Endoscopic ultrasound (EUS) is the endoscopy combined with ultrasound to obtain images of the gastrointestinal (GI) tract and adjacent structures. At the beginning, the procedure was performed by endosonographers or gastroenterologists with extensive training to solve digestive diseases. The imaging has improved our understanding of many disease states, including submucosal tumors of the digestive tract, mucosal gastric and esophageal cancers, early pancreatic malignancy and nodal metastases. EUS-guided fine needle aspiration (FNA), first reported in 1992, has increased the accuracy of EUS in the diagnosis and staging of malignancies, which plays an important role in managing treatment selection.[1,2]

A recently published evidence-based consensus stated some of the clinical applications of EUS, which is supported by a high degree of evidence, including diagnosis and staging of esophageal cancer and rectal cancer, differential diagnosis of subepithelial lesions (gastrointestinal stromal tumors (GIST), lipoma, leiomyoma, ectopic pancreas, tuberculosis infiltration), thickened gastric folds (e.g., mucosa-associated lymphoid tissue lymphoma; linitis plastica; Menetrier disease; Zollinger-Ellison syndrome; eosinophilic gastroenteritis), assessment of T3/T4 gastric cancer, diagnosis of common bile duct/gallbladder stones, diagnosis of chronic pancreatitis and differential diagnosis of pancreatic cyst.[3]

These applications were mostly utilized by gastroenterologists and surgeons.[4-6] However, with more than 30 years of development, the incidences for EUS have already expanded into many subject areas. I will highlight some of the indications that may be noticed by other specialists.

Non-small cell lung cancer can be diagnosed and staged by EUS, proven by high-level evidence-based studies. Nowadays, endobronchial ultrasound (EBUS), which is actually a special EUS technique for the respiratory system, has been widely applied. EBUS-guided transbronchial needle aspiration enables real-time aspiration of peritracheal and peribronchial lesions, which provides good access to the mediastinal and hilar lymph nodes. The recently published guideline by the American College of Chest Physicians (ACCP) recommends that in patients with a high suspicion of N2 and N3 involvement, either by discrete mediastinal lymph node enlargement or positron emission tomography uptake (and
no distant metastases), a needle technique (EBUS-needle aspiration, EUS-FNA of combined EBUS/EUS-FNA) is recommended over surgical staging as a best first test.[7,8]

The remarkable clinical practice applied to endocrine disease is the diagnosis of pancreatic neuroendocrine tumors (PNETs). A high sensitivity and diagnostic accuracy has been reported. EUS-FNA helped in the assessment of the malignant behavior of PNETs and was able to predict a 5-year survival rate. Although the detection rate of computed tomography (CT) has significantly improved over time, EUS is still superior to multidetector CT for the detection of PNETs. CT-negative tumors are small and more likely to be insulinomas. A sequential approach of CT followed by EUS can detect most PNETs. EUS is a more sensitive initial test for the detection of suspected insulinomas.[9-13]

Also, EUS and EUS-FNA have been used for imaging diagnosis and sampling the kidney and adrenal masses.[14-16] EUS-FNA of renal masses appears safe and feasible and should be considered when results would affect patient management.[14] As well as the left adrenal gland, the right adrenal gland was also usually visible by EUS. EUS/EUS-FNA provided an accurate diagnosis of adrenal metastasis in these patients with potentially resectable lung cancer.[14]

Endometriosis is a common gynecological disease, characterized by the presence of endometrial glands and stroma outside the uterus. The GI tract is the most common site for extra-pelvic endometriosis. Pelvic magnetic resonance imaging and CT have a low sensitivity in making this diagnosis. The sensitivity and specificity of EUS for rectosigmoid endometriosis is extremely high (95% and 90%).[17-19]

EUS is also a unique and effective minimal invasive therapeutic procedure that is commonly applied for celiac plexus neurolysis and pseudocyst drainage.[20-22] New and novel therapeutic indications continue to emerge. These include local ablation, brachytherapy, placement of fiducial markers for radiotherapy and direct injection of antitumor agents into cancer.[23] These alternative modalities should be acknowledged by an oncologist and radiologist. The newly developed EUS-based Natural Orifice Transluminal Endoscopic Surger (NOTES) is a promising alternative to conventional surgery.[24] EUS-assisted endoscopic full-thickness resection (EFTR) can treat GI stromal tumors that had needed open or laparoscopic surgery in the past.[25,26] EUS-guided lymph node detecting and resecting is a valuable tool in diagnosis. EUS-assisted transmural cholecystogastrostomy fistula acts as a bridge for endoscopic internal gallbladder therapy, including gallbladder stone removal, polyp resection and acute purulent cholecystitis drainage.[27,28] EUS-assisted NOTES was developed as an effective approach to access the peritoneal cavity and, therefore, has become a valuable modality holding promised improvements in gastroenterological, thoracic, urological and gynecological surgeries.

- In conclusion, the clinical applications of EUS carried out by endosonographers have not been limited by the diagnosis and therapy of digestive disease. Actually, diversified new indications covering all internal medicine have been developed and are becoming more promising, and are now being considered a cutting edge technique in this rapidly expanding field.

REFERENCES


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