Endoscopic Ultrasound-Guided Fine Needle Aspiration Used for the Diagnosis of a Retroperitoneal Abscess. A Case Report

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Abstract

Background. The evaluation of idiopathic abdominal masses by EUS-guided fine needle aspiration (FNA) is considered a feasible and safe option. Moreover, different case reports and small case series recently described EUS-guided drainage of abscesses located nearby the digestive tract as a viable option of mini-invasive treatment. Case report. We present the case of a young patient with a retroperitoneal abscess diagnosed by EUS-guided FNA. Trans-abdominal ultrasound (TUS) and computer tomography (CT) scan were helpful, but insufficient for the final diagnosis. Although the abdominal mass was clearly visualized by these imaging methods, it was not possible to differentiate between a cystic tumor mass and an abscess. The mass was located in the vicinity of the pancreas tail, near the spleen and superior pole of the left kidney. The case management was complex due to the associated disorders and occurrence of severe episodes of hemolytic anemia. The association of gastric varices and left-sided portal hypertension further complicated the differential diagnosis and precluded percutaneous aspiration procedures. EUS-guided FNA established the final diagnosis, because of pus aspiration and positive bacterial cultures that sustained the initial supposition. The patient was referred to surgery and the evolution was favorable after abscess drainage and splenectomy. Conclusion. EUS-FNA is an excellent option used to obtain a tissue diagnosis in suspicious retroperitoneal masses, with a clear impact for the management decisions of these patients.

Key words
Endoscopic ultrasound - fine needle aspiration - retroperitoneal abscess

Introduction

Idiopathic retroperitoneal masses can pose difficult diagnostic and therapeutic problems. Both standard transabdominal ultrasonography (TUS) and CT can guide fine needle aspiration (FNA) procedures to obtain a tissue confirmation, but they have certain disadvantages because of insufficient visualization of the needle tract as well as the inability to avoid intervening structures (1). Aspiration of deep retroperitoneal lesions is usually complicated especially due to the difficulties of finding a safe skin to lesion route. EUS has recently become an excellent option for the diagnosis of several non-digestive disorders, while EUS-guided FNA clearly improved the diagnosis by obtaining a tissue confirmation (2). Furthermore, due to the vicinity with the digestive tract, many lesions are more accessible to EUS-guided procedures, thus avoiding the inherent limitations of TUS and CT.

A study published recently delineated the possible role of EUS-FNA for the diagnosis of idiopathic abdominal masses, including patients with infectious and inflammatory lesions (1). The accuracy for infectious masses was 80%, although the number of included patients was small. In a larger multicentric study, EUS was found helpful for the diagnosis of extraluminal masses with a sensitivity, specificity, and accuracy of 88%, 95%, and 90%, respectively (3). Furthermore, several case reports and small case series described the use of different endoscopic techniques used for the drainage of infected pancreatic pseudocysts or abscesses (4-11). The introduction of EUS-guided transmural procedures assured the certainty for abscess proximity to the digestive tract and the absence of interposed vessels, creating the premises for a reduced risk of complications (12). The presented case clearly illustrates the role of EUS-FNA for the differential diagnosis between cystic masses and abscesses.

Case presentation

An 18-year-old patient was admitted to the emergency room complaining of abdominal and lumbar pain associated...
with high fever and vomiting. The patient had a history of recurrent urinary tract infections starting in childhood. One month before admission in our department he had presented one episode of upper gastrointestinal bleeding. Clinical examination revealed pallor, fever (39\(^\circ\) C), low systolic blood pressure (80 mmHg), enlarged spleen and upper left quadrant abdominal pain during palpation.

Biological results after admission revealed a low hemoglobin (9.74 g/dL), high blood leukocytes (14800/mm\(^3\)), high erythrocyte sedimentation rate (60 mm/hour), and increased C reactive protein (CRP). All other biological tests were normal. An electrocardiogram and chest X-ray were normal.

TUS was performed showing an enlarged spleen and a hypoechoic, inhomogeneous mass, located near the tail of the pancreas, between the superior pole of the left kidney and spleen, in contact with the splenic vein (Fig.1). CT was performed and revealed a multi-cystic mass of 9/7.5 cm diameter, between the left kidney and spleen, with a strong suspicion of a cystic tumor mass possibly related to the pancreatic tail or left adrenal gland (Fig.2). An upper gastrointestinal endoscopy revealed the presence of gastric varices, which were considered the most probable cause of the recent bleeding episode.

