Correlating Cellular and Diagnostic Yield of Endobiliary Brush Cytology to Fine Needle Aspiration Using a New Large Caliber Endobiliary Brush in Suspected Pancreaticobiliary Malignancies - a Single Center Retrospective Review

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Background

- Endoscopic ultrasound guided fine needle aspiration (EUS-FNA) is used increasingly for the cytopathologic diagnosis of pancreaticobiliary malignancies. While some studies have suggested that EUS-FNA of malignant biliary structure is superior to conventional endobiliary brushing, other literature claims that either procedure alone is insufficient for reliable diagnosis. ⁴
- Despite the growing use of EUS-FNA, endobiliary brush sampling during endoscopic retrograde cholangiopancreatography (ERCP) is a useful diagnostic tool and remains an initial method for evaluating biliary duct structures (Figures 1 and 2), especially where no mass is visible on imaging. ³
- However, traditional endobiliary brush sampling is known to have poor diagnostic yield and a variable sensitivity between 27-45%. ⁴
- The US Endoscopy Infinity® ERCP sampling device is “built for collecting substantial and quality samples” by employing two types of bristles, spaces for collecting cells, a stiffer brush material, and a stiffer device.” ⁵
- The aim of our study is to investigate the results obtained from endobiliary brush cytology with the US Endoscopy Infinity® ERCP sampling device correlate to results obtained from EUS-FNA in patients with a suspected pancreaticobiliary malignancy.

Methods

- A systematic retrospective chart review at a large tertiary care referral center was performed.
- Over 200 patients underwent EUS-FNA and/or ERCP due to two interventional endoscopists from January 1, 2013 to July 5, 2014.
- The procedures performed due to concern for pancreaticobiliary malignancy were reviewed and only patients who underwent both procedures were included. Patients with previously known gastrointestinal malignancy were excluded leaving a total population of 29 patients.
- Endobiliary brush cytology and EUS-FNA results were reviewed and compared for sample quality and diagnostic concern.
- Sample quality was classified as adequate or inadequate for diagnosis and then stratified according as result to negative, atypical, suspicious, or diagnostic for malignancy.
- All endobiliary brush cytology was performed using the US Endoscopy Infinity® ERCP sampling device.

Results:

- Twenty-nine patients underwent both ERCP with endobiliary brush cytology and EUS-FNA due to concern for potential pancreaticobiliary malignancy. Twenty-one were combined procedures.
- Endobiliary brush cytology with the US Endoscopy Infinity® ERCP sampling device resulted in an adequate sample yield 97% of the time, whereas 76% of EUS-FNA were adequate.
- Only 52% of patients had correlating studies and this only improved to 82% when less than optimal and inadequate samples were removed.
- When one study was diagnostic for malignancy, the other study correlated only 53% of the time.
- After correcting for inadequate quality:
  - When EUS-FNA was diagnostic for malignancy, brush cytology correlated in 64% of cases.
  - When brush cytology was diagnostic for malignancy EUS-FNA had 70% correlation.
- On two occasions brush cytology was diagnostic for malignancy where EUS-FNA was not:
  - One less than optimal sample resulted as atypical (pancreatic adenocarcinoma) and one negative result (cholangiocarcinoma).

Discussion:

- EUS-FNA and endobiliary brush cytology are both used in evaluation of potential pancreaticobiliary malignancies. However, as our data demonstrates, the results of these studies can have substantial correlation. ³
- Many factors can play into obtaining an adequate diagnosis with brush cytology type of tumor location of the tumor categorization of results, ³,⁴,⁸ pathologist experience, ³ sampling technique, ⁳ and type of brush. ³
- The literature has also suggested that brush cytology may be superior for biliary strictures and EUS-FNA for pancreatic masses. ⁶
- Previous studies have demonstrated that newer technologies do not increase detection rates compared to traditional brush cytology. ³
- In our study the US Endoscopy Infinity® ERCP sampling device resulted in an adequate cellular yield in 97% of cases. This is much higher than previous literature has shown.
- We have also highlighted two cases where endobiliary brush cytology was able to diagnose where the use of EUS-FNA was not: one pancreatic adenocarcinoma and one cholangiocarcinoma.
- Our study supports the claim that endobiliary brush cytology and EUS-FNA should be used in a complementary fashion ³ and suggests that brush cytology should remain the initial diagnostic test of choice for biliary strictures ⁴ even where EUS-FNA is available, especially if a mass is not visualized on imaging. ³

References: