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Rethinking the Value of Pancreatic Cyst CEA Levels from Endoscopic Ultrasound Fine-Needle Aspiration (EUS-FNA): A Longitudinal Analysis

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Abstract : Background/Aims: Pancreatic cysts (PC) have recently become an increasingly common entity, often diagnosed as incidental findings on cross-sectional imaging. Clinically, management of the lesions is difficult because of uncertainties in their potential for malignant degeneration. Prior series have reported that carcinoembryonic antigen (CEA), a biomarker collected from cyst fluid aspiration, has a high diagnostic accuracy for discriminating between mucinous and non-mucinous lesions, at the patient's initial presentation. To the author's best knowledge, no prior studies have reported PC CEA levels obtained from endoscopic ultrasound fine-needle aspiration (EUS-FNA) over years of serial EUS surveillance imaging. Methods: We report a consecutive retrospective series of 624 patients who underwent EUS evaluation for a PC between 11/20/2009 and 11/13/2018. Of these patients, 401 patients had CEA values obtained at the point of entry. Of these, 157 patients had two or more CEA values obtained over the course of their EUS surveillance. Of the 157 patients (96 F, 61 M; mean age 68 [range, 62-76]), the mean interval of EUS follow-up was 29.7 months [3.5-128]. The mean number of EUS procedures was 3 [2-7]. To assess CEA value fluctuations, we defined an appreciable increase in CEA as "spikes" – two-times increase in CEA on a subsequent EUS-FNA of the same cyst, with the second CEA value being greater than 1000 ng/mL. Using this definition, cysts with a spike in CEA were compared to those without a spike in a bivariate analysis to determine if a CEA spike is associated with poorer outcomes and the presence of high-risk features. Results: Of the 157 patients analyzed, 29 had a spike in CEA. Of these 29 patients, 5 had a cyst with size increase >0.5cm (p=0.93); 2 had a large cyst, >3cm (p=0.77); 1 had a cyst that developed a new solid component (p=0.03); 7 had a cyst with a solid component at any time during surveillance (p=0.08); 21 had a complex cyst (p=0.34); 4 had a cyst categorized as "Statistically Higher Risk" based on molecular analysis (p=0.11); and 0 underwent surgical resection (p=0.28). Conclusion: With serial EUS imaging in the surveillance of PC, an increase in CEA level defined as a spike did not predict poorer outcomes. Most notably, a spike in CEA did not correlate with the number of patients sent to surgery or patients with an appreciable increase in cyst size. A spike in CEA did not correlate with the development of a solid nodule within the PC nor progression on molecular analysis. Future studies should focus on the selected use of CEA analysis when patients undergo EUS surveillance evaluation for PCs.

Keywords : carcinoembryonic antigen (CEA), endoscopic ultrasound (EUS), fine-needle aspiration (FNA), pancreatic cyst, spike
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