



## Original article

# Metastatic cancer to the stomach

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### Abstract

**Background.** Metastases in the stomach are rare. The increased use of esophagogastroduodenoscopy (EGD), associated with better treatment results for malignancies, requires them to be acknowledged. The aim of this study was to describe a series of cases of metastasis to the stomach, their primary sites, clinical and endoscopic features, treatment, and results.

**Methods.** Twenty cases were diagnosed between December 1999 and January 2004. Their analysis included symptomatology, macroscopic presentation, time from diagnosis of the primary tumor to the detection of the gastric metastasis, treatment approach, and survival.

**Results.** The primary sites were the esophagus, skin, lung, cervix, breast, sigmoid colon, and testis. The symptom most frequently requiring EGD was upper gastrointestinal bleeding. Ten patients showed concomitant metastases to other organs. The mean time between diagnosis of the primary tumor and diagnosis of gastric metastasis was 16 months (range, 0 to 56 months). Only seven patients were given some form of treatment after diagnosis of the gastric metastasis. The median survival was 4.75 months. Overall survival during the first year was 20% and survival was nil at 2 years.

**Conclusions.** Gastric metastasis marks advanced disease and the prognosis is poor. New advances in diagnosis and treatment are required for better results.

**Key words** Gastrointestinal endoscopy · Stomach neoplasms · Neoplasm seeding · Gastric metastasis

### Introduction

The presence of metastasis in the stomach is a rare condition [1–3] and the main studies reported in the literature are based on endoscopic findings [4–6],

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necropsies [1], and surgical specimens [7], or a combination of these three methods [2,3,8]. The most frequently described primary sites are the lung, breast, melanoma, and the esophagus, among other less prevalent areas [1–4].

The endoscopic aspect of metastatic lesions varies considerably and, although a consensus has not yet been reached, several classifications have been put forth [2,3,5,6]. The prognosis is almost invariably poor, because this condition is a disseminated disease [8,9].

The aim of the present study was to describe a series of cases of metastasis to the stomach, their primary sites, clinical and endoscopic features, treatment, and results.

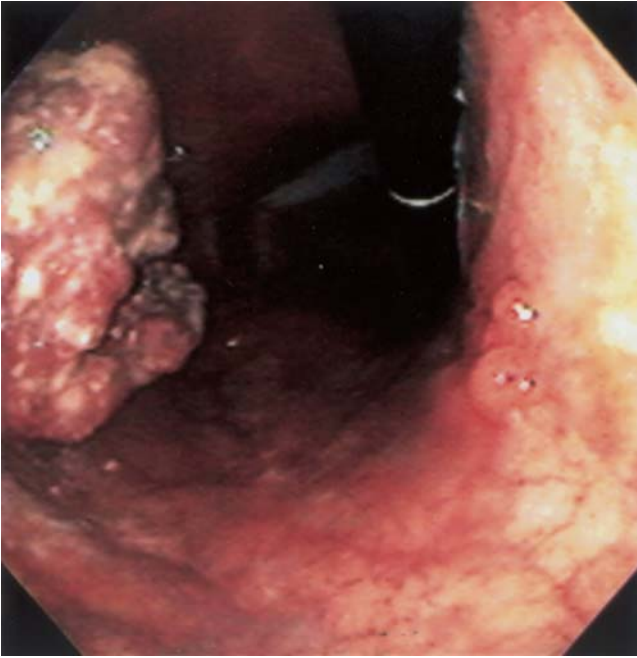
### Patients and methods

From December 1999 to January 2004, 771 patients with gastric neoplasms, including adenocarcinomas, lymphomas, and sarcomas, among others, were admitted to the Araújo Jorge Hospital. This study is based on a series of 20 cases of gastric metastasis diagnosed during that period, at the Department of Digestive Endoscopy of the Araújo Jorge Hospital. Patients showing direct invasion by an adjacent organ and those with systemic lymphoma were excluded from this study.

