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ANATOMICAL PATHOLOGY

Observations on the application of the Papanicolaou Society of Cytopathology standardised terminology and nomenclature for pancreaticobiliary cytology

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Summary

In 2014 the Papanicolaou Society of Cytopathology (PSC) published a system of standardised terminology and nomenclature for pancreaticobiliary cytology (STNPC). In the present study, 232 previously reported pancreaticobiliary cytology specimens were categorised according to this set of guidelines in order to identify potential challenges to implementation of the PSC system into routine practice. Overall, 207 (89%) of the cases were found to comply with the PSC scheme in their original form. Twenty-five cases (11%) demonstrated that the application of the PSC system would result in a change of category. In the majority of these cases, the change was related to the method of categorising low grade and premalignant neoplasms, using the categories of 'Neoplastic: other' (a new category unique to STNPC classification scheme) and 'Atypical', for specimens deemed to be diagnostic of or suspicious for these lesions, respectively. The study also highlighted the emphasis on the inclusion of imaging context and cyst fluid analysis in the interpretation of endoscopic ultrasound guided fine needle aspiration specimens in the guidelines. The STNPC offers an approach to pancreaticobiliary cytology that reflects the considerable variation in the nature and treatment of the entities that may be encountered in these specimens. Challenges in utilisation of the scheme include awareness of the unique approach to the categorisation of premalignant and low grade neoplasms, and the amount and quality of available clinical and imaging information.

Key words: Pancreaticobiliary cytology; EUS, FNA pancreas; bile duct brushing cytology; structured reporting.

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INTRODUCTION

Standardised reporting systems are increasingly utilised in pathology reports. Ideally, a standardised reporting system facilitates consistent reporting of concise, unambiguous diagnostic information that is relevant to management algorithms, thereby improving usability for clinicians and providing better support for management decisions.[1] Additionally, standardised reporting is conducive to data capture, enabling usage in areas such as audit, clinical trials or population based research.[2] The implementation of standardised reporting systems has been particularly successful in the reporting of cervical cytology, and more recently, thyroid cytology.[3–5]

The Papanicolaou Society of Cytopathology (PSC) has published standardised terminology and nomenclature for pancreaticobiliary cytology (STNPC).[6] There are adjunctive clinical guidelines which encompass the indications, techniques and management strategies for endoscopic ultrasound (EUS) guided fine-needle aspiration (FNA).[7–10] The six-tiered classification scheme for pancreaticobiliary reporting is comprised of the following categories:

I. Non-diagnostic
II. Negative for malignancy
III. Atypical
IV. Neoplastic: benign and other
V. Suspicious for malignancy
VI. Positive for malignancy

The scheme applies to both pancreatic EUS-FNA and bile duct brushing (BDB) specimens, with the exception of category IV 'Neoplastic: benign and other', which is relevant to EUS-FNA specimens, but not to BDB. The present study aims to identify existing pancreaticobiliary cytology reporting practices that differ from the STNPC proposed by PSC in order to predict challenges that may be encountered in implementing the PSC system.

MATERIALS AND METHODS

All pancreatic EUS-FNA and BDB cases reported at Austin Pathology over a 2 year period between October 2012 and September 2014 were reviewed and re-categorised according to the criteria presented in the STNPC guidelines. Re-categorisation was based on the content of the written report, request form information and results of cyst fluid analysis if performed (no other types of ancillary testing were performed on any of the specimens); slides were not reviewed. When incorporating cyst fluid analysis results into the re-categorisation of cases, a carcinoembryonic antigen (CEA) level greater than 200 ng/mL was used to support a diagnosis of a mucinous cyst.[11–13] A total of 232 cases, including 135 EUS-FNA and 97 BDB specimens were re-categorised. During this process, a qualitative assessment was made in each case to determine whether the original report reflected the resulting category, whether any alterations would be required in order for the report to comply with the new system, and if so, what types of alterations would be required. The initial assessment was performed by the first author. Cases for which there was any doubt regarding the re-classification were also reviewed by the second author and a consensus decision reached.

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At the time the cases were originally reported, no specific structured reporting system was in place for pancreaticobiliary cytology in our institution and CEA results were separately reported. A basic schema utilising the five categories of: non-diagnostic, negative for malignancy, atypical, suspicious for malignancy and malignant, was commonly employed; however, there were multiple reports that offered a specific diagnosis or a descriptive statement not equivalent to any of these categories. For the purpose of comparison, cases with a specific diagnosis were grouped together and the small number of remaining cases without a specific diagnosis or a clear diagnostic category were grouped under the heading of miscellaneous.

