CASE REPORT

ENDOSCOPIC ULTRASOUND GUIDED BIOPSY OF A MEDIASTINAL MASS

Aasim Yusuf, Shahid Raza Khalid, Qasim Ahmed* and Zia S Faruqui.**

Division of Gastroenterology and Hepatology, Department of Internal Medicine, *Department of Pathology and **Department of Radiology, Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan.

Endoscopic ultrasound (EUS) now has an established role in the diagnosis, staging and management of cancers of the oesophagus, stomach, pancreato-biliary system and rectum. Recently, a role for EUS in the staging of lung cancers has been proposed. Linear EUS allows fine needle aspiration (FNA), core biopsies and therapeutic manoeuvres such as coeliac plexus block to be performed. We present here the first reported EUS-guided biopsy from Pakistan. A patient with probable bronchogenic carcinoma was referred for assessment of operability. A thoracic CT scan showed subcarinal and aorto-pulmonary recess lymphadenopathy. An EUS-guided FNA was performed, confirming metastatic non-small cell lung cancer and rendering the patient inoperable.

INTRODUCTION

EUS is now considered the standard of care for staging of oesophageal, gastric, pancreatic and rectal cancers. The primary advantage of EUS over other forms of imaging, such as CT and MRI, is its unique ability to accurately stage mucosal depth of invasion of tumours. This often upstages lesions extending beyond the serosa, and thus prevents unnecessary surgery.[1,2] With the advent of linear EUS, a number of interventions have become possible. Gastroenterologists can now perform EUS-guided FNA and core biopsies of lymph nodes and other masses in the mediastinum and abdomen.[3] Accessible liver metastases can also be biopsied through the oesophageal or gastric wall. Indeterminate pancreatic tumours, submucosal tumours and large gastric folds mimicking gastric varices or otherwise causing diagnostic confusion, can all be biopsied using linear EUS. Other therapeutic manoeuvres, such as EUS-guided coeliac plexus block[4,5] and transgastric endoscopic pseudocyst drainage[6,7], are also possible. Current modalities available to obtain tissue from mediastinal masses include CT-guided FNA or core biopsy, mediastinoscopy, video-assisted thoracic surgery (VATS) and EUS-FNA. Recently, transbronchial needle biopsy of mediastinal nodes has also been described.[8] Each procedure has its own risks and benefits. EUS-FNA is safe, well-tolerated and avoids exposure to radiation and anaesthesia associated with other methods.

CASE HISTORY

A 54-year-old male smoker with COPD presented with a six month history of increasing hoarseness and a productive cough. A chest radiograph revealed a mediastinal mass with left hilar lymphadenopathy. A CT scan of the thorax showed a subcarinal lymph node mass extending into the aorto-pulmonary window and left peribronchial region. EUS-guided FNA of this mass was performed under conscious sedation, after obtaining written, informed consent, with continuous monitoring of pulse, blood pressure and pulse oximetry. Using an Olympus linear echoendoscope (GF-UMD240P), the subcarinal region was identified between the left atrium and the left main pulmonary artery. Pathologically enlarged nodes were seen

here as hypoechoic masses. An aspiration needle (Olympus NA-10J-1) was passed through the wall of the oesophagus into the adjacent lymph node mass, under direct vision, and tissue aspirated for cytological examination. Material so obtained was smeared, air dried, stained and examined by an on-site cytopathologist. The needle was then flushed with fixative to recover material to prepare a cell block. In the patient described, small clusters of atypical epithelial cells, with cellular crowding and nuclear overlapping, were seen. The cells showed high nuclear-cytoplasmic ratio and hyperchromatic nuclei, with occasional small nucleoli. The cytoplasm was pale to clear. A cytological diagnosis of non-small cell lung cancer was made.

Following the procedure, the patient was observed for one hour to exclude immediate complications, before being allowed home. Based on the EUS-FNA findings, the patient was deemed inoperable and was referred for palliative radiation therapy.

DISCUSSION

In linear echoendosonography, the ultrasound beam travels in a plane parallel to the shaft of the endoscope, allowing tracking of instruments extending from the working channel of the endoscope, so that EUS-guided FNA and core biopsies of lymph nodes and other masses in the mediastinum and abdomen[3] can be performed. Liver metastases, pancreatic tumours, submucosal tumours and large gastric folds mimicking gastric varices can all be biopsied. EUS-guided coeliac plexus block[4,5] and transgastric pancreatic pseudocyst drainage[6,7], are also possible. EUS- guided FNA is very safe[9], with only occasional infectious complications being reported. Apart from the initial costs of equipment and training, consumable costs are low and a re-usable FNA needle is available.

EUS provides the most accurate assessment available for the staging of oesophageal cancer. It has been shown to be superior to CT in this respect[1] as well as for staging of gastric carcinoma.[10] EUS-guided FNA of mediastinal masses is now a standard procedure in many countries.[9] Several studies support the use of EUS-guided FNA for diagnosing pancreatic masses.[11-16]

Figure-1: FNA showing small clusters of atypical epithelial cells, with cellular crowding and nuclear overlapping, high nuclear-cytoplasmic ratio and hyperchromatic nuclei, with occasional small nucleoli. The cytoplasm is pale to clear. The cytological features are consistent with non-small cell lung cancer.

