



## Sporadic Congenital Hyperplasia of Interstitial Cell of Cajal of Rectum as a Cause of Chronic Constipation

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### ABSTRACT

Gastrointestinal stromal tumors (GIST) are the usual primary mesenchymal neoplasms of the GI tract. Interstitial cells of Cajal (ICCs) are intestinal pacemaker cells that instigate peristalsis in the stomach and intestine, and are measured to be precursors of GIST. We are reporting a 17 year old boy with chronic constipation since childhood and a huge rectum in abdominal radiography, who underwent exploratory laparotomy, resection of huge rectum and construction of sigmoid colostomy. Pathology report was "Hyperplasia of Interstitial Cells of Cajal".

**Keywords:** Gastrointestinal stromal tumor (GIST), ICC hyperplasia, Chronic Constipation

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### 1. Introduction

Gastrointestinal stromal tumor (GIST) is the usual primary mesenchymal neoplasm of the GI tract (1). GISTs are unusual in the colon and rectum (5-10%). (2) GISTs are currently thought to derive from or differentiate similar to the gastrointestinal pacemaker cells, the interstitial cells of Cajal (ICCs) (3). ICCs are CD117-positive CD34-expressing slender bipolar mesenchymal cells that form a network surrounding the autonomic nerves of the Auerbach

plexus and are also distributed within the internal and external layer of the muscularis propria (4). The term ICC hyperplasia has been applied to a variety of microscopic CD117-expressing spindle cell lesions founded incidentally in surgical or autopsy specimens harboring larger GISTs or other non-GIST lesions (3, 5, 6). ICC hyperplasia may either occur as a sporadic (incidental) lesion or present in a syndromic situation known to multiple GIST tumors at different locations. The latter situation has been observed in patients with hereditary GIST syndromes

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►Implication for health policy/practice/research/medical education:

In differential diagnosis of congenital hyperplasia, we should keep in mind many different causes, even rare cases, such as: Interstitial Cell of Cajal. This article may be helpful to pediatric and colorectal surgeons.

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caused by germline mutations in *c-KIT*(7) or *PDGFRA* (8) and in patients with neurofibromatosis type 1 (NF-1) (9). Decrease in total ICC number reported previously in a group of patients with idiopathic chronic constipation (10), and ICC hyperplasia as a pathologic finding in a patient with chronic constipation reported in 2000 for the first time (11). We report our case with ICC hyperplasia, perhaps as the second one.

## 2. Case presentation

A 17 year old boy, the known case of Xeroderma Pigmentosa with a history of long lasting constipation since childhood, has had severe abdominal distention. Plain abdominal X-ray showed huge colon full of stool (Figure 1). So exploratory laparotomy was done which showed huge rectum, small size colon and sigmoid (Figure 2, 3), small size liver and other abdominal organs due to pressure effect of the huge rectum.

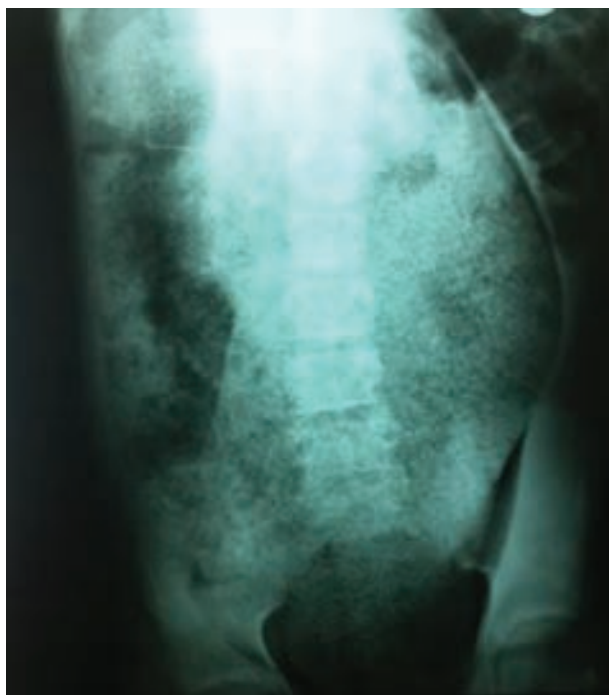


Figure 1.

