

# Simultaneous Gastric Adenocarcinoma and Gastrointestinal Stromal Tumor of the Stomach: A Case Report

Jalaluddin Khoshnevis<sup>1,2</sup>, Azadeh Rakhshan<sup>2</sup>, Mohammad Reza Sobhiyeh<sup>1,2</sup>, Barmak Gholizadeh<sup>1,2</sup>, Ali Rahbari<sup>2</sup>, Farideh Adhami<sup>1,2</sup>, Saran Lotfollahzadeh<sup>2</sup>

## Abstract

Simultaneous a collision tumor of stomach consisting of adenocarcinoma and Gastrointestinal Stromal Tumor (GIST) is very rare based on our knowledge. This coexistence has rarely been reported in literatures.

We report a case of 64-year-old woman who has diagnosed with prepyloric poorly-differentiated diffuse signet-ring cell type adenocarcinoma and has undergone an elective D2 total gastrectomy. During operation another mass in fundic body region has found.

The pathologic examination of the mass has shown GIST. Immunohistochemical staining for CD117 and Desmin was positive whilst that for S100 was negative.

This case reports the simultaneous two tumors development of different histotypes and natures in the same organ.

**Keywords:** Stomach cancer; Adenocarcinoma; Gastrointestinal stromal tumor

**Please cite this article as:** Khoshnevis J, Rakhshan A, Sobhiyeh MR, Gholizadeh B, Rahbari A, Adhami F, Lotfollahzadeh S. Simultaneous Gastric Adenocarcinoma and Gastrointestinal Stromal Tumor of the Stomach: A Case Report. *Iran J Cancer Prev*.2013; 6(1): 55-8.

1. Dept. of General and Vascular Surgery, Shahid Beheshti University of Medical Sciences, Tehran, Iran  
2. Cancer Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Corresponding Author:  
Mohammad Reza Sobhiyeh, MD  
Tel: (+98) 21 22 72 11 44  
Email:MRReza.Sobhiyeh@yahoo.com

Received: 6 Oct. 2012  
Accepted: 25 Nov. 2012  
**Iran J Cancer Prev 2013; 1:55-8**

## Introduction

Adenocarcinoma is the most common type of malignant gastric neoplasm (95%) but Gastrointestinal Stromal Tumors (GISTs) have relatively appeared rare (1%) [1-4].

GISTs and adenocarcinoma are distinct malignancies originating from different cell layers and the simultaneous development of a GIST and gastric adenocarcinoma is relatively rare [5-10].

Here we present a very rare combination of synchronous prepyloric gastric adenocarcinoma and a GIST of fundic body region.

## Case Presentation

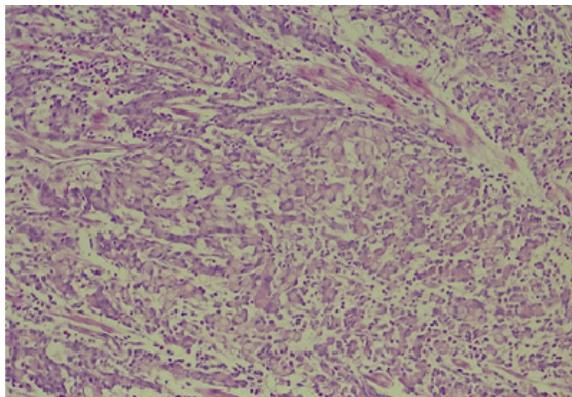
Sixty four-year-old female has admitted to our hospital complaining of dyspeptic symptoms, during the last 2 months. Physical examination and laboratory tests were unremarkable. Endoscopy has shown infiltrative tumor in the pyloric region from which biopsies have taken. Histologic examination revealed poorly-differentiated diffuse signet-ring cell type adenocarcinoma. Chest x-ray and

abdominal CT-scan have not shown any signs of metastasis.

