Percutaneous sonography-guided fine needle aspiration biopsy of colonscopic biopsy-negative colonic lesions

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Background: Pre-operative tissue diagnosis with colonoscopy is not always possible in patients with colonic lesions. Objective: To study the usefulness and efficacy of percutaneous ultrasound-guided aspiration biopsy of colonic lesions. Methods: Fifty consecutive patients with colonic lesions in whom colonoscopic brush cytology and biopsy were either negative or the lesion was not accessible on colonoscopy on two attempts, underwent percutaneous ultrasound-guided fine-needle aspiration biopsy. The results were compared with surgical findings. Results: Fine-needle aspiration biopsy revealed adenocarcinoma in 40 patients; one had lymphoma, 2 had tuberculosis, 2 had abscess and 5 patients had negative aspiration. Forty-eight patients (excluding 2 with tuberculosis) underwent laparotomy and the diagnoses on aspiration biopsy were confirmed. Of the 5 negative aspirations, 3 had adenocarcinoma, one had tuberculosis and one intussusception. Thus, we had sensitivity of 91.8%, specificity of 100%, predictive value of positive results 100%, predictive value of negative results 20%, and percentage of false negative results 8.1%. Two patients developed complications — hemorrhage into the peritoneum and sepsis due to perforation at the site of aspiration; both survived after surgery. Conclusion: Percutaneous ultrasound-guided aspiration biopsy may be attempted for diagnosis of colonic lesions in situations where it may be the only means of obtaining a cytological diagnosis before surgery. [Indian J Gastroenterol 1999;18:146-148] Keywords: Ultrasound-guided aspiration

Percutaneous fine-needle aspiration biopsy (PFNAB) under ultrasound guidance has been used as a means of diagnosing abdominal diseases, especially solid lesions of the liver, gall bladder, kidneys, pancreas, adrenals and retroperitoneum. Aspiration of bowel masses was initially considered unsafe due to fear of perforation. But recent reports have established its safety in diagnosing diseases of hollow organs like the stomach, gastro-esophageal junction and ileocecal region. The safety and usefulness of fine-needle aspiration cytology (FNAC) in the diagnosis of abdominal masses has been documented.

In case of colonic lesions, fine-needle aspiration biopsy serves as a means of getting early diagnosis pending colonoscopy; if colonoscopy fails to yield a diagnosis, as in ileocecal diseases; or if it is difficult, as in debilitated patients. If colonic lesions are due to tuberculosis, diagnosis by aspiration would obviate the need for surgery. Also, it would help in planning surgery in case of lymphoma, adenocarcinoma or abscess.

We analyzed data from 50 patients who underwent ultrasound-guided PFNAB of colonic lesions and in whom colonoscopic brush cytology/biopsy either was not possible due to inaccessibility of the lesion or was negative.

Methods

Fifty consecutive patients (30 men: mean age 45 years, range 40-70) with suspected colonic lesion and bowel mass on ultrasonography, admitted in our department between March 1995 and September 1998, in whom colonoscopic brush cytology and biopsy of lesion were negative or the site of lesion was not accessible on colonoscopy on two attempts, formed the study group. Patients with evidence of secondary spread of the disease were excluded. All patients gave written informed consent before the procedure. The study was approved by our institute ethics committee.

A sterile transducer (Aloka SSD 256; Aloka, Tokyo) with a pre-set puncture area and guiding channel was used to locate the mass. A 22-gauge bevelled 15-cm-long Teflon-coated needle (Cook; Bloomington, IN, USA) was used for aspiration. Following skin cleansing, local analgesia at the selected skin site was induced by 2% lidocaine injection. The needle ensased in a stylet was inserted through the guiding channel till its tip reached the center of the mass. The stylet was then removed; a 20 mL syringe was attached to the hub of the needle and continuous negative pressure applied while slowly pushing the needle in and out. The aspirated material was smeared over glass slides, air-dried and stained with May-Grünwald-Giemsa stain. No more than three passes were made at one sitting. After the procedure, the patients were observed for 24 hours for signs of peritonitis, hemorrhage or perforation.

Forty-eight patients underwent laparotomy. At laparotomy, biopsy of the colonic lesion was performed; resected specimens were subjected to histologic examination, which formed the gold standard.

Data analysis

Diagnostic results of percutaneous aspiration were compared with those of surgery and specificity, sensitivity, predictive value for positive result, predictive value for negative result, and percentage of false negative results were calculated.
Results

During the study period, 332 patients with colon cancer were seen: 312 underwent colonoscopy and 242 (77.6%) were successfully diagnosed by colonoscopic biopsy. In addition, two patients with colonic lymphoma and one with tuberculosis were diagnosed by colonoscopic biopsy. In 17 patients, colonoscopic biopsy was negative and ultrasound did not reveal a lesion; they were subjected to laparotomy.

