

University of British Columbia

Endoscopic Retrograde Cholangiopancreatography (ERCP) in Tertiary Care Hospital: Clinical Evidence and Literature Assessing Diagnostic Performance

Tami Lin, Adrian Bak, Brent Parker, Fahd Jowhari, Jeremy Dick, Katie Baba, Raj Brar, Justin Lambert, Murray Savard, Rafael Perini

Objectives

- To assess diagnostic performances of ERCP techniques in the setting of indeterminate biliary strictures (IDBS) at Kelowna General Hospital
- To carry out internal quality improvement by comparing our findings with corresponding literature values as well as diagnostic performances of other modalities of pancreatobiliary tissue acquisition

Introduction

- Pancreatobiliary malignancies often present with late disease, with only 30% being resectable tumours, contributing to poor prognosis and outcome<sup>1</sup>
- ERCP is a mainstay for diagnosing and treating conditions of the bile and pancreatic duct
- Indeterminate biliary strictures (IDBS) are lesions whose nature remain ambiguous even after imaging, ERCP, and laboratory analysis, and run the risk of misdiagnosing cholangiocarcinomas or pancreatic adenocarcinomas<sup>2</sup>
- Current ERCP techniques have statistically offered sensitivities and specificities below desired values

Methods

- Retrospective study of 3723 ERCP procedures
- 222 patients (285 ERCP procedures) met study inclusion/exclusion criteria
- Patients were ≥19 years old who had undergone fluoroscopy-guided pancreatic and/or biliary ERCP sampling at KGH for which cytology brushing and/or tissue biopsies were obtained
- Demographic, clinical, and disease information was collected
- Three main ERCP techniques were analyzed: brushing alone, biopsy alone, or brushing and biopsy dual modality approach
- Test performances of ERCP sampling methods were determined by reviewing clinical reports

Results

- 125 (56%) male patients and 97 (44%) female patients
- Mean age 71 years old (range 40-95)

Table 1. Test performance of ERCP sampling modalities.

Clinical Characteristics	N (%)
Mass identified on CT	99 (45%)
History of pancreatitis	20 (9%)
History of primary sclerosing cholangitis	5 (2%)
Abnormal liver enzymes at presentation	157 (71%)
Abnormal lipase levels at presentation	48 (22%)
History of cancer	37 (17%)
History of metastases	23 (10%)

Table 2. Test performance of ERCP sampling modalities.

	Brushing Alone	Biopsy Alone	Biopsy and Brushing
Total (N)	85 (29%)	36 (13%)	164 (58%)
Diagnostic Results			
Sensitivity	73%	56%	79%
Specificity	96%	93%	94%
Accuracy	85%	83%	86%
Prevalence of cancer in this population	40 (47%)	9 (25%)	84 (51%)

Results (continued)

Table 3. Test performance of ERCP sampling modalities in the literature.

Modality	Sensitivity	Specificity	Accuracy
Brushing Alone <sup>3-7</sup>	6 – 64%	100%	38 – 80%
Biopsy Alone <sup>6-11</sup>	43 – 81%	90 – 100%	65 – 81%
Biopsy and Brushing <sup>12</sup>	54 – 65%	99 – 100%	70 – 73%
SOC for Visual Inspection <sup>12,13</sup>	78 – 100%	77 – 96%	80 – 97%
SOC Biopsy <sup>12,13</sup>	38 – 88%	82 – 100%	61 – 96%
EUS FNA <sup>14,15</sup>	75%	100%	79%

Discussion & Conclusion

- Combining modalities of tissue acquisition appears to improve both sensitivity and specificity, which is supported in existing literature
- Brush cytology remains first-line method of obtaining tissue at ERCP despite its low sensitivity
- There is a definite need for more effective screening and diagnostic measures in pancreatobiliary malignancies

References

1. Canadian Cancer Statistics Advisory Committee, "Canadian Cancer Statistics 2018," Toronto, 2018

2. A. Sinh, A. Gelrud and B. Agarwal, "Biliary strictures: diagnostic considerations and approach," Gastroenterology Report, vol. 3, no. 1, pp. 22-31, 2015

3. A. S. Burnett, T. J. Calvert and R. J. Chokshi, "Sensitivity of endoscopic retrograde cholangiopancreatography standard cytology: 10-y review of the literature," Journal of Surgical Research, vol. 184, no. 1, pp. 304-311, 2013.