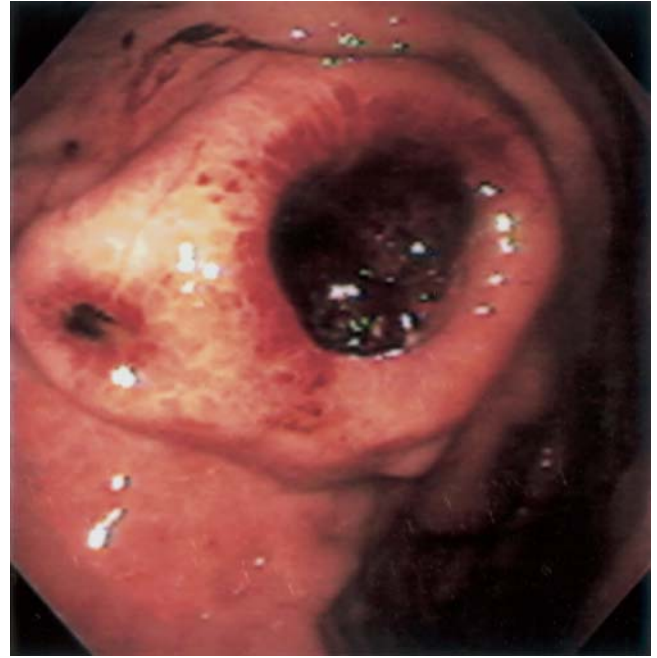
Esophagogastroduodenoscopy (EGD) was used for diagnostic purposes and all lesions were confirmed by histology, following an endoscopic biopsy.

The analysis included epidemiological aspects, symptomatology, indication for endoscopic investigation, macroscopic presentation, and period of time between the diagnosis of the primary tumor and detection of the gastric metastasis, as well as the treatment approach for these metastases.

The study included six patients whose stomachs had been raised to the mediastinal level as a result of a transhiatal esophagectomy. In these patients, the gastric



**Fig. 1.** Endoscopic finding of a metastasis of a squamous cell carcinoma of the esophagus, seen in the gastric body



**Fig. 2.** Gastric metastasis of a cutaneous melanoma

tube was divided into three equal parts, for the purpose of locating the metastases.

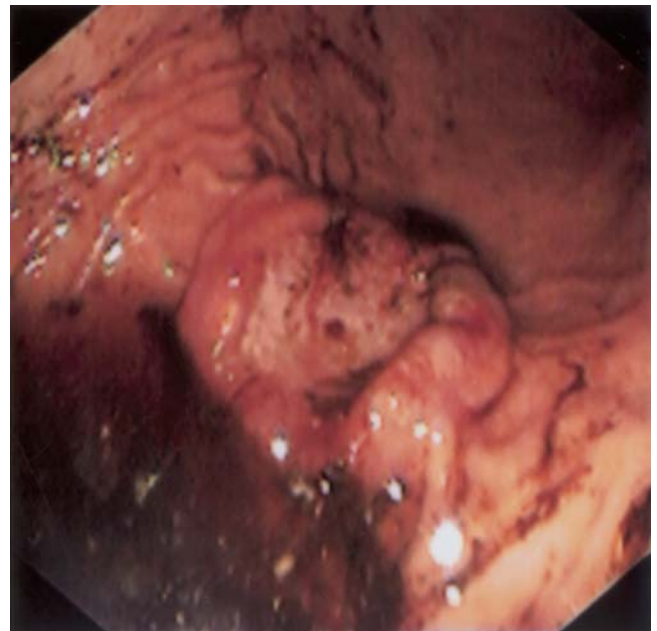
At the end of this investigation, all the patients had already died of neoplasia-related causes. The survival rates were calculated on the basis of the date the diagnosis of gastric metastasis was established. Both median survival and the overall survival were calculated.

## Results

Our study included 12 men and 8 women, ranging in age from 31 to 95 years (mean, 58.1 years). The primary malignancies seen in this series were ten cases of metastases of squamous cell carcinoma of the esophagus (Fig. 1), followed by metastases of melanoma (Fig. 2), lung (Fig. 3), uterine cervix, breast (Fig. 4), sigmoid colon (Fig. 5), and testicular cancer, in that order.

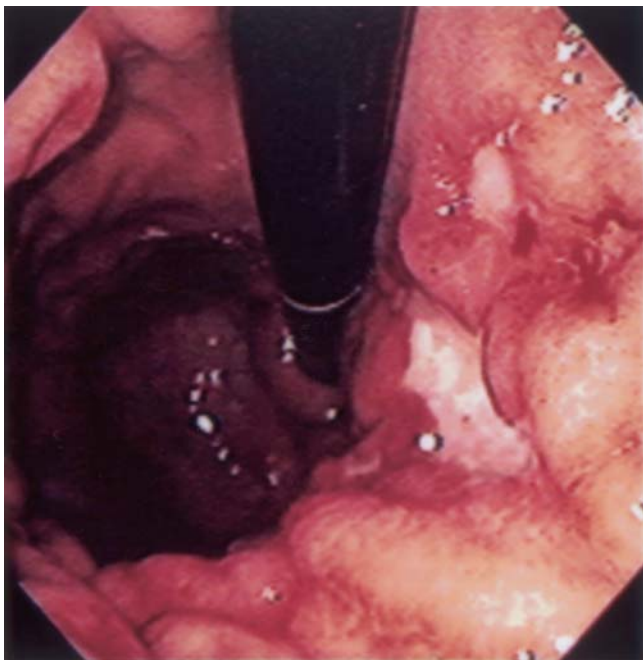
The clinical symptom most frequently requiring EGD was upper gastrointestinal bleeding. Dysphagia and chest pain were the most significant complaints in patients with metastases caused by carcinoma of the esophagus (Table 1).

With regards to the macroscopic features observed at endoscopy, classifiable lesions, such as Borrmann II (10 cases) or Borrmann III (6 cases) were clearly predominant. Metastases of breast carcinoma (Fig. 4) and of adenocarcinoma of the lung were seen as diffuse infiltration (Borrmann IV). In two patients, it was possible to observe raised non-ulcerated lesions.



**Fig. 3.** Endoscopic view of the gastric metastasis of a squamous cell carcinoma of the lung, in the distal third of the gastric body

Sixteen patients exhibited only one lesion. In 2 patients there was more than one gastric metastatic lesion. One was a melanoma with two pigmented ulcers and the other was a testicular cancer metastasis with three concomitant lesions in the stomach.



**Fig. 4.** Retroverted view of the proximal stomach, showing diffuse infiltration, with superficial ulcerations caused by the metastasis of a breast carcinoma



**Fig. 5.** Large polypoid and fungating mass projecting into the gastric lumen, resulting from the metastasis of an adenocarcinoma of the sigmoid colon

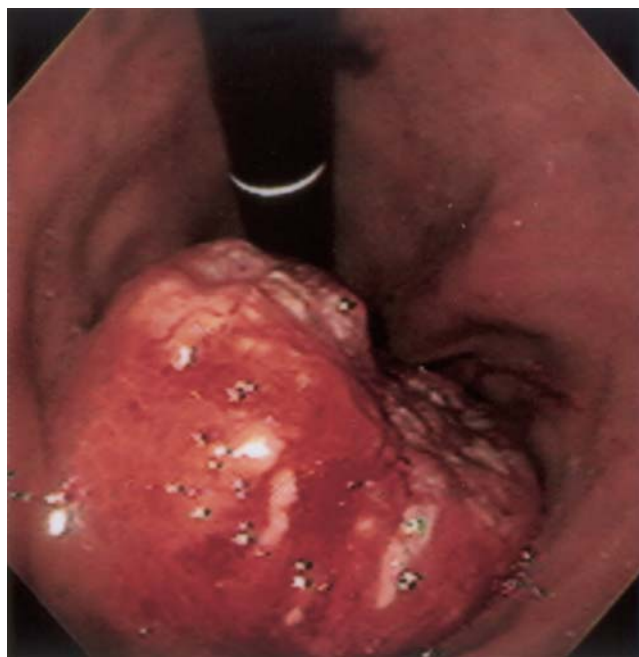
Of the 20 cases presented in this article, 14 patients had their stomachs in the correct anatomical position and had not been operated on. In this group, the metastases were predominantly located in the gastric body, while there were only two cases of antral lesions.

Among the ten patients with metastases of carcinoma of the esophagus, six had undergone transhiatal esophagectomy with gastric interposition (Fig. 6). These cases were diagnosed only on the basis of endoscopic findings and biopsies. The degree of mediastinal involvement was not investigated by complementary tests. The gastric tube placed in the chest was divided into three parts, and in all six patients the metastases were located in the two cranial thirds (three in the middle third and three in the upper third). The esophagogastric anastomosis was not compromised in any of the patients.

For ten patients, other organs had already been affected when the diagnosis of gastric metastasis was established. The two main sites of simultaneous metastases were the lymph nodes and the lung (Table 2).

The mean time lapse between the diagnosis of the primary tumor and diagnosis of the gastric metastasis was 16 months (range, 0 to 56 months). However, in half of the patients, this diagnosis was established in less than 1 year. Diagnosis was made after 2 years in only 20% of the patients.

