

A Case of Pancreatic Adenocarcinoma with Unique Clinical and Unusual Pathological Features

Hala Kfoury*

King Saud University Medical City, Riyadh, Saudi Arabia

*Corresponding author: Hala Kfoury, King Saud University Medical City, Riyadh, Saudi Arabia, Tel: +00966504127781; E-mail: halakfoury@hotmail.com

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Abstract

Pancreatic adenocarcinoma is a form of cancer with ominous prognosis which occurs particularly among men above 50 years old with genetic predisposition and environmental and lifestyle risk factors. The incidence is low in patients less than 50 years old. We report a case of a 35 year old male, who was admitted to our hospital complaining of difficulty in breathing, and was found to have a mediastinal mass, a right subscapular mass, a duodenal polyp, a thickening of the roof of the right orbit. Immunostains of the right subscapular mass showed positivity for CK19, CK7 and focal positivity for B-HCG and alpha fetoprotein

Keywords: Pancreatic adenocarcinoma; Clinical presentation; Pathological features

Introduction

Pancreatic adenocarcinoma is a fatal disease, and has a high metastatic and mortality rates. Almost all patients with pancreatic adenocarcinoma develop metastases and die within a short period of time after the diagnosis is established. In most patients, signs and symptoms are brought about by compression of surrounding structures with secondary jaundice and/or abdominal or back pain. Diagnosis is usually made when demographic factors such as old age (usually above 50 years old), male gender, black race, coupled with genetic factors and presence of medical conditions and environmental and lifestyle factors come into play (smoking, occupational exposures and low dietary intake of fruits and vegetables) [1].

Case Report

We report a case of a 35 year old male, heavy smoker who was admitted to our institution complaining of difficulty in breathing. The patient was found to have a large heterogeneous mass of the superior mediastinum measuring $6 \times 5.7 \times 5$ cm, on the CT-scan of the head, neck, thorax, abdomen and pelvis and showing central necrosis, encasing the aortic arch and its adjacent branches and displacing the esophagus laterally. Also noted on the CT-scan were soft tissue thickenings of the roof of the right orbit, bilateral adrenal masses with heterogeneous enhancement. The largest adrenal mass was on the left side and measured 5×3 cm. There was a 1.7×1.5 cm hypodense lesion in the tail of the pancreas. Liver, spleen, and kidneys appeared unremarkable. A Gallium⁶⁷ Whole Body Scan was performed followed by SPECT-CT Images of the thorax and showed the known mediastinal mass with mild increased gallium uptake. No intra-abdominal gallium avid lesion was noted; however, two foci of faint uptake were seen in the soft tissue of the left side of pelvis and correlated with lesions involving gluteal muscle on CT scan. There was also focal uptake seen in the middle of right leg, as well as in the right subscapular area. The initial working diagnosis was of a malignant lymphoma, and in view of

the difficulty of performing a tru-cut biopsy of the mediastinal mass, a biopsy of the right subscapular area was performed.

The biopsy received to the anatomical-pathology section consisted of multiple fragments of tan firm soft tissue measuring in aggregate $0.7 \times 0.3 \times 0.2$ cm. The biopsy showed skeletal muscle fibers and fibrous tissue infiltrated by epithelial cells forming focally glands with mucin secretion and prominent desmoplastic reaction (Figure 1).

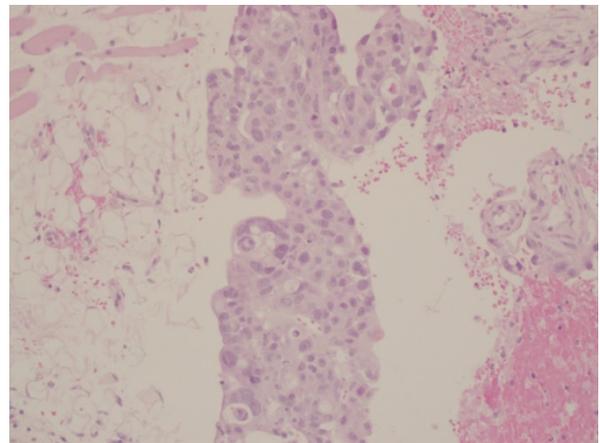


Figure 1: Pictomicrograph showing skeletal muscle fibers and fibrous tissue infiltrated by epithelial cells forming glands with mucin secretion.

Immunostaining showed positivity of the malignant cells for CK19 and CK7, focal positivity for Beta-HCG and alpha-fetoprotein (AFP) while chromogranin, synaptophysin, CD56, CEA monoclonal, PLAP, CD30, CA19-9, CK20, TTF-1, Napstin-A, P63 and PSA were negative. Ki67 proliferation index was 40%. Special stains for mucin including mucicarmine and alcian blue showed focal positivity in the infiltrating glands. An upper gastrointestinal tract endoscopy was performed and a biopsy of the ampulla of Water polyp noted, showed infiltration by a similar adenocarcinoma to the previously metastatic focus noted in the

right scapula (Figure 2). The overall histological features were in favor of a metastatic adenocarcinoma, of pancreatico-biliary origin. There was no evidence of lymphoma, as initially thought.

He received two cycles of Bleomycin, Etoposide and Cisplatin but did not show up for the third cycle.