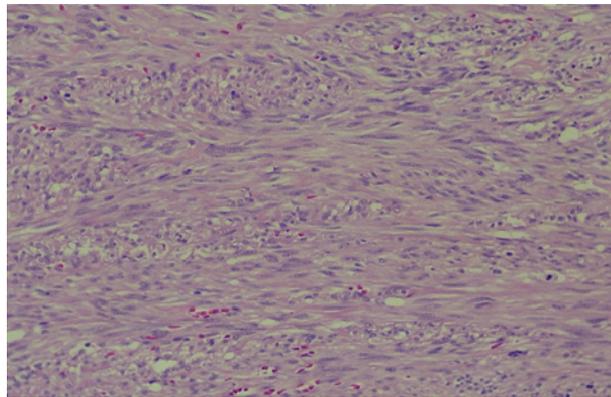
Subsequently the patient has undergone an elective subtotal gastrectomy and Billroth-II gastrojejunal anastomosis during the operation. There was a second nodule has palpated in the fundic body region at the greater curvature which has separately resected.

Pathology examination has shown a polypoid and infiltrative circumferential mass that has measured 6×4×2 cm in antropyloric region on macroscopic examination.

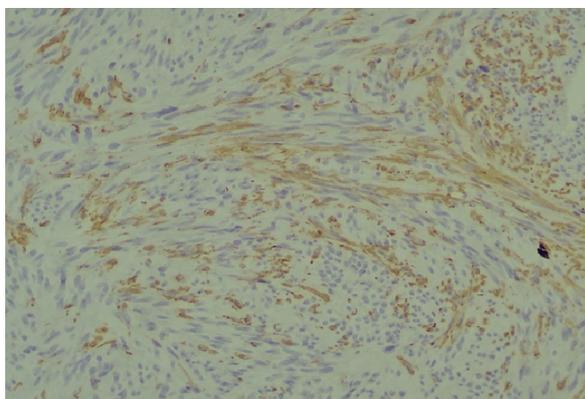
In gross examination of specimen an infiltrative circumferential mass in antropyloric region measuring 6x4x2cm has detected. The histopathologic examination has revealed a signet ring type poorly differentiated adenocarcinoma of stomach, that has been infiltrating the wall and reaching the subserosa. It has comprised of diffuse sheets of signet ring cells (Figure 1). Surgical margins were tumor free. Omentum and six recovered perigastric lymph nodes were tumor free. The separate nodule of fundic body



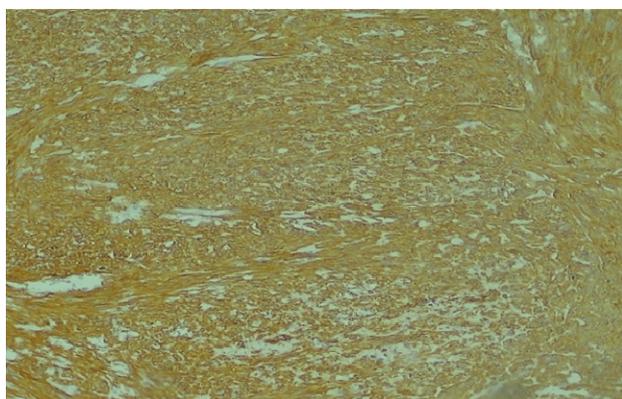
**Figure 1.** Poorly differentiated adenocarcinoma of antrum/pyloric region is shown. The signet ring cells infiltrate the muscular wall of stomach.



**Figure 2.** Gastrointestinal Stromal Tumor (GIST) of stomach is shown. The neoplastic cells have uniform spindle nuclei, eosinophilic fibrillar.



**Figure 3.** GIST with focal cytoplasmic staining for desmin



**Figure 4.** GIST showing diffuse and strong membranous and cytoplasmic staining for CD117 (c-kit).

region of stomach was a well circumscribed tan elastic tumoral mass measuring 1 cm in diameter. In microscopic examination it was a spindle cells neoplasm located in muscularis propria extending up to serosa composed of intersecting fascicles of spindle cells with abundant eosinophilic fibrillar cytoplasm and minor degree of nuclear pleomorphism (Figure 2). In immunohistochemical study focal positivity for desmin (Figure 3) and diffuse strong positivity for CD117 (Figure 4) have detected which has confirmed the diagnosis of gastrointestinal stromal tumor.

