EDITORIAL

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Choosing needles wisely: 19-G conventional vs. Franseen needles in endoscopic ultrasound-guided fine-needle aspiration for malignant lymphoma diagnosis and classification

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See "Comparison of 19-gauge conventional and Franseen needles for the diagnosis of lymphadenopathy and classification of malignant lymphoma using endoscopic ultrasound fine-needle aspiration" by Mitsuru Okuno, Keisuke Iwata, Tsuyoshi Mukai, et al., Clin Endosc 2024;57:364–374.

The etiologies of abdominal lymphadenopathy (LAD) range from benign diseases to malignancies. Tuberculosis, lymphoma, and metastatic cancer are reportedly the most common causes of abdominal LAD depending on patient characteristics and geographical differences in disease prevalence.[1-3] Diagnostic challenges, especially lymphoma, may arise including adequate and high-quality tissues for pathological, cytological, and cytogenetic assessment.[4] Endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA) has been the mainstay diagnostic tool for evaluating abdominal LAD. A meta-analysis of 26 studies (2,833 lymph nodes) demonstrated that EUS-FNA provided a pooled sensitivity of 87% (95% confidence interval [CI], 86%–90%), specificity of 100% (95% CI, 99%–100%), and area under the curve of 0.99 for differentiating benign and malignant lesions. The sensitivity increased when rapid on-site evaluation (ROSE) was applied.[5]

Despite outstanding diagnostic performance, the main limitation of FNA is inadequate sampling and a lack of tissue architecture. The quest for diagnostic accuracy drives constant innovation, leading to ongoing refinement of techniques and tools. Fine-needle biopsy (FNB) has been developed to overcome these limitations. The Franseen tip design has a crown tip with three symmetrical cutting edges that enables core tissue procurement. With its unique tri-cut tip design, the 22-gauge (G) Franseen needle provides superior tissue acquisition capabilities, yielding higher-quality specimens and enhancing diagnostic accuracy for malignant solid lesions,[6] making it a game-changer in EUS-guided tissue acquisition procedures.

The utility of FNB in abdominal LAD has been assessed; however, it is worth noting that the bulk of studies to date focused on 22-G and 25-G needles. A multi-center comparative analysis demonstrated that EUS-FNB was superior to traditional FNA for diagnosing LAD using 22-G or 25-G needles, providing a specificity of 100% versus 93.6% for EUS-FNA (p=0.01) while maintaining a comparable sensitivity (67% vs. 75%, p=0.21).[7] The evidence from a meta-analysis of nine studies

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further accentuates the superiority of novel end-cutting needles like the Acquire and SharkCore, which show favorable diagnostic accuracy over FNA (odds ratio, 1.87; p=0.09) coupled with a significantly reduced number of needle passes.[8] The diagnostic accuracy of EUS-FNA increased to 98% for diagnosing LAD of unknown origin using 19-G FNA needles.[3] However, the trade-off with 19-G needles lies in their rigidity, which renders trans-duodenal biopsies more difficult. Despite their diagnostic strength for pancreatic lesions, 19-G needles also exhibit a higher incidence of technical failure than their 22-G counterparts.[9]

In the previous issue of *Clinical Endoscopy*, Okuno et al.[10] provided valuable insight into the comparative diagnostic performance of 19-G conventional and Franseen needles with the presence of ROSE in LAD diagnosis and malignant lymphoma classification. This is the first study to compare the 19-G FNA and Franseen-designed FNB needles for lymph node sampling. The authors analyzed patient characteristics, number of needle passes, puncture routes, and cytological/ histological diagnostic sensitivity, specificity, and accuracy. Moreover, the immunohistochemical evaluation rate, flow cytometry sensitivity, and cytogenetic assessments using G-band karyotyping and/or fluorescence in situ hybridization were compared between the needle types. Notably, the two needle types demonstrated similar high accuracy for LAD diagnosis and malignant lymphoma classification using immunohistochemistry, flow cytometry, and cytogenetic assessment, underscoring their indispensable utility in clinical practice. While the 19-G conventional and Franseen needles offered comparable diagnostic efficacy, their tissue acquisition ability and procedural safety differed. The lower median number of needle passes associated with conventional needles suggested their efficiency for tissue sampling. Nonetheless, the authors attributed this finding to the change in their strategy used to obtain cytogenetic assessment samples, resulting in the addition of one more pass to the Franseen needle group. However, the bleeding adverse events noted in the Franseen group prompts a nuanced consideration of needle selection that balances diagnostic precision with procedural safety.

This study demonstrated that the histological diagnostic accuracy for malignant diseases did not differ significantly between the conventional FNA and Franseen needles (94% vs. 97%, p=0.43). This could be explained by the characteristics of lymph node tissue including high cellularity, low fibrous tissue, and weak tissue connections. Thus, the larger conventional needle could obtain sufficient tissue.

Immunohistochemistry, flow cytometry, and cytogenetic assessments are crucial for classifying malignant lymphoma. The cytogenetic assessment requires greater tissue sample amounts than immunohistochemistry, followed by flow cytometry. In this study, the tissue samples were sufficient for immunohistochemistry regardless of needle type without significant differences. The cytological and histological sensitivity was high for both groups without significant differences. The Franseen needle seemed to have higher sensitivity for the cytogenetic assessment using G-band karyotyping (78% vs. 63%). However, after the adjustment for the number of needle passes, the malignant lymphoma diagnostic rate did not differ significantly between groups. The World Health Organization classification of lymphoma was highly possible to achieve by the combined use of these three methods without significant differences between groups (92.3% vs. 98.3%, p=0.19).

In terms of adverse events, three cases of bleeding occurred in the Franseen group and two patients were diagnosed with sarcoidosis, which could have involved minor vessels. In a previous report, EUS-FNA appeared safe for sampling intraperitoneal and mediastinal lymph node lesions. There were only a few cases of non-severe complications regardless of needle size.[11,12]

The findings of this study emphasize the importance of tailoring needle size to individual patient needs and procedural considerations. While both needle types offer high diagnostic accuracy, clinicians must weigh the advantages of sufficient tissue collection with the risk of procedural adverse events such as bleeding. In cases in which bleeding risk is a concern, 19-G conventional needles or smaller needles may be safer for diagnosing LAD. Furthermore, as flexibility is of concern in the deep duodenal station, a prospective study comparing 19-G FNA and 22-G FNB needles may be needed to optimize EUS-guided tissue acquisition in LAD. ROSE would be helpful if available.

In conclusion, this comparative study of 19-G FNA and Franseen needles sheds light on the needle selection and procedural considerations for LAD diagnostics and malignant lymphoma classifications. Prospective studies with larger patient cohorts and long-term follow-up are essential to validate this study's findings and elucidate optimal strategies for needle selection in LAD evaluation and malignant lymphoma classification. Additionally, ongoing technological advancements in needle design and procedural techniques hold promise for enhancing both diagnostic precision and procedural safety in clinical practice.

Conflicts of Interest

The authors have no potential conflicts of interest.

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Author Contributions

Conceptualization: NP, KR; Data curation: KR, WY; Supervision: NP; Writing–origical draft: KR, WY; Writing–review & editing: NP.

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