Case Reports in Gastroenterology

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Case Series

Endoscopic Ultrasound-Guided Fine-Needle Aspiration of Suspected Locoregional Rectal Cancer Localizations: A Valuable Tool

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Keywords
Rectal cancer · Locoregional staging · Endosonography · Fine-needle aspiration

Abstract
Introduction: Organ-preserving treatment for rectal cancer using local excision (LE) and/or chemoradiotherapy (CRT) is increasingly used. Locoregional metastasis precludes LE and locoregional regrowth, recurrence, or persistence after LE or chemoradiation (CRT) may prompt total mesorectal excision (TME). We believe that the time has passed to make such life-changing treatment decisions without pathological confirmation and investigated the use of linear endoscopic ultrasound with fine-needle aspiration (EUS-FNA). ***Case Presentations:*** We report 8 cases of suspected locoregional tumor growth (LRTG) on MRI: adjacent or in the rectal wall, within the mesorectal fascia, high presacral region, and obturator foramen. MRI images were studied thoroughly before and during EUS to identify the target lesion using rectal EUS-FNA. Patients were prepared using an enema. The procedure was performed on an outpatient basis without conscious sedation. FNA was performed using a 25G needle. The patient received a 3-day course of ciprofloxacin after the procedure to prevent infection of the perirectal space. Identification of the target was the most difficult part of EUS but was successful in all cases. FNA revealed adenocarcinoma in 7 cases. Five cases were confirmed by TME results: 1 patient died before the operation, and 1 patient was treated with CRT. One patient with a suspected node in the obturator foramen was free of tumors on FNA. The TME resection specimen contained 31 lymph nodes without metastasis. All procedures were well tolerated, and no complications were observed. ***Conclusion:*** Suspected LRTG on MRI can be confirmed using EUS-FNA. In the era of organ-preserving treatment for rectal cancer, EUS-FNA may play a supportive role when considering TME or CRT.

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Introduction

Organ-preserving treatment for rectal cancer is widespread in the Netherlands and includes local excision and/or chemoradiotherapy (CRT). During the initial oncological staging and/or follow-up, locoregional tumor growth (LRTG) may be suspected on magnetic resonance imaging (MRI), which is the standard of care for initial locoregional rectal cancer staging and follow-up after organ-preserving treatment [1]. The Dutch guidelines on rectal cancer treatment advises total mesorectal excision (TME) when LRTG is present [2], which is an operation with serious morbidity and an average mortality of 1.5% [3]. When LRTG is detected after local excision, CRT is currently offered in a trial setting or in case of explicit patient preference [4]. In addition, CRT is not free of complications, including mortality [5].

Gleeson et al. [6] reported their EUS-FNA experience in the initial staging of rectal cancer in 316 patients: 234 with LRTG within the perirectal fascia, 55 with LRTG outside the perirectal fascia, and 27 at both sides. Half of the patients with extrafascial suspicion of LRTG had adenocarcinoma on FNA.

In addition, EUS-FNA has been used to clarify obscure lesions in the perirectal area, with a reported sensitivity of 91% and specificity of 100% [7, 8]. None of these studies reported any adverse events associated with the procedure. Notwithstanding these data, EUS-FNA is infrequently used to confirm suspected LRTG.

We investigated the feasibility of EUS-FNA for suspected LRTG in 8 cases. The CARE Checklist has been completed by the authors for these case reports and is attached as online supplementary material (for all online suppl. material, see https://doi.org/10.1159/000544767).

Case Reports

General

In all cases, EUS-FNA was performed at the request of a multidisciplinary team in cases of suspected LRTG. EUS-FNA was performed without sedation after preparation with two phosphate enemas using an Olympus GF UCT 180 Curvilinear Array Ultrasound Gastrovideoscope with tissue harmonic imaging-resolution mode with an Olympus ME2 processor (Olympus Nederland B.V., Hoofddorp) [9]. FNA was performed using an EchoTip® Ultra 25-gauge needle (Cook Medical, Limerick, Ireland) for onsite cytological analysis. LRTL were sampled for a maximum of three times. All patients received ciprofloxacin (500 mg bid) for 3 days after the procedure to prevent infection of the perirectal space.

An overview of the results is summarized in Table 1. In general, the procedure was well tolerated, except for 1 patient who experienced slight pain during puncture. No postprocedural infection or bleeding was observed.

