

# 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

## 1: Understanding Endoscopic Ultrasound and Fine Needle Aspiration

*Endoscopic ultrasound guided-fine needle aspiration cytology (EUS-FNAC) is a minimally invasive technique widely used for the evaluation of deep-seated benign and malignant lesions. However, the value of cytological samples in lymphoma diagnosis is still a matter of debate.*

In a meta-analysis, the combination of the 2 procedures was found to provide greater sensitivity than either procedure alone in mediastinal staging of lung cancer. In the former, the access to mediastinal lymph nodes is transtracheal or transbronchial, whereas the latter requires a transesophageal route. This increases the cost, as well as waiting times, for patients requiring both procedures. Hwangbo et al 11 have reported the use of the echobronchoscope for carrying out transesophageal needle aspiration, termed as endoscopic ultrasound with bronchoscope-guided fine-needle aspiration EUS-B-FNA. We have also described our initial experience with this technique recently in unselected subjects with mediastinal lymphadenopathy. Next, all the authors independently searched the PubMed and EmBase databases for relevant studies published between and May describing the diagnostic value of EUS-B-FNA in subjects with mediastinal lymphadenopathy using the following search terms: From the EmBase database, we included citations under only 2 categories: We reviewed the list of references of original studies, editorials, and reviews; and also sifted through our personal files. We excluded the following studies: Initial Review of Studies The database thus created from the electronic searches was assimilated in the reference manager package Endnote X7 Thomson Reuters, New York, New York , and all duplicate citations were discarded. Two authors SD, RA screened these citations by review of the title and abstract to identify the relevant studies. Any disagreement was resolved by discussion between the authors. This database was then scrutinized again to include only primary articles. The full text of each of these studies was obtained and reviewed in detail. Data Abstraction Data were entered into a standard data extraction form. The following items were extracted: Assessment of Study Quality The quality and validity of each study incorporated in this meta-analysis was assessed using the QualSyst tool for qualitative studies. Each article was independently adjudged by 2 authors SD, RA for the stated criteria. Statistical Analysis The statistical software packages Meta-Disc 1. The analyses performed in this study are on a per patient basis and not per lymph node , and the test performance characteristics were derived from the raw data of each study. Assessment of Heterogeneity Heterogeneity for the individual outcomes was assessed using the I2 test, which measures the extent of inconsistency among the results of the studies. An institutional review board clearance was not required for this study, as this was a meta-analysis of published studies. Results The initial database search retrieved a total of 4, citations, of which 10 studies 1, subjects met our inclusion criteria Fig. One study each was performed for the diagnosis of sarcoidosis, diagnosis of mediastinal lesions, molecular diagnosis of lung cancer, restaging of lung cancer after chemotherapy, and diagnosis of suspected malignant mediastinal lesions in those with non-diagnostic conventional techniques. A 22 gauge TBNA needle was used in most of the studies, a 21 gauge needle was used in a single study, 29 and one study did not report the needle size. Of the 10 studies, the procedure was performed under conscious sedation in 8, general anesthesia in one, and either of the 2 modalities in one. The studies were generally of good quality Table 4 with the median interquartile range score being 18 18â€”

## 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

### 2: Endoscopic ultrasound - Wikipedia

*GASTROINTESTINAL ENDOSCOPY VOLUME 54, NO. 6, The utility of EUS and EUS-guided fine needle aspiration in detecting celiac lymph node metastasis in patients with.*

