Usefulness of EUS-FNA with contrast-enhanced harmonic imaging for diagnosis of gallbladder tumor

Dear Editor,

It is usually difficult to obtain pathological evidence from gallbladder tumors before surgery and chemotherapy; however, histological diagnosis of gallbladder tumors is necessary for determining the treatment policy.[1] In recent years, EUS-FNA is reportedly useful to obtain a tissue for the diagnosis of gallbladder mass lesions. However, EUS-FNA for gallbladder tumor has a risk of bile leak and needle-track seeding by puncturing fluid space.[2,3] We report a new technique of EUS-FNA with contrast-enhanced harmonic imaging (EUS-FNA-CHI) for accurately and safely obtaining tissue from a gallbladder mass to clarify the borderline between the gallbladder tumor and fluid spaces.[4] In this letter, we report usefulness of EUS-FNA-CHI for diagnosis of gallbladder tumor.

Our strategy for obtaining tissue from gallbladder tumors is first to try to obtain tissue from gallbladder tumors by endoscopic retrograde cholangiography (ERC) biopsy, then from liver or lymph node metastases by EUS-FNA, and finally from gallbladder tumors by EUS-FNA-CHI.

The detailed procedures for EUS-FNA-CHI were published elsewhere. Before EUS-FNA-CHI, we first manipulated the echoendoscope to detect the gallbladder mass lesion using fundamental B-mode [Figure 1a]. A few seconds after ultrasound contrast agent injection, gallbladder mass lesions typically

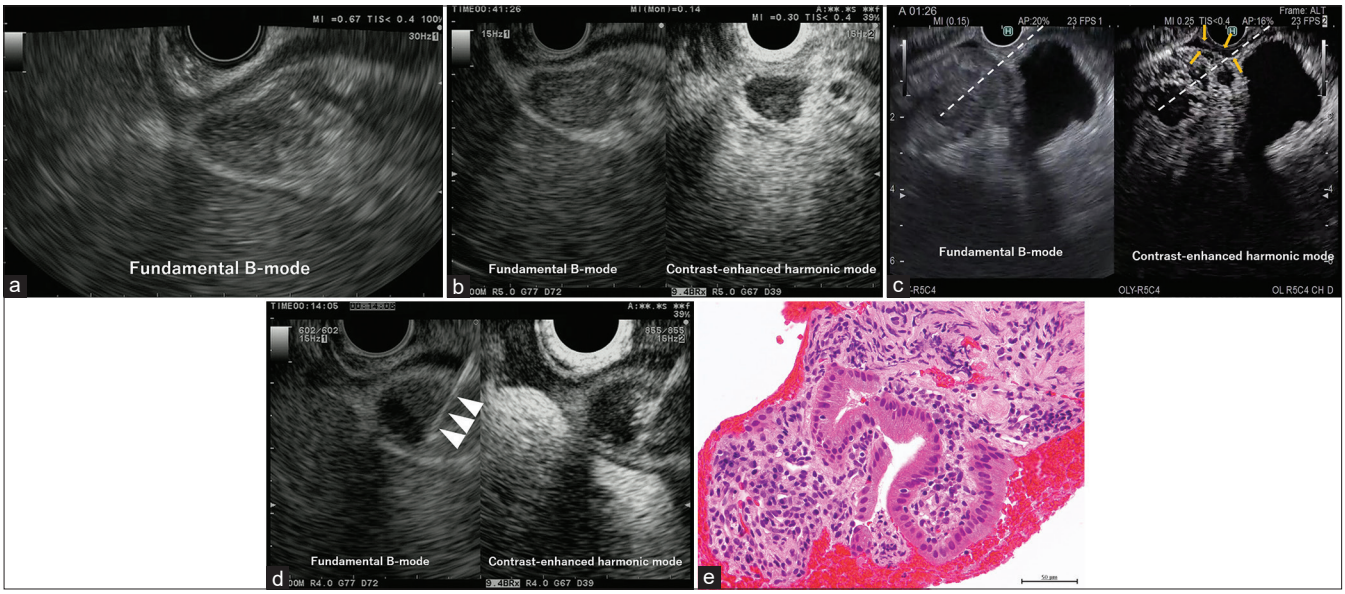

Figure 1. EUS-FNA with contrast-enhanced harmonic imaging for gallbladder tumor. (a) Fundamental B-mode EUS showing a mass lesion in the gallbladder. There is no fluid space visible in the gallbladder under fundamental B-mode imaging. (b) The borderline between the gallbladder tumor and fluid space become clear under contrast-enhanced harmonic EUS (CH-EUS). (c) CH-EUS revealing the presence of a fluid space (yellow arrow) on the puncture line (dot line) that fundamental B-mode imaging failed to depict. (d) CH-EUS showing that the enhanced part of the gallbladder tumor is punctured by the needle (white arrow head) passing through the gallbladder wall. (e) Histological examination of tissue obtained by EUS-FNA showing inflammatory cell aggregation and gallbladder epithelium without atypical nuclear cell (H and E, ×400) (final diagnosis: xanthogranulomatus cholecystitis)