Case 1

This 78-year-old lady was treated for obstructing cT4N2 rectal cancer with diverging colostomy and CRT. After 3 months, endoscopy showed only adenomatous remnants and severe stenosis; however, MRI revealed an extraluminal remnant in the mesorectal fat (shown in Fig. 1a). EUS-FNA revealed that the lesion was a lymph node (shown in Fig. 1b). Cytological examination revealed an adenocarcinoma. The patient was treated with a TME. Pathology showed an yPT3N1c adenocarcinoma. At present, 2 years later, the patient is doing well and has had no tumor recurrence.

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Table 1. Summary of cases

	Primary treatment	Months after primary treatment	Localization	Tumor on FNA	Treatment	Final verdict
1	CRT	3	Extraluminal deposit	Yes	TME	ypT3N1c
2	Local	6	Obturator foramen	Yes	CRT	2 years FU negative
3	CRT	3	Presacral	Yes	TME	ypT3N1b
4	CRT	7	Pararectal node	Yes	N/A	Diffuse metastases
5	CRT	12	Extraluminal deposit	Yes	TME	ypT3N1c
6	CRT	9	Pararectal	Yes	TME	ypT2N2
7	Local?	0	Obturator foramen	No	TME	pT2N0
8	Local?	0	Presacral	Yes	CRT	pT1–2N1

CRT, chemoradiation; local, local excision; local?, evaluation of local excision as treatment option; final verdict, pathology of the TME resection specimen or follow-up.

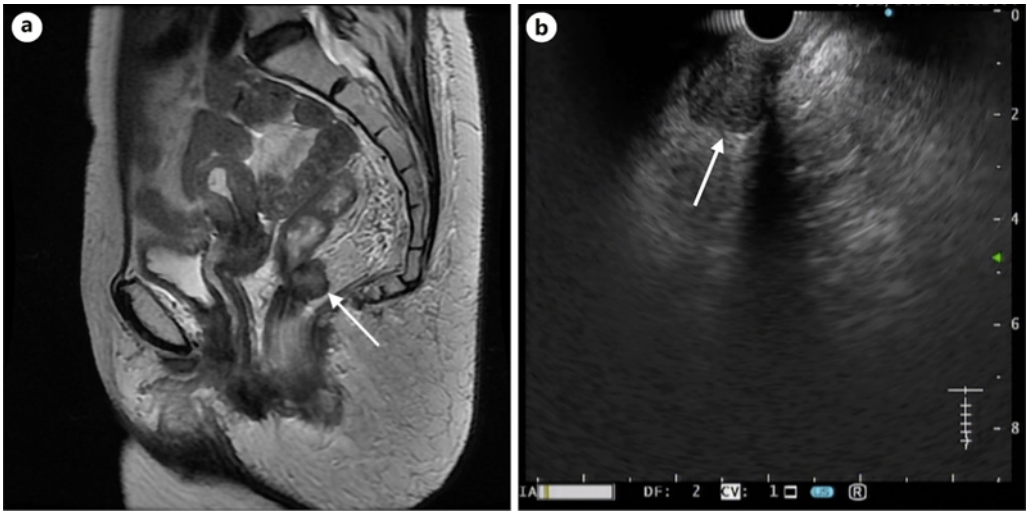

Fig. 1. a, **b** MRI and EUS-FNA images of the remnant perirectal lesion.

Case 2

This male patient of 75 years underwent macroscopically radical endoscopic submucosal resection of a T1 distal rectal mucinous adenocarcinoma. Due to uncertain pathological radicality, an MRI was performed, which showed an 11 mm lymph node without diffusion restriction in the right obturator foramen. During the multidisciplinary discussion, the absence of lymphangioinvasion in the resected specimen was considered a discrepancy, and a reactive lymph node was considered more likely. Endoscopic follow-up and repeat MRI were