July 14, Abstract AIM: To investigate the impact of endoscopic ultrasound-guided fine-needle aspiration EUS-FNA in association with a multidisciplinary team evaluation for the detection of gastrointestinal malignancies. A cohort of patients with suspected malignant lesions adjacent to the gastrointestinal tract received EUS-FNA after a standardized multidisciplinary team evaluation MTE and were divided into 4 groups according to their specific malignant risk score MRS. For patients with a MRS score ranging from 1 low risk - through 2 intermediate risk - to 3 high risk , EUS-FNA cytology of the lesion was planned for a different time and was prioritized for those patients at higher risk for cancer. The accuracy, efficiency and quality assessment for the early detection of patients with potentially curable malignant lesions were evaluated for the whole cohort and in the different classes of MRSs. The time to definitive cytological diagnosis TDCD , accuracy, sensitivity, specificity, positive and negative predictive values, and the rate of inconclusive tests were calculated for all patients and for each MRS group. In patients of with true malignant lesions the tumor was diagnosed by EUS-FNA; patients with resectable lesions received early surgical treatment, and 94 patients received chemo-radiotherapy. The number of patients who received surgical treatment or chemo-radiotherapy was significantly higher in the MRS-3 patient group EUS-FNA can effectively detect a curable malignant lesions at an earlier time and at a higher rate in patients with a higher cancer risk that were evaluated using MTE. Gastrointestinal neoplasm , Endoscopic ultrasonography , Clinical scoring system , Fine needle aspiration , Clinical decision support system Core tip: Endoscopic ultrasound-guided fine-needle aspiration EUS-FNA has become paramount in establishing a diagnosis for all suspected malignant lesions of the gastrointestinal tract. Due to its increasing demand, the diagnostic yield of EUS-FNA and the length of time to determine a definitive cytological diagnosis may not be satisfactory in clinical practice. We found that EUS-FNA, when combined with the clinical evaluation of malignancy risk, was associated with a reliable level of accuracy. When prioritized for those patients with the highest clinical suspicion of cancer risk, EUS-FNA provides a shorter time to diagnosis for those patients with a higher cancer risk who can benefit from early therapy. Endoscopic ultrasound-guided fine-needle aspiration for suspected malignancies adjacent to the gastrointestinal tract. However, the ability of EUS to differentiate between inflammatory masses and cancer is limited[ 1 - 3 ]. With the advent of curvilinear echoendoscopes, transesophageal, transgastric, trans-duodenal or trans-rectal endoscopic ultrasound guided fine needle aspiration EUS-FNA biopsies have become common practice. The role of EUS-FNA has also become paramount in establishing a correct tissue diagnosis in patients with abnormal lymph nodes during the diagnosis of unexplained mediastinal lymphadenopathy and during the staging of non-small-cell lung cancer NSCLC when histo-pathological findings may guide the correct therapeutic management[ 4 - 6 ]. Due to emerging evidence that supports its utility[ 7 , 8 ], the indications and requests for EUS-FNA for all suspected malignant lesions are increasing despite its limited availability. Given the increasingly widespread clinical use of EUS-FNA, it seems justified to implement strategies to prioritize the procedure for those patients with resectable disease who can benefit from early surgical treatment and for those patients with unresectable malignancies who can take advantage of specific chemotherapy or radiation therapy. The aim of this study was to assess the potential benefit of EUS-FNA when scheduled on a priority basis in patients stratified for cancer risk by a multidisciplinary team evaluation MTE according to a specific malignancy risk score MRS. We evaluated a large cohort for possible benefit of EUS-FNA when patients were stratified into 4 different classes of MRS by analyzing and comparing the time to obtain a definitive cytological diagnosis TDCD , the rate of patients who underwent surgery, and the rate of patients with unresectable lesions who could receive specific cancer treatment in different groups. Detailed analyses of accuracy and quality assessments of EUS-FNA as well as their

