

# Esophageal seeding after endoscopic ultrasound-guided fine-needle aspiration of a mediastinal tumor



## Authors

Kensuke Yokoyama<sup>1</sup>, Jun Ushio<sup>1</sup>, Norikatsu Numao<sup>1</sup>, Kiichi Tamada<sup>1</sup>, Noriyoshi Fukushima<sup>2</sup>, Alan Kawarai Lefor<sup>3</sup>, Hironori Yamamoto<sup>1</sup>

## Institutions

- 1 Department of Medicine, Division of Gastroenterology, Jichi Medical University, Tochigi, Japan
- 2 Department of Diagnostic Pathology, Jichi Medical University, Tochigi, Japan
- 3 Department of Surgery, Jichi Medical University, Tochigi, Japan

submitted 25.1.2017

accepted after revision 2.5.2017

## Bibliography

DOI <https://doi.org/10.1055/s-0043-114662> |  
Endoscopy International Open 2017; 05: E913–E917  
© Georg Thieme Verlag KG Stuttgart · New York  
ISSN 2364-3722

## Corresponding author

Jun Ushio, MD, Department of Medicine, Division of Gastroenterology, Jichi Medical University, 3311-1 Yakushiji, Shimotsuke, Tochigi 329-0498, Japan  
Fax: +81 285 44 8297  
[j.ushio@jichi.ac.jp](mailto:j.ushio@jichi.ac.jp)

## ABSTRACT

**Background and study aims** Tumor seeding after endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) is rare. A 53-year-old man underwent transesophageal EUS-FNA for diagnosis of a 6-cm mass in the mediastinum as seen by computed tomography (CT). Four weeks later, repeat CT scan revealed a mass in the esophageal wall. Upper gastrointestinal endoscopy confirmed a lesion in the mid-esophagus, which was biopsied and found to be consistent with needle tract seeding after EUS-FNA. Tumor seeding in the gastrointestinal wall or peritoneum after EUS-FNA is rare, but may adversely affect the prognosis. Indications for EUS-FNA must be carefully considered.

## Introduction

Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) is a useful technique to obtain specimens for histopathologic examination. However, there is a small risk of tumor cell seeding along the needle track or within the peritoneum caused by EUS-FNA [1, 2]. We report needle track seeding following EUS-FNA in a patient with a mediastinal tumor.

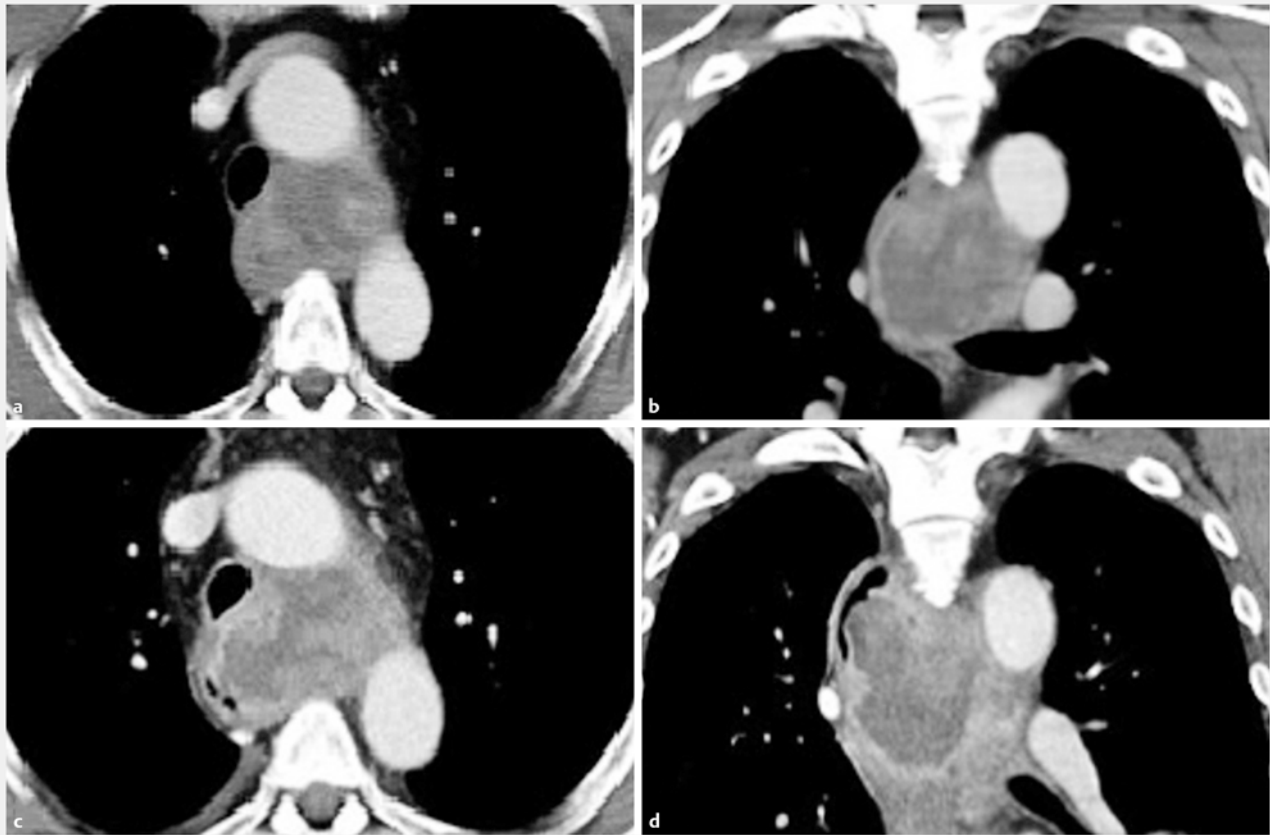
## Case Report

The patient was a 53-year-old man who presented with hoarseness. Chest computed tomography (CT) revealed a 6-cm mass in the mediastinum (► **Fig. 1**). EUS showed a heterogeneous, septated tumor. Transesophageal EUS-FNA was performed (► **Fig. 2a, b**). Three passes were made with a 22-gauge needle (Olympus Medical Systems, Tokyo, Japan). During the second pass, necrotic tissue was obtained. No immediate adverse events developed after the EUS-FNA. Pathology showed carcinoma with embryonal features (► **Fig. 2c, d, e**).

Two weeks after the EUS-FNA, the patient presented with mediastinitis. Symptoms improved with medical therapy. Two weeks later, a repeat CT scan showed a mass in the esophageal wall. Upper gastrointestinal endoscopy showed a protruding lesion in the middle esophagus (► **Fig. 3**), which was biopsied using forceps and confirmed to be histologically similar to the mediastinal mass. This was believed to be consistent with needle tract seeding from the EUS-FNA. Tumor resection was not performed because the mass was felt to be technically unresectable, in part due to the tumor seeding. Chemotherapy was administered and the patient died less than 2 years later.

## Discussion

This case underscores the potential risk of needle tract seeding after EUS-FNA. In this patient, the location of tumor seeding corresponded to the entry point of the EUS-FNA. The endoscopic unusual appearance of mushroom-shaped tumor protruding from the FNA puncture site was suggestive of seeding as spontaneous direct tumor invasion would be expected to appear as a flat elevation. In addition, the tumor became mucous



► **Fig. 1** Computed tomography (CT) scan findings. **a, b** CT scan revealed a 6-cm mediastinal mass. **c, d** Four weeks after endoscopic ultrasound-guided fine-needle aspiration, repeat CT scan revealed a mass in the esophageal wall.

sally based. We believe this is the reason for the rapid development of seeding. The tumor seeding also might have been associated with the post-FNA mediastinitis.

The literature from 2003 to 2016 contains reports on only 14 previous patients with needle tract seeding to gastrointestinal tract wall by a malignancy following EUS-FNA (► **Table 1**). Needle size, number of passes, needle movement during puncture, suction, and characteristics of the tumor, might be factors in tumor seeding [3]. According to previous reports, the number of needle passes and tumor characteristics (poorly differentiated or cystic tumor) are considered to be risk factors [2]. Interestingly, needle size was not associated with seeding. In this patient, we speculate that multiple needle passes and tumor characteristics (a poorly differentiated and cystic tumor) may have contributed to development of seeding. Although EUS showed the lesion to be solid, the aspirate showed an abundance of necrotic tissue. We speculated the tumor had a fluid component similar to a cystic tumor.

