

Small bowel infarction associated with pancreatic glucagonoma

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Summary: An 88 year old woman presented comatose, hypothermic and hyperglycaemic. She died soon after admission and at autopsy recent small bowel infarction was found. The superior mesenteric artery was encased in a dense pancreatic mass and there was marked luminal narrowing of the vessel. Histology revealed a pancreatic glucagonoma which had metastasized to colonic submucosa and serosa.

Glucagonoma is a rare tumour and this presentation of small bowel infarction associated with pancreatic glucagonoma would appear to be a unique event.

Introduction

Although the course of the superior mesenteric artery places it adjacent to the neck and uncinate process of the pancreas, reports of damage to this vessel associated with pancreatic pathology are rare. We report a case of superior mesenteric artery restriction by a clinically silent pancreatic glucagonoma which led to small bowel infarction.

Case report

An 88 year old woman was admitted having been found collapsed on the floor of her home, partly clothed and very cold. At the time of admission no previous medical history was known. On examination she was unresponsive and markedly hypotensive with a systolic blood pressure of 50 mmHg and an irregular pulse rate of 48. Rectal temperature was 28.8°C and blood glucose was 33 mmol/l. She died within 24 hours of admission.

The major post-mortem findings were of recent small bowel infarction involving approximately the distal two-thirds of the small bowel. An irregular area of fibrosis replaced the body of the pancreas and encased and compressed the superior mesenteric artery causing marked luminal narrowing of the vessel (Figure 1). There was no evidence of arterial thrombosis. On opening the bowel a firm white polyp 1.2 cm in diameter was present in the ascending colon. Both lungs showed basal oedema and congestion. The heart was of normal size for the body weight (48 kg).

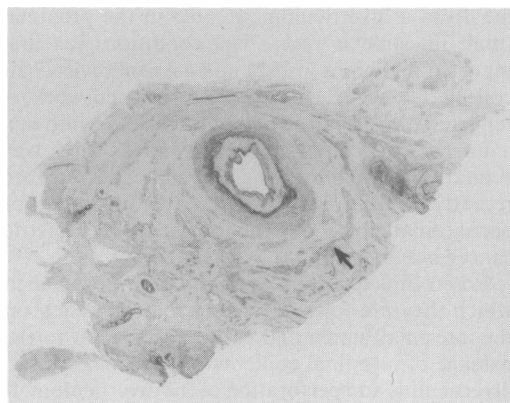


Figure 1 Superior mesenteric artery encased in tumour stroma. Islands of infiltrating tumour cells arrowed. Haematoxylin and eosin. Magnification $\times 2.25$.

Histological examination of the pancreatic mass showed a tumour composed of small cells with central, dense, round or oval nuclei and scant, faintly granular cytoplasm arranged in solid islands within a hyalinized stroma. Perineural invasion was present. Tissue from the macroscopically normal head of pancreas showed diffuse infiltration by nests and trabeculae of tumour cells. The colonic polyp was a submucosal tumour deposit similar in morphology to the pancreatic tumour and there were serosal tumour deposits.

The neuroendocrine nature of the tumour was confirmed by the finding of dense core granules on electron microscopy and strong cytoplasmic immunoreactivity for PGP 9.5 (Figure 2). PGP 9.5 is established as a marker for neuronal and neuroendocrine tissue.¹ There was also faint cyto-

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plasmic reactivity with CAM 5.2, a monoclonal antibody directed against low molecular weight cytokeratin.²

Labelling for pancreatic hormones was performed using polyclonal antibodies to pancreatic polypeptide, insulin, glucagon and somatostatin obtained from Dakopatts, A/S Denmark in a standard indirect immunoperoxidase method. Tumour cells of the primary pancreatic tumour and the colonic deposit showed strong cytoplasmic reactivity with anti-glucagon (Figure 3) and variable cytoplasmic reactivity with anti-somatostatin and anti-pancreatic polypeptide. There was no reactivity with anti-insulin.

Discussion

Neuroendocrine tumours of the pancreas are rare with an incidence of 1 per 200,000 population and glucagonoma accounts for only 1% of these tumours.³ Clinically silent, non-secreting neuroendocrine tumours are said to occur in 0.4–1.5% of unselected autopsies.⁴ Glucagonoma is more common in females, commonly metastasizes before clinical presentation and an association with necrolytic migratory erythema is well documented as is

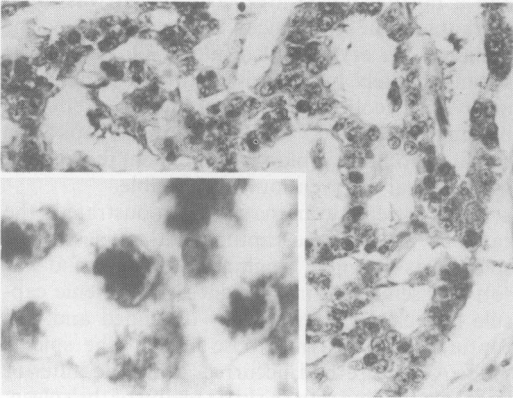


Figure 2 Trabeculae of tumour cells showing granular cytoplasmic positivity for PGP 9.5. Inset shows poorly preserved dense core granules 150 nm diameter within tumour cell cytoplasm. Haematoxylin counterstain. Original magnification $\times 200$.

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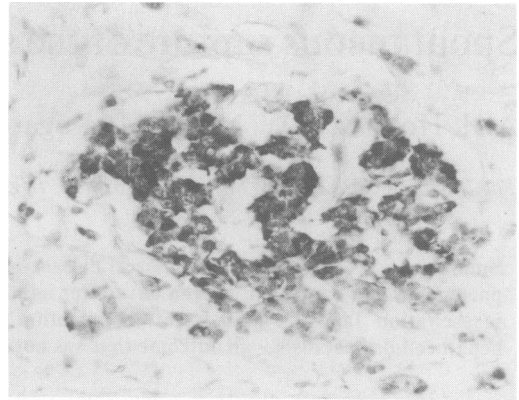


Figure 3 Localization of glucagon within tumour cell cytoplasm. Haematoxylin counterstain. Original magnification $\times 200$.

a marked tendency to venous thrombosis.⁵ Immunohistochemistry reveals 80% of glucagonomas to have a mixed complement of neuroendocrine substances present including large numbers of pancreatic polypeptide-containing cells.⁶

On enquiry it appeared that this woman never visited her general practitioner, her family confirmed she had no health complaints and in particular, there were no symptoms of hyperglycaemia. The clinical presentation in this case was very unusual. Metastatic malignant disease was present but the terminal event was small bowel infarction secondary to superior mesenteric artery restriction by tumour and not to venous occlusion which is more typical of this tumour. Although encasement of the major upper abdominal vessels is the rule in advanced pancreatic tumours, small intestinal infarction such as was found in this patient is exceptional; possibly the combination of vascular encasement and a thrombotic tendency was responsible.

Acknowledgements

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