

The best approach for sampling of pancreatic neuroendocrine tumors – EUS-FNA or EUS-FNB?



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The limitations of transabdominal ultrasound in diagnosis of pancreatic diseases [1] were the driving force in developing endosonography (EUS) with the first echoendoscope being launched in 1980 [2]. The curvilinear array design of modern echoendoscope transducer heads enables EUS-guided sampling of lesions [3]. Traditionally, the principal sampling technique has been EUS-guided fine-needle aspiration (EUS-FNA) with open-tip needles designed for cytology [4].

Among all neoplasms originating from the pancreas, pancreatic neuroendocrine tumors (PanNETs) constitute a relatively rare entity. Incidence of PanNETs reportedly is increasing [5], and these tumors are challenging to diagnose with imaging alone [6], which implicates sampling of lesions suspected for PanNET. In addition, immunostaining for entity-specific tumor markers is required for reliable microscopic diagnosis [7].

Problematically, EUS-FNA is suboptimal in solid pancreatic lesions, with an 85% sensitivity for malignancy [8]. Furthermore, a majority of publications include mostly or exclusively pancreatic ductal adenocarcinomas [9, 10]. The few studies addressing PanNETs have shown varying diagnostic sensitivity for EUS-FNA, ranging from 47% [11] to 90% [12], (► **Fig. 1**).

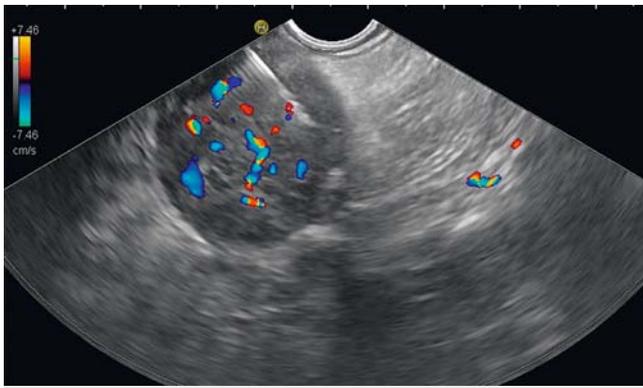
In recent years, a new generation of biopsy needles (EUS-FNB [fine-needle biopsy]) has been developed for acquisition of whole tissue samples [13–15]. At present, it is not known whether FNB needles and processing of histology specimens can improve diagnosis of suspected PanNETs and motivate a shift from EUS-FNA.

In this issue of Endoscopy International Open, Eusebi et al contribute new knowledge on this important topic by investigating the diagnostic yield and sensitivity of EUS-FNB. The study has a retrospective design and it was conducted in a two-center setting during a 13-year period (2004–2017). Ex-

clusively PanNETs were included and 102 EUS-guided sampling procedures were analyzed in 91 patients. Sampling was performed either by EUS-FNA (22/25-gauge needle), by EUS-FNB, or by both modalities. From 2004 to 2011, a 19-gauge Quick-Core FNB-needle (Cook Medical, Limerick, Ireland) was used while using a 22/25-gauge reverse bevel ProCore FNB-needle (Cook Medical) or a 22-gauge opposing bevel SharkCore FNB-needle (Medtronic, Minneapolis, Minnesota, United States) from 2011 to 2017.

The authors report that the diagnostic yield, i. e. the acquisition of a macroscopically adequate sample, was 85% (35/41) in EUS-FNB and 78% (69/89) in EUS-FNA. In an intention-to-diagnose analysis, the final diagnostic sensitivity of EUS-FNB and EUS-FNA was 80% (33/41) and 69% (61/89), respectively. In dual sampling procedures (n=28), the combination of EUS-FNB and EUS-FNA had a significantly higher diagnostic yield than EUS-FNA alone, 96% (27/28) vs 75% (21/28), $P=0.023$. Either of the two techniques was diagnostic for PanNET in all of the 27 adequate samples. Seven EUS-FNA samples were inadequate for a conclusive diagnosis and in six of seven of these cases (86%), the EUS-FNB sample was diagnostic. On the other hand, in six cases EUS-FNB was non-diagnostic and in all of these six cases, EUS-FNA was diagnostic. No noticeable difference in diagnostic performance was seen between the three FNB needles. No adverse events were recorded after EUS-FNB, which is a finding in line with the results of other studies [14, 16].

The study by Eusebi et al is important because a high number of patients were included and small PanNETs were not excluded. Moreover, few studies on EUS-FNB have been performed in cohorts containing exclusively PanNETs [17]. There are some weaknesses in the study discussed by the authors. As



► **Fig. 1** EUS-FNA of a hypoechoic, highly vascularized PanNET.

an example, different types of FNB needles were used, one of which – the Quick-Core needle – has been discarded by most endosonographers due to a high frequency of technical failures and a low diagnostic accuracy [18].

According to a recent study on solid pancreatic lesions [19], the accuracy of the reverse bevel FNB needle was found inferior (74%) to that of the opposing bevel FNB needle (92%). The number of cases sampled by EUS-FNB in the study by Eusebi and co-workers was not sufficient to determine which FNB needle is the superior one. Furthermore, there are yet other FNB needles available, such as the Franseen tip needle [20].

Importantly, the comparison of EUS-FNB and EUS-FNA is not exclusively a comparison between needles but rather a comparison between two different diagnostic approaches, which also include sampling maneuvers, sample preparation, and sample assessment by the (cyto)pathologist. Poor quality at any of these steps will result in a non-diagnostic work-up. This is a crucial aspect to keep in mind when interpreting studies investigating the accuracy of EUS-guided sampling.

Even though Eusebi and co-workers present valuable new data, it remains to be decided to what extent EUS-FNB may be superior to EUS-FNA in the work-up of suspected PanNETs. This study, like others [21], shows that EUS-FNB is a useful adjunct to EUS-FNA. Whether EUS-FNB should be used as the primary technique, or as a rescue technique after an unsuccessful EUS-FNA, warrants further investigation. Studies analyzing the benefit of combining a 25-gauge FNA needle and a 22-gauge reverse bevel FNB needle in the same solid pancreatic lesion have shown contradictory results [21, 22]. Moreover, such an approach implicates increased costs and a prolonged procedural time. Therefore, dual-modality sampling should be considered only in strictly selected cases. Future studies focusing on PanNETs should be designed as prospective, randomized trials using a predefined set of FNA and FNB needles with surgical specimens as the reference standard.

Competing interests

None

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