The location of bowel mass on ultrasonography in the 50 patients who underwent PFNAB was: ileocecal (n=25), hepatic flexure (14), transverse colon (3), splenic flexure (5) and sigmoid colon (3). The sonographic characteristics of the bowel lesions were: (a) bowel wall thickening (n=12) (Fig 1), (b) pseudo-kidney appearance (11) (Fig 2), (c) hypoechoic oval mass with high-level internal echoes suggestive of air, the so-called target sign (24) (Fig 3) and (d) bowel mass with dilatation of proximal bowel loops (3).

The mean size of the bowel lesion on ultrasonography was 4.5 cm x 3.5 cm. In 25 patients with ileocecal bowel masses, 18 had negative histology on two colonoscopic examinations and in 7 patients, examination of the cecum was not possible. Biopsy could not be entered in any of these 25 patients. Of the 14 patients with hepatic flexure masses, in 8 patients colonoscopic brush cytology and biopsy were negative and in 5 patients, the site of lesion could not be reached on colonoscopy; one patient did not allow repeat colonoscopy. In all 3 patients with transverse colon lesion, cytology was negative. Of 5 patients with splenic flexure mass, 3 had stricture, and brush cytology and biopsy were negative; in 2 patients, colon examination had to be abandoned due to severe pain. All 3 patients with sigmoid colon lesion had stricture and aspiration cytology was negative. A total of 60 PFNABs were performed in 50 patients.

Of 50 patients who underwent PFNAB, 45 had positive result: 40 had adenocarcinoma, one lymphoma, 2 tuberculosis (diagnosed by presence of epithelioid granuloma in one and of epithelioid granuloma and acid-fast bacilli in another), and two had abscesses as evidenced by necrotic material and pus cells. The abscesses were situated in the ileocecal area. Forty-eight patients underwent laparotomy (excluding the two with tuberculosis). At final diagnosis, 43 had adenocarcinoma, 1 lymphoma, 3 tuberculosis, 2 appendicular abscess and one intussusception. Thus, only 3 patients had false negative results for malignancy. 45 had true positive results, and only one was true negative (the patient with intussusception). PFNAB thus had a sensitivity of 91.8%, specificity of 100%, predictive value of positive result 100%, predictive value of negative result 90% and percentage of false negative results 8.1%

Two patients developed complications — hemorrhage in one, perforation and sepsis in one. There was no death. The patient who developed hemoperitoneum after PFNAB had a splenic flexure mass and was transfused two units of
whole blood. Bleeding persisted and laparotomy revealed stage III colonic carcinoma; resection and anastomosis were performed and the patient survived. The patient who developed signs of peritonitis after PFNAB was found to have a sigmoid colon growth which had perforated at the site of aspiration. Definitive surgical procedure with peritoneal lavage was performed and the patient survived. Surgery was avoided in 2 patients. In another 2 patients (with abscess) surgery was done on priority basis. The 45 patients with positive PFNAB were taken for elective surgery.

Discussion
In our study, PFNAB helped confirm the diagnosis in 45 of 50 patients. We avoided laparotomy in two patients who had tuberculosis on PFNAB. Of five patients with negative results, on final diagnosis only three had malignancy while one had tuberculosis and one intussusception which we could not diagnose on clinical examination or radiology. There was no identifiable cause for intussusception in this patient.

Green et al., using real-time sector B-scan ultrasonography-guided percutaneous fine-needle aspiration biopsy, demonstrated signet-cell carcinomatous material in three patients with symptoms of gastric malignancy and thickened gastric walls with negative endoscopic biopsies. In a prospective study on 112 abdominal lesions in 106 patients (69 hepatic, 27 pancreatic, 16 of undetermined origin), PFNAB contributed significantly to the diagnosis in 75% of patients. 3

Radhika et al., studied the use of percutaneous FNAC in 105 patients with abdominal tuberculosis (ileocecal 69, lymph node 18, colon 10, jejunouleal 2, duodenoejejunal 1, peritoneal 1 and hepatic 4). In 19 cases aspirate showed only necrotic material, in 36 it showed epithelial granulomas with necrosis, in 50 it showed only granulomas. AFB was positive in 47 cases. Since bowel involvement is primarily submucosal in tuberculosis, the usefulness of mucosal biopsy in its diagnosis has been questioned. 10 Aspiration under ultrasound may help reach deeper into the submucosa.

One of the main drawbacks with percutaneous aspiration is false negative results. The yield increases significantly if more passes are made. Whether the number of complications increases with multiple passes is controversial.11,12,13 In our study, one patient who developed hemoperitoneum had only one attempt at aspiration; the patient who developed perforation and sepisis following PFNAB had undergone two attempts. A number of complications have been reported with percutaneous aspiration, including hemorrhage, sepsis, pancreatitis, and needle track seeding. 13 The mortality ranges from as low as 0.006% to as high as 0.018%; 14 in one study a higher mortality of 0.18% was reported.15 We had no deaths in our series.

The present study shows that PFNAB of colonic lesions can be done safely in certain situations to get a histological diagnosis for planning treatment, either prior to laparotomy or avoiding laparotomy altogether. It gives a good yield and causes little inconvenience to the patient; it can be performed as an outdoor procedure.

References

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