Global Journal of Medicine and Public Health
www.gjmedph.org

# Gastrointestinal stromal tumor of rectum- a case report

Madhuri S.Kate, Pruthviraj D. Jaybhaye, Nidhi Chaturvedi

Dept of pathology, ESIPGIMSR & Model hopital, Andheri, Mumbai.India

drpruthvirajj@gmail.com

ABSTRACT

Gastrointestinal stromal tumor (GIST) is an uncommon neoplasm of GI tract with rectum being rare site. Biopsy of the lesion and immunohistochemistry (IHC) confirms the diagnosis. Complete surgical resection is the principal curative procedure. Chemotherapy with Imatinib alone show cure in intermediate risk rectal GIST. We describe a case of a 45-year-old male with per rectal bleeding and generalized weakness. CT scan revealed rectal mass with metastasis in the right lobe of the liver. Rectal biopsy revealed intermediate grade tumor GIST which was confirmed on IHC (CD117 and CD34). Imatinib chemotherapy alone had good symptomatic improvement at 4 months of follow up.

Key words: c-Kit; Gastrointestinal stromal tumor; Imatinib; Rectal GIST;

Corresponding Author: :- Pruthviraj D. Jaybhaye, Dept of pathology, ESIPGIMSR & Model hopital,

Andheri, Mumbai.India

Email : drpruthvirajj@gmail.com

Funding: None

Conflict of interest: None

**Introduction:** Gastrointestinal stromal tumor (GIST) is a rare tumor involving the gastrointestinal tract. Exact epidemiological data of incidence and prevalence of GIST is not available due to lack of well defined pathologic criteria, various nomenclature in past when nearly 60% of all the GIST have been diagnosed as benign tumors or tumors of uncertain malignant potential[1].

By definition GIST is a mesenchymal neoplasm expressing KIT protein, driven by KIT or PDGFRα (platelet derived growth factor alpha) mutations[2]. They are derived from interstitial cells of Cajal (ICC). ICC are pacemaker cells that regulates peristalsis and have immunophenotypic and ultrastructural features of both smooth muscle and neural differentiation in varying degrees. ICC are KIT positive cells. Activation of KIT by mutations, causes Cajal cell proliferation and GIST[3].

Stomach is the common site for GIST (50–60%), followed by small intestine (30–40%), colon (7%) and esophagus (1%). Rectum is the rare site of GIST[4]. We present a case of rectal GIST, with metastasis to liver treated by chemotherapy.

**Case Details:** A 45-year-old man presented to our hospital with history of per rectal bleeding, generalized weakness and fever since 5 days. He was on anti-koch's treatment (AKT) for six months for rectal tuberculosis diagnosed elsewhere. However, details of that biopsy report were not available. The rectal examination showed two well defined masses one located at the right superior aspect and another located at left lateral aspect of the rectal wall. Routine blood tests were within normal limits.

Plain CT scan revealed distension of rectum with two large polypoidal soft tissue attenuation lesions (Fig 1). Larger mass measured 9.1x8.7x5.2 cm, located superiorly towards right and seen attached to superior wall. The smaller lesion measured 8x2x4 cm and

seen placed lateral and inferior aspect. Post contrast image revealed heterogenous enhancement and variable areas of central necrosis with few calcified areas. Liver showed a 2x2 cm well defined hypodense, hypoenhancing focal lesion in segment V of right lobe.(Fig 2) There was no significant lymphadenopathy on CT scan. Punch biopsy was taken from the rectal masses.

Fig1. CT Abdomen- showing distension of rectum with large polypoidal soft tissue attenuation, heterogenous enhancement and areas of central necrosis calcification

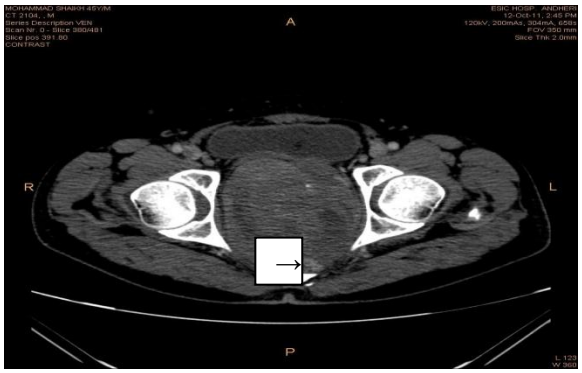
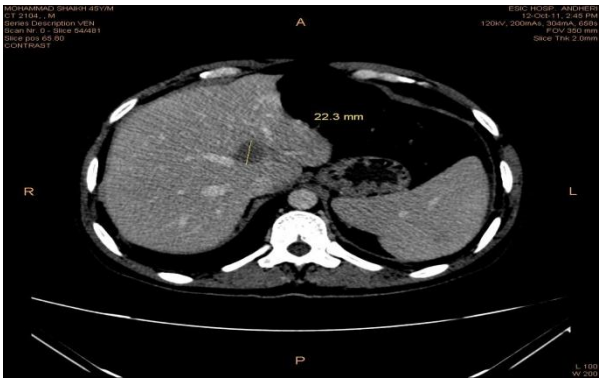



Fig 2: CT Scan liver showing well defined hypodense, hypoenhancing focal lesion in segment V of right lobe suggestive of metastasis




Histological examination showed rectal tissue with submucosal tumor location composed of proliferation of densely packed epitheloid and spindle cells, with prominent nuclear palisading (Fig 3). Mitotic count was of 3 mitosis/50HPF. C-KIT protein (Fig 4) and CD34(Fig 5) were positive. Final diagnosis was GIST of intermediate risk aggressive behavior(Table1) with metastasis in liver. Patient underwent chemotherapy with Imatinib and defunctional colostomy. Postoperative course was uneventful. The patient was discharged on postoperative day 12. Follow up at 4 months with rectal ultrasonography and CT scan showed significant reduction in size of tumor mass.

Fig 3. Histopathology –High power view -Tumour composed of proliferation of densely packed spindle cells, with nuclear palisading. (HE X400)

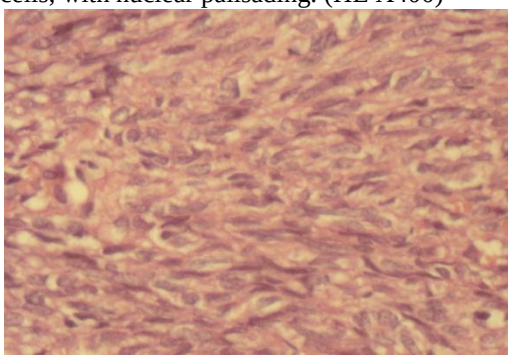


Fig 4. C-KIT staining in GIST. Cytoplasmic and perinuclear strongly positive tumour cells (×400).

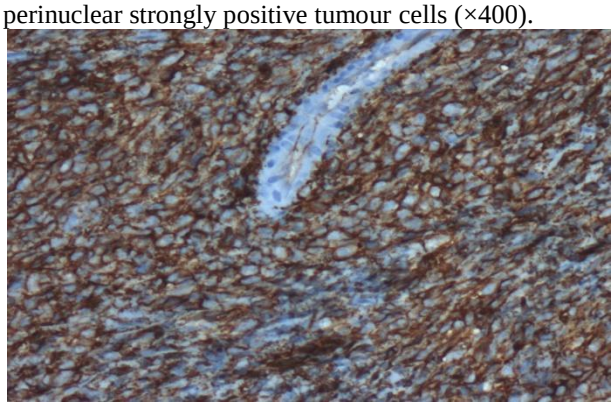
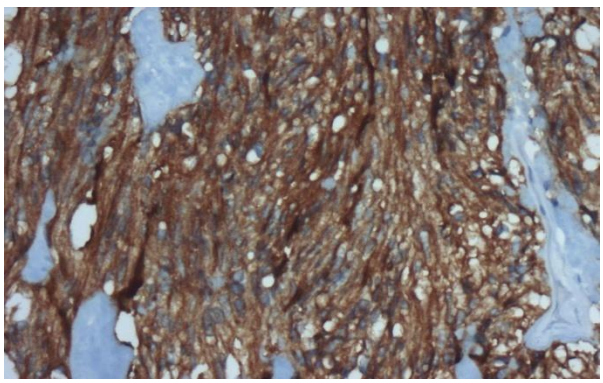


Fig 5. CD34 Positivity seen in tumor cells of GIST (IHCx 400)



**Discussion:** The term "GIST" was introduced in 1983. It included tumors of the GI tract that could not be classified as either smooth muscle or neurogenic in origin[5]. Among GI mesenchymal tumors GISTs are the most common.