Only seven patients were given some form of treatment after the diagnosis of the gastric metastasis. Four



**Fig. 6.** Metastasis of squamous cell carcinoma of the esophagus in gastric tube transposed to the posterior mediastinum, after gastric pull-up esophagectomy

patients with metastasis of a carcinoma of the esophagus received palliative radiotherapy, and a partial clinical response was observed. Two surgical resections were performed — a partial gastrectomy in a patient with

**Table 1.** Gastric metastases listed by their primary sites, histology, and clinical symptoms

Primary site	Histological type	n	Clinical symptoms				
			UGB	Dysphagia	Chest pain	Dyspepsia	Weight loss
Esophagus	Squamous cell carcinoma	10	—	5	4	—	1
Skin	Melanoma	3	2	—	—	1	—
Lung	Adenocarcinoma	2	1	1	—	—	—
	Squamous cell carcinoma						
Cervix	Squamous cell carcinoma	2	2	—	—	—	—
Breast	Ductal carcinoma	1	1	—	—	—	—
Sigmoid colon	Adenocarcinoma	1	—	—	—	1	—
Testis	Embryonal carcinoma	1	1	—	—	—	—
	TOTAL	20	7	6	4	2	1

n, number of cases; UGB, upper gastrointestinal bleeding

**Table 2.** Organs that were affected simultaneously

Organs	Primary site									
	Esophagus (3)			Melanoma (2)		Lung	Uterus	Breast	Colon	Testis
Lymph nodes	x	x	x	x						
Lung				x	x			x		x
CNS					x	x		x		
Liver			x				x			
Bones						x		x		
Surgical wound	x									
Kidney				x						
Rectum									x	
Stomach	x	x	x	x	x	x	x	x	x	x

CNS, central nervous system

metastasis from cervical cancer, and a segmental gastric resection of a metastasis from an adenocarcinoma of the sigmoid colon (Fig. 5). Only one patient, with metastasis from a carcinoma of the esophagus, was treated with chemotherapy, in this patient, however, the disease progressed.

Survival after the diagnosis of gastric metastasis ranged from 0 to 14 months. The median survival in this series, calculated from the time of the diagnosis of the gastric metastasis, was 4.75 months. Overall survival during the first year was 20%, and survival was nil at 2 years.

## Discussion

Being a rare condition, the actual incidence of a metastasis to the stomach is difficult to assess. Some reports refer to necropsies performed at general hospitals, on individuals with both benign and malignant diseases (incidence of 0.8% according to Green [2], 0.3% according to Davis and Zollinger [10], and 0.2% according

to Higgins [11]). The incidence increases when one evaluates the necropsies performed on those individuals with malignant neoplasias (1.7% according to Menuck and Amberg [1], 2.9% according to Green [2], 5.4% according to Oda et al. [3], and 4.9% according to Telerman et al. [12]).

The most prevalent primary sites are the lung, breast, skin (melanoma), and esophagus. Lung and breast neoplasias were the most common primary sites of gastric metastases in several series [2–5,10–12], and these findings reflect the high incidence of these tumors among the general population [13].

Studies carried out on the basis of necropsy results performed on individuals with certain neoplasias are good sources of data on the actual incidence rate. Oda et al. [3] and Antler et al. [14] found 84 and 10 cases of gastric metastases when they performed necropsies in 1235 and 423 individuals, respectively, with lung cancer, arriving at rates of 6.8% and 2.4%.

In four major studies of necropsies in individuals with breast cancer [3,15–17], the percentages of gastric metastases ranged from 5.9% to 11.6%.

**Table 3.** Gastric metastases detected during EGD or necropsy

Author	Year	Endoscopy	Necropsy	Total
Green [2]	1990	10	57	67
Kadokia et al. [4]	1992	13	0	13
Hsu et al. [5]	1996	5	0	5
Oda et al. [3]	2001	54	347	389 <sup>a</sup>
Current series	2006	20	0	20

<sup>a</sup>Twelve cases diagnosed by esophagogastroduodenoscopy (EGD) and confirmed by necropsy

The incidence of melanoma among the general population is lower than that reported for lung and breast cancer. However, the number of cases of gastric metastases from melanomas is significant, because of the high tropism for the gastrointestinal tract [18,19]. A series of necropsies in individuals with melanoma [3,18–20] revealed gastric metastasis rates of more than 22%.

