# Synchronous occurrence of colon adenocarcinoma and gastric schwannoma Case report and review of the literature



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### Synchronous occurrence of colon adenocarcinoma and gastric schwannoma. Case report and review of the literature

MATERIAL OF STUDY: We report a case of a 66-year-old man with a gastric schwannoma incidentally discovered during the treatment of a colon cancer. At the pre-operative computed tomography performed for the stadiation of the colonic tumor was incidentally noted the presence of a nodular tumor between the liver and the gastric wall.

RESULT: A wedge resection of this gastic tumor and the surgical resection of the left colon were performed all at once. The pathological examination of the gastric neoplasia revealed a picture consistent with gastric schwannoma.

DISCUSSION: Gastrointestinal schwannomas are difficult but not impossible to diagnose preoperatively although they are often asymptomatic and radiologic findings are often nonspecific. Radiological features of Gastrointestinal schwannomas described in literature are reviewed.

CONCLUSIONS: The treatment of choice is complete surgical excision with free margins because of diagnostic uncertainty, and the long-term outcome is excellent as these lesions are uniformly benign.

KEY WORDS: Colonic adenocarcinoma, Computed Tomography, Gastric schwannoma, Radiologic Features, Surgical treatment

## Introduction

GI schwannomas are difficult but not impossible to diagnose preoperatively although they are often asymptomatic and radiologic findings are often nonspecific. The treatment of choice is complete surgical resection with free margins because of diagnostic uncertainty, and the longterm outcome is excellent as these lesions are uniformly benign.

## Material and Methods

A 66-year-old man, one month before admission to our hospital, suffered from an episode of pain at the upper abdomen. He referred asthenia since about five months before. He performed haemato-chemical tests that showed low haemoglobin (7,3 g/dl), erythrocytes (4,14 x 10<sup>6</sup>/mm<sup>2</sup>) haematocrit (26.4%) and ferritin (3,6 ng/ml). Then he performed an ultrasonography of the abdomen demonstrating only a slight thickness of the gastric wall in the little curve. After a few days he performed the upper gastrointestinal endoscopic examination revealing only a light gastritis. The colonoscopy showed instead a 10 cm substenotic neoplasia of the left colic flexure whose histologic examination revealed an adenocarcinoma. A preoperative study with computed tomography was performed for a preoperative cancer staging; the study

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was performed using a 16-slice Multi Detector Computed Tomography (MDCT) scanner.

Before starting the exam, as we always do in all cases in which an abdominal CT is required, we administered to the patient four glasses of water to achieve an adequate gastric distension.

Images were acquired during the i.v. administration of 140 ml of contrast agent (Iomeron 350 mgI/dl, Bracco, Italy) with a flow rate of 3,5 ml/s using an automatic injector (Medrad).

To examine more accurately the known colon cancer, we performed the CT scan from the pelvic floor, in caudocranial direction. The beginning of the scan was determined by using a bolus triggering technique, monitoring the common iliac arteries and triggering the scan when it reached an acceptable level of contrast enhancement. Images were acquired in three sequential post-contrast phases: arterial, venous and tardive phases (respectively after two, five and nine minutes from the beginning of the intravenous contrast injection).

### Results

CT images confirmed the colon cancer just below the splenic flexure (Fig. 1). Its dimension was about 7 cm along the colon wall, with stenosis. There were no radiological signs of local invasion and nodal or distant metastases were absent. It was also described, as an incidental finding, a mass (maximum diameter of about 3 cm) between the free edge of the liver and the gastric wall (Fig. 2 A-B). This lesion had a solid CT density and no evident contrast-enhancement.

Finally surgical resection of the left colon was performed. During the surgical exploration of the peritoneal cavity was seen a round exophytic nodule about 3 cm in diameter, with hard parenchimatous consistency, net margins, over the anterior wall near the lesser curvature of the stomach (Fig. 3). A wedge resection of this tumor including 3 cm of the gastric wall was performed using surgical staples. The pathological examination revealed a picture of adenocarcinoma of the left colon, with low dif-



Fig. 1: MDCT image in venous phases. The white arrow shows a tract of the colon cancer just below the splenic flexure.



Fig. 2: MDCT images in arterial (A) and venous phases (B). The gastric schwannoma (white arrows) appears as a small submucosal mass between the free edge of the liver and the gastric wall. Its typical signs are: the gastric mucosa undistorted, the well-defined margins, the homogeneous density, the poor contrast enhancement.



