

Colonic Adenocarcinoma Diagnosed by Contrast-Enhanced Ultrasound Combined with Percutaneous Ultrasound-Guided Biopsy after Failed Endoscopic Biopsy: A Case Report

Liu Xiao¹ | Lai li-zhong² | Lu Hao¹ | Pan Min^{1*}

*Correspondence: Pan Min

Address: ¹Department of Ultrasonography, Shenzhen Hospital of Guangzhou University of Chinese Medicine (Futian), Shenzhen, China; ²Department of Pathology, Shenzhen Hospital of Guangzhou University of Chinese Medicine (Futian), Shenzhen, China

e-mail ✉: min.pan@siat.ac.cn

Received: 26 February 2021; Accepted: 03 March 2021

Copyright: © 2021 Xiao L. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided that the original work is properly cited.

ABSTRACT

The pathological diagnosis of gastrointestinal masses may pose challenges to the gastroenterologist or surgeon as far as obtaining access and tissue diagnoses (Ballo and Guy, 2001). There are various types of colon tumors, including epithelial tumors (adenocarcinoma, adenosquamous carcinoma, undifferentiated carcinoma, etc.), mesenchymal tumors, and metastatic tumors. The treatment protocols are made according to the pathological type (Tarazona *et al.*, 2020). Endoscopic biopsy is the most commonly used method for intestinal neoplasm (ASGE Standards of Practice Committee, 2010), but there are some limitations, such as discomfort in the examination process of patients with contraindications to anesthesia, difficulty in sampling due to the lesion morphology and regional necrosis. We present a case of colon adenocarcinoma diagnosed by contrast-enhanced ultrasound combined with percutaneous ultrasound-guided biopsy after failed endoscopic biopsy.

Keywords: *Gastrointestinal Tumor, Biopsy, Ultrasound-Guided, Contrast-Enhanced Ultrasound*

Case Presentation

A 77-year old woman was presented with weight loss and increased defecation frequency for two months. Computed tomography (CT) showed diffuse thickening in ascending colon, with infiltration of serous layer and multiple enlarged lymph nodes in adjacent area (Fig. 1a). Colonoscopy indicated cauliflower-like tumor in the ascending colon with narrow lumen (Fig. 1b). Colonoscopic biopsy showed necrosis and no cancer cells were found. The patient refused another recommended colonoscopic biopsy. In order to make a definitive pathological diagnosis, contrast-enhanced ultrasound combined with percutaneous ultrasound-guided biopsy was performed. Two-dimensional ultrasound examination confirmed diffuse wall thickening in ascending colon with maximum thickness of 2 cm, with a small

amount of gas in the lumen (Fig. 2a). Sparse blood flow signal was observed by color Doppler ultrasound (Fig. 2b). Most of the thickened intestinal wall showed no enhancement during contrast-enhanced ultrasonography (Fig. 2c), considering necrosis area. Under the guidance of ultrasound, carefully avoiding the gas line in the colonic lumen, the contrast-enhanced area was punctured by a 18G semi-automatic biopsy needle (SOMATEX Medical Technologies, Germany) and 3 complete tissues were obtained (Fig. 2d). Complications related to biopsy such as bleeding, peritonitis, and pain were not observed in our case. Pathologic examination observed nest-like cancer cells surrounded by necrotic tissue (Fig. 3a). Histological examination confirmed low differentiated adenocarcinoma (Fig. 3b-d). The patient refused the operation and adopted comprehensive therapies based on chemotherapy.

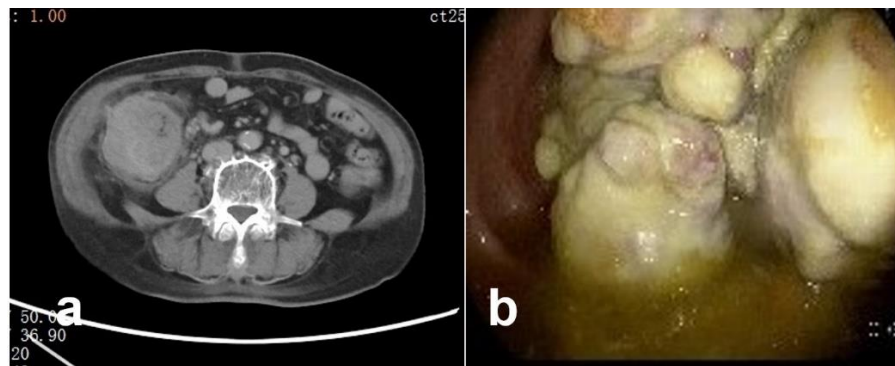


Figure 1: (a) Thickened ascending colonic wall by CT image. (b) Cauliflower-like tumor in the ascending colon lumen by colonoscopy

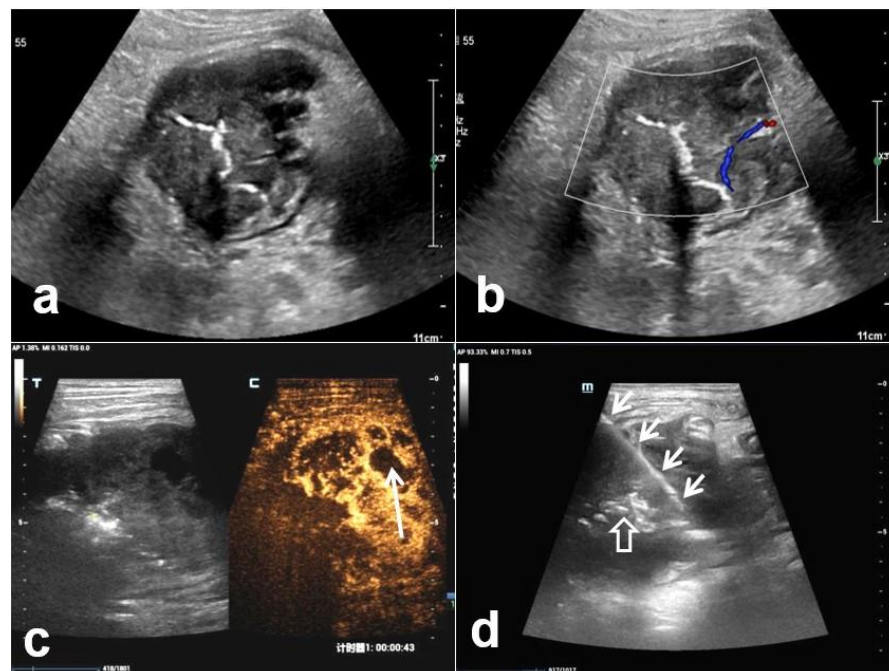


Figure 2: Ultrasound manifestation of the tumor: (a) 2D-image, the tumor seemed homogeneous. (b) Color Doppler image: Sparse blood flow signal observed inside the tumor. (c) Contrast-enhanced ultrasonography: Scattered necrotic area showed as dark area (arrow). (d) Ultrasound-guided biopsy: biopsy needle (arrow), gas line in the colonic lumen (hollow arrow)

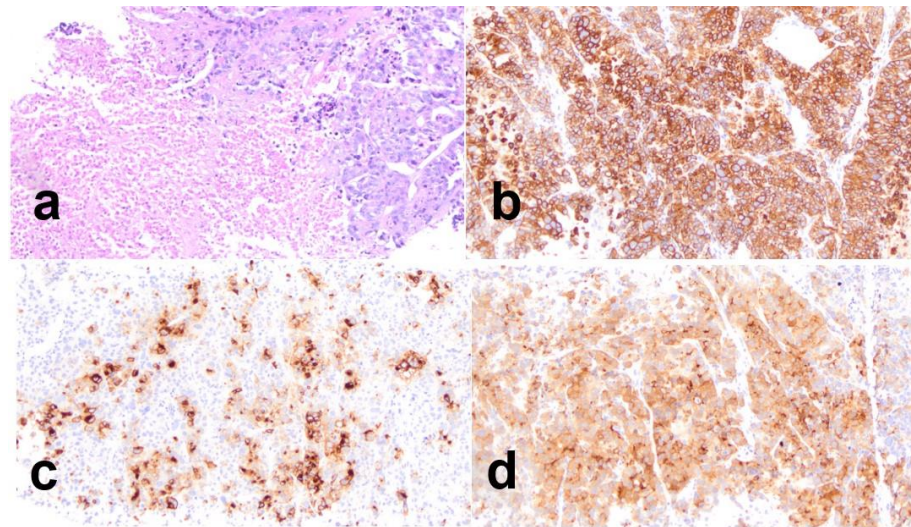


Figure 3: (a) HE, orig. mag. 100×. (b) Immunostaining with CK, org. mag. 100×. (c) Immunostaining with CEA, orig. mag. 100×. (d) Immunostaining with Villin, org. mag. 100×