The degree to which the stomach is compromised by metastases from esophageal cancer has been described in a series of necropsies [3,8,21–24], and the percentage rate has been progressively increasing, ranging from 2.4% to 15.2%. The significant number of cases reported in surgical specimens from patients who had undergone operation in Japan is really noteworthy [7,8,25–28].

Another methodology used is the diagnosis of gastric metastasis by EGD. There are four published series dealing with cases discovered by EGD [2–5], whose features are listed in Table 3, along with the present series.

Three studies [6,29,30] describe a series of cases detected by EGD, specifically in patients with breast cancer. Taal et al. [6] studied the largest number of cases, consisting of 51 patients examined over 21 years. Schwarz et al. [29] and Zelek et al. [30] describe 6 and 10 cases examined in 3 and 16 years of study, respectively.

Three other reports [9,31,32] provide a similar description of a series of melanoma patients. Gallino et al. [9], Nelson and Lanza [31], and Taal et al. [32] presented 7, 10, and 11 cases each, respectively.

In half of the patients reported here, the primary site was the esophagus, reflecting the profile of the patients seen in a clinic for tumors of the gastrointestinal tract. The presence of two cases of metastases from the uterine cervix is to be expected in our region, where there is a high incidence of this neoplasia, which is second highest in terms of the incidence of neoplasias [33].

Gastric metastasis from colon cancer is rarely described in the literature [2,3,5,10], and our series reported only one case. This specific case was detected following dyspeptic symptoms. It was a single large lesion, with an exophytic growth pattern, which was surgically resected.

The literature provides a vast number of reports of metastases from testicular tumors to the gastrointestinal tract, manifested by digestive hemorrhage [34–38], at times associated with intestinal obstruction [39–41]. There are several reports of metastases to the stomach, specifically those associated with bleeding [2–5,10,42–44]. The case we have described here was of an embryonal carcinoma of the testes with three metastatic lesions in the gastric body, manifested by upper gastrointestinal bleeding.

Corroborating the data from other authors, the clinical symptom most frequently requiring an EGD in this series, was upper gastrointestinal bleeding [3–5]. Within the subgroup of patients with cancer of the esophagus, the symptoms justifying EGD were dysphagia and chest pain. Unfortunately, the diagnosis of metastasis in the symptomatic phase signifies a late diagnosis, at a stage which renders any treatment procedure ineffective.

The macroscopic features observed by EGD vary considerably and are, therefore, not specific of metastatic disease. Oda et al. [3], in a large series, list eight different endoscopic manifestations. The patients we have described showed a predominance of ulcerated lesions, resembling advanced gastric carcinoma. In two patients, the manifestation was of a non-ulcerated submucosal tumor. Several authors [3,6,15,31] have described this manifestation as a diffuse infiltration. In the present series, two such cases were observed, one was a metastasis of the breast and the other, of the lung.

In our study it was possible to observe a clear predominance of single lesions (80%), most frequently located in the gastric body, corroborating similar observations by Oda et al. [3].

Among our patients there were six with metastases of carcinoma of the esophagus to a gastric tube that had been built to restore post-esophagectomy transit (Fig. 6). To the best of our knowledge, the literature includes no reports of similar cases with EGD diagnosis. Saito et al. [8] describe nine identical cases, which were, however, detected during necropsy.

With regards to the time between the diagnosis of the primary site and detection of the metastasis, half of the cases were detected within 1 year, corroborating the report by Oda et al. [3].

The existence of gastric metastasis is an important marker of advanced disease. Corroborating similar observations by Kobayashi et al. [45], in 50% of the patients presented here, there were concomitant metastases to other organs. This explains the lack of therapeutic options and the poor prognosis associated with this condition.

In the small series presented in this article, the survival period was extremely short. New studies, with a large number of patients, are required in order to carry

out an investigation on the real prognostic effect of gastric metastases from different primary sites.

In conclusion, despite the low prevalence of gastric metastases, EGD, associated with good biopsy practices and a close study of the specimens, must be used in the follow-up of patients with malignant neoplasias, especially those at a greater risk of metastatic disease.

## References

1. Menuck LS, Amberg JR. Metastatic disease involving the stomach. *Am J Dig Dis* 1975;20:903–13.
2. Green LK. Hematogenous metastases to the stomach. A review of 67 cases. *Cancer* 1990;65:1596–600.
3. Oda I, Kondo H, Yamao T, Saito D, Ono H, Gotoda T, et al. Metastatic tumors to the stomach: analysis of 54 patients diagnosed at endoscopy and 347 autopsy cases. *Endoscopy* 2001;33:507–10.
4. Kadakia SC, Parker A, Canales L. Metastatic tumors to the upper gastrointestinal tract: endoscopic experience. *Am J Gastroenterol* 1992;87:1418–23.
5. Hsu CC, Chen JJ, Changchien CS. Endoscopic features of metastatic tumors in the upper gastrointestinal tract. *Endoscopy* 1996;28:249–53.
6. Taal BG, Peterse H, Boot H. Clinical presentation, endoscopic features, and treatment of gastric metastases from breast carcinoma. *Cancer* 2000;89:2214–21.
7. Maeta M, Koga S, Shimizu N, Hamazoe R, Inoue Y. Clinicopathologic study of esophageal cancer associated with simultaneous metastatic lesions in the stomach. *J Surg Oncol* 1988;38:143–6.
8. Saito T, Iizuka T, Kato H, Watanabe H. Esophageal carcinoma metastatic to the stomach. A clinicopathologic study of 35 cases. *Cancer* 1985;56:2235–41.
9. Gallino G, Belli F, Bonfanti G, Ditto A, Andreola S, Tragni G, et al. Surgical treatment of gastric metastases from cutaneous melanoma: experience of the National Cancer Institute of Milan. *Tumori* 2001;87:229–31.
10. Davis GH, Zollinger RW. Metastatic melanoma of the stomach. *Am J Surg* 1960;99:94–6.
11. Higgins PM. Pyloric obstructions due to a metastatic deposit from carcinoma of the bronchus. *Can J Surg* 1962;5:438–41.
12. Telerman A, Gerard B, Van den Heule B, Bleiberg H. Gastrointestinal metastases from extra-abdominal tumors. *Endoscopy* 1985;17:99–101.
13. Jemal A, Ward EM, Thun MJ. Cancer statistics. In: DeVita VT, Hellman S, Rosenberg SA, editors. *Cancer: principles and practice of oncology*, seventh edition. Philadelphia: Lippincott Williams & Wilkins; 2005. pp. 226–41.
14. Antler AS, Ough Y, Pitchumoni CS, Davidian M, Thelmo W. Gastrointestinal metastases from malignant tumors of the lung. *Cancer* 1982;49:170–2.
15. Choi SH, Sheehan FR, Pickren JW. Metastatic involvement of the stomach by breast cancer. *Cancer* 1964;17:791–7.
16. Asch MJ, Wiedel PD, Habif DV. Gastrointestinal metastases from carcinoma of the breast. Autopsy study and 18 cases requiring operative intervention. *Arch Surg* 1968;96:840–3.
17. Cifuentes N, Pickren JW. Metastases from carcinoma of mammary gland: an autopsy study. *J Surg Oncol* 1979;11:193–205.
18. Dasgupta TK, Brasfield RD. Metastatic melanoma of the gastrointestinal tract. *Arch Surg* 1964;88:969–73.
19. Potchen EJ, Khung CL, Yatsuhashi M. X-ray diagnosis of gastric melanoma. *N Engl J Med* 1964;271:133–6.
20. Patel JK, Didolkar MS, Pickren JW, Moore RH. Metastatic pattern of malignant melanoma. A study of 216 autopsy cases. *Am J Surg* 1978;135:807–10.
21. Attah EB, Hajdu SI. Benign and malignant tumors of the esophagus at autopsy. *J Thorac Cardiovasc Surg* 1968;55:396–404.
22. Bosch A, Frias Z, Caldwell WL, Jaeschke WH. Autopsy findings in carcinoma of the esophagus. *Acta Radiol Oncol Radiat Phys Biol* 1979;18:103–12.
23. Mandard AM, Chasle J, Marnay J, Villedieu B, Bianco C, Roussel A, et al. Autopsy findings in 111 cases of esophageal cancer. *Cancer* 1981;48:329–35.
24. Anderson LL, Lad TE. Autopsy findings in squamous-cell carcinoma of the esophagus. *Cancer* 1982;50:1587–90.
25. Takubo K, Sasajima K, Yamashita K, Tanaka Y, Fujita K. Prognostic significance of intramural metastasis in patients with esophageal carcinoma. *Cancer* 1990;65:1816–9.
26. Kuwano H, Baba K, Ikebe M, Kitamura K, Adachi Y, Mori M, et al. Gastric involvement of oesophageal squamous cell carcinoma. *Br J Surg* 1992;79:328–30.
27. Kato H, Tachimori Y, Watanabe H, Itabashi M, Hirota T, Yamaguchi H, et al. Intramural metastasis of thoracic esophageal carcinoma. *Int J Cancer* 1992;50:49–52.
28. Ebihara Y, Hosokawa M, Kondo S, Katoh H. Thirteen cases with intramural metastasis to the stomach in 1259 patients with esophageal squamous cell carcinoma. *Eur J Cardiothorac Surg* 2004;26:1223–5.
29. Schwarz RE, Klimstra DS, Turnbull AD. Metastatic breast cancer masquerading as gastrointestinal primary. *Am J Gastroenterol* 1998;93:111–4.
30. Zelek L, Cottu PH, Mignot L, de Roquancourt A, Fizazi K, Cojean-Zelek I, et al. Gastric metastases from breast cancer: a retrospective series of 12 patients. *Am J Clin Oncol* 2001;24:363–5.
31. Nelson RS, Lanza F. Malignant melanoma metastatic to the upper gastrointestinal tract. *Gastrointest Endosc* 1978;24:156–8.
32. Taal BG, Westerman H, Boot H, Rankin EM. Clinical and endoscopic features of melanoma metastases in the upper GI tract. *Gastrointest Endosc* 1999;50:261–3.
33. Curado MP, Latorre MRO, Bandeira CM, Cruz A, Sousa EC, Martins IM, et al. Brazil, Goiânia. In: Parkin DM, Whelan SL, Ferlay J, Teppo L, Thomas DB, editors. *Cancer incidence in five continents*, vol VIII. Lyon: IARC Scientific Publications; 2002. p. 112–3.
34. Zerbib P, Prieur E, Khoury-Helou A, Catala P, Pruvot FR, Chambon JP. Hemorrhagic digestive metastases from testicular choriocarcinoma (in French with abstract in English). *Ann Chir* 2002;127:300–1.
35. Syrigos KN, Tsioulos D, Efstathiou S, Kouvaras S, Mitromaras A, Merikas EA. Metastatic testicular cancer with massive gastrointestinal haemorrhage as initial presentation. *Clin Oncol (R Coll Radiol)* 2002;14:179–81.
36. Rosenblatt GS, Walsh CJ, Chung S. Metastatic testis tumor presenting as gastrointestinal hemorrhage. *J Urol* 2000;164:1655.
37. Nakamura A, Ikeda Y, Morishita S, Sato Y, Matsumoto M, Inomoto T, et al. Upper gastrointestinal bleeding arising from metastatic testicular tumor. *J Gastroenterol* 1997;32:650–3.
38. Cunningham LN, Ginsberg P, Manfrey S, Finkelstein LH. Massive hemorrhage secondary to metastatic testicular carcinoma. *J Am Osteopath Assoc* 1989;89:341–4.
39. Hofflander R, Beckes D, Kapre S, Matolo N, Liu S. A case of jejunal intussusception with gastrointestinal bleeding caused by metastatic testicular germ cell cancer. *Dig Surg* 1999;16:439–40.
40. Sweetenham JW, Whitehouse JM, Williams CJ, Mead GM. Involvement of the gastrointestinal tract by metastases from germ cell tumors of the testis. *Cancer* 1988;61:2566–70.
41. Chait MM, Kurtz RC, Hajdu SI. Gastrointestinal tract metastasis in patients with germ-cell tumor of the testis. *Am J Dig Dis* 1978;23:925–8.

42. Harikumar R, Harish K, Aravindan KP, Thomas V. Testicular choriocarcinoma with gastric metastasis presenting as hematemesis. *Indian J Gastroenterol* 2004;23:223–4.
43. Aydiner A, Olgaç V, Darendeliler E, Oztürk N, Dinçol K, Erseven G, et al. Testicular germ cell tumor with gastric metastasis. *Acta Oncol* 1993;32:459–60.
44. Fleck RM, Schade RR, Kowal CD, Van Thiel DH. Testicular choriocarcinoma with metastasis to gastric mucosa. *Gastrointest Endosc* 1984;30:188–9.
45. Kobayashi O, Murakami H, Yoshida T, Cho H, Yoshikawa T, Tsuburaya A, et al. Clinical diagnosis of metastatic gastric tumors: clinicopathologic findings and prognosis of nine patients in a single cancer center. *World J Surg* 2004;28:548–51.