So with preserving pelvic part of rectum, resection of rectum was done and end sigmoid colostomy was constructed. Pathology result was "Grossly" normal intestine. The mucosal surface was completely normal. Sections were stained by H&E, which were unremarkable, however C-kit immune histochemistry showed numerous Cajal cells, (Figure 4). He had no family history of GIST or any specific diseases.

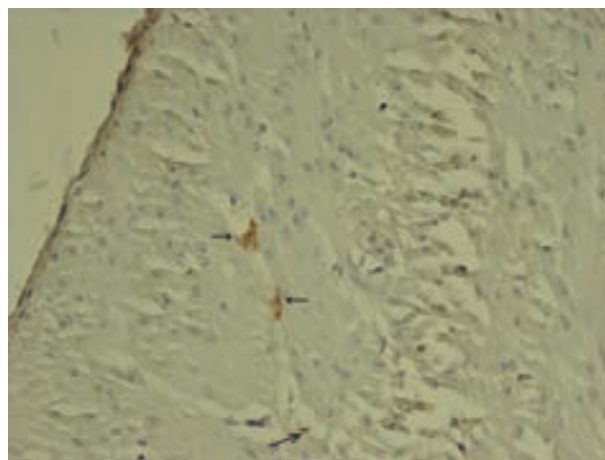


Figure 2.



Figure 3.

Figure 4.



Sections from colon resection show cajal cells (arrows) with increased number (IHC for c-kit X250)

### 3. Discussion

It is probable that we have reported the second case of congenital hyperplasia of interstitial cells of Cajal of colon in a case of chronic constipation and the first case of it in rectum in an adolescent.

Jeng, yung-Ming et al (11), reported the first case, a 2 year old girl with chronic constipation with ICC hyperplasia in right colon that underwent right hemi colectomy and ileostomy. Similar cases of ICC hyperplasia were in elderly patients with signs and symptoms of ileus, mechanical ileus, adhesion bands, Adenocarcinoma of colon (12) and in surgical or autopsy samples of GISTs or non GISTs lesions (3, 5, 6), but these were not congenital or had significant manifestations of constipation for a long time. Associated diseases or disorders with ICC's anomaly are very different, such as Hirschsprung's disease (13) allied Hirschsprung's disease (14) infantile pyloric stenosis (15) and chronic idiopathic intestinal pseudo-obstruction (16), most of them can be presented with constipation but their manifestations and managements are different. Association between ICC hyperplasia and Xeroderma Pigmentosa has been unclear yet.

Hyperplasia of Interstitial cells of Cajal (microscopic GIST) is a very rare phenomenon and rare pathologic finding, which present with many signs and symptoms. Both of them decrease in total ICC number and ICC hyperplasia progress with chronic constipation but the second one is precursor of GIST. More studies are needed to clarify role of ICC hyperplasia, ICC mutations and overall its anomaly in featured disease, disorders and malignancies associated within.

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### Authors' Contribution

Dr. Bananzadeh and Dr. Ghahramani did the surgery and presented the main idea of study. Dr. Safarpour and Dr. Moslemi organized and wrote the article. Dr. Geramizade helped with pathological comments.

### Financial Disclosure

There is no conflict of interest.