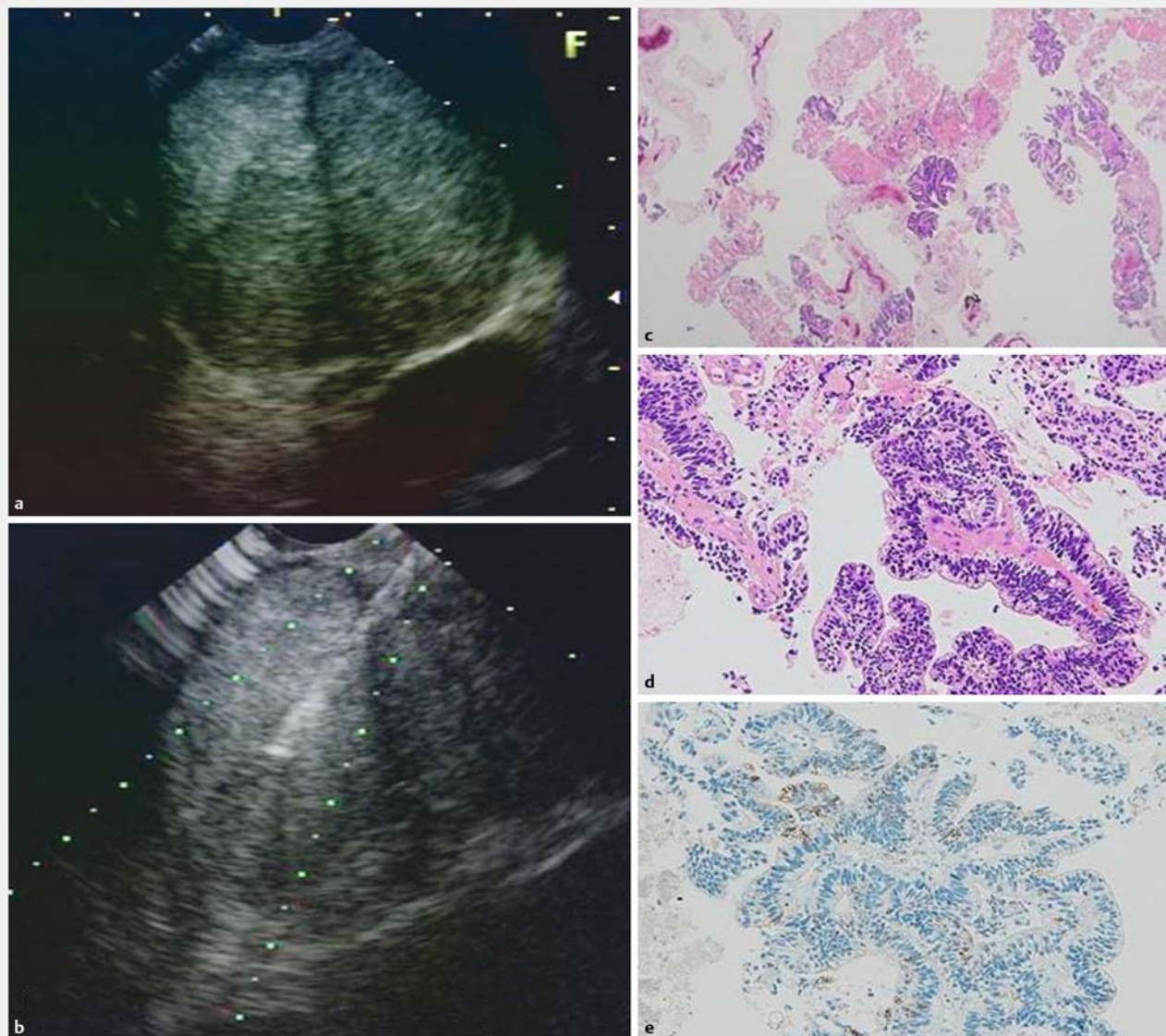
Peritoneal dissemination has been reported more frequently than needle tract seeding. The exact etiology is unknown but once a patient suffers needle tract seeding, the prognosis is worse.

## Conclusion

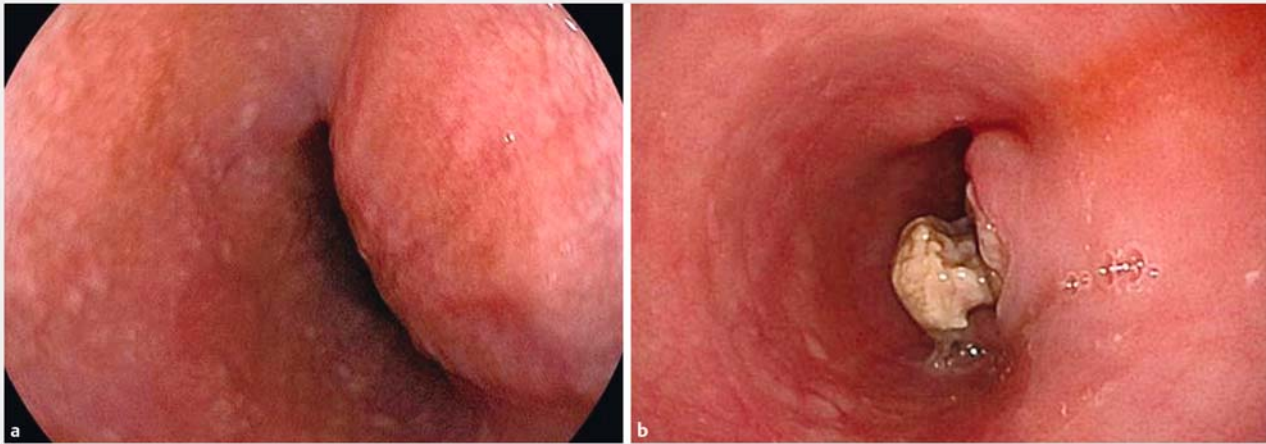
In conclusion, in patients who have lesions that are surgically resectable for curative intent, we must carefully consider appropriate indications for performing EUS-FNA and inform these individuals about the potential for esophageal seeding, which is rare.

## Competing interests

Dr. Yamamoto has a consultant relationship with FUJIFILM Corporation and has received honoraria, grants and royalties from the company.



► **Fig. 2** Endoscopic ultrasound findings and pathologic findings of biopsy specimens. **a** Endoscopic ultrasound showed a tumor with a heterogeneous appearance and a septum. **b** Endoscopic ultrasound-guided fine-needle aspiration was performed with a 22-gauge needle. **c** The biopsy specimen from the tumor showed tumor cells and necrotic tissue. (hematoxylin-eosin,  $\times 4$ ). **d** Tumor cells show a papillary pattern. Nuclei are overlaid and cell polarity is lost. **e** Cells stain positive for AFP ( $\times 4$ ).



► **Fig. 3** Endoscopic findings. **a** Upper gastrointestinal endoscopy showed a mass effect in the middle esophagus. **b** Four weeks after endoscopic ultrasound-guided fine-needle aspiration, a protruding lesion was seen in the middle esophagus

► **Table 1** Summary of previous reports of endoscopic ultrasound-guided fine-needle aspiration seeding.

No.	Author year	Aspiration site	Pathological diagnosis	Seeding site	Needle size	Passes	Interval from EUS-FNA until identification of seeding
1	Hirooka, 2003	Pancreatic body mass	Adenocarcinoma (IPMC)	Posterior gastric wall (and peritoneal seeding)	22G	3	10 days
2	Shah, 2004	Perigastric lymph node	Melanoma	Posterior gastric wall	22G	1	6 months
3	Paquin, 2005	Pancreatic tail cancer	Adenocarcinoma	Posterior gastric wall	22G	5	16 months
4	Doi, 2008	Lymph node metastasis of gastric cancer	Adenocarcinoma	Esophageal wall	19G	1	18 months
5	Ashmed, 2011	Cystic mass in the pancreatic body	Adenocarcinoma	Gastric wall of antrum and body	Unknown	Multiple	4 years
6	Chong, 2011	Pancreatic tail cancer	Adenocarcinoma	Posterior gastric wall of body	22G	2	2 years
7	Katanuma, 2012	Pancreatic body cancer	Adenocarcinoma	Posterior gastric wall of upper body	22G	4	22 months
8	Anderson, 2013	Celiac lymph node (and pancreatic head mass)	Adenocarcinoma	Gastroesophageal junction	Unknown	Unknown	Unknown
9	Minaga, 2015	Pancreatic body cancer	Adenocarcinoma	Posterior gastric wall	22G	3	8 months
10	Sakurada, 2015	Pancreatic body cancer	Adenosquamous carcinoma	Posterior gastric wall	22G	Unknown	19 months
11	Tomonari, 2015	Pancreatic body cancer	Adenocarcinoma	Posterior gastric wall	22G	2	8 months
12	Iida, 2016	Pancreatic body cancer	Adenocarcinoma	Posterior gastric wall	22G	3	6 months
13	Kita, 2016	Pancreatic body-tail cancer	Adenocarcinoma	Posterior gastric wall	22G	2	7 months
14	Yamabe, 2016	Pancreatic mass beside cystic lesions	Adenocarcinoma (IPMC)	Posterior gastric wall	25G	Unknown	3 months
15	Our Case	Mediastinal tumor	Embryonal adenocarcinoma	Esophageal wall	22G	3	4 weeks

IPMC, intraductal papillary mucinous adenocarcinoma

## References

---

- [1] Katanuma A, Maguchi H, Hashigo S et al. Tumor seeding after endoscopic ultrasound-guided fine-needle aspiration of cancer in the body of the pancreas. *Endoscopy* 2012; 44: (Suppl. 02): E160–E161
- [2] Minaga K, Kitano M, Yamashita Y. Surgically resected needle tract seeding following endoscopic ultrasound-guided fine-needle aspiration in pancreatic cancer. *J Hepatobiliary Pancreat Sci* 2015; 22: 708–709
- [3] Doi S, Yasuda I, Iwashita T et al. Needle tract implantation on the esophageal wall after EUS-guided FNA of metastatic mediastinal lymphadenopathy. *Gastrointest Endosc* 2008; 67: 988–990
- [4] Hirooka Y, Goto H, Itoh A et al. Case of intraductal papillary mucinous tumor in which endosonography-guided fine-needle aspiration biopsy caused dissemination. *J Gastroenterol Hepatol* 2003; 18: 1323–1324
- [5] Shah JN, Fraker D, Guerry D et al. Melanoma seeding of an EUS-guided fine needle track. *Gastrointest Endosc* 2004; 59: 923–924
- [6] Paquin SC, Gariépy G, Lepanto L et al. A first report of tumor seeding because of EUS-guided FNA of a pancreatic adenocarcinoma. *Gastrointest Endosc* 2005; 61: 610–611
- [7] Ahmed K, Sussman JJ, Wang J et al. A case of EUS-guided FNA-related pancreatic cancer metastasis to the stomach. *Gastrointest Endosc* 2011; 74: 231–233
- [8] Chong A, Venugopal K, Segarajasingam D et al. Tumor seeding after EUS-guided FNA of pancreatic tail neoplasia. *Gastrointest Endosc* 2011; 74: 933–935
- [9] Anderson B, Singh J, Jafri SF. Tumor seeding following endoscopic ultrasonography-guided fine-needle aspiration of a celiac lymph node. *Dig Endosc* 2013; 25: 344–345
- [10] Tomonari A, Katanuma A, Matsumori T et al. Resected tumor seeding in stomach wall due to endoscopic ultrasonography-guided fine needle aspiration of pancreatic adenocarcinoma. *World J Gastroenterol* 2015; 21: 8458–8461