Discussion

Colonic adenocarcinoma is the fourth common cancer worldwide and the second leading cause of cancer-related mortality (Edwards *et al.*, 2010). However, tumors and other lesions involving the wall of the gastrointestinal tract may pose diagnostic challenges to the gastroenterologist or surgeon as far as obtaining access and tissue diagnoses (Ballo and Guy, 2001). Although endoscopic biopsy is the current standard diagnostic modality for gastrointestinal tumors (Nakano *et al.*, 2019), the choice of biopsy technique also depends on patient's tolerance and lesion morphology. Extensive necrosis inside the tumor increased the probability of failure in biopsy (Zhang and Chen, 2016), which might cause the failed endoscopic biopsy in this patient. Contrast-enhanced ultrasound is a technique that uses contrast agent to enhance backscatter echo and improve the resolution, sensitivity and specificity of ultrasound diagnosis, which can reflect and observe the blood perfusion of normal and diseased tissues (Wei *et al.*, 2020; Sparchez *et al.*, 2011). In this patient, the necrotic area of neoplasm can be identified with contrast-enhanced ultrasound. The application of enhanced-ultrasound confirmed the necrosis and survival areas in the tumor, active tissues were taken for pathomorphological and immunohistochemical analysis, thus ensured a successful pathological diagnosis.

Conclusion

Contrast-enhanced ultrasound combined with percutaneous ultrasound-guided biopsy of the colonic neoplasm may serve as a supplementary option for intestinal neoplasms, when endoscopic biopsy is challenging.

References

ASGE Standards of Practice Committee, Harrison ME, Anderson MA, Appalaneni V, Banerjee S, Ben-Menachem T, Cash BD, Fanelli RD, Fisher L, Fukami N, Gan SI, Ikenberry SO, Jain R, Khan K, Krinsky ML, Maple JT, Shen B, Van Guilder T, Baron TH, Dominitz JA. The role of endoscopy in the management of patients with known and suspected colonic obstruction and pseudo-obstruction. *Gastrointest Endosc* 2010; 71: 669-679.

Ballo MS and Guy CD. Percutaneous fine-needle aspiration of gastrointestinal wall lesions with image guidance. *Diagn Cytopathol* 2001; 24: 16-20.

Edwards BK, Ward E, Kohler BA, Ehemann C, Zauber AG, Anderson RN, Jemal A, Schymura MJ, Lansdorp-Vogelaar I, Seeff LC, van Ballegooijen M, Goede SL, Ries LA. Annual report to the nation on the status of cancer, 1975–2006, featuring colorectal cancer trends and impact of interventions (risk factors, screening, and treatment) to reduce future rates. *Cancer* 2010; 116: 544-573.

Nakano S, Minaga K, Yamashita Y. Endoscopic ultrasound-guided fine-needle aspiration of sigmoid colon cancer undiagnosed with endoscopic biopsy. *Arab J Gastroenterol* 2019; 20: 209-210.

Sparchez Z, Radu P, Zaharia T, Kacso G, Grigorescu I, Botis G, Badea R. Usefulness of contrast enhanced ultrasound guidance in percutaneous biopsies of liver tumors. *J Gastrointestin Liver Dis* 2011; 20: 191-196.

Tarazona N, Roda D, Roselló S, Huerta M, Cervantes A. New guidelines for optimal patient care with localized colon cancer: recommending what is proven, but also watching what research is bringing. *Ann Oncol* 2020; 31: 1287-1288.

Wei T, Lu M, Wang L, Jiang Z, Wu M, Li J, Hu Z, Cheng X, Li T, Zhang Z, Wu X, Tan B, Liao J. Contrast-Enhanced Ultrasound Guided Transoral Core Needle Biopsy: A Novel, Safe and Well-Tolerated Procedure for Obtaining High-Quality Tissue in Patients with Oral Cancer. *Ultrasound Med Biol* 2020; 46: 3210-3217.

Zhang X and Chen L. The recent progress of the mechanism and regulation of tumor necrosis in colorectal cancer. *J Cancer Res Clin Oncol* 2016; 142: 453-463.