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### References

1. 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 preimatinib mesylate era—a population-based study in western Sweden. *Cancer*. 2005;**103**(4):821-9.
2. Miettinen M, Lasota J. Gastrointestinal stromal tumors: pathology and prognosis at different sites. *Semin Diagn Pathol*. 2006;**23**(2):70-83.
3. Kindblom LG, Remotti HE, Aldenborg F, Meis-Kindblom JM. Gastrointestinal pacemaker cell tumor (GIPACT): gastrointestinal stromal tumors show phenotypic characteristics of the interstitial cells of Cajal. *Am J Pathol*. 1998;**152**(5):1259-69.
4. Streutker CJ, Huizinga JD, Driman DK, Riddell RH. Interstitial cells of Cajal in health and disease. Part II: ICC and gastrointestinal stromal tumours. *Histopathology*. England: 2007. p. 190-202.
5. Agaimy A, Wunsch PH. Sporadic Cajal cell hyperplasia is common in resection specimens for distal oesophageal carcinoma. A retrospective review of 77 consecutive surgical resection specimens. *Virchows Arch*. 2006;**448**(3):288-94.
6. Agaimy A, Wunsch PH, Dirnhofer S, Bihl MP, Terracciano LM, Tortolero L. Microscopic gastrointestinal stromal tumors in esophageal and intestinal surgical resection specimens: a clinicopathologic, immunohistochemical, and molecular study of 19 lesions. *Am J Surg Pathol*. 2008;**32**(6):867-73.
7. Hirota S, Okazaki T, Kitamura Y, O'Brien P, Kapusta L, Dardick I. Cause of familial and multiple gastrointestinal autonomic nerve tumors with hyperplasia of interstitial cells of Cajal is germline mutation of the c-kit gene. *Am J Surg Pathol*. 2000;**24**(2):326-7.
8. Chompret A, Kannengiesser C, Barrois M, Terrier P, Dahan P, Tursz T, et al. PDGFRA germline mutation in a family with multiple cases of gastrointestinal stromal tumor. *Gastroenterology*. United States: 2004. p. 318-21.
9. Miettinen M, Fetsch JF, Sobin LH, Lasota J. Gastrointestinal stromal tumors in patients with neurofibromatosis 1: a clinicopathologic and molecular genetic study of 45 cases. *Am J Surg Pathol*. United States: 2006. p. 90-6.
10. Yu CS, Kim HC, Hong HK, Chung DH, Kim HJ, Kang GH, et al. Evaluation of myenteric ganglion cells and interstitial cells of Cajal in patients with chronic idiopathic constipation. *Int J Colorectal Dis*. 2002;**17**(4):253-8.
11. Jeng YM, Mao TL, Hsu WM, Huang SF, Hsu HC. Congenital interstitial cell of Cajal hyperplasia with neuronal intestinal dysplasia. *Am J Surg Pathol*. 2000;**24**(11):1568-72.
12. Agaimy A, Markl B, Arnholdt H, Hartmann A, Schneider-Stock R, Chetty R. Sporadic segmental interstitial cell of Cajal hyperplasia (microscopic GIST) with unusual diffuse longitudinal growth replacing the muscularis propria: differential diagnosis to hereditary GIST syndromes. *Int J Clin Exp Pathol*. 2010;**3**(5):549-56.
13. Yamataka A, Kato Y, Tibboel D, Murata Y, Sueyoshi N, Fujimoto T, et al. A lack of intestinal pacemaker (c-kit) in aganglionic bowel of patients with Hirschsprung's disease. *J Pediatr Surg*. United States: 1995. p. 441-4.
14. Yamataka A, Ohshiro K, Kobayashi H, Fujiwara T, Sunagawa M, Miyano T. Intestinal pacemaker C-KIT+ cells and synapses in allied Hirschsprung's disorders. *J Pediatr Surg*. United States: 1997. p. 1069-74.
15. Yamataka A, Fujiwara T, Kato Y, Okazaki T, Sunagawa M, Miyano T. Lack of intestinal pacemaker (C-KIT-positive) cells in infantile hypertrophic pyloric stenosis. *J Pediatr Surg*. United States: 1996. p. 96-8.
16. Yamataka A, Ohshiro K, Kobayashi H, Lane GJ, Yamataka T, Fujiwara T, et al. Abnormal distribution of intestinal pacemaker (C-KIT-positive) cells in an infant with chronic idiopathic intestinal pseudoobstruction. *J Pediatr Surg*. United States: 1998. p. 859-62.