Calcification in a gastric neoplasm

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A 45-year-old woman presented with a history of vomiting, nausea, weakness, anorexia and a 4–5 kg weight loss the month before hospital admission. On examination we did not find any pathological features. Analytical studies showed normocytic and normochromic anaemia (haemoglobin 47 g/l, haematocrit 0.15). The rest of the analytical parameters were normal.

Gastroscopy showed several single submucosal tumours in the subcardial area (4–5 cm in diameter), on the greater curvature (2–3 cm in diameter), the lesser curvature (1 cm in diameter) and the antrum (2–3 cm in diameter). The submucosal lesions had a normal mucosa except the one in the subcardial area which had a peripheral ulceration. Biopsy was performed but histology showed a normal gastric mucosa. Abdominal ultrasound showed epigastric masses on the posterior wall of the stomach (one 4 cm in diameter and another 5 cm in diameter) with inhomogenous echo pattern.

A contrast barium examination of the upper gastrointestinal tract (figure 1) and an abdominal computed tomography (CT) scan (figure 2) were performed.

Questions
1. What do the figures show?
2. What is the differential diagnosis?

Figure 1 Contrast barium meal in the upper gastrointestinal tract

Figure 2 Abdominal CT scans (see text for further details)
Answers

QUESTION 1
In figure 1, the barium swallow shows several single lesions on the fundus, body and antrum of stomach. The extragastric growth of the tumour from the fundus has a peripheral calcification.

In figure 2A the abdominal CT shows several exogastric and intraluminal masses arising from the wall of stomach, in the fundus, body and on the antrum. A ring peripheral calcification was seen in the exogastric mass growing from the fundus (figure 2B).

QUESTION 2
The differential diagnosis is leiomyoma, leiomyosarcoma, leiomyoblastoma, adenocarcinoma.
The patient underwent a laparotomy at which a total gastrectomy was performed. Macroscopic study of the removed stomach showed a mass in the subcardial area (8 x 6 x 5 cm) with cystic components (haemorrhagic and mucinous areas) and peripheral calcification. In the greater curvature, lesser curvature and antrum there were some masses with a similar macroscopic pattern without calcification.

On microscopic examination of the tumour, clusters of epithelioid cells were seen. The tumour cells displayed abundant clear cytoplasm and often had peripheral vessels. The mucinous areas were surrounded by a fibrotic plane. The histology revealed a leiomyoblastoma.

Discussion
Leiomyoblastoma is an uncommon mesenchymal neoplasm of the stomach. The microscopic picture consists of clusters of epithelioid or spindled cells, with or without haemorrhagic and mucinous areas. It is usually confined to the muscularis propria although the serosa may be partially involved.\[^1,2\]

CAUSES OF GASTRIC CALCIFICATION
Gastric tumours with calcification areas are rare, the most common being the mucinous adenocarcinoma. This tumour may show miliary and punctate calcifications, 1–3 mm in diameter. In gastric adenocarcinoma, the regional lymph nodes and metastases to liver, spleen and peritoneum may be calcified. Leiomyoma is a exophytic and spherical mass with uniform density. It may occasionally show circumscribed and patchy calcifications into central or peripheral areas. The appearance of leiomyosarcoma includes an extragastric mass with central necrosis, patchy calcification, direct tumour extension into adjacent organs, mesenteric omental spread and necrotic liver metastasis. Air and air-fluid pockets could be recognised in the mass indicating a communication with the gastric lumen. The presence of calcification within leiomyoblastoma is a rare condition. It has been reported previously as patchy calcification in the central area of the tumour.\[^3,4\]

CLINICAL FEATURES AND ASSOCIATIONS
The most common clinical presentation of leiomyoblastoma is gastrointestinal haemorrhage (50%). Other symptoms are: abdominal pain, abdominal palpable mass, weakness, nausea, weight loss, jaundice and diarrhoea.\[^1,2,5\]
An association between leiomyoblastoma and other neoplasms such as pulmonary chondroma and paraganglioma (Carnay’s triad) has been found in some patients.\[^1,2,5\]
Duodenal carcinoid tumour has been associated with leiomyoblastoma. Severely five per cent of leiomyoblastoma are completely or predominately intragastric. Liver and peritoneal metastases have also been found.\[^2\]
Tumour size, mitotic activity, invasion of mucosa, gastric localisation and metastases were correlated to clinical behaviour and prognosis.\[^2\]
Patients with gastric leiomyoblastoma can survive for a long time, even after the appearance of metastases.\[^2\]

IMAGING STUDIES
The upper gastrointestinal barium study may show different patterns, such as intramural lesions, an intraluminal mass with a smooth surface, an exogastric mass with filling defect, ulceration and multiple simultaneous tumours.\[^5\]
Upper gastrointestinal endoscopy may reveal different lesions, such as an umbilicated or ulcerous mass or an intraluminal tumour with smooth mucosa and flattened folds. Abdominal ultrasound may show an abdominal mass with cystic or solid areas. There may be hypoechoic liver areas due to hepatic metastases. Endoscopic ultrasound may demonstrate a clearly demarcated hypoechoic mass with central ulceration. Abdominal CT may show a soft-tissue mass, or solid mass with cystic areas or fluid inside.\[^5,5\]

Final diagnosis
Gastric leiomyoblastoma.

Keywords: leiomyoblastoma, calcification, gastric neoplasm, stomach

<table>
<thead>
<tr>
<th>Neoplasm</th>
<th>Calcification type</th>
<th>Calcification localisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucinous adenocarcinoma</td>
<td>punctate</td>
<td>wall of stomach, regional lymph nodes, metastases</td>
</tr>
<tr>
<td>Leiomyoma</td>
<td>patchy</td>
<td>central or peripheral areas</td>
</tr>
<tr>
<td>Leiomyosarcoma</td>
<td>patchy</td>
<td>central or peripheral areas</td>
</tr>
<tr>
<td>Leiomyoblastoma</td>
<td>patchy</td>
<td>central or peripheral (ring) areas</td>
</tr>
</tbody>
</table>
A 30-year-old woman took an ‘ecstasy’ tablet for the first time while attending a rave. She began to feel unwell about four hours after ingestion and one hour later collapsed and had a generalised seizure. On admission to hospital 30 minutes later she was confused and agitated. She gradually became less responsive, was incontinent several times and suffered two further seizures.

On examination, she was hypothermic (34°C), the pulse was 80 beats/min and regular; her blood pressure was 110/70 mmHg. There were no focal neurological signs but the plantar responses were both extensor. Biochemical investigations were as follows: sodium 117 mmol/l, potassium 3.1 mmol/l, CO2 25 mmol/l, urea 1.9 mmol/l, liver function tests and coagulation screen normal, pO2 27.7 kPa, pCO2 4.6 kPa, hydrogen ion 36 mmol/l, and bicarbonate 19.5 mmol/l.

Over the next 24 hours she developed a pyrexia (39°C), remained confused and had several further seizures. She became oliguric with dark coloured urine.

**Questions**

1. What is the most likely cause of her hyponatraemia?
2. What two investigations would be useful?
3. What is the cause of her oliguria?
4. What two tests would you perform?
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