International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 28-03-2018; Accepted: 30-04-2018
www.medicalsciencejournal.com
Volume 4; Issue 5; May 2018; Page No. 135-138

Study of patients suffering from gastrointestinal stromal tumors of stomach and duodenum

Dr. Sanjay Kumar[1], Dr. Amarjit Kumar Raj[2*], Dr. Utpal Anand[3], Dr. Rakesh Kumar Singh[4], Dr. Manish Mandal[5]

[1, 2, 4] Assistant Professor, Department of G.I. Surgery, Indira Gandhi Institute of Medical Sciences, Sheikhpura, Patna, Bihar, India

[3] Associate Professor, Department of G.I. Surgery, Indira Gandhi Institute of Medical Sciences, Sheikhpura, Patna, Bihar, India

[5] Professor and HOD, Department of G.I. Surgery, Indira Gandhi Institute of Medical Sciences, Sheikhpura, Patna, Bihar India

[*] Corresponding Author: Dr. Amarjit Kumar Raj

Abstract
Gastro intestinal stromal tumors (GIST) are primary distinctive mesenchymal tumors of the gastro intestinal tract. Early diagnosis is important for better clinical outcome. The objective was to study presentation, age distribution, various diagnostic methods adopted, treatment modalities being used and outcome of gastrointestinal stromal tumors.

The present study was done in the Department of Surgical Gastroenterology, Indira Gandhi Institute of Medical Sciences, Sheikhpura, Patna. Total 20 cases of the Gastro intestinal stromal tumors from stomach and duodenum were reviewed retrospectively in the present study from January 2015 to December 2017.

From the present study and the reported literature it can be concluded that GIST is more a disease of elder age group. CECT abdomen is a good diagnostic modality in detection of GIST with an acceptable risk of missing small lesions (<1cm) which usually carries minimal risk of metastasis. Also carries risk of down staging with small sized peritoneal deposits being missed and being diagnosed intraoperatively. Wide excision with negative margins (2cm from tumor margin) is adequate and treatment of choice for benign tumors.

Keywords: Gastro intestinal stromal tumors, GIST, factors, etc.

Introduction

Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal neoplasms of the gastrointestinal tract. GISTs arise in the smooth muscle pacemaker interstitial cell of Cajal, or similar cells. Gastrointestinal stromal tumors (GISTs) belong to a group of cancers known as soft tissue sarcomas. The number of new cases in the United States annually has been estimated to be 5,000-6,000. Tumors usually arise from the intestinal tract with the most common site being the stomach, followed by the small intestine, and then the colon/rectum with rare cases arising in the esophagus. There are also tumors that appear to arise in the membranous tissue lining the wall of the stomach (peritoneum) or in a fold of such membranous tissue (the omentum). There are also case reports of tumors arising in the appendix and/or pancreas. These tumors most commonly present with abdominal pain, bleeding or signs of intestinal obstruction. They spread most commonly to sites within the abdominal cavity and to the liver, although there are rare cases of spread to the lungs and bone. Some GISTs are noncancerous (benign) and do not spread (indolent); others are aggressive with extensive local invasion as well as distant metastases. Most cases result from a change (mutation) in one of two genes, KIT or PDGFR, which leads to continued growth and division of tumor cells. There are a few reported cases of families in which a gene mutation is inherited; however, the majority of tumors occur randomly for no apparent reason (sporadically) and not inherited (acquired mutation). Most cases arise in older adults [1].

Fig 1

GIST was introduced as a diagnostic term in 1983 [1]. 1060 Until the late 1990s, many non-epithelial tumors of the gastrointestinal tract were called "gastrointestinal stromal tumors". Histopathologists were unable to specifically distinguish between types we now know to be dissimilar molecularly. Subsequently, CD34, and later CD117 were identified as markers that could distinguish the various types. [citation needed] Additionally, in the absence of specific therapy, the diagnostic categorization had only a limited influence on prognosis and therapy.

The understanding of GIST biology changed significantly with identification of the molecular basis of GIST [1]. 1065 particularly c-KIT. Historically, literature reviews prior to the molecular definition of GIST, and for a short time thereafter, asserted that 70-80% of GISTs were benign [2].

The identification of a molecular basis for GIST led to the exclusion of many tumors that had been considered as GIST previously