## 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

relevance in the process of clinical decision making, were also evaluated and discussed in the whole cohort and in the different groups. Data were collected in a prospectively dedicated computerized database and then retrospectively analyzed 30 mo after the end of the study November , end of the study: All relevant clinical data with cytological findings, TDCD, and final clinical diagnoses for all patients with inconclusive tests were recorded, as well as all complications associated with the procedure. Inclusion criteria All patients with a suspected malignant lesion who could benefit from possible treatment with surgery, chemotherapy or radiotherapy were included. All patients with a known primary tumor requiring surgical evaluation for resectability by tissue diagnosis of a suspected metastatic lesion were also included in the study provided that EUS-FNA was evaluated as technically feasible by the attending gastroenterologist Gambitta P. All patients provided written informed consent to undergo the procedure. Criteria for MRS assessment The clinical records of each patient were reviewed by one gastroenterologist and collegially discussed during the MTE; the team was composed of surgeons, oncologists and radiologists. Three specialists one radiologist, one oncologist and one surgeon expressed their clinical judgements by subjective evaluation and by objective clinical criteria following the National Comprehensive Cancer Network NCCN guidelines for diagnosis[ 9 ]. They assigned a score of 0 if the lesion was judged as most likely benign, or a score of 1 if the lesion was judged as most likely malignant. The final clinical score was the sum of the scores of each specialist. The clinical judgment of each single specialist was blind to the other two judgements. These patients were followed-up for at least 30 mo or until death. Further investigations were planned whenever clinically required. TDCD was evaluated as the number of days required from the last clinical evaluation to obtain the final report of cytological evaluation. The time for the cytological processing technique did not receive any different prioritization for the whole cohort of patients and it was always performed in the shortest time possible. EUS-FNA procedure and technique Patients were placed in the left lateral decubitus position and were sedated with iv meperidine plus midazolam, according to the judgment of the endoscopist. Solid masses in the head and uncinate process of the pancreas were biopsied by a transduodenal approach with a 22 Gauge or 19 Gauge ultrasound needle Wilson-Cook Medical Inc. Following infiltration of the target lesion, the mandarin was pulled back and an excess of 50 passes into the lesion were performed before the needle was finally retracted. This technique allowed for the optimal use of collected material avoiding the routine handling of this material as a smear, leading to a reduction in processing time[ 10 ]. No cytopathologist was present in the examination room, and the determination of adequacy was based on macroscopic inspection of the aspirate by the operator. A cloudy sediment suggesting cellularity or core tissue was used for determination of adequacy. The biopsy procedure was repeated until sufficient material was aspirated. Criteria for cytological and final diagnoses The cytological diagnoses were then categorized into three groups: The cytological material obtained by EUS guided aspiration was recorded as positive diagnostic for cancer when malignant cells were present in the aspirate, or as benign if only benign cells from the target organ were present. However, if no cells were present or no cells from the target organ were observed, or if destroyed cytological material was found, the cytological diagnosis was recorded as inconclusive. Lymph node aspirates without lymphatic cells and without cancer cells were also recorded as cases with an inconclusive cytological diagnosis. All cytology reports that were benign, malignant or inconclusive were confirmed or invalidated by one or more of the following: The results were calculated by standard statistical computing as follows: To ensure that all relevant information was present we utilized the standards for reporting of diagnostic accuracy statement and checklist to improve the quality of diagnostic accuracy[ 11 ]; Inconclusive results were grouped in accordance with recent recommendations[ 12 ]. Statistical analysis To analyze significant differences among the three groups i. In patients a specific treatment was adopted surgical procedure and chemo-radiotherapy procedures. The different anatomical locations for all the lesions, the number of patients who required surgical treatment and the different surgical procedures employed are summarized in Table 1.

# 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

## 3: Endoscopic ultrasound fine needle aspiration: Technique and applications in clinical practice

*Endoscopic ultrasonography-guided fine-needle aspiration biopsy of lymph nodes Peter Vilmann, MD Endoscopic ultrasonography (EUS) has proved to be a substantial advance in the visualization of peri-in-* From the Department of Surgical Gastroenterology D and Ultra- sonic Laboratory, Gentofte University Hospital, DK Hellerup, Denmark.

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**Abstract** Endoscopic ultrasound fine-needle aspiration EUS-FNA is used to make a cytopathologic diagnosis of suspicious lesions located around the gastrointestinal tract. It is a safe technique with few complications. The most common complications of EUS-FNA are related to pancreatic lesions pancreatitis, bleeding, and abdominal pain. Rare complications have been noted such as stent malfunction, air embolism, infection, neural and vascular injuries, and tumor cell seeding. There are very few studies examining equipment malfunctions. We report a case of needle fracture during the EUS-FNA of suspicious thoracic lymph nodes in a year-old man investigated for unexplained weight loss.

**Introduction** Endoscopic ultrasound fine-needle aspiration EUS-FNA is used to make a cytopathologic diagnosis of suspicious lesions located around the gastrointestinal tract. These include mediastinal lymph nodes easily accessible with the transesophageal position. Rare complications have been noted such as stent malfunction, air embolism, infection, neural and vascular injuries, and tumor cell seeding [ 1 - 3 ].

**Case Report** A year-old man, past smoker, known for hypertension and diabetes, was hospitalized for an unexplained weight loss. During the initial investigation, multiple lymphadenopathies were discovered on a thoracic scanner including lymph nodes located anterior to the trachea cm , in the aortopulmonary window cm , inferior to the carina cm , and at the right and left hilum measuring, respectively, cm and cm. In addition, peribronchial micronodules were located in the right and left superior lobes, the inferior right lobe, and the root of the middle lobe. A bronchoscopy was performed. Reactive cellular changes without malign neoplastic cells were found on the bronchial washing, while the bronchial biopsy demonstrated nonnecrotizing granuloma inflammation. Multiple possible diagnoses were retained including lymphoma, non-small cell pulmonary neoplasm, sarcoidosis, and tuberculosis. An inadequate amount of tissue was extracted due to the rigidity of the lymph node. Significant rigidity was again noted during puncture but the needle made it through the lymph node twice. The fanning technique with repeated erector movement was tried during the first and second passage but failed to adequately move the needle given the hard texture of the lymph node. The needle fractured during removal after the second passage as the operator was using significant force on the handle and torque on the endoscope feeling that the needle was stuck in the lymph node. The distal part of the needle was visible, pinned in the esophagus wall, while the proximal part remained attached to the needle sheet [Figure 2 a ]. After switching to a standard gastroscope GIF-HQ, Olympus Medical Systems , an esophageal overtube was installed and multiple attempts were made to remove the needle using various tools, including a polypectomy snare, an alligator jaw forceps [Figure 2 b ], and an endoscopic basket [Figure 2 c ]. The tip of the needle seemed to have stayed in the rigid lymph node since all instruments were sliding on the needle even with good grip and significant traction force. After numerous tries, the fractured needle was grabbed with a polypectomy snare sensation oval 27 mm, Boston Scientific which hardly closed on the needle near the esophageal wall [Figure 3 b ]. The needle was then bent using the overtube by pushing the tube downward and by forcing the needle upward in the tube. With the bent needle now in a V shape, we were able to keep the closed polypectomy snare at the bottom of the V and apply a good traction force to extract the needle [Figure 3 a ]. Two endoscopic clips were used to close the puncture site [Figure 3 c ].

**Subcarinal lymphadenopathy on transesophageal EUS**

a. The fractured EUS needle visible in the esophageal lumen with a gastroscope a. Multiple removal attempts with an alligator forceps b and an extraction basket c. The extracted fractured needle a. Notice the bent V shape made on the needle with the polypectomy snare and the overtube that permitted the extraction b. Endoscopic clip on the puncture site c. A