RESULTS

The distribution of cases in each category according to the original reports, the adjustments made during re-categorisation, and the distribution of cases in each category following re-categorisation are shown in Tables 1 and 2.

It was assessed that the reports for 111 of 135 (82%) EUS-FNA cases and 96 of 97 (99%) BDB cases readily conformed to the STNPC; that is, these reports demonstrated a conclusion statement equivalent to one of the STNPC categories, accompanied by a microscopic description, clinical information/imaging results and cyst fluid analysis consistent with that category according to the PSC guidelines.

Twenty-five (24 EUS-FNA and one BDB) cases were identified that did not readily conform to the STNPC system. In twenty of these cases the reasons were related to the diagnosis of or suspicion of a mucinous neoplasm [inclusive of both mucinous cystic neoplasms and intraductal papillary mucinous neoplasms (IPMN)] or neuroendocrine tumour, with alterations required for the following reasons: (1) a cyst fluid analysis finding of CEA greater than 200 ng/mL resulted in a categorisation of 'Neoplastic: other' in cases originally interpreted as negative for malignancy (four cases), atypical (one case) or miscellaneous (one case); (2) cases were categorised as 'Neoplastic: other' due to a diagnosis of a mucinous neoplasm (two cases) or neuroendocrine tumour (five cases) made on cytological grounds; or (3) cases reported as suspicious for, but not diagnostic of a mucinous neoplasm (six cases) or neuroendocrine tumour (one case) were re-categorised as 'Atypical'. One EUS-FNA specimen originally reported as 'Negative for malignancy', was found to be in the setting of a well-defined mass demonstrated on imaging, and was re-categorised as 'Non-diagnostic'. Finally, three EUS-FNA specimens and one bile duct brushing specimen originally placed in the miscellaneous category were re-categorised as 'Non-diagnostic' because the reports contained a microscopic description implying an inadequate sample (for example duodenal or gastric sampling only), with a conclusion stating or implying the specimen was negative for malignancy.

DISCUSSION

Cytological assessment can be a powerful adjunct in the separation of low grade pancreatic neoplasms from the more common and aggressive pancreatic ductal carcinoma. In our study the greatest differences between existing reporting practices and those proposed in the STNPC relate to the categorisation of low grade neoplasms (including premalignant neoplasms and neoplasms of uncertain malignant potential) such as mucinous neoplasms and neuroendocrine tumours (Fig. 1A–C), in EUS-FNA specimens. The STNPC utilises a new category, unique to this scheme, that of 'Neoplastic: other', for specimens diagnostic for low grade neoplasms, and the category of 'Atypical' for specimens suspicious for, but not diagnostic of these lesions. The rationale for the creation of the category 'Neoplastic: other' is essentially that low grade neoplasms do not belong in any of the other more familiar categories. The PSC maintain that the category of 'Positive for malignancy' should be reserved for aggressive cancers such as pancreatic adenocarcinoma (Fig. 1D), which confer a worse prognosis and generally necessitate different treatment compared with low grade neoplasms. Lymphoma (Fig. 1E) and high grade neuroendocrine carcinomas are also included in the malignant category.

The categories of 'Atypical' and 'Suspicious for malignancy' are also considered unsuitable in cases that are diagnostic of a low grade neoplasm, as they imply uncertainty about the diagnosis and may lead to unnecessary additional investigations. Similarly, the PSC maintain that category V 'Suspicious for malignancy' should be reserved for cytology specimens with features suspicious for aggressive cancers and that the more appropriate category for those that are suspicious for, but not diagnostic of a low grade neoplasm is the category of 'Atypical'. In addition, the STNPC aims to

Table 1 Summary of redistribution of cases for EUS-FNA specimens

	Distribution of cases by original report	Category changes due to application of STNPC	Distribution of cases after re-categorisation
Non-diagnostic	20		24
Negative for malignancy	47	1 → Non-diagnostic 4 → Neoplastic	42
Atypical	11	1 → Neoplastic	17
Neoplastic			13
Suspicious for malignancy	5		5
Positive for malignancy	34		34
Mucinous neoplasm	2	2 → Neoplastic	
Neuroendocrine tumour	5	5 → Neoplastic	
Suspicious for mucinous neoplasm	6	6 → Atypical	
Suspicious for neuroendocrine tumour	1	1 → Atypical	
Miscellaneous	4	3 → Non-diagnostic 1 → Neoplastic	

STNPC, standardised terminology and nomenclature for pancreaticobiliary cytology.