Pancreatic Somatostatinoma Associated with Neurofibromatosis Type 1

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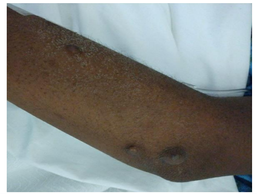
❖ Introduction

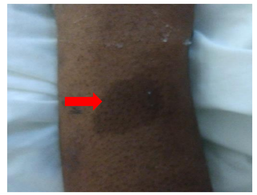
- Somatostatinoma is a rare neuroendocrine tumor often associated with neurofibromatosis type 1, Von Hippel Lindau syndrome, Multiple endocrine neoplasia and tuberous sclerosis (1,2).
- They have an insidious growth, and as a result, it presents in later stages as a malignant disease.
- Somatostatinomas are most frequently located in the duodenum, followed by the pancreas (4).
- Somatostatinoma syndrome is uncommon and consists of steatorrhea, diabetes, and gallstones.

❖ Case Presentation

- A 24-year-old female with newly diagnosed diabetes presented with diarrhea, nausea, vomiting and abdominal pain.
- Upon initial evaluation the patient was hypotensive, tachycardic, tachypneic and afebrile. The patient was found to have multiple nodular skin lesions, hyper-pigmented patches, and axillary freckling (Picture 1 and 2). Abdominal examination revealed diffuse tenderness with no guarding or rigidity.
- Laboratory findings were significant for hyperglycemia and an elevated anion gap which was concerning for DKA. She was evaluated with cross-sectional imaging which showed a mass in the pancreatic head measuring 2cm in diameter, a mass in the duodenum near the ampulla of vater measuring 12 X 20 mm, and dilation of pancreatic duct, common bile duct and intrahepatic ducts. Numerous hyper-vascular masses were seen throughout the liver, the largest measuring 8cm (Image1).
- Patient underwent ERCP with stenting and liver biopsy. Biopsy revealed neoplastic cells in predominantly nested and focal glandular configurations. Psammoma bodies were also identified. The immunohistochemical evaluation (Image 2) showed cells that stained positive for AE1/AE3, Chromogranin, CD56, and CK7. The KI67 percentage of positive nuclei was1-2%. The patient was diagnosed with WHO grade 1 metastatic malignant neuroendocrine tumor with either the pancreas or the duodenum as the likely primary.
- She underwent further work up with serum gastrin, chromogranin A and glucagon levels all of which where within normal results. A positron emission tomography with Ga-Dotatate did not show any uptake in the index tumor or the hepatic metastasis.

❖ Clinical Images (Pictures 1&2)





❖ Radiology and Histology

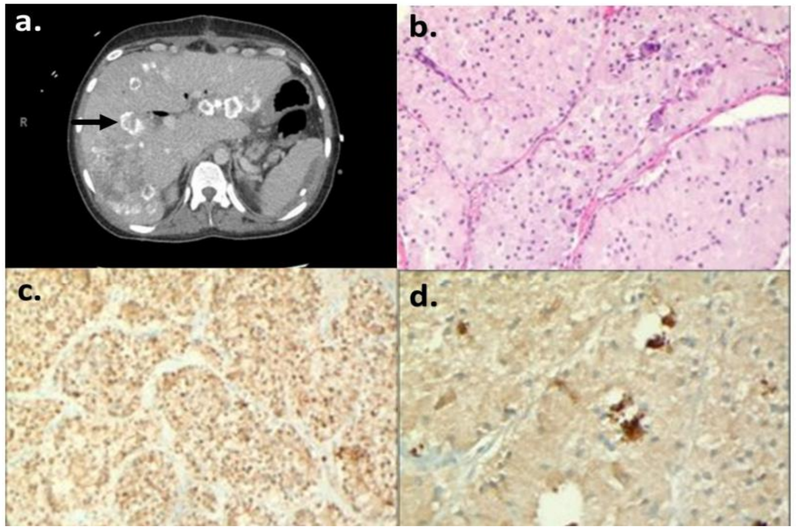


Figure 1: a. Transverse view of a CT of the abdomen showing metastatic lesions of the liver (arrow). b-d. Remining images show Immunohistochemistry analysis of liver biopsy using Mouse Monoclonal anti-betaNGF Antibody IHC stain (b.), AE1/AE3 IHC stain (c.), and Chromogranin IHC stain (d.)

❖ Patient Outcome

- Patients' hospital course was complicated by gastric perforation and intraabdominal abscess formation. She was successfully treated with surgery.
- Repeat CT scan showed metastatic lung nodules
- She was then treated palliatively with octreotide 20 mg every 4 weeks, given the extensive metastasis.

❖ Discussion

- Somatostatinoma is a rare tumor with an incidence rate of 1 in 40 million people and an average age of incidence around 50 (3,4).
- The majority of somatostatinomas are present in the pancreatic head (45%), followed by the duodenum (19%), the pancreatic tail (13%) and later the ampulla of vater (6%) (4).
- The somatostatinoma syndrome triad was mostly seen in pancreatic tumors while obstructive symptoms were associated with duodenal masses.
- Somatostatinoma occurs in association with multiple neuroendocrine syndrome type 1 (MEN-1) in 45% of cases and with neurofibromatosis type 1 in 10% of the cases (1,2).
- Patients diagnosed with somatostatinoma should be screened for other components of MEN-1 by either serum calcium level or DNA-based genetic testing. A thorough skin exam looking for signs of NF-1 should also be considered.
- Due to the insidious growth and the ambiguity of symptoms, it is diagnosed in later stages as a metastatic disease. Large tumors are treated with pancreaticoduodenectomy. Tumors that are challenging to resect or those with extensive metastasis are treated by tumor debulking, somatostatin analogs, and cytotoxic chemotherapy (5).

❖ Conclusion

- Although somatostatinoma presents at a later age given the insidious growth, it should not be missed in younger individuals who present with typical symptoms of somatostatinoma syndrome/triad. Given its association with genetic disorders, effort should be made to distinguish sporadic tumors from those associated with genetic conditions.
- Patients diagnosed with somatostatinoma should be screened for other components of MEN-1 by either serum calcium level or DNA-based genetic testing. A thorough skin exam looking for signs of NF-1 should also be considered.

❖ References

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