## 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

thoracic scan following the procedure showed a mild paraesophageal pneumomediastinum and a discreet mm parietal hematoma, but no signs of perforation with ingestion of contrast. The patient was completely asymptomatic and did not require any surgical intervention. A control CT scan showed no oral contrast extravasation and complete resolution of the pneumomediastinum within 24 hours. The patient was then able to eat without sequelae. The biopsy specimen demonstrated a few small nonnecrotizing granulomas, epithelioid histiocytes, and rare giant cells. An infectious process or sarcoidosis was retained as possible diagnosis [Figure 4]. Histology from fine-needle aspiration showing nonnecrotizing granulomatous inflammation. Discussion Many authors have explored the complications associated with EUS-FNA [1-3], but only a few have explored needle malfunctions specifically. In their study, comparing the effectiveness of the gauge and gauge needles in the diagnosis of pancreatic solid mass, Siddiqui et al. In a study comparing gauge aspiration and gauge biopsy needles in pancreatic cancer, only 1 technical failure was found due to a detached stylet cap [5]. The authors suspected that a combination of factors contributed to the needle breaking, including endoscopic techniques, mainly torqueing and multiple punctures, and the rigid texture of the pancreas. Similarly, our patient had very rigid lymph node that may have also contributed to the break in the needle. There is more literature on needle fractures in pulmonary medicine. In fact, a recent survey examining complications associated with endobronchial ultrasound-guided transbronchial needle aspiration EBUS-TBNA done by the Japan Society for Respiratory Endoscopy [7] found needle fracture in 15 out of 77 procedures. Recently, Vial et al. The authors did not mention whether endoscopic maneuvers or the quality of the lymph nodes might have played a role. After multiple removal attempts, it was decided to leave the needle in place without surgery. No information was provided whether further complications were experienced as a result of the foreign body being imbedded in the lymph node. The authors noted that the texture of the lymph nodes was normal and they did not have difficulties in reaching them. A manufacturing error was suspected. The needle could not be retrieved on the subsequent urgent bronchoscopy, as it was no longer in the airways. It was later located in the transverse colon on an abdominal X-ray. The patient remained asymptomatic and no complications were observed on follow-up. The needle broke from its sheath and protruded outwards. Fortunately, the broken needle was still attached to the rest of the apparatus and was thus removed in one piece without any remnants left in the patient. Once again, standard endoscopic techniques were used and there was only a single aspiration done. The texture of the tissue was not described. Presently, the consequences of a broken needle during ultrasound-assisted techniques are unknown due to the limited literature on the subject. It is possible to assume that if the foreign body is left in situ, an inflammatory reaction may develop within the tissue leading to further complications. In addition, there is always the possibility of the fragments dislodging and migrating while damaging the mucosal lining. This may result in perforation and surgical intervention. It is difficult to identify specific risk factors for needle fracture. However, as mentioned by other authors, certain endoscopic maneuvers as torqueing, multiple punctures with the same needle, and rigid tissue texture could all be predisposing factors. We also feel that repeated erector movement for the fanning technique in the hard lymph node may have caused a focal weakness on the needle in our case. It is important for clinicians to be aware not only of complications associated with ultrasound-guided techniques, but also of complications related to the devices themselves including fractured needles. Competing Interests All authors have no competing interests to disclose related either to product or companies named in the paper or to competing products or companies. The paper has been reviewed by an English speaker as a second language. View at Google Scholar T.

