

Comment on: Pancreaticoduodenectomy for the treatment of pancreatic neoplasms in children: A Pediatric Surgical Oncology Research Collaborative study

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31 **Abbreviations:**

Full terms	Abbreviations
Body Mass Index	BMI
Computerized tomography	CT
Endoscopic ultrasound fine needle biopsy	EUS-FNA
<u>Fine needle biopsy</u>	FNA
Magnetic resonance imaging	MRI
Pancreaticoduodenectomy	PD
Rhabdomyosarcoma	RMS
Solid pseudopapillary tumors	SPN
Vincristine-Actinomycin D-Cyclophosphamide	VAC
Vincristine-Irinotecan	VI

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33 Dear Editor,

34 We offer a comment on the article “Pancreaticoduodenectomy for the treatment of
35 pancreatic neoplasms in children: A Pediatric Surgical Oncology Research
36 Collaborative study” published by Vasudevan, S.A. et al in Pediatric Blood and Cancer
37 (2020, e28425)¹, more specifically on the role of presurgical biopsies for pediatric
38 pancreatic tumors. Through presentation of our case of a 15-year-old female who
39 underwent pancreaticoduodenectomy (PD) for what appeared to be a solid
40 pseudopapillary tumor (SPN), we wish to emphasize the role a diagnostic biopsy can
41 have in avoiding potential morbidity from PD. Our patient was diagnosed with alveolar
42 rhabdomyosarcoma (RMS) and experienced considerable morbidity during therapy.

43 She presented to our center with a pancreatic mass discovered during investigation of
44 hyperbilirubinemia. MRI showed a well circumscribed 3.3 × 2.3 × 2.5 cm mass, most
45 consistent with non-metastatic SPN (Figure 1). She underwent a PD with retroperitoneal
46 lymph node dissection. Pathology was consistent with a FOXO1 fusion-positive RMS.
47 The tumor arose from the pancreatic parenchyma and invaded the duodenum, but not
48 the biliary tract. One of three lymph nodes was positive for disease. Her final diagnosis
49 was stage III, group II fusion-positive RMS. Treatment consisted of cycles of vincristine,
50 dactinomycin and cyclophosphamide (VAC) alternating with vincristine and irinotecan
51 (VI). Radiation therapy completed local control.

52 Early in her treatment, she presented with abdominal discomfort, early satiety, nausea
53 and vomiting. Use of antiemetic agents, acid suppression therapy, gastroprokinetic
54 agents and antibiotic therapy did not alleviate these symptoms. Investigations lead to a

55 diagnosis of delayed gastric emptying post-PD. She later developed diarrhea, not
56 improved with loperamide. Exocrine pancreatic insufficiency was diagnosed. Despite
57 pancreatic enzyme replacement, she suffered long-standing grade 3 diarrhea, with
58 bowel movements exceeding seven per day. This was attributed to exocrine pancreatic
59 insufficiency, irinotecan toxicity, post-radiation enteritis and C. difficile infection. VI was
60 discontinued in favor of VAC only. Her diarrhea improved but did not resolve.

61 These side effects led to significant weight loss. Her BMI dropped from 20.7 (50th
62 percentile) to 13.7 (<3rd percentile), despite a prolonged hospitalization, nasojejun
63 feeding and total parenteral nutrition. She ultimately recovered from her abdominal
64 symptoms a few months after completing therapy, and her BMI stabilized around 18.
65 Unfortunately, she died from metastatic recurrence 23 months later, having declined
66 systemic second-line therapy.

67 This case illustrates the limitation of imaging in determining the nature of a pancreatic
68 mass, and the significant morbidity that can result from PD. In their study, Vasudevan et
69 al. noted that only 54% of tumors were biopsied before undergoing PD¹. As they
70 mentioned, multiple groups have shown improved diagnostic yield of FNA for SPN,
71 especially endoscopic ultrasound fine needle biopsy (EUS-FNA)²⁻⁴, with adverse events
72 ranging from 0 to 5%⁵. Considering the potentially significant anatomical and functional
73 perturbations of PD, and the effectiveness of chemotherapy and radiotherapy alone to
74 treat some malignant tumors, we argue that all pediatric patients presenting with a
75 pancreatic mass should undergo a biopsy prior to PD. This is in line with the diagnostic

76 and therapeutic recommendations for malignant pancreatic lesions in children published
77 by the Italian national cooperative initiative in 2010⁶.

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79 **Conflict of interest:**

80 We have no conflict of interest.

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82 References

1. Vasudevan SA, Ha TAN, Zhu H, et al. Pancreaticoduodenectomy for the treatment of pancreatic neoplasms in children: A Pediatric Surgical Oncology Research Collaborative study. *Pediatric Blood and Cancer*. 2020;(May):1-9.
2. Law JK, Stoita A, Weaver W, et al. Endoscopic ultrasound-guided fine needle aspiration improves the pre-operative diagnostic yield of solid-pseudopapillary neoplasm of the pancreas: An international multicenter case series (with video). *Surgical Endoscopy*. 2014;28(9):2592-2598.
3. Springer S, Wang Y, Dal Molin M, et al. A Combination of Molecular Markers and Clinical Features Improve the Classification of Pancreatic Cysts. *Gastroenterology*. Published online 2015.
4. Khashab MA, Kim K, Lennon AM, et al. Should we do EUS/FNA on patients with pancreatic cysts? The incremental diagnostic yield of EUS over CT/MRI for prediction of cystic neoplasms. *Pancreas*. Published online 2013.
5. Collins JA, Ali SZ, VandenBussche CJ. Pancreatic Cytopathology. *Surgical Pathology Clinics*. 2016;9(4):661-676.
6. Dall'Agna P, Cecchetto G, Bisogno G, et al. Pancreatic tumors in children and adolescents: The Italian IREP project experience. *Pediatric Blood and Cancer*. Published online 2010.