but prediction of metastasis of larger tumors is difficult.^{1,2,9)} Indeed, none of these markers of metastasis predicted lymph node involvement in this particular case. Furthermore, the validity of any of these markers has not yet been confirmed by a prospective study.

Meanwhile, several prospective studies have shown the value of TRUS for preoperative staging of rectal cancer with respect of both tumor invasion and regional lymph node involvement.^{3,4)} The results with our patient suggest that TRUS is also useful for the preoperative evaluation of pararectal

lymph node involvement of rectal carcinoid tumors. Although detection of small involved nodes with diameters of 5 mm or less may be difficult and warrants further investigation, larger involved nodes can be detected easily by TRUS. Moreover, TRUS showed the depth of invasion and tumor size accurately, which are also necessary for selecting the appropriate treatment.

Our results also demonstrate the value of TRUS-guided needle biopsy for histological confirmation of lymph node involvement. However, there is a possible risk of needle tract seeding of tumor cells¹³⁾ and the safest course may be to remove the needle tract completely during surgery when the needle biopsy specimen is positive for cancer.

The TRUS findings of rectal carcinoid tumors are characteristic, as discussed above and described before.^{14, 15)} Since the cross-sections of rectal carcinoid tumors are unique, the corresponding TRUS images are considered to have diagnostic value. Although endoscopy and biopsy are the most reliable methods for diagnosing various tumors arising in the gastrointestinal tract, endoscopic diagnosis of rectal carcinoid tumors is sometimes difficult.^{6, 9)} Furthermore, endoscopic biopsy sometimes fails to reveal such tumors, because most part of the tumor surface is covered by normal mucosa. On such occasions, TRUS helps to make an accurate diagnosis.

In conclusion, our observations suggest that TRUS demonstrates the regional lymph node involvement and depth of invasion of rectal carcinoid tumors accurately, therefore, helps in selecting appropriate treatment.

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References

- 1) Naunheim KS, Zeitels J, Kaplan EL, Sugimoto J, Shen KL, Lee CH, Straus FH II: Rectal carcinoid

- tumors: treatment and prognosis. *Surgery* 94: 670-676, 1983
- 2) Bates HR Jr: Carcinoid tumors of the rectum: a statistical review. *Dis Colon Rectum* 9: 90, 1966
- 3) Tio TL, Coene PP, van Delden OM, Tytgat GN: Colorectal carcinoma: preoperative TNM classification with endosonography. *Radiology* 179: 165-170, 1991
- 4) Rosch T, Classen M: Colorectal carcinoma. In *Gastroenterologic Endosonography*, Elder D, ed, Thieme Medical Publishers, New York. p170-185, 1992
- 5) Bates HR Jr: Carcinoid tumors of the rectum. *Dis Colon Rectum* 5: 270-280, 1962
- 6) Burke M, Shepherd N, Mann CV: Carcinoid tumours of the rectum and anus. *Br J Surg* 74: 358-361, 1987
- 7) Sauven P, Ridge JA, Quan SH, Sigurdson ER: Anorectal carcinoid tumors: is aggressive surgery warranted? *Ann Surg* 211: 67-71, 1990
- 8) Orloff MJ: Carcinoid tumors of the rectum. *Cancer* 28: 175-180, 1971
- 9) Jetmore AB, Ray JE, Gathright JB Jr, McMullen KM, Hicks TC, Timmcke AE: Rectal carcinoids: the most frequent carcinoid tumor. *Dis Colon Rectum* 35: 717-725, 1992
- 10) Johnson LA, Lavin P, Moertel CG, Weiland L, Dayal Y, Doos WG, Geller SA, Cooper HS, Nime F, Masse S, Simson IW, Sumner H, Folsch E, Engstrom P: Carcinoids: the association of histologic growth pattern and survival. *Cancer* 51: 882-889, 1983
- 11) Federspiel BH, Burke AP, Sobin LH, Shekitka KM: Rectal and colonic carcinoids: a clinicopathologic study of 84 cases. *Cancer* 65: 135-140, 1990
- 12) Tsioulis G, Muto T, Kubota Y, Masaki T, Suzuki K, Akasu T, Morioka Y: DNA ploidy pattern in rectal carcinoid tumors. *Dis Colon Rectum* 34: 31-336, 1991
- 13) Pasiaka JL, Thompson NW: Fine-needle aspiration biopsy causing peritoneal seeding of a carcinoid tumor. *Arch Surg* 127: 1248-1251, 1992
- 14) Kawamoto K, Ueyama T, Iwashita I, Utsunomiya T, Honda H, Onitsuka H, Haraguchi Y, Kojima N, Takano H, Masuda K: Colonic submucosal tumors: comparison of endoscopic US and target air-enema CT with barium enema study and colonoscopy. *Radiology* 192: 697-702, 1994
- 15) Matsumoto T, Iida M, Suekane H, Tominaga M, Yao T, Fujishima M: Endoscopic ultrasonography in rectal carcinoid tumors: contribution to selection of therapy. *Gastrointest Endosc* 37: 539-542, 1991