EUS with EUS-guided FNA was then performed in an attempt of further characterizing the cystic mass. An inhomogeneous, hypoechoic, well-delineated mass was observed from the stomach near the pancreatic tail, between the superior pole of the left kidney and the spleen (Fig.3). A normal left adrenal gland was also clearly visualized by EUS in the vicinity of the retroperitoneal mass, close to the upper pole of the left kidney (Fig.4). Power Doppler EUS also depicted a dilated splenic vein with collaterals in the splenic hilum (Fig.5), as well as gastric and peri-gastric varices (left-sided portal hypertension). EUS-guided FNA was carefully performed from the stomach by avoiding the vascular structures under real-time guidance of the needle puncture (Fig.6). Pus was extracted and sent for cytology, as well as for cultures. Cytological examination revealed frequent polymorphonuclear leucocytes and cell detritus. The bacteriological results (examination and culture) revealed the presence of \textit{Escherichia coli}, which was also found in the urinary culture (over 400 000 CFU/mL).

During the first week of hospitalization the patient presented septic fever, increasing anemia and progressive clinical deterioration. A subsequent evaluation of the biological parameters showed: decreased hemoglobin level (to 7.9 g/dL), increased level of CRP, as well as increased liver function tests (alanin aminotransferase, aspartate aminotransferase and \(\gamma\)-glutamyl transeptidase). Extended exploration of the anemia showed: normal blood iron level, elevated level of hemoglobin C and low level of glucose-6-phosphate dehydrogenase (G6PD). Blood cultures were negative and the trans-thoracic and trans-esophageal heart ultrasound examinations were normal.

Because the general status was rapidly worsening despite intensive treatment (large spectrum antibiotics and repeated blood transfusions), the patient was referred for surgery, with splenectomy and evacuation of the retroperitoneal abscess being performed. Further evolution was favorable with slow improvement of general status and complete recovery. The patient has remained symptom free after two years of follow-up.

**Discussion**

This case was interesting because of various problems encountered during the diagnosis and management. Thus, several medical conditions were associated without obvious clinical connections: hemolytic anemia, sepsis, multi-cystic retroperitoneal mass, history of upper gastrointestinal bleeding, left-sided portal hypertension and recurrent urinary tract infections. Worsening of the hereditary hemolytic anemia (hemoglobin C presence combined with deficiency of G6PD) during the episodes of high fever raised the suspicion of sepsis with an intra-abdominal source. Despite the complex work-up (TUS, CT and upper GI endoscopy), the diagnosis was not clear until EUS with EUS-guided aspiration of pus established the source of sepsis, while the suspicion of a cystic tumor mass was ruled out. Interestingly for this case, the presence of left-sided (segmental) portal hypertension was associated with a multi-loculated abscess formed in the vicinity of the splenic vein and pancreatic tail. Splenic vein thrombosis or compression (splenic vein stenosis) might have been the cause of left-sided portal hypertension in this patient as described previously in the literature (13-16).

Before the introduction of EUS, standard TUS and CT were used to guide FNA of retroperitoneal masses, despite many drawbacks (1). US guidance is sometimes preferred over CT because the needle is visualized in real-time. Disadvantages include difficulty in visualizing the needle tip due to overlying bowel gas and inability to clearly delineate intervening tissues. Furthermore, in our patient, both techniques were avoided due to the presence of left-sided portal hypertension (history of upper gastrointestinal bleeding, presence of gastric varices and enlarged spleen). Thus, interposed vessels might have precipitated bleeding complications after percutaneous FNA, due to the unsafe route and unclear visualization of the needle tract.

EUS-FNA of idiopathic abdominal masses has been already reported to be safe and accurate, because it guides the subsequent evaluation and therapy in the majority of patients (1, 2). Transmural EUS-FNA provides minimally invasive tissue sampling of retroperitoneal lesions and obviates the need for exploratory laparotomy (17). Furthermore, the region of the left adrenal gland / tail of the pancreas can be routinely scanned from the stomach, with EUS-guided procedures already being performed for lesions in this anatomical region (18). Endoscopic placement of a transducer near the lesion allows the use of higher ultrasound frequencies, which provides greater spatial resolution and better details as compared with standard US and CT (3).
EUS guided fine needle aspiration of a retroperitoneal abscess

Fig.1 TUS: a large hypoechoic, inhomogeneous mass, located near the tail of the pancreas, between the superior pole of the left kidney and spleen.