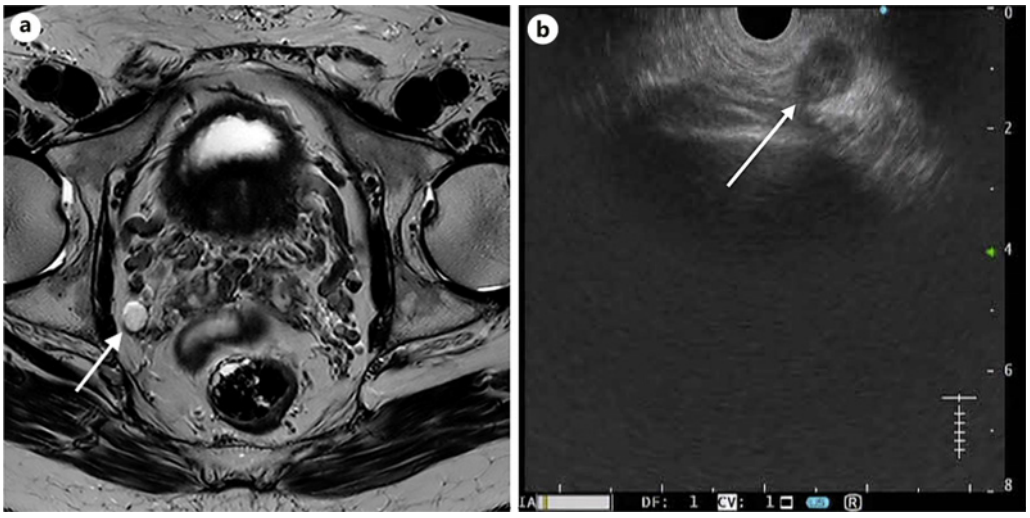

Fig. 2. a, **b** MRI and EUS-FNA images of a suspected lymph node in the right obturator foramen.

performed after 6 months. At that time, endoscopy was unremarkable, and MRI revealed an unchanged lymph node in the right obturator foramen (shown in Fig. 2a) without diffusion restriction. A reactive node was considered less likely, and EUS-FNA was performed.

The lymph node in the right obturator foramen was visualized using EUS (shown in Fig. 2b). FNA revealed an adenocarcinoma, and the patient was treated with CRT.

After 1 year, the lymph nodes remained unchanged on the MRI. EUS-FNA was repeated, but no residual cancer was detected. It was decided to continue the Watch and Wait (W&W) policy, and until now, again 1 year later, and 2 years after CRT, no sign of recurrence has occurred.

Case 3

This 70-year-old man was referred from another hospital after receiving CRT for pT3N1 rectal cancer to evaluate inclusion in the W&W protocol (surveillance). At the time of evaluation, CRT was performed 3 months prior.

A presacral lymph node was observed on MRI (shown in Fig. 3a) and was well visualized on EUS (shown in Fig. 3b). FNA revealed adenocarcinoma. The patient was not included in the W&W protocol and was referred for TME with a colorectal anastomosis. Pathology showed ypT3N1b carcinoma.

Case 4

This 70-year-old man was treated with CRT for cT3N2 rectal cancer followed by regression of the tumor with no endoscopic residual disease. In addition, the lymph nodes regressed, but after 7 months, there was suspicion of growth again in the perirectal fat (shown in Fig. 4a). The nodes were localized on EUS (shown in Fig. 4b) and FNA revealed adenocarcinoma. Although TME with colorectal anastomosis and lateral pelvic node dissection was advised, the patient died of diffuse metastasis prior to the procedure.

Case 5

This 57-year-old man was treated with CRT for cT3N2 rectal cancer with complete response. After 1 year, endoscopy was unremarkable (shown in Fig. 5a); however, LRTG was suspected on MRI (shown in Fig. 5b). LRTG was confirmed using EUS-FNA (shown in Fig. 5c). Cytological examination revealed an adenocarcinoma. The patient underwent TME without an anastomosis. Pathological examination revealed a yPT3N1c tumor.

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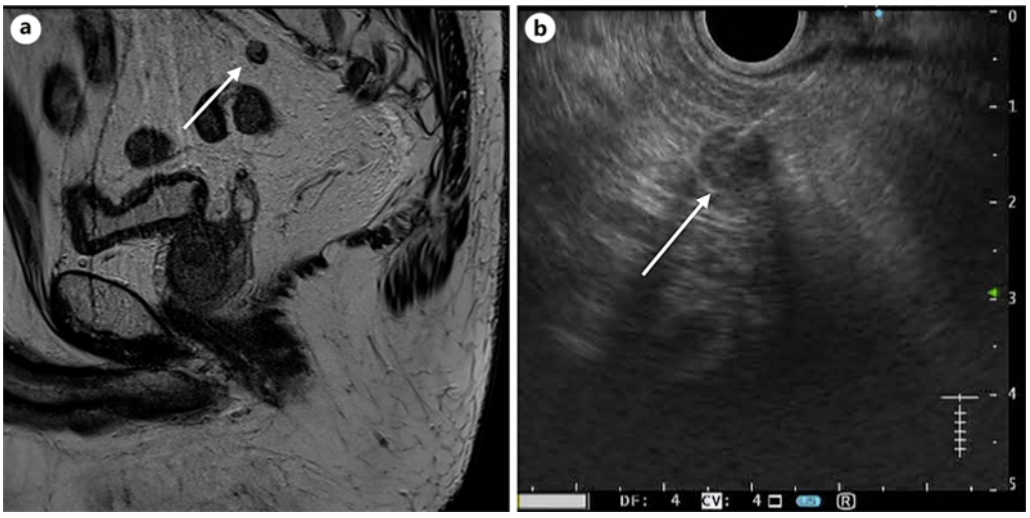