The postoperative period was uneventful and she has discharged on the sixth postoperative day.

The patient has received imatinibas adjuvant therapy for the GIST, according to the international guidelines for GISTs risk stratification [2]. Four month later on her follow up visit she has shown clinically and radiographically disease free.

## Discussion

The collision of adenocarcinoma and GIST in the stomach is extremely rare and to the best of our knowledge only few cases have been reported in the English literature [5-10]. In the cases the synchronous tumors have located in different parts of the stomach, in our case there was prepyloric gastric signet cell adenocarcinoma and a proximal gastric GIST.

GISTs are typically sessile big soft tumors and could develop necrosis or ulceration of overlying mucosa. However when the GIST is sub mucosal or subserosal the gastric mucosa might not be invaded and endoscopic assessment could be normal.

In our case preoperative diagnosis was adenocarcinoma and during laparotomy we have incidentally found a small nodule in proximal part of stomach and the histopathological and immunohistochemical examination of the specimen have revealed the diagnosis of GIST.

GISTs have first introduced by Mazur and Clark in 1983 [11].

This designates a heterogeneous group of mesenchymal malignancies that consist of spindle or epithelioid cells with varying degrees of differentiation. These tumors have classified as leiomyomas, leiomyosarcomas, leiomyblastomas, or schwannomas [1].

These tumors had an annual incidence of approximately 10-15 cases per 1 million people; however GISTs are the most common mesenchymal tumors of the gastrointestinal tract accounting for 0.1 to 3% of all GI tumors [12, 13]. The most common site of GISTs is stomach [14].

These tumors are thought to originate either from the stem cells that differentiate towards interstitial cells of Cajal or directly from interstitial cells of Cajal [14, 15].

In general GISTs could distinguish from other spindle or epithelioid cell tumors by expressing CD117 and CD 34 in 50-80% of cases [14, 15].

Ninety percent of GISTs have a mutation in the KIT oncogene but 10% miss this mutation [15].

Surgical resection is the primary treatment for GIST. Approximately 70-85 % of patients have a complete resection but overall five-year survival is only 50%. Since 2002 a novel therapy, imatinib mesylate, has introduced to treat this kind of malignancies. This is a tyrosine kinase inhibitor and has demonstrated with great dramatic effects in majority of patients [16, 17].

Approximately 20% of patients with GIST develop other neoplasms [18-20]. Various hypotheses have been proposed about synchronized occurrence of GIST and adenocarcinoma. They have considered whether such an association was incidental coexistence, or the two lesions have connected by a connecting relationship.

Some articles suggest that gene mutations or a single carcinogenic agent might interact with two neighboring tissues inducing tumors development of different histotypes in the same organ. But no evidence of this last hypothesis has yet been found [10, 21,22]. Both tumors have different precursor cells and molecular make up and if there were a single carcinogen, these types of tumor would probably diagnose. More often simple coincidence have also known as the case especially in geographical regions with high incidence rate of gastric cancer such as Japan. Although *Helicobacter Pylori* infection has been implicated in gastric cancer development, there is no evidence of such association in GIST [9].

N-methyl-N Nitro-Nnitrosogunidine has induced gastric adenocarcinoma development of following oral administration in rats [23] and when it has combined with agents such as aspirin or stress, leiomyosarcoma has developed in combination with epithelial tumors [24]. Other articles have reported induction of gastric adenocarcinoma after injection of 9, 10-Dimethyl-1, 2-Benzanthracene (DMBA) where management with DMBA and cellophane plate could cause mainly the induction of gastric sarcomas [25].