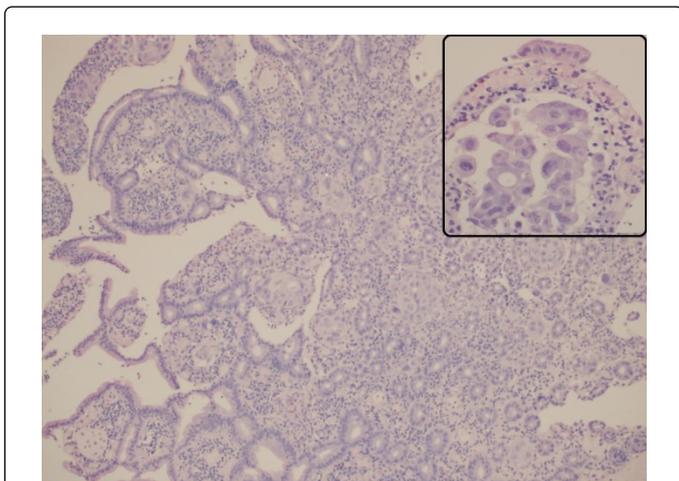


Figure 2: Pictomicrograph of duodenal biopsy showing infiltration by a similar adenocarcinoma to the previously metastatic focus noted in the right scapula.

Discussion

What is unique with our patient? For one, the age of diagnosis of pancreatic cancer. Although there were concerns that the incidence of pancreatic cancer in patients under 50 years old is increasing, younger patients are still considered at low risk of pancreatic cancer [1]. This was supported by a study conducted in England wherein they found out that there was actually no increase in the incidence of pancreatic cancer in the young. They thought that the perceived increase in the incidence of pancreatic cancer in the young is just brought about by an increase in the awareness of the disease; hence the more frequently reported cases [2]. There is no family history of cancer for this patient, however, he is a heavy smoker and he was a drug and alcohol addict until one year prior to the presentation to our hospital.

Secondly, the metastatic mediastinal mass as presentation is another unique feature of our patient. Pancreatic cancer can be quite advanced when it is first diagnosed, and patient may not have any symptoms when it is in its early stages. However, pancreatic cancer metastasizes usually into the nearby areas through the bloodstream or the lymphatic system, commonly to the liver. The metastasis to the mediastinum in our patient was unique in the sense that the spread was to the mediastinum, adrenals, soft tissue, roof of the right orbit and the duodenum without involvement of the liver. Although there were previous reports of metastatic pancreatic cancer into the mediastinum simulating an esophageal tumor [3].

Thirdly, the Beta-HCG and AFP immunostains positivity. The immunostaining pattern of pancreatic adenocarcinoma is not specific and cannot be used to differentiate between different high-grade pancreatic tumors. The clinical impression pertaining to the linkage between pancreatic tumors and the rise in serum AFP and beta hCG levels has been presented in several published articles. Pancreatic

adenocarcinoma cause elevations in serum beta HCG and alpha fetoprotein, and in several cases have the ability to differentiate between benign and malignant gastroenteropancreatic tumors [4,5]. In some of the cases, an increase in both the serum AFP and beta-hCG levels correlates well with a worse/worsening prognosis, impaired survival and poor outcome [6]. The beta subunit of HCG is the one mostly produced by non-trophoblastic tumors, in contrast to the alpha subunit which is mostly produced by the trophoblastic tumors of placental and germ cell origin [7]. Elevated serum levels are observed in 45-60% of patients with biliary and pancreatic cancer and in 10-30% of most other cancers [6]. Furthermore, hCG beta expression has been suggested as a serum tumor marker particularly in pancreatic adenocarcinoma cases [8]. AFP producing acinar cell pancreatic carcinoma was reported in 28 cases, wherein its level increased when widespread metastases appeared. Furthermore, AFP was also detected in the cytoplasm of the pancreatic cancer cells by immunohistochemical staining [9]. This shows that AFP levels are useful for the diagnosis of pancreatic cancers. In our case, not only the serum levels of AFP and Beta- HCG were increased, also a positive immunostaining of the adenocarcinoma cells for both Beta-HCG and AFP was seen. Although AFP positivity on the tissue was reported previously, the Beta-HCG immunostaining has not been recorded in the English literature.

Pancreatic adenocarcinoma is generally CK7 and CK20 positive, CEA positive and reacts with somatostatin, synaptophysin, chromogranin, or other neuroendocrine markers [10]. Our case was CK20 negative, CEA negative and did not react with synaptophysin and chromogranin.

Cytokeratin 19 (CK19) is normally expressed in the lining of the gastroenteropancreatic and hepatobiliary tracts. Recently, CK19 immunohistochemistry has been used in the pancreas, liver and gastrointestinal tract (GIT) tumors and has been associated with poor outcome [11]. A study showing CK7 negativity made the diagnosis of a pancreatic origin unlikely, whereas CK7 positivity especially with mesothelin positivity makes the diagnosis of a pancreatic origin more likely [12].

The most important challenge was to rule out a germ cell neoplasia which may imply a better prognosis for this patient and which was excluded in view of the immunostaining results.

Conclusion

This case report highlights an unusual presentation of pancreatic adenocarcinoma in a young male and an immunostaining pattern for AFP and particularly for Beta HCG which has not been reported previously.

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