Table 1: Defining risk of aggressive behavior in GIST [12]

| | Size | Mitotic Count |
|---|---|---|
| Very low risk | < 2 cm | < 5/50 HPF |
| Low risk | 2–5 cm | < 5/50 HPF |
| Intermediate risk | < 5 cm | 6–10/50 HPF |
| | 5–10 cm | < 5/50 HPF |
| High risk | > 5 cm | > 5/50 HPF |
| | > 10 cm | Any mitotic rate |
| | Any size | > 10/50 HPF |

GIST is an uncommon mesenchymal tumor and expresses CD117, a tyrosine-kinase growth factor receptor as important marker.[5] CD117 also serves as the target for drug therapy with imatinib, a selective tyrosine-kinase receptor inhibitor that is at present the only promising chemotherapeutic drug for the treatment of patients with advanced GIST, although complete surgical resection remains the most effective treatment for such a tumor[10]. The symptoms of GIST in the rectum do not generally differ from those of other rectal tumors and diagnostic work-up is also similar. Digital examination of the rectum, colonoscopy and transrectal ultrasound are essential for diagnosis.Preoperative biopsy plays a key role in the diagnosis of GIST, since it provides information on the immunohistochemical features and mitotic count. GIST typically expresses CD117, often CD34 and sometimes SMA and S-100, but its expressions vary depending on different sites. Miettinen *et al* [11] found that CD34 expression in rectal GIST is 92%, but only 50% in small intestinal. Smooth muscle antigen (SMA) is most frequently seen in the small intestinal (47%) and only 14% of rectal GISTs. The reason for these variations remains explained. Most GISTs originate within the muscularis propria and most commonly have an exophytic growth pattern[12-13], seen on CT and MRI images. A focal, well-circumscribed mural mass is the most common finding and an infiltrated layer can be clearly assessed[6]. CT or MRI helps define local invasion and detection of metastases.

Because of low incidence the clinicopathological profiles of rectal GIST have not yet been accurately characterized and prognostic factors of common sites like stomach is used instead.. Size and mitotic rate are common prognostic criterias.[15-17] A rate of $\leq 5$ mitoses per 50 HPF is taken used as a limit to discriminate between benign and malignant.[4] Tumors of 2 cm in diameter generally behave in a benign fashion. Less than 5 cm in diameter are associated with a better survival. The epithelioid phenotype has poor outcome. Symptoms lasting for at a year is considered as further prognostic factors.

Complete surgical resection with negative margins is curative for primary and non-metastatic low risk tumors.[12,19-21] Local excision, anterior resection or abdomino-perineal resection for rectal GIST depends on tumor size and location[4,22]. Neoadjuvant imatinib may be useful in inoperable malignant GIST to optimize surgical timing. Imatinib is useful as adjuvant post-operative treatment in high risk or incomplete surgical resection. Imatinib is accepted treatment for advanced or metastatic tumors but further evidence is needed in the case of high risk tumors and for the neoadjuvant therapy.

**Conclusion:** Rectal GIST tumoris rare. The diagnostic workup is same as other rectal neoplasia. Biopsy tumoris essential for preoperative diagnosis. Immunohistochemical characterisation of CD117 and CD34 are important tumor markers. Further studies are necessary to establish extent of resection and effective treatment strategy for rectal GIST.

**Acknowledgement-** We are grateful to Dr. Meenakshi Mathur, Dean, ESI PGIMSR, Andheri (E), Mumbai, for her encouragement and support.

**References:**

1. Nilsson B, Bumming P, Meis-Kindblom JM, Oden A, Dortok A, Gustavsson B, Sablinska K, Kindblom LG, 2005: Gastrointestinal stromal tumors: the incidence, prevalence, clinical course, and prognostication in the preimatinib mesylate era – a populationbased study in western Sweden. Cancer, 103:821-829.
2. Heinrich MC, Blanke CD, Druker BJ, Corless CL 2002: Inhibition of KIT tyrosine kinase activity: a novel molecular approach to the treatment of KIT-positive malignancies. J Clin Oncol, 20:1692-1703.
3. Hirota S, Isozaki K, Moriyama Y, Hashimoto K, Nishida T, Ishiguro S, Kawano K, Hanada M, Kurata A, Takeda M, et al 1998.: Gain-of-function mutations of c-kit in human gastrointestinal stromal tumors. Science, 279:577-580.
4. Miettinen M, Sarlomo-Rikala M, Lasota J: Gastrointestinal stromal tumors 1998. Ann Chir Gynaecol, 87:278-281
5. Fletcher CD, Berman JJ, Corless C, Gorstein F, Lasota J, Longley BJ, Miettinen M, O'Leary TJ, Remotti H, Rubin BP, Shmookler B, Sobin LH, Weiss SW 2002. Diagnosis of gastrointestinal stromal tumors: A consensus approach. Hum Pathol; 33: 459-465