Fig.2 CT: a multi-cystic mass of 9/7/5 centimeters diameter, between the left kidney and spleen.

Fig.3 EUS: an inhomogeneous, hypoechoic mass, observed from the stomach near the pancreatic tail, between the superior pole of the left kidney and the spleen.

Fig.4 EUS: a normal left adrenal gland in the vicinity of the retroperitoneal mass, near the upper pole of the left kidney.

Fig.5 EUS power Doppler: dilated splenic vein with collaterals in the splenic hilum.

Fig.6 EUS-guided FNA performed from the stomach with aspiration of pus from the retroperitoneal lesion.

EUS-FNA offers clear and consistent visualization of the needle along its path, excellent delineation of intervening tissues, and no interference by bowel gas (1). In our case, the exact location and nature of the mass could be easily determined by EUS-FNA, thus indicating the best management approach consisting of surgery with abs-
cess drainage, associated with splenectomy (considered the treatment of choice for left-sided portal hypertension).

However, for infectious and inflammatory masses, subsequent management based on non-malignant EUS-FNA results might be more difficult, due to the false-negative results encountered in malignant diseases. Nevertheless, EUS-FNA has the advantage to change the management of patients with idiopathic retroperitoneal masses, by providing a precise diagnosis and thereby by obviating expensive imaging studies or diagnostic surgical interventions. Thus, EUS-FNA is currently considered an excellent method for the diagnosis of retroperitoneal masses, with extremely rare adverse events. Moreover, all EUS procedures are minimally invasive techniques that can be performed with a high level of patient satisfaction and with low levels of pain, discomfort and anxiety (19). The new research directions are to establish the role of EUS for the evaluation and especially for the treatment of patients with abdominal abscesses.

Although several authors described the use of endoscopic techniques for the drainage of infected pancreatic pseudocysts or abscesses, the method is still difficult and limited to tertiary centers with a high case load, sufficient expertise and excellent cooperation between gastroenterologists, interventional radiologists and surgeons (4-12). Transgastric or transduodenal placement of nasal drains and/or stents in the necrotic cavity, followed by high-volume irrigation was already advocated ten years ago for the patients with organized pancreatic necrosis, although as high as 45% of the patients experienced significant complications (4). Subsequent articles showed a success rate of about 90% for the transpapillary or transmural pancreatic abscess drainage (6-8, 10). After the introduction of EUS techniques, a combination of EUS-directed transmural puncture, followed by dilation of the tract and repeated endoscopic debridement sessions were successfully introduced for the treatment of pancreatic abscesses and necrosis (5). Aggressive endoscopic therapy was also advocated recently with good results that allowed avoidance of surgery in 70% of patients (11). The treatment sequence described by the authors includes: 1) synchronous EUS-guided multiple transmural and/or transpapillary drainage procedures followed by balloon dilation of the cystogastrostoma or cystoduodenostoma, 2) daily endoscopic necrosectomy and saline solution lavage, and 3) sealing of pancreatic fistula by N-butyl-2-cyanoacrylate. A similar procedure of endoscopic debridement after EUS-directed access was also successfully employed for patients with parasophageal, mediastinal abscesses, however with a mortality of 7% due to massive pulmonary embolism in one patient (20). Other authors also described the utility of EUS-guided drainage procedures for deep pelvic abscesses with a success rate of almost 90%, especially after the development of new therapeutic echo endoscopes which allow more effective drainage and a direct one-step procedure for placement of stents (21). A few case reports also described the use of EUS-guided drainage of mediastinal, subphrenic, hepatic or diverticular abscesses (22-26).

New experimental methods of transgastric surgery have already started to expand the spectrum of interventional EUS by developing a whole new range of mini-invasive surgical procedures that start with EUS-guidance and access to the organs or lesions situated nearby the digestive tract (27, 28). An exciting field of mini-invasive transgastric surgery is already on the edge of daily clinical routines, and EUS-guided procedures will undoubtedly open new opportunities. Due to the major influence of treatment decisions, the use of EUS will most probably increase after surpassing the barriers of high costs, limited availability and lack of awareness.

References

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