Table 1. Detailed summary of 8 patients who underwent endoscopic ultrasound-guided fine-needle aspiration for gallbladder tumor

Gender/ age	Size of gallbladder tumor mass (mm)	Usefulness of contrast harmonic enhanced-EUS in EUS-FNA	Location	Biliary obstruction	Biopsy or cytology ERC	FNA result	Final diagnosis	Confirmation	Follow-up period
Male/87	20	Change the puncture position	Fundus	–	Not done	Benign	XGC	Observation	35 months
Female/59	22	Not change the puncture position	Fundus	+	Not done	Adenocarcinoma	GBC	Chemotherapy	Died 20 months later by GBC
Male/66	31.9	Change the puncture position	Body	–	Not done	Benign	XGC	Operation	2 months
Male/68	85	Change the puncture position	All around thickening of gallbladder wall	+	Insufficient sample	Malignant B-cell lymphoma	Malignant B-cell lymphoma	Chemotherapy	Died 15 months later
Male/76	26	Not change the puncture position	Neck	+	Insufficient sample	Neuroendocrine carcinoma	Neuroendocrine carcinoma	Operation	Died 13 months later
Male/68	20	Not change the puncture position	All around thickening of gallbladder wall	+	Negative	Benign	Cholecystis	Operation	12 months
Female/79	37	Change the puncture position	Fundus	–	Not done	Adenocarcinoma	GBC	Chemotherapy	14 months alive
Female/84	38	Change the puncture position	Fundus	+	Insufficient sample	adenocarcinoma	GBC	Chemotherapy	12 months alive

ERC: Endoscopic retrograde cholangiography; GBC: Gallbladder carcinoma; XGC: Xanthogranulomatus cholecystitis

became enhanced on contrast-enhanced harmonic mode, while fluid spaces, sludge, and necrotic tissue in the gallbladder remain unenhanced [Figure 1b]. If a nonenhanced space was observed on the puncture line, the puncture line was changed to avoid it [Figure 1c]. The enhanced part of the gallbladder tumor was targeted for EUS-FNA [Figure 1d and e].

Between September 2016 and December 2019, a total of 22 patients needed tissue for pathological evidence due to suspected gallbladder carcinoma at Wakayama Medical University. Among these patients, eight patients underwent EUS-FNA-CHI from gallbladder tumor. The mean mass lesion size was 35 mm along the longest axis (range: 20–85 mm). EUS-FNA-CHI obtained adequate tissue for pathological evidence in all eight patients. There were no serious procedure-related complications such as bile leakage or needle-track seeding [Table 1]. The average of follow-up period was 15.1 months in all patients; 9 and 19.2 months in those with and without undergoing cholecystectomy, respectively.

The final diagnoses of the gallbladder tumors were three gallbladder adenocarcinoma, one neuroendocrine carcinoma, one diffuse B-cell malignant lymphoma, one xanthogranulomatus cholecystitis, and two cholecystitis, all of which were correctly diagnosed by EUS-FNA-CHI [Table 1]. In particular, it properly diagnosed neuroendocrine carcinoma and malignant lymphoma, which are usually difficult to diagnose with only a cytology examination. The present report shows that EUS-FNA-CHI allows appropriate positioning the needle within the gallbladder tumor by avoiding fluid space, which may result in obtaining a higher volume of tissue. EUS-FNA has an advantage over bile cytology with ERCP in obtaining sufficient samples for histopathology and gene analysis to reveille phenotype and clue for special innovative drugs.[5] It would be mandatory to take sufficient materials in the patients who receive chemotherapy, particularly neoadjuvant chemotherapy for a tumor localized in the gallbladder. In conclusion, performing EUS-FNA-CHI may be a useful and safe method to obtain gallbladder tissue.

Acknowledgments

The present study was supported by grants from the Japan Society for Promotion of Science.

Financial support and sponsorship

The present study was supported by grants from the Japan Society for Promotion of Science.

Conflicts of interest

There are no conflicts of interest.

Takashi Tamura[1], Yasunobu Yamashita[1], Masahiro Itonaga[1], Reiko Ashida[1], Masayuki Kitano[1]

[1]Second Department of Internal Medicine, Wakayama Medical University, Wakayama, Japan

Address for correspondence:
Dr. Masayuki Kitano,
Second Department of Internal Medicine, Wakayama Medical University, 811-1, Kimiidera, Wakayama City, Wakayama 641-8509, Japan.
E-mail: kitano@wakayama-med.ac.jp

Received: 2020-06-02; **Accepted:** 2020-11-02;
Published online: 2021-02-09

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Quick Response Code:

Website: www.eusjournal.com

DOI: 10.4103/EUS-D-20-00112

How to cite this article: Tamura T, Yamashita Y, Itonaga M, Ashida R, Kitano M. Usefulness of EUS-FNA with contrast-enhanced harmonic imaging for diagnosis of gallbladder tumor. Endosc Ultrasound 2021;10:224-6.