In collision tumors the adenocarcinoma has been determined to have a greater unfavorable effect on prognosis than the GIST, even if the GIST has belonged to the high-risk group [26].

## Acknowledgment

We would like to thank Cancer Research Center of Shahid Beheshti University of Medical Sciences for its cooperation with us.

## Conflict of Interest

The authors declare that they have no conflict of interest in this article.

## Authors' Contribution

Jalaluddin khoshnevis and Azadeh Rakhshan designed the study; Mohammad Reza Sobhiyeh and Barmak Gholizadeh wrote the paper, Ali Rahbari and Farideh Adhami contributed to the data entry and analyzed the data while Saran Lotfollahzadeh helped in writing the manuscript.

## References

1. Heinrich MC, Corless CL. Gastric GI stromal tumors (GISTs): The role of surgery in the era of targeted therapy. *Journal of Surgical Oncology*. 2005; 90(3):195-207.
2. Miettinen M, Lasota J. Gastrointestinal stromal tumors: Pathology and prognosis at different sites. *Seminars in Diagnostic Pathology*. 2006; 23(2):70-83.
3. Nowain A, Bhakta H, Pais S, Kanel G, Verma S. Gastrointestinal stromal tumors: clinical profile, pathogenesis, treatment strategies and prognosis. *J GastroenterolHepatol*. 2005 Jun; 20(6):818-24.
4. Nilsson B, Bummig P, Meis-Kindblom JM, Oden A, Dortok A, Gustavsson B, et al. Gastrointestinal stromal tumors: the incidence, prevalence, clinical course, and prognostication in the preimatinibmesylate era--a population-based study in western Sweden. *Cancer*. 2005 Feb 15; 103(4):821-9.
5. Lee FY, Jan YJ, Wang J, Yu CC, Wu CC. Synchronous gastric gastrointestinal stromal tumor and signet-ring cell adenocarcinoma: a case report. *Int J SurgPathol*. 2007 Oct; 15(4):397-400.
6. Villias C, Gourgiotis S, Veloudis G, Sampaziotis D, Moreas H. Synchronous early gastric cancer and gastrointestinal stromal tumor in the stomach of a patient

with idiopathic thrombocytopenic purpura. *J Dig Dis*. 2008 May; 9(2):104-7.

7. Theodosopoulos T, Dellaportas D, Psychogiou V, Gennatas K, Kondi-Pafiti A, Gkiokas G, et al. Synchronous gastric adenocarcinoma and gastrointestinal stromal tumor (GIST) of the stomach: a case report. *World J Surg Oncol*. 2011; 9:60.

8. Yamamoto D, Hamada Y, Tsubota Y, Kawakami K, Yamamoto C, Yamamoto M. Simultaneous development of adenocarcinoma and gastrointestinal stromal tumor (GIST) in the stomach: case report. *World J Surg Oncol*. 2012; 10:6.

9. Jeong SH, Lee YJ, Park ST, Choi SK, Hong SC, Jung EJ, et al. Synchronous Adenocarcinoma and Gastrointestinal Stromal Tumor of the Stomach Treated by a Combination of Laparoscopy-assisted Distal Gastrectomy and Wedge Resection. *Journal of gastric cancer*. 2011 Mar; 11(1):55-8.

10. Bircan S, Candir O, Aydin S, Baspinar S, Bulbul M, Kapucuoglu N, et al. Synchronous primary adenocarcinoma and gastrointestinal stromal tumor in the stomach: a report of two cases. *The Turkish journal of gastroenterology: the official journal of Turkish Society of Gastroenterology*. 2004 Sep; 15(3):187-91.

11. Mazur MT, Clark HB. Gastric stromal tumors. Reappraisal of histogenesis. *The American journal of surgical pathology*. 1983 Sep; 7(6):507-19.

12. Rabin I, Chikman B, Lavy R, Sandbank J, Maklakovsky M, Gold-Deutch R, et al. Gastrointestinal stromal tumors: a 19 year experience. *Isr Med Assoc J*. 2009 Feb; 11(2):98-102.

