North Clin Istanb 2017;4(3):275-278
doi: 10.14744/nci.2017.60437

Case Report General Surgery

Gastric cancer with adenocarcinoma and yolk sac tumor components: A rare entity

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ABSTRACT

Despite a sharp worldwide decline in the incidence and mortality due to gastric cancer during the second half of the 20th century, gastric cancer remains the world's second leading cause of cancer-related deaths. Variants of gastric cancer account for approximately 5% of all stomach carcinomas. Herein, we report on a rare case of combined germ cell tumor and adenocarcinoma that arose in the stomach of a 68-year-old woman with a high level of alpha-fetoprotein in the serum. Clinical and pathological findings are presented.

Keywords: Adenocarcinoma; gastric cancer; germ cell tumors; yolk sac.

Germ cells tumors most frequently occur in the gonads. Extragonadal localization is rare and concerns mainly midline locations such as the mediastinum, retroperitoneum, and pineal gland. Yolk sac tumor (YST) is a malignant tumor originating from the germ cell. Gastric adenocarcinoma with a yolk sac component is extremely rare with only a few cases reported in the literature [1].

Herein, we present a rare case of gastric cancer with adenocarcinoma and YST components in a 68-year-old woman who presented with metastatic para-aortic lymphadenopathy (LAP).

CASE REPORT

A 68-year-old woman presented with symptoms of appetite loss, weight loss, and abdominal pain that had persisted for 4 months. During a general health examination at a local clinic, para-aortic LAP was detected by abdominal tomography. Tru-Cut biopsy revealed adenocarcinoma with probable primary ovarian or other serosal origin. She was referred to our hospital for further evaluation and management. There was no significant physical findings. Except for anemia (level of hemoglobin: 11.1 g/dl), hematological and biochemical parameters were normal. The level of alpha-fetoprotein (AFP) in her serum was elevated to 50 ng/mL (normal: 0–32 ng/mL), whereas levels of carcinoembryonic antigen (CEA) (normal: 0–3 ng/mL), and human chorionic gonadotropin (HCG) (normal: 0–10 mlU/ml) in the serum were within the normal limits. Computed tomography of the abdomen showed gastric wall thickness at the lesser curvature of the mid body in

Received: October 06, 2016 *Accepted:* January 10, 2017 *Online:* October 17, 2017

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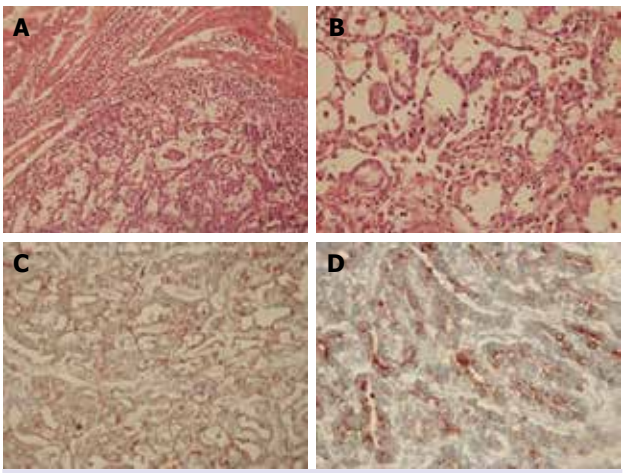

Figure 1. Morphological features of yolk sac tumor (A). Tumor with reticular pattern adjacent the gastric foveolar epithelium (B). Tumor cells, with pale eosinophilic cytoplasm and vesicular nuclei, appear to be arranged into microcystic and papillary or pseudopapillary structures. The tumor cells show immunoreactivity for cytokeratin (C) and for AFP (D).

addition to para-aortic lymph node enlargement. Upper digestive tract endoscopy showed a 5–6 cm-ulcerofungating mass in the lesser curvature of the gastric body. Histopathologic findings following gastroduodenoscopy revealed an invasive poorly differantiated adenocarcinoma. Total gastrectomy with D2 lymph node dissection and esophagojejunostomy were performed. Precise histopathological examination of resected specimens revealed the presence of a moderate-to-poorly differentiated invasive adenocarcinoma, with features of YST. An elevated tumor, 6×5×3 cm in size, with surface ulceration and hemorrhage was located in the antral minor curvature of the stomach. The tumor was primarily located in the mucosa and submucosa. The final diagnosis was T3, N3, M0, and stage III according to the Japanese classification of gastric cancer. Metastases to perigastric lymph nodes were also observed. The gastric tumor was composed of two histological types: YST and a moderately differentiated tubular adenocarcinoma. Majority of the tumor was occupied by a YST which showed the most common reticular pattern (Fig. 1A, B). Schiller-Duval bodies were also sporadically observed. Other components of germ cell tumors, like embryonal carcinomas and choriocarcinomas, were not identified. In the yolk sac component, tumor cells showed immunoreactivity for cytokeratin (Fig. 1C) and AFP (Fig. 1D) but not for CEA, chromogranin A, cytokeratins 7 and 20, β-HCG , CDX2, placental alkaline phosphatase, and CD30. Focal staining for AFP was also observed in the adenocarcinoma foci (Fig. 2). Alternatively, CEA was strongly positive in the adenocarcinoma. The postoperative period was uneventful, and the patient was discharged on the 9 th postoperative day with a plan for chemotherapy. The patient died in 8 months after the surgery.

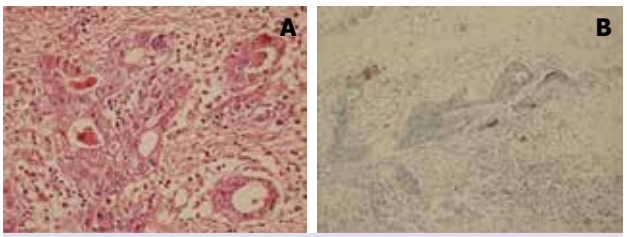

Figure 2. The adenocarcinomatous component of the tumor shows atypical tubular glands with luminal necrotic material (A). Focal AFP immunostaining in the adenocarcinoma component (B).

DISCUSSION

Gastric cancer remains one of the deadly diseases with poor prognosis. Sixteen cases of gastric YST have been reported in the medical literature since the description of the tumor in 1985 by Gharcia et al. (Table 1). It is notable that 11 cases (68.75%) have been reported to have adenocarcinoma components as well. The level of AFP in the serum was increased in most of these cases [2]. Six of the 16 patients with gastric YST had rapidly fatal clinical courses, consistent with the highly aggressive nature of these neoplasms at other sites. According to reported literature, gastric YST usually affect middle-aged and elderly people with male preponderance, as confirmed by our case. They are aggressive neoplasms with early metastases. Five of the reported patients had long-term survival and one was a autopsy case. The remaining four patients had short survival times. The clinical presentation in most pa-

Table 1. Summary of reported gastric yolk sac tumors

Authors (year)	Age/Sex	Location	Tumor (cm)	Therapy	Histology	Metastasis	Prognosis
Garcia & Ghali (1985)	65/M	Antrum	5	NT	YST, CC, AC	Liver	Autopsy case
Motoyama (1985)	72/F	Body	10.5x9.5x8.5	S	YST, AC	None	Survival for 3 years
Motoyama (1993)	72/F	NM	7x6		YST, AC, CC	None	Died in 3 years
Zamecnik (1993)	88/M	Antrum	NM	S	YST	LN, omentum, retropyloric	Died in 4 weeks
Suzuki (1999)	56/M	Cardia	15x10x7	S, CT	YST, AC	LN, abdominal cavity	Died in 6 weeks
Puglisi (1999)	61/M	Antrum	6	NT	YST, AC	Abdominal cavity	Died in 1 month
Wang (2000)	36/M	Body	NM	CT	YST, AC	LN, lung, spinal cord	Died in 6 months
Napaki (2004)	38/F	E-G junction	NM	S, CT	YST, AC	Liver	Survived for 32 months
Kanai (2005)	87/M	Cardia	3x3	S	YST	LN	Died in 7 months
Singh (2007)	67/M	Body, antrum	8x10	S, CT	YST, AC	LN	Died in 2 months
Hong (2007)	50/M	Antrum	4.5x3	S	YST, AC	None	Survived for 12 months
Tahara (2008)	74/M	Body	5x3.5	NT	YST	LN, liver, O	Died in 6 days
Gupta (2008)	67/M	NM	NM	S, CT	YST, AC, CC	Liver, lung	Death during adjuvan CT
Kim (2009)	61/M	Body	1x0.8	S	YST	None	No recurrence and good condition for 3 months after surgery
Magni (2010)	62/M	Antrum	7	S, CT	YST	None	Died in 12 months
Satake (2011)	74/M	Body, antrum	11x8x3	S, RFA, CT	YST, CC, AC	LN, liver, O, pancreas	Recurrence in 6 months
Present case	68/F	Body	5x6	S, CT	YS, AC	LN	Died in 8 months

YST: Yolk sac tumor; AC: Adenocarcinoma; CC: Choriocarcinoma; LN: Lymph node; O: Omentum; NM: Not mentioned; NT: No treatment; S: Surgery; CT: Chemotherapy; RFA: Radiofrequency ablation.

tients is remarkably uniform. YSTs of the stomach that have been reported to be large masses within the stomach. Although there has been at least one report of YST that did not respond at all to germ cell regimens, YSTs of the stomach should be treated with germ cell regimens, such as bleomycin, etoposide, and cisplatin or vinblastine, ifosfamide, and cisplatine. However, the adenocarcinomatous components may not be as responsive as the germ cell tumors. The disease tends to rapidly recur in spite of initial response to chemotherapy. Controversy remains regarding the origin of extragonadal germ cell tumors. These tumors can be found anywhere on the midline, particularly the retroperitoneum, anterior mediastinum, sacrococcyx, and pineal gland. Other less common sites include the orbit, suprasellar area, palate, thyroid, submandibular region, anterior abdominal wall, stomach, liver, vagina, gallbladder, pancreas, and prostate [3]. The classic theory suggests that germ cell tumors in these areas are derived from migrating germ cells sequestered in the midline during embryogenesis [4]. This may be the case of pure YSTs occurring in the stomach [5–8]. An alternative theory suggests that the tumor originates due to aberrant differentiation of somatic cells [9, 10]. This might explain cases of YST occurring in the stomach or lung. Aberrant differentiation of adenocarcinomas may explain the devel-

opment of gastric YST with a adenocarcinomatous component, as observed in the present case.

CONCLUSION

In patients with gastric carcinoma with a high level of AFP in the serum, YST is the likely diagnosis. Although the reported number of gastric adenocarcinomas with a yolk sac component is not so large to predict a proper outcome, the presence of the yolk sac component may be an indication of poor prognosis in terms of duration of survival.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

Authorship contributions: Concept – M.Y., M.T.K.; Design – M.Y., M.T.K., A.T.; Data Collection – M.Y., A.T.; Analysis – M.Y., M.T.K. A.T., Literature search – M.Y., M.T.K.; Writing – M.Y., M.T.K.

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