## 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

### 4: Endoscopic ultrasound - Mayo Clinic

*Endoscopic ultrasound (EUS) -guided fine-needle aspiration (FNA) is an accurate, safe, and minimally invasive technique for the analysis of mediastinal lymph nodes (LNs) and can additionally detect tumor invasion (T4) in patients with centrally located tumors.*

This article has been cited by other articles in PMC. Abstract Accurate diagnosis and subtyping of lymphoma have important prognostic implications and are generally required for treatment planning. Histological assessment, immunophenotyping, and genetic studies are usually necessary. Endoscopic ultrasound guided-fine needle aspiration cytology EUS-FNAC is a minimally invasive technique widely used for the evaluation of deep-seated benign and malignant lesions. However, the value of cytological samples in lymphoma diagnosis is still a matter of debate. Endoscopic ultrasound guided-fine needle biopsy EUS-FNAB can provide tissue core samples that may help overcome the limitations of cytology. In addition, we discuss its usefulness in the management of primary extra-nodal lymphomas, as well as technical issues that may influence sample quality. The latest classification by the World Health Organization lists 70 different forms of lymphoma. Therefore, a correct diagnosis and classification of the disease is mandatory before initiating treatment. Currently, diagnosis of lymphoma is based upon the evaluation of histological, immunophenotypic, and genetic studies interpreted in the context of the clinical scenario. However, this process is sometimes cumbersome because of the inaccessibility of deep-seated lymph nodes or organs. Therefore, invasive and costly procedures, such as thoracotomy, laparotomy, mediastinoscopy, or laparoscopy, may be required. Finally, EUS allows access to deep-seated lesions, which is a challenge with other techniques. In addition, we discuss the utility of EUS-FNA in the diagnosis of primary extranodal lymphomas and technical issues related to optimization of tissue acquisition. FNA for the diagnosis of lymphoma Several reports have described the efficacy of FNA cytology in the diagnosis of lymphoma. Some authors claim that CA combined with immunophenotyping by FC can obviate more invasive procedures in the evaluation of this disease. FC was used in all the studies as an ancillary technique, whereas cytogenetic analysis and immunocytochemistry were performed occasionally. As shown in Table 1, the addition of ancillary techniques, mainly FC, increased the sensitivity considerably. Most of the lymphomas in these series were detected. The number of passes varied across the studies. Subclassification of lymphoma was possible in First, although long-term clinical follow-up was carried out in all the studies, diagnosis and subtyping were not confirmed universally by histology. This procedure is particularly important, as subtyping assessed by EUS-FNA does not always correlate with excisional biopsy results, and it is well-known that lymphomas can respond partially to different chemotherapies although a particular chemotherapy is not the most appropriate treatment for a specific lymphoma subtype. Another limitation is the inability to adequately grade follicular lymphomas, one of the most frequent subtypes after large B-cell lymphomas. This step is a key prognostic factor to guide patient management. No information was available about grading. Table 2 Open in a separate window False negative results deserve some comment. Subclassification of lymphomas is conventionally based on histological findings, and this information is imperative for planning treatment. Excisional biopsy of a node is traditionally performed to provide sufficient tissue for histologic, immunologic, molecular biologic assessment, and classification of lymphomas. The series differ in the design prospective or retrospective, techniques used FC, cytogenetic analysis, and histological assessment, needle size 19 G or 22 G or needle type trucut biopsy needle vs. Adequate tissue samples were provided in most cases. Less than six passes were required for lymphoma diagnosis and subclassification in most cases. Table 3 Open in a separate window In 29 patients, subclassification was not possible. These data are in accordance with the study of Ribeiro et al. Interestingly, Yasuda et al. When suspected, it is crucial to achieve the correct diagnosis, because management and prognosis of PPL are completely different from pancreatic adenocarcinoma. The diagnosis and classification of lymphoma were possible in most cases. For splenic tumors, lymphoma is the most common diagnosis.

## 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

However, to obtain an adequate core sample for histological evaluation preserving tissue architecture, large FNA needles are used. Regarding the conventional 19 G FNA needle, several studies have shown its ability to provide histological specimens sufficient to diagnose sarcoidosis or lymphoma and to perform ancillary techniques. However, the number of passes ranges from two to five in all published studies. Finally, the necessity for on-site cytology is questionable. The presence of the cytologist is helpful to exclude epithelial cancer and to confirm the need to take samples for tests required to diagnose lymphoma. However, the presence of the cytologist may not improve the yield of EUS-FNA for lymphoma, because obtaining adequate lymphoid tissue from lymph nodes is usually not difficult as long as enough passes are performed. When the cytologist sees only lymphoid tissue during on-site analysis, it is impossible to diagnose most lymphomas until FC is performed. Therefore, when lymphoma is suspected and an epithelial cancer is very unlikely. For histological samples, onsite analysis is not possible, so the issue is moot. These techniques are a reasonable first choice when superficial nodes or lesions are not accessible.

**Disclosures** The authors declared no conflicts of interest. Funding sources had no involvement in study design, collection, analysis, interpretation of data, writing of the report, or decision to submit the paper for publication.

**Ultrasound-guided fine needle biopsy of the spleen:** Fine-needle aspiration biopsy of hepatic lesions: A meta-analysis and systematic review. Fine needle aspiration diagnosis of intraabdominal and retroperitoneal lymphomas by a morphologic and immunocytochemical approach. Fine needle aspiration biopsy in lymphoma. Radiol Clin North Am. Accuracy of diagnosis of malignant lymphoma by combining fine-needle aspiration cytology with immunocytochemistry and in selected cases, Southern blotting of aspirated cells: Value and limitations of fine-needle aspiration cytology in diagnosis and classification of lymphomas: Diagnosis and subclassification of primary and recurrent lymphoma. The usefulness and limitations of combined fine-needle aspiration cytology and flow cytometry. Am J Clin Pathol. Utilization of fine-needle aspiration cytology and flow cytometry in the diagnosis and subclassification of primary and recurrent lymphoma. Diagnosis of deep-seated lymphomas by endoscopic ultrasound-guided fine needle aspiration combined with flow cytometry. Endobronchial ultrasound-guided transbronchial needle aspiration for the evaluation of suspected lymphoma. Diagnosis of peripheral T-cell lymphoma by fine-needle aspiration biopsy: Diagnosis of lymphoma by fine-needle aspiration cytology using the revised European-American classification of lymphoid neoplasms. Endoscopic ultrasound-guided fine-needle aspiration of lymph nodes: EUS-guided fine-needle aspiration combined with flow cytometry and immunocytochemistry in the diagnosis of lymphoma. Diagnosis of deep-seated lymphoma and leukemia by endoscopic ultrasound-guided fine-needle aspiration biopsy. Flow cytometric analysis of deep-seated lymph nodes. EUS-guided FNA combined with flow cytometry in the diagnoses of suspected or recurrent intrathoracic or retroperitoneal lymphoma. Role of endoscopic ultrasound-guided fine-needle aspiration with flow cytometry to diagnose lymphoma: Endoscopic ultrasound-guided fine-needle aspiration with or without flow cytometry for the diagnosis of primary pancreatic lymphoma - a case series. Transgastric endoscopic ultrasound-guided fine-needle aspiration biopsy and flow cytometry of suspected lymphoma of the spleen. Endoscopic ultrasound-guided fine needle aspiration biopsy for diagnosis of lymphoproliferative disorders: Utility of fine-needle aspiration as a diagnostic technique in lymphoma. How I treat patients with diffuse large B-cell lymphoma. Kwan V, Gottlieb D. Endoscopic ultrasound-fine needle aspiration for the diagnosis of lymphoma: Endoscopic-ultrasound-guided mural trucut biopsy in the investigation of unexplained thickening of esophagogastric wall. Endoscopic ultrasound-guided fine-needle aspiration biopsy for lymphadenopathy of unknown origin. EUS-guided biopsy for the diagnosis and classification of lymphoma. Usefulness of endoscopic ultrasound-guided fine needle aspiration EUS-FNA for undiagnosed intra-abdominal lymphadenopathy. Endoscopic ultrasound-guided fine needle aspiration biopsy for splenic tumor: The prospective randomized, controlled trial of endoscopic ultrasound-guided fine-needle aspiration using 22G and 19G aspiration needles for solid pancreatic or peripancreatic masses. Advantage of EUS Trucut biopsy combined with fine-needle aspiration without immediate on-site cytopathologic examination. The yield of

## 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

endoscopic ultrasound-guided fine needle aspiration for histological diagnosis in patients suspected of stage I sarcoidosis. Feasibility and yield of a new EUS histology needle:

## 10. EUS GUIDED FINE NEEDLE ASPIRATION OF LYMPH NODES PART I (GASTROINTESTINAL DISEASE) pdf

Pennsylvania and Middle Atlantic States genealogical manuscripts Alchemy The Third Column Of Medicine Civil society : active or passive? Manzanar National Historic Site, California 4.1.3. Corporate and Income Tax Administration 77 How to Do Everything with Google Tools (How to Do Everything) Millons theory of personality The seven mountains of Thomas Merton Hail Caesar (Push) Proceedings Wind Energy R&d Contractors Meeting East Kilbride 8 to 10 Feb 1995 (Eur.) The constitutionality of slavery prohibition in the territories MCSA/MCSE Windows 2000 PASS-IT(70-215 Exam Preparation US Federal official publications Undoing the damage with system restore Introduction to integral calculus AZ Reversible Road Map of Great Britain Halifax Commission, 1877 For health and beauty Twelve views of Kensington and Chelsea, c. 1695-1822 Stud Sol Linear Alg 2e /Fraleigh Dead Bank Walking Principles of genetics by robert h tamarin Good-Bye, Mr. Chips/Pbn 20085/2-Cassettes Reptilian brain in humans The new common wealth Part 3 : Language and cognitive development in children. Atlanta womana club cook book Selected vacanas of Sarvajna The art of arranging silk flowers The Florentine dagger Nissan sunny 91 95 manual Emergency action plans C sharp windows application tutorial I Dont Want to Play With My Friends (I Dont Want to Series) When I Grow Up I Can Be. Allied Special Forces (Elite Attack Forces) The All-Star Game The international thought of Martin Wight Ian Hall. The art of the puppet. Basic Relaxation and Ego-Strengthening (CD)