CONCLUSION

EUS-guided aspiration of mediastinal masses is a safe and well-tolerated procedure. This case serves to highlight the need for expanding facilities in selected hospitals to allow physicians to train in and perform such advanced techniques. Cancer is an increasingly common diagnosis in Pakistan. As the burden of illness from infectious diseases falls, diagnosis and treatment of illnesses such as cancer will become increasingly important. Many such patients would be helped by EUS and we should continue to see exciting developments in interventional therapies guided by EUS.

REFERENCES

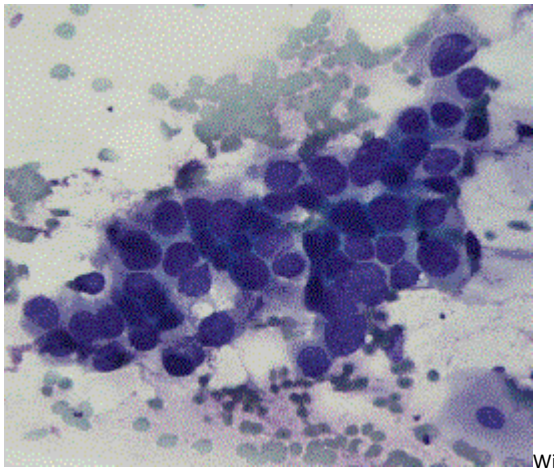
1. Botet JF, Lightdale CJ, Zauber G, Gerdes H, Urmacher C, Brennan MF. Preoperative staging of oesophageal cancer: comparison of endoscopic US and dynamic CT. Radiology 1991;81:419-25.

2. Rosch T, Lorenz R, Zenker K. Local staging and assessment of resectability in carcinoma of the oesophagus, stomach and duodenum by endoscopic ultrasonography. Gastrointest Endosc 1992;38:460-7.

3. Suits J, Frazee R, Erickson RA. Endoscopic ultrasound and fine needle aspiration for the evaluation of pancreatic masses. Arch Surg 1999;134(6):639-42;

4. Wiersema MJ, Wiersema LM. Endosonography-guided celiac plexus neurolysis. Gastrointestinal Endoscopy 1996;44(6):656-62.

5. Gress F, Schmitt C, Sherman S, Ikenberry S, Lehman G. A prospective randomized comparison of endoscopic ultrasound- and computed tomography-guided celiac plexus block for managing chronic pancreatitis pain. Am J Gastroenterol 1999;94(4):900-5.

6.  Wiersema MJ. Endosonography-guided cystoduodenostomy with a therapeutic ultrasound endoscope. Gastrointest Endosc 1996;44:616-7.

7. Giovannini M, Bernardini D, Seitz JF. Cystogastrostomy entirely performed under endosonography guidance for pancreatic pseudocyst: results in six patients. Gastrointestinal Endoscopy 1998;48(2):200-3.

8. Hermens FH, Van Engelenburg TC, Visser FJ, Thunnissen FB, Termeer R, Janssen JP. Diagnostic yield of transbronchial histology needle aspiration in patients with mediastinal lymph node enlargement. Respiration. 2003;70(6):631-5.

9. Janssen J, Johanns W, Greiner L. Clinical value of endoscopic ultrasound-guided transoesophageal fine needle puncture of mediastinal lesions. Dtsch Med Wochenschr 1998;123(47):1402-9.

10. Snady H. The role of endoscopic ultrasonography in diagnosis, staging and outcomes of gastrointestinal disease. Gastroenterologist 1994;10:91-110.

11. Gress FG, Hawes RH, Savides TJ, Ikenbery SO, Lehman GA. Endoscopic ultrasound-guided fine-needle aspiration biopsy using linear array and radial scanning endosono-graphy. Gastrointestinal Endoscopy 1997;45(3):243-50.

12. Wiersema MJ, Vilmann P, Giovannini M, Chang KJ, Wierseman LM. Endosonography guided fine-needle aspiration biopsy: diagnostic accuracy and complication assessment. Gastroenterology 1997;112:(4)1087-95.

13. Giovannini M, Seitz JF, Monges G, Perrier H, Rabbia I. Fine needle aspiration cytology guided by endoscopic ultrasonography results in 141 patients. Endoscopy 1995;27(2):171-7.

14. Chang KJ, Albers CG, Erickson RA, Butler JA, Wuerker RB, Lin F. Endoscopic ultrasound-guided fine needle aspiration of pancreatic carcinoma. Am J Gastro 1994;89(2):263-6.

15. Chang KJ, Nguyen P, Erickson RA, Durbin TE, Katz KD. The clinical utility of endoscopic ultrasound-guided fine-needle aspiration in the diagnosis and staging of pancreatic carcinoma. Gastrointestinal Endoscopy 1997;45(5): 387-93.

16. Faigel DO, Ginsberg GG, Bentz JS, Gupta PK, Smith DB, Kochman ML. Endoscopic ultrasound-guided real-time fine-needle aspiration biopsy of the pancreas in cancer patients with pancreatic lesions. J Clin Oncol 1997;15(4):1439-4.

Address For Correspondence:

Dr Aasim Yusuf, Consultant Gastroenterologist, Shaukat Khanum Memorial Cancer Hospital, 7-A Block R-3, MA Johar Town, Township PO Box 13014, Lahore

Email: aasim@skm.org.pk