Fig. 3: Round exophytic nodule about 3 cm in diameter, with hard parenchimatous consistency, net margins, over the anterior wall near the lesser curvature of the stomach.

ferentiation (G3), ulcerated, infiltrating all the thickness of the wall, except the serous membrane, without linfovascular invasion (pTNM: T3 N0). The pathological examination of the gastric neoplasia revealed a picture of spindle cell tumor that was strongly positive for S-100 protein stain, and non-reactive for CD34, CD117,  $\alpha$ -actin, DOG1 and h-Caldesmon, consistent with gastric schwannoma.

## Discussion

Schwannomas, also known as neurinomas or neurilemmomas, arise from the Schwann cells, therefore they are peripheral nerve sheath tumors (PNSTs)<sup>1,2</sup>.

The most frequent involved sites are the head-neck region (eg. acustic neurinoma), the flexor surfaces of the upper and lower extremities and, among the deep tissues, the posterior mediastinum and the retroperitoneum (eg. sacral neurinoma); it is rarely located in the abdominal wall or in the visceral wall (urinary bladder, bowel)<sup>3,4</sup>.

In the gastrointestinal tract, the stomach is the most affect organ, followed by colon, rectum, esophagus and small bowel. The gastric schwannoma is an extremely rare tumor (only 0,2% of all the gastric cancers)<sup>5</sup>. Preoperative diagnosis of gastric schwannoma is difficult, however CT abdominal imaging reveals some radiological signs that could be helpful in the differential diagnosis with other tumor of the gastric wall.

In several gastric diseases a common sign is the wall thickening (normal gastric wall at CT was less than 7-10 mm). Several false-positive or false-negative CT results are caused by an inadequate gastric distension<sup>6</sup>; in our patient the examination of the incidental gastric lesion was facilitate by the oral administration of 600 ml of water as a negative oral contrast agent.

The gastric schwannoma appears as a single submucosal mass without any mucosal changes at both CT and endoscopic examinations <sup>7</sup>.

The radiological appearance depends on the prevalent growth pattern of the tumor: endoluminal, extraluminal or mixed. In our patient the gastric lesion had a diameter of about 3 cm and produced a typical bulging effect only on the external profile of the gastric wall (extraluminal pattern).

The hypothesis of the extragastric origin of the tumor was excluded because it was absent a fat plane between the mass and the stomach wall and it was not identifiable a displacement of the gastric wall due to a mass effect  $^8$ .

The benign nature of the tumor is suggested by the presence of well-defined, rounded and not infiltrating margins.

Its solid composition, with numerous spindle cells and poor extracellular fluid, is responsible for the homogeneous density in CT images. In contrast to the extraintestinal schwannoma, detection of calcification and cystic or hemorrhagic areas is extremely rare <sup>9</sup>.

Lee et al. observed in a study about the CT features of G.I. subepithelial masses <sup>8</sup> that the enhancement of G.I. schwannomas is minimal or absent during the arterial phase, sometimes evident in the late phase.

The differential diagnosis of gastric schwannoma should be taken with other malignancies with a sub-epithelial origin. The distinction between schwannomas and gastrointestinal stromal tumors (GISTs) is important because GISTs are the most common mesenchymal tumors of the gastro-intestinal tract and so they are significantly more frequent than schwannomas.

To distinguish if the patient suffers from a schwannoma or a GIST is fundamental because the two diseases have different clinical implications: schwannoma is a tumor characterized by a well cellular differentiation, a slow growth and an excellent prognosis after surgical removal; GISTs have malignant potential and can be frequently subjected to recurrence after excision.

The clinical criteria are not conclusive because schwannomas as all GISTs are often asymptomatic and their diagnosis is occasional <sup>10</sup>. Rare presenting symptoms are: Gastrointestinal bleeding, dyspepsia and palpable abdominal mass. Extremely rare as first clinical manifestation is acute abdomen for perforated GIST <sup>11,12</sup>.

Definitive diagnosis is often confirmed only postoperatively by immunohistological and molecular tests: GISTs originate from Cajal cells and their histological feature is the cellular positivity for C-kit or CD117 (steam cell factor receptor)<sup>13</sup>; they are also positive for CD34 (60-70%), alpha smooth muscle (30-40%), but only at 5% for S100 and rarely for desmin, which helps their differential diagnosis from other gastrointestinal tumors derived from smooth muscle or Schwann cells <sup>14</sup>.

