## Title

False Positive Pregnancy Test due to HCG Positive Pancreatic Cancer



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## Authors

Slomowitz, Samuel J.
Eisenbud, Lauren E.

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**CLINICAL VIGNETTE**

# False Positive Pregnancy Test due to HCG Positive Pancreatic Cancer

Samuel J. Slomowitz, MD and Lauren E. Eisenbud, MD

A 49-year-old woman initially presented to the local emergency department with right upper quadrant abdominal pain, mild leukocytosis and elevated total bilirubin of 7.3 mg/dL. Initial CT imaging showed mesenteric inflammatory changes, and ultrasound showed gallbladder sludge. The surgical team decided to take her to OR for cholecystectomy. Intraoperative cholangiogram demonstrated a duct stricture in the pancreatic head and pathology showed subacute and chronic cholecystitis. She subsequently underwent ERCP with stenting and brushing showed rare atypical cells. MRCP and repeat CT failed to identify the mass which was more clearly demonstrated on endoscopic ultrasound. Subsequent biopsy revealed locally advanced pancreatic cancer a few days later. Initial pancreatic cancer evaluation may be radiographically occult. Her elevated β hCG levels raised questions about the diagnosis.

The patient underwent routine pre-procedural β hCG urine screening which was positive, despite negative serum qualitative β hCG. Repeat β hCG testing of urine remained positive, and subsequent quantitative β hCG of the serum was positive at 31 mIU/mL. Her elevated β hCG resulted in gynecologic and gynecology/oncology consultations and transvaginal ultrasound which showed no evidence of intrauterine pregnancy, though not ruling out an early ectopic pregnancy or recent spontaneous abortion. Pathology performed additional immunohistochemistry (IHC) β hCG testing on the biopsy specimen which returned positive.

Most physicians are aware that β hCG may be elevated in pregnancy, germ cell tumors and trophoblastic neoplasms. Secretion of β hCG from epithelial cancers like pancreatic cancer is less well known. Human chorionic gonadotropin (hCG) is usually physiologically present heterodimers of α and β forms. It can exist in free α, free β, nicked, fragmented or sulfated isoforms. Most commercial β hCG assays can detect multiple isoforms but do not necessarily specify the isoform present.[1] Gastrointestinal tumors including esophagus, colorectal, and gastric can have detectable serum β hCG concentrations.[2] In a limited case series β hCG positivity in pancreatic cancer was higher than expected. One case series of 36 patients with pancreatic adenocarcinoma reported >40% with serum positive β hCG. That series correlated β hCG with a worse prognosis.[3] Others reported pancreatic cancer patients with positive pregnancy tests found incidentally on preoperative screening.[4,5] Our patient had pancreatic cancer confirmed on IHC confirmed tissue staining from the tumor. It is unclear if that was performed on previous patients with serum positivity. One series of 35 tumors, in Japan reported 21 of 35 tumors sampled had IHC positive β hCG. They performed test cell culture and proliferation assays and speculated that β hCG positivity led to a poorer prognosis via epithelial mesenchymal transition.[6]

Standard of care involves testing all women of child bearing age with either serum or urine pregnancy tests prior to administration of chemotherapy.[7] In our busy oncology practice we try to test all woman of child bearing age and intact uteruses prior to every chemotherapy dose. Our anecdotal practice experience is never having a positive test that was not associated with an intrauterine pregnancy in last 5 years other than this report.

Since our patient was diagnosed with locally advanced pancreatic cancer, she was treated with neoadjuvant chemotherapy with FOLFIRINOX,[8] and we followed serial quantitative β hCG which trended down from 31 to 1 mIU/mL with treatment which the correlated with the imaging response.

We present this case to raise awareness about positive β hCG testing that is not related to pregnancy in oncology patients as we continue more expansive pretreatment testing. As pretreatment β hCG testing becomes an established quality metric we should anticipate increased frequency of positivity in other cancers. Clinicians should be aware that elevated β hCG may be cancer related, and not due to pregnancy. We encourage further studies if there are prognostic implications. As more of the scientific mechanisms for production of β hCG in epithelial tumors are elucidated, treatment implications should be studied.

**REFERENCES**

1. **Birken S, Berger P, Bidart JM, Weber M, Bristow A, Norman R, Sturgeon C, Stenman UH**. Preparation and characterization of new WHO reference reagents for human chorionic gonadotropin and metabolites. *Clin Chem*. 2003 Jan;49(1):144-54. doi: 10.1373/49.1.144. PMID: 12507971.
2. **Syrigos KN, Fyssas I, Konstandoulakis MM, Harrington KJ, Papadopoulos S, Milingos N, Peveretos P, Golematis BC**. Beta human chorionic gonadotropin concentrations in serum of patients with pancreatic adenocarcinoma. *Gut*. 1998 Jan;42(1):88-91. doi: 10.1136/gut.42.1.88. PMID: 9505891; PMCID: PMC1726967.
3. **Birkenfeld S, Noiman G, Krispin M, Schwartz S, Zakut H**. The incidence and significance of serum hCG and CEA

in patients with gastrointestinal malignant tumors. *Eur J Surg Oncol*. 1989 Apr;15(2):103-8. PMID: 2703054.

4. **Manohar A, Werner E, Murphy J.** Elevated human chorionic gonadotrophin due to pancreatic cancer, *Open Journal of Anesthesiology*. 2012;2(4):178-182. Available at: https://www.scirp.org/html/18-1920048_22241.htm.
5. **Fang F, Wang AA, Kapali M, Lai J**. Beta-HCG-Positive Pancreatic Duct Adenocarcinoma Initially Presenting with Cutaneous Metastases. *J Gastrointest Cancer*. 2023 Dec;54(4):1383-1385. doi: 10.1007/s12029-023-00942-3. Epub 2023 May 17. PMID: 37195401.
6. **Uesato Y, Kawamata F, Ishino S, Ono S, Tamashiro K, Koyama H, Takatsuki M**. Human chorionic gonadotropin-β promotes pancreatic cancer progression via the epithelial mesenchymal transition signaling pathway. *J Gastrointest Oncol*. 2022 Jun;13(3):1384-1394. doi: 10.21037/jgo-21-907. PMID: 35837184; PMCID: PMC9274033.
7. American Society of Clinical Oncology (ASCO) Quality Oncology Practice Initiative (QOPI®) standard 1.2.4, QOPI® Certification Program Standards January 1, 2020. Available at: https://society.asco.org/sites/new-www.asco.org/files/content-files/practice-patients/documents/2020-QOPI-QCP-Standards.pdf.
8. **Choi JG, Nipp RD, Tramontano A, Ali A, Zhan T, Pandharipande P, Dowling EC, Ferrone CR, Hong TS, Schrag D, Fernandez-Del Castillo C, Ryan DP, Kong CY, Hur C**. Neoadjuvant FOLFIRINOX for Patients with Borderline Resectable or Locally Advanced Pancreatic Cancer: Results of a Decision Analysis. *Oncologist*. 2019 Jul;24(7):945-954. doi: 10.1634/theoncologist.2018-0114. Epub 2018 Dec 17. PMID: 30559125; PMCID: PMC6656457.