4. L. J. Layfield, T. D. Wax, J. G. Lee and P. B. Cotton, "Accuracy and morphologic aspects of pancreatic and biliary duct brushings," Acta cytologica, vol. 39, no. 1, pp. 11-18, 1995.

5. G. Kodjan and A. N. Smith, "Bile duct brush cytology: potential pitfalls in diagnosis," Diagnostic Cytopathology, vol. 16, pp. 358-363, 1997.

6. T. Ponchon, P. Gagnon, F. Berger, M. Labadie, A. Liaras, A. Chavallion and R. Bory, "Value of endobiliary brush cytology and biopsies for the diagnosis of malignant bile duct stenosis: results of a prospective study," Gastrointestinal Endoscopy, vol. 42, no. 6, pp. 565-572, 1995.

7. V. Pugliese, M. Conio, G. Nicolò, S. Saccomanno and B. Gatteschi, "Endoscopic retrograde forceps biopsy and brush cytology of biliary strictures: a prospective study," Gastrointestinal Endoscopy, vol. 42, no. 6, pp. 520-526, 1995.

8. Y. Kubota, M. Takaoka, K. Tani, M. Ogura, H. Kin, K. Fujimura, T. Mizuno and K. Inoue, "Endoscopic transpapillary biopsy for diagnosis of patients with pancreaticobiliary ductal strictures," Aenican Journal of Gastroenterology, vol. 88, no. 10, pp. 1700-1704, 1993.

9. M. Sugiyama, Y. Atomi, N. Wada, A. Kuroda and T. Muto, "Endoscopic transpapillary bile duct biopsy without sphincterotomy for diagnosing biliary strictures: A prospective comparative study with bile and brush cytology," American Journal of Gastroenterology, vol. 91, no. 3, pp. 465-467, 1996.

10. R. Schoell, M. Haefner, F. Wrb, F. Pfeffel, C. Stain, R. Poetzi and A. Gangl, "Forceps Biopsy and Brush Cytology during Endoscopic Retrograde Cholangiopancreatography for the Diagnosis of Biliary Stenoses," Scandinavian Journal of Gastroenterology, vol. 32, no. 4, pp. 363-368, 1997.

11. J. Jallwala, E. L. Fogel, S. Sherman, K. Gottlieb, J. Flueckiger, L. G. Bucksot and G. A. Lehman, "Triple tissue sampling at ERCP in malignant biliary," Gastrointestinal Endoscopy, vol. 51, no. 4, pp. 383-390, 2000.

12. U. Navaneethan, M. K. Hasan, V. Louridasamy, B. Njei, S. Varadarajulu and R. H. Hawes, "Single-operator cholangioscopy and targeted biopsies in the diagnosis of indeterminate biliary strictures: a systematic review," Gastrointestinal Endoscopy, vol. 82, no. 4, pp. 608-614, 2015.

13. Y. K. Chen, M. A. Parsi, K. F. Binmoeller, R. H. Hawes, D. K. Pleskow, A. Slivka, O. Haluszka, B. T. Petersen, S. Sherman, J. Devière, S. Meisner and P. Stevens, "Single-operator cholangioscopy in patients requiring evaluation of bile duct disease or therapy of biliary stones (with videos)," Clinical Endoscopy, vol. 74, no. 4, pp. 805-814, 2011.

14. D. M. DTH, M. EGH, B. WM, D. M. ETH, B. F. K. A. M. SE and A. A. EL, "Endoscopic retrograde cholangiopancreatography versus endoscopic ultrasound for tissue diagnosis of malignant biliary stricture: Systematic review and meta-analysis," Endoscopic Ultrasound, vol. 7, no. 1, pp. 10-19, 2018.

15. A. Sadeghi, M. Mohamadnejad, F. Islami, A. Keshkar, M. Biglari, R. Malekzadeh and M. A. Eloubeidi, "Diagnostic yield of EUS-guided FNA for malignant biliary stricture: a systematic review and meta-analysis," Gastrointestinal Endoscopy, vol. 83, no. 2, pp. 290-298, 2016.