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MOHAMMAD AL-HADDAD: Hello, my name is Mohammad Al-Haddad. I'm an associate professor of medicine at Indiana University Medical School. Today we'll be discussing a fine needle biopsy. We'll review clinical case presentation, as well as discuss best practices specifically pertaining to the Acquire Fine Needle Biopsy Platform.

We all know that fine needle aspiration remains the most widely utilized US guided sampling technique. However, its sensitivity can be limited, depending on many factors, including the type of the lesion and the type and size of the needle used. A new generation of fine needle biopsy devices have become available in the recent years. And this helped improve the tissue yield compared to the first generation of true cut biopsy needles.

Nowadays, fine needle biopsy plays an increasing role in sampling solid lesions. However, its role is yet to be defined and is currently mainly limited as a salvage technique when FNA fails to provide a clear cytological diagnosis. Recent studies have shown that fine needle biopsy can increase cost effectiveness from the perspective of a third party payer, and this was applicable to both pancreatic and non-pancreatic lesions.

The objectives of our study were to evaluate the performance characteristics of the Acquire 22 gauge fine needle biopsy device as a first line needle in sampling all solid lesions under endoscopic ultrasound guidance. To that end, we sought to assess the cytological and histological yield of the fine needle biopsy samples compare to historical find needle aspirate samples, which were the controls in this case. We also sought to compare the number of passes required to achieve a clinical diagnosis by each method. Finally, we assessed the overall diagnostic yield of fine needle biopsy versus fine needle aspiration.

In our study, we try to define the best practices of fine needle biopsy using that Acquire Needle Platform. We initially identify the lesion under endoscopy ultrasound. We interrogate the area with Doppler to identify a vessel free track. Following complete withdrawal of the stylet, low volume negative pressure up to five mls can be applied. Negative pressure magnitude can be increased in subsequent passes that are dedicated for cell block. If possible, fanning should be performed.

And we usually prepare one to two smears with Diff Quick staining and alcohol fixation. And towards the end of the sampling process, we usually dedicate two passes for cell block, which could be used for immunostains as needed and/or genetic or molecular profiling.

Here are the results of our study. 50 patients underwent EOS guided FNB of 51 solid lesions using the Acquire 22 gauge fine needle biopsy device. Data from this cohort was compared to 50 recently obtained FNA specimens from solid lesions using 22 gauge Expect FNA platform. The mean histology scores on the cell block were significantly higher in the FNB group compared to the FNA group.

In addition, there was a lower mean number of passes in the FNB group compared to the FNA group. The degree of tumor differentiation for primary tumors, original metastatic lesions, and mitotic index in neuroendocrine and stromal tumors was adequately assessed in all qualifying lesions based on cell block in the FNB group. We have not witnessed any significant adverse events during or immediately after the procedure and, in follow up, to 72 hours after the exam.

Additional results from our study can be found in the stables. We demonstrated that the mean size of the lesion was not different in the two groups. In addition, the location of the lesions, pancreatic versus pancreatic, was also no different between the FNB and the FNA groups. I would like to highlight that the cytology scores of the smears were not statistically different among the two groups as well, indicating that fine needle biopsy is associated with similar cytological yield for on site review compared to FNA specimens.

We also noted that there were fewer number of passes dedicated for smears in the FNB group compared to the FNA group. In addition, cell block histology scores were significantly higher for the FMB group compared to the FNA group. The overall number of passes performed in their FNB group was also significantly lower than that in the FNA group. And finally, our diagnostic field was numerically higher in the FNB group at 96% compared to 87% the FNA group, although this did not reach statistical significance.

Next we would like to present a case where a fine needle biopsy was the only US guided sampling technique that was capable of securing a diagnosis and improving patient care and outcomes. A 77-year-old female patient presented with a three month history of progressive epigastric abdominal pain, early satiety, nausea, and postprandial vomiting associated with 30 pounds weight loss. A CT scan of the abdomen who was performed and revealed diffuse gastric thickening, most notable in the antrum.

Upper endoscopy at an outside facility demonstrated circumferential mucosal thickening and edema with restricted gastric lumen. Mucosal biopsies showed chronic gastritis with intestinal metaplasia and lymphocytic infiltrate with no evidence of dysplasia or malignancy and were also negative for H. Pylori. Endoscopic ultrasound was performed at the outside facility and showed significant gastric wall thickening and some difficulty passing the EUS scope beyond the gastroesophageal junction. Mucosa and submucosa were thickened at seven millimeters on that exam. Fine needle aspiration was performed and showed no evidence of malignancy. Because the biopsies were repeated during endoscopic ultrasound procedure and showed chronic and active gastritis with no evidence of H. Pylori by immunostains.

We opted to repeat and endoscopic ultrasound at our institution. This exam showed persistent gastric thickening on both endoscopy and endoscopic ultrasound. Find needle biopsy was performed with an Acquire 22 gauge fine needle biopsy device. Cytology smears were prepared, and two additional passes were submitted for cell block with visible mini-cores.

The final cytology review showed scattered single atypical cells with high nuclear to cytoplasmic ratio. Additional clusters of atypical epithelial cells were embedded with an occasional stromal fragments, as shown in figure 5. Review of cell blocks stained by HE showed malignant cells infiltrating through smooth muscle and fibrous tissue as well as clusters of tumor cells as demonstrated in figure 6.

The pathological diagnosis of poorly differentiated adenocarcinoma was made, and the clinical picture of linitis plastica was confirmed. The patient was subsequently referred to medical oncology and surgery after an eight week delay in securing a diagnosis. The decision was made to pursue neoadjuvant therapy. The patients underwent total gastrectomy with lymphadenectomy two months after completion of neoadjuvant therapy and recovered well from her surgery.

We all know that linitis plastica is a challenging clinical entity. Often mucosal biopsies are insufficient to sample deep wall infiltration of the tumor. Fine needle aspiration is typically hypo cellular or non diagnostic in the vast majority of cases or at times might yield atypical cells that are not sufficient for a cytological diagnosis. At the time, when more and more patients are directed towards new neoadjuvant therapy, we find a need for a solid and definitive pathological diagnosis before initiation of treatment.

In conclusion, our study demonstrated that EUS guided fine needle biopsy can be used as a first line sampling technique for all solid lesions. Fine needle biopsy using the Acquire needle platform appears to provide histologically superior and cytologically comparable specimens to FNA in fewer passes and potentially lower cost. In centers where rapid on site evaluation is not available, fine needle biopsy may be preferentially used due to its high tissue diagnostic yield.