Fig. 3. a, **b** MRI and EUS-FNA images of a suspected presacral lymph node.

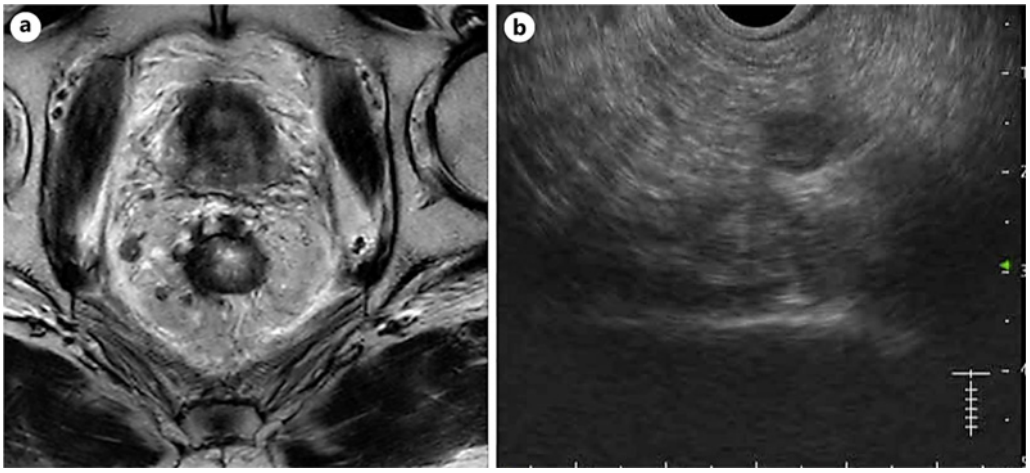

Fig. 4. a, **b** MRI and EUS-FNA images of a suspected lymph node in the perirectal fat.

Case 6

This 59-year-old male was treated with CRT for cT2N2 rectal cancer with complete endoscopic response. However, on MRI, three suspicious lymph nodes, all less than 10 mm in size, persisted after 9 months (Fig. 6a). The node was visualized and punctured on EUS (shown in Fig. 6b). Cytological examination revealed an adenocarcinoma. TME without anastomosis was performed, which revealed a pT2N2 tumor.

Case 7

This 81-year-old man was diagnosed with rectal cancer of the rectosigmoid junction. Oncological staging revealed a cT2N1 status with free perirectal fascia.

However, MRI (shown in Fig. 7a) revealed a 6 mm node in the right obturator foramen, which is an extra-mesorectal location. In case of metastasis, TME is not the proper oncological treatment, and CRT should be chosen instead. After the multidisciplinary discussion, EUS-FNA of this node was performed (shown in Fig. 7b).

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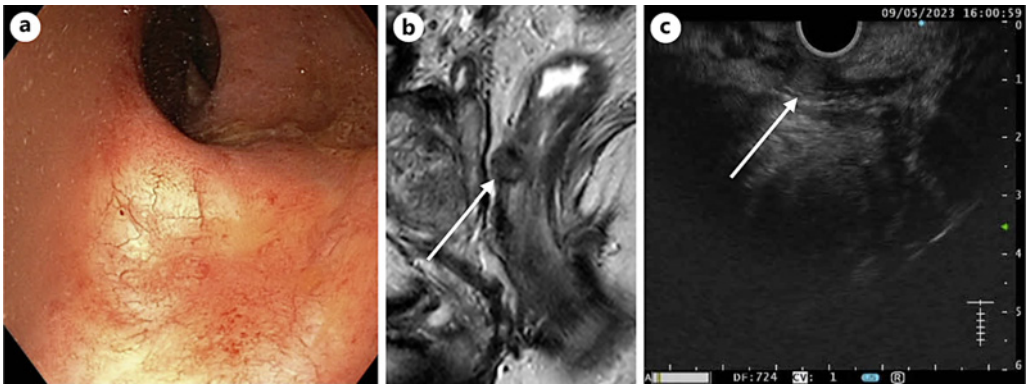

Fig. 5. a, **b**, **c** Endoscopy, MRI, and EUS-FNA images of suspected regrowth in the bowel wall, which is endoscopically not visible.