Radiologic findings are often nonspecific but Gastrointestinal schwannomas are difficult - not impossible- to diagnose preoperatively. Levy et al, examining CT features of 64 cases of GIST, reported that 92% of them had hemorrhagic areas, necrosis and cysts in their context, while only 8% appeared with homogeneous enhancement <sup>15,16</sup>. This suggests that the most important CT criterion to differentiate a schwannoma from a gastric GIST is the density of mass: the internal structure is solid and homogeneous in the first case, it presents a central area with hemorrhage or necrosis and a peripheral enhancement in the second case <sup>17</sup>. In our case the mass was very small (only 3 cm) and it was impossible to distinguish certainly it from a small non-malignant GIST. It was necessary to wait the result of the pathological examination for the conclusive diagnosis of schwannoma.

However, because of the preoperative diagnostic uncertainty, they should be considered potentially malignant tumors, so the treatment of choice is complete surgical resection with free margins without lymphadenectomy, as they never give lymph nodes metastases. Gastric tumors <5 cm need a wedge resection, while partial and total gastrectomy should be limited respectively for larger distal and for fundic or juxta cardial lesions <sup>18</sup>. Finally long-term outcome is excellent as these lesions are uniformly benign.

The presence of a gastrointestinal schwannoma together with other tumor of the gastrointestinal tract has rarely been reported in the literature.

Jang et al. reported a case of association gastric adenocarcinoma-gastric schwannoma <sup>19</sup>; Wild et al. described the case of a 68 year-old patient with an adenocarcinoma of the sigma with another colic lesion mimicking a synchronous tumor that instead was found to be a schwannoma <sup>20</sup>; Mulchandani et al. reported the case of a patient with an adenocarcinoma of the left flessura of the colon, an adenomatous polyp of the right colon and a schwannoma of rectum <sup>21</sup>.

We did not find in literature any other case of a gastric schwannoma togheter with an adenocarcinoma of the colon so, to our knowledge, it could be the first reported case.

## Conclusions

The true value of our pre-operative study with computed tomography was to recognize the gastric neoplasia in a patient with no suspicious specific clinical signs suffering from a colon cancer. So we were able to explore the tumor brought to our attention by the imaging study and to remove it during the surgical procedure performed for the colic neoplasia. Although during an operation for tumor of the colon it is a good rule to fully explore the peritoneal cavity, in these cases the highest attention is generally given to palpation of the liver. So, if the radiologist should not have underlined the presence of the incidental gastric lesion, the tumor would not have been probably seen at the surgical exploration because of the massive structure of the patient that made hard an accurate evaluation of the peritoneal cavity for the extreme amount of adipose tissue.

The possibility of a not-casual association between epithelial and mesenchimal gastrointestinal tumors need further investigations searching possible pathogenetic connections still unknown.

We find opportune to underline the importance for the radiologist to know the existence of these possible tumoral associations of the gastrointestinal tract for a better diagnostic management of the oncologic patient; for the surgeon to perform always, in the way as accurate as possible, a careful and complete evaluation of the peritoneal cavity to the purpose not to "forget" a lesion that could afterward result in severe complications (hemorrhage, perforation).

We have finally to remember that today exists a physician-legal contentious constantly increasing and both the missed radiologic diagnosis and the uncomplete surgical treatment could be sources of physician-legal controversy.

#### Riassunto

Riportiamo il caso di un uomo di 66 anni con uno schwannoma gastrico scoperto casualmente durante l'iter diagnostico per cancro del colon. Alla TC preoperatoria eseguita per la stadiazione del tumore del colon è stata incidentalmente evidenziata la presenza di una tumefazione nodulare tra il fegato e la parete dello stomaco. Una "wedge resection" di questa tumefazione è stata eseguita in unico tempo con l'intervento di emicolectomia sinistra. L'esame istopatologico della tumefazione ha evidenziato un quadro dirimente per schwannoma gastrico.

La diagnosi preoperatoria degli schwannomi gastrointestinali è difficile ma non impossibile, benché essi siano in genere asintomatici ed il quadro clinico e i reperti radiologici siano aspecifici. A causa dell'incertezza diagnostica il trattamento di scelta è la resezione chirurgica completa; trattandosi di lesioni benigne la prognosi a distanza è eccellente.

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