6. Joensuu H, Fletcher C, Dimitrijevic S, Silberman S, Roberts P, Demetri G 2002. Management of malignant gastrointestinal stromal tumors. Lancet Oncol; 3: 655-664
7. Tran T, Davila JA, El-Serag HB 2005. The epidemiology of malignant gastrointestinal stromal tumors: an analysis of 1,458 cases from 1992 to 2000. Am J Gastroenterol; 100: 162-168
8. Miettinen M, Furlong M, Sarlomo-Rikala M, Burke A, Sobin LH, Lasota J 2001. Gastrointestinal stromal tumors, intramural leiomyomas, and leiomyosarcomas in the rectum and anus: a clinicopathologic, immunohistochemical, and molecular genetic study of 144 cases. Am J Surg Pathol; 25:1121-1133
9. Conlon KC, Casper ES, Brennan MF, 1995. Primary gastrointestinal sarcomas: analysis of prognostic variables. Ann Surg Oncol; 2: 26-31
10. DeMatteo RP, Lewis JJ, Leung D, Mudan SS, Woodruff JM, Brennan MF, 2000. Two hundred gastrointestinal stromal tumors: recurrence patterns and prognostic factors for survival. Ann Surg; 231: 51-58
11.Miettinen M, Sobin LH, Sarlomo-Rikala M, 2000. Immunohistochemical spectrum of GISTs at different sites and their differential diagnosis with a reference to CD117 (KIT). Mod Pathol; 13: 1134-1142
12. Eisenberg BL, Judson I, 2004. Surgery and imatinib in the management of GIST: emerging approaches to adjuvant and neoadjuvant therapy. Ann Surg Oncol; 11: 465-475
13. Richmond JA, Mount SL, Schwarz JE 2004. Gastrointestinal stromal tumor of the stomach with rhabdoid phenotype: immunohistochemical, ultrastructural, and immunoelectron microscopic evaluation . Ultrastruct Pathol; 28: 165-170
14. Lo SS, Papachristou GI, Finkelstein SD, Conroy WP, Schraut WH, Ramanathan RK. 2005. Neoadjuvant imatinib in gastrointestinal stromal tumor of the rectum: report of a case. Dis Colon Rectum; 48: 1316-1319
15. Levy AD, Remotti HE, Thompson WM, Sobin LH, Miettinen M 2003. Gastrointestinal stromal tumors: radiologic features with pathologic correlation. Radiographics; 23: 283-304, 456; quiz 532
16. Franquemont DW 1995. Differentiation and risk assessment of gastrointestinal stromal tumors. Am J Clin Pathol; 103: 41-47
17. Lerma E, Oliva E, Tugues D Prat J1994 .Stromal tumors of the gastrointestinal tract: a clinicopathological and ploidy analysis of 33 cases. Virchows Arch; 424: 19-24
18. Rudolph P, Gloeckner K, Parwaresch R, Harms D, Schmidt D,1998. Immunophenotype, proliferation, DNA ploidy, and biological behavior of gastrointestinal stromal tumors: a multivariate clinicopathologic study. Hum Pathol; 29: 791-800
19. Connolly EM, Gaffney E, Reynolds JV, 2003. Gastrointestinal stromal tumors. Br J Surg; 90: 1178-1186
20. Roberts PJ, Eisenberg B, 2002. Clinical presentation of gastrointestinal stromal tumors and treatment of operable disease. Eur J Cancer; 38 Suppl 5: S37-S38
21. Cipolla C, Fulfaro F, Sandonato L, Fricano S, Pantuso G, Grassi N, Vieni S, Valerio MR, Lo Dico R, Gebbia N, Latteri MA, 2006. Clinical presentation and treatment of gastrointestinal stromal tumors. Tumori; 92: 279-284
22. Shibata Y, Ueda T, Seki H, Yagihashi N, 2001. Gastrointestinal stromal tumor of the rectum. Eur J Gastroenterol Hepatol; 13: 283

**Access This Article Online**

**Quick Response Code:**

Website: www.gjmedph.org