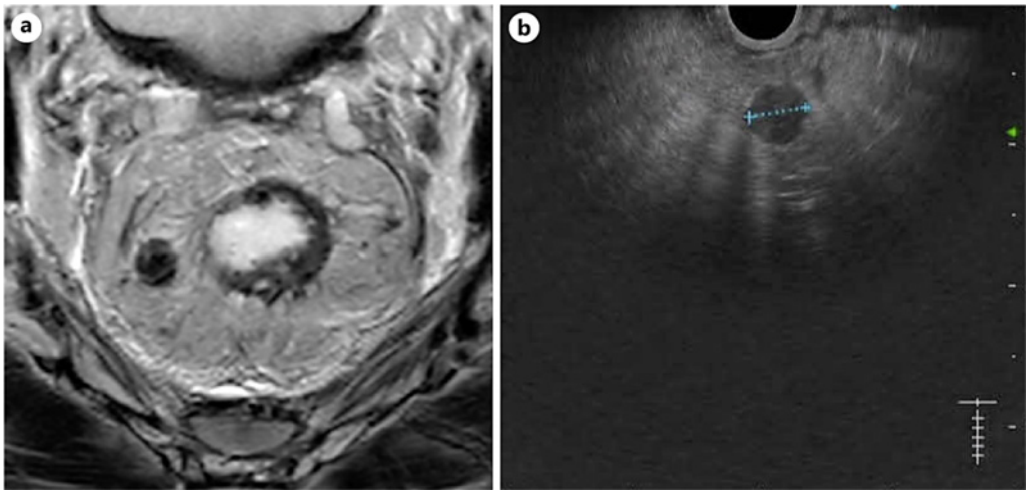

Fig. 6. a, **b** MRI and EUS-FNA images of a suspected lymph node in the perirectal fat.

FNA revealed lymphoid tissue without malignancy. TME with colorectal anastomosis was then performed. Pathological examination of the resected specimen revealed 31 lymph nodes without metastasis (pT2N0).

Case 8

This 66-year-old lady was referred to our hospital with suspected early rectal cancer. However, MRI revealed a suspected node dorsolateral to the rectum (shown in Fig. 8a). The lesion was visualized using EUS (shown in Fig. 8b) and FNA revealed adenocarcinoma. The patient was then treated with CRT.

Discussion

Our cases demonstrate the feasibility of EUS-FNA for suspected LRTG on MRI. This is important because the reliability of MRI is not without its flaws. For instance, while a node with a short-axis diameter ≥ 5 mm is considered suspicious, the positive predictive value of this finding has been reported to be only 46%, implying considerable overstaging [10, 11].

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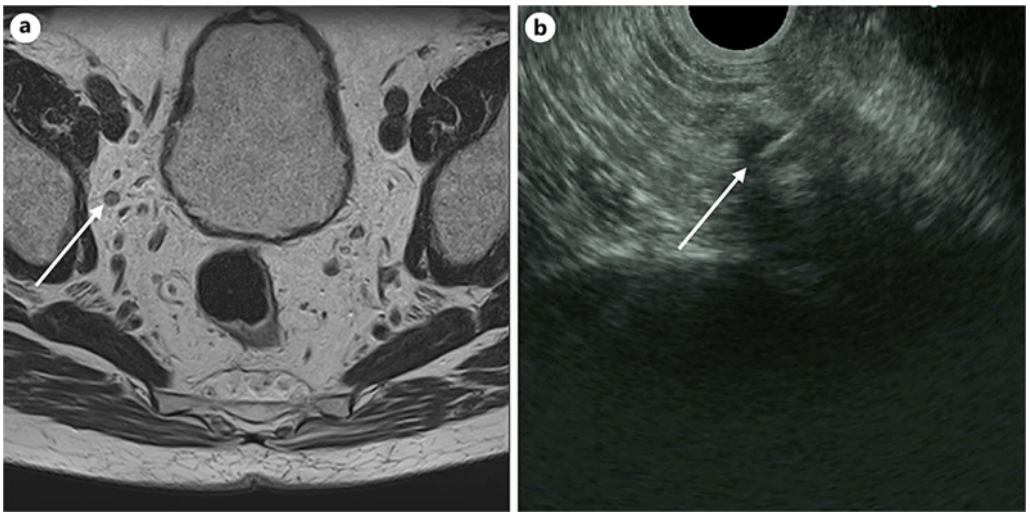

Fig. 7. a, **b** MRI and EUS-FNA images of a suspected lymph node outside the perirectal fascia in the right obturator foramen.

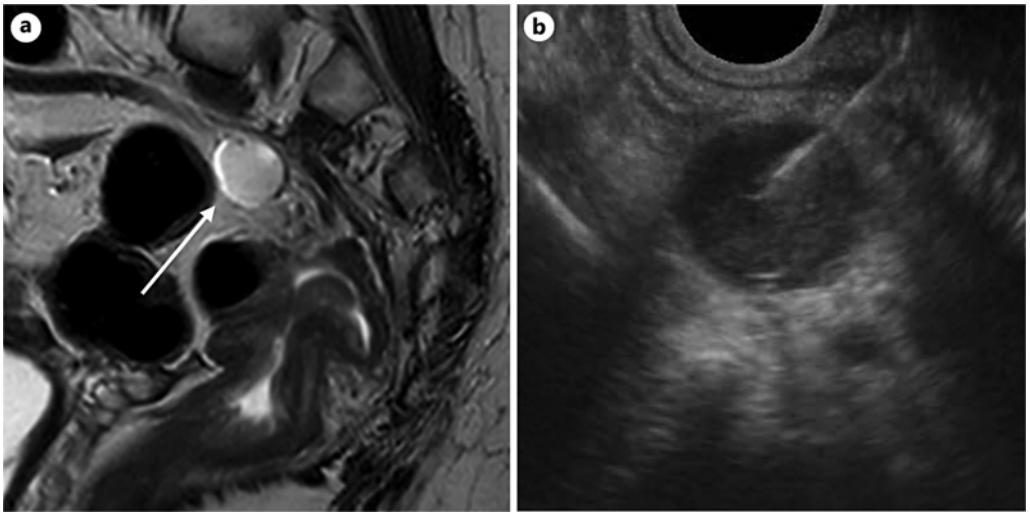

Fig. 8. a, **b** MRI and EUS-FNA images of a suspected lymph node in the perirectal fat.

Repeat MRI with follow-up of uncertain lesions is currently advised [12]; however, data on the prognostic value of limited or absent growth are nonexistent. Geubels et al. [12] reported 9 patients undergoing TME because of suspected LRTG on MRI during follow-up after CRT. In 1 case (11%), the resected specimen showed no tumor.

Positron emission tomography-computed tomography (PET-CT) has been evaluated in this context; however, it showed lower specificity, implying more false-positive findings [13]. Therefore, the Dutch guideline on the follow-up of patients with a complete response after CRT states that "the limited sensitivity for detecting small regrowths makes PET-CT an unsuitable modality for follow-up" [2]. Nevertheless, PET-CT may support a diagnosis of LRTG in selected cases, as illustrated in the small series of Geubels et al. [12].

EUS-FNA has excellent sensitivity and specificity in the upper and lower gastrointestinal tract. A meta-analysis of lymph node sampling showed sensitivities between 85 and 100% with a specificity of almost 100% [14].

The main difficulty in rectal EUS-FNA is the reliable identification of suspected LRTG. This is illustrated by the series by Geubels et al. [12] where FNA was successful in five out of nine attempts. However, once detected, the tumor was always present in the FNA sample .

As FNA has been demonstrated to have excellent sensitivity and specificity, follow-up of the lesion without TME should be considered in cases where FNA is negative (case 2) but of course only in case the lesion has been adequately visualized and sampled.

We observed no morbidity or mortality caused by the procedure, which is in accordance with the data in the literature. In summary, our results demonstrate that rectal EUS-FNA may provide confirmatory pathology in patients with suspected LRTG on MRI, with important decisional sequelae regarding organ-sparing treatment.

Statement of Ethics

This study was performed in accordance with the Declaration of Helsinki. Ethics approval for this human study was waived by Deventer Hospital Academy. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

F. ter Borg conceived the original study, performed the investigations, and wrote the manuscript. S.H. de Bie reviewed the magnetic resonance images and critically reviewed the manuscript. A.K. Talsma critically reviewed the manuscript.

Data Availability Statement

Data are not publicly available because their containing information could compromise the privacy of research participants but are available from the corresponding author F. ter Borg upon reasonable request.

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