Surgical resection of hepatic and cardiac neuroendocrine metastases from a caecal primary tumour

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ABSTRACT

A 66-year-old patient had an incidentally detected caecal neuroendocrine tumour that had metastasised to the liver and left atrium. He was asymptomatic with regard to this tumour and did not have carcinoid syndrome. Resection of the primary tumour and the metastatic deposits (with the ablation of one lesion) is thought to be curative.

KEYWORDS

Caecal neuroendocrine tumour – Hepatic neuroendocrine metastasis – Cardiac neuroendocrine tumour metastasis

Accepted 23 April 2013; published online XXX

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Case history

A 66-year-old man underwent a routine laparoscopic cholecystectomy for symptomatic gallstones. He was otherwise well, had no significant medical history and no abnormalities on examination. At laparoscopy, two small abnormal liver nodules were seen incidentally and biopsied. The rest of the liver appeared normal. The biopsy revealed carcinoid/non-functioning neuroendocrine tumour metastases. A subsequent colonoscopy revealed a caecal carcinoid tumour, for which he underwent an urgent right hemicolectomy.

Postoperative magnetic resonance imaging raised the suspicion of residual hepatic metastases, leading to a referral to a hepatopancreatobiliary surgeon. The patient’s gut hormone profile was normal. In order to confirm the presence of liver metastases, he went on to have contrast enhanced ultrasonography and octreotide imaging, both of which were negative. As the suspicion of residual liver metastases remained high, he then had gallium-68 DOTATATE whole body positron emission tomography (PET). This demonstrated three specific points of activity: two in the liver (segments 7 and 4b) and one in the pericardium/epicardium of the heart (Figs 1 and 2). These findings were discussed with the patient as well as at local hepatopancreatobiliary and neuroendocrine tumour (NET) multidisciplinary team meetings. It was decided to resect all of these lesions with a combined hepatic and cardiac resection.

At laparotomy, on-table ultrasonography was used to confirm the lesions seen on gallium imaging. A further five unexpected deposits were noted. Two of these were next to the lesion in segment 7 and it proved possible to resect all three of these together as a segment 7 segmentectomy. Two further unexpected lesions seen in segments 5 and 8 were excised with wedge resections. The final unexpected lesion was seen in segment 4a. This would have required a formal left hepatectomy to excise, which would not have left an adequate functional liver remnant. This lesion was therefore radiofrequency ablated. The last lesion, seen on the gallium imaging in segment 4b, proved amenable to resection via a segmentectomy.

Once the laparotomy was closed, a median sternotomy was performed. An epicardial lesion extending from the diaphragmatic hiatus to the left atrial wall was identified, cardiopulmonary bypass was established and an en bloc resection of the left atrial wall was performed to excise the tumour. The resultant atrial wall defect was closed primarily.

Postoperatively, the patient had to be heparinised following his cardiac resection, which was relatively hazardous given his multiple hepatic resections. He had an uneventful recovery, initially on the cardiac intensive care unit, with no evidence of intra-abdominal bleeding. Histological examination confirmed complete excision of metastatic NETs in all hepatic and cardiac resections. The Ki67 index was 1–2% with occasional mitoses.

Discussion

Gastrointestinal NETs are rare, with an incidence of seven per million.¹ They originate from neoplastic proliferations

ONLINE CASE REPORT

Ann R Coll Surg Engl 2014; 96: e7–e8
doi 10.1308/003588414X13814021676954
of enterochromaffin cells, which predominate in the gastrointestinal tract. Approximately 7% of all gastrointestinal NETS arise in the colon and there is a right-sided predominance with a peak incidence in the sixth decade. Many NETs are hormonally active but most do not cause symptoms. Some patients, however, will present with carcinoid syndrome (flushes, diarrhoea, bronchial obstruction and right-sided heart failure) if liver metastases are present. Computed tomography is the mainstay of diagnosis, and octreotide and gallium-68 DOTATATE whole body PET can be used as adjuncts. As 70–90% of all gastrointestinal NETs express somatostatin receptors, they are normally detectable with octreotide imaging (sensitivities of 86–95%). Between 46% and 93% of patients with NETs have hepatic metastases at diagnosis. This is partly due to the invasive nature of the disease and the relative lack of symptoms associated with the disease. Hepatic resection has an increasingly important role in the management of NET metastases, and it has been shown to both improve patient survival and alter the natural history of the disease process. Consequently, all patients should be considered for operative intervention if complete (or near complete) resection of hepatic metastases can be achieved.

Conclusions

This case demonstrates several unusual aspects of gastrointestinal NETs. First, caecal NETs are rare and they can be relatively asymptomatic, as in this case. Increasing numbers of NETs are detected incidentally. Second, octreotide imaging was inconclusive, which is unusual and not supported by other investigations in this case. Third, there were both hepatic and cardiac metastases associated with this NET. Fourth, preoperative imaging failed to detect the extent of the hepatic metastases and only intraoperative ultrasonography demonstrated the liver involvement. Lastly, although hepatic resection is the best treatment modality for liver metastases, it is essential to consider the size of the hepatic remnant so as to prevent postoperative liver failure. In this case, a combination of therapies was used to treat the liver lesions.

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