13. Perez EA, Livingstone AS, Franceschi D, Rocha-Lima C, Lee DJ, Hodgson N, et al. Current incidence and outcomes of gastrointestinal mesenchymal tumors including gastrointestinal stromal tumors. *J Am Coll Surg*. 2006 Apr; 202(4):623-9.

14. Miettinen M, Sarlomo-Rikala M, Lasota J. Gastrointestinal stromal tumors: recent advances in understanding of their biology. *Human pathology*. 1999 Oct; 30(10):1213-20.

15. van der Zwan SM, DeMatteo RP. Gastrointestinal stromal tumor: 5 years later. *Cancer*. 2005 Nov 1; 104(9):1781-8.

16. Verweij J, van Oosterom A, Blay JY, Judson I, Rodenhuis S, van der Graaf W, et al. Imatinibmesylate (STI-571 Glivec, Gleevec) is an active agent for gastrointestinal stromal tumours, but does not yield responses in other soft-tissue sarcomas that are unselected for a molecular target. Results from an EORTC Soft Tissue and Bone Sarcoma Group phase II study. *European journal*

*of cancer* (Oxford, England: 1990). 2003 Sep; 39(14):2006-11.

17. Sexton JA, Pierce RA, Halpin VJ, Eagon JC, Hawkins WG, Linehan DC, et al. Laparoscopic gastric resection for gastrointestinal stromal tumors. *Surgical endoscopy*. 2008 Dec; 22(12):2583-7.

18. Kaffes A, Hughes L, Hollinshead J, Katelaris P. Synchronous primary adenocarcinoma, mucosa-associated lymphoid tissue lymphoma and a stromal tumor in a *Helicobacter pylori*-infected stomach. *Journal of gastroenterology and hepatology*. 2002 Sep; 17(9):1033-6.

19. Fletcher CD, Berman JJ, Corless C, Gorstein F, Lasota J, Longley BJ, et al. Diagnosis of gastrointestinal stromal tumors: A consensus approach. *Human pathology*. 2002 May; 33(5):459-65.

20. Pandurengan RK, Dumont AG, Araujo DM, Ludwig JA, Ravi V, Patel S, et al. Survival of patients with multiple primary malignancies: a study of 783 patients with gastrointestinal stromal tumor. *Ann Oncol*. 2010 Oct; 21(10):2107-11.

21. Maiorana A, Fante R, Maria Cesinaro A, Adriana Fano R. Synchronous occurrence of epithelial and stromal tumors in the stomach: a report of 6 cases. *Archives of pathology & laboratory medicine*. 2000 May; 124(5):682-6.

22. Liu SW, Chen GH, Hsieh PP. Collision tumor of the stomach: a case report of mixed gastrointestinal stromal tumor and adenocarcinoma. *Journal of clinical gastroenterology*. 2002 Oct; 35(4):332-4.

23. Sugimura T, Fujimura S, Baba T. Tumor production in the glandular stomach and alimentary tract of the rat by N-methyl-N'-nitro-N-nitrosoguanidine. *Cancer research*. 1970 Feb; 30(2):455-65.

24. Cohen A, Geller SA, Horowitz I, Toth LS, Werther JL. Experimental models for gastric leiomyosarcoma. The effects of N-methyl-N'-nitro-N-nitrosoguanidine in combination with stress, aspirin, or sodium taurocholate. *Cancer*. 1984 Mar 1; 53(5):1088-92.

25. Shitkov KG, Talalaeva AV. [Gastric sarcomas induced in rats by DMBA and cellophane]. *Voprosy onkologii*. 1979; 25(8):62-5.

26. Agaimy A, Wunsch PH, Sobin LH, Lasota J, Miettinen M. Occurrence of other malignancies in patients with gastrointestinal stromal tumors. *Seminars in diagnostic pathology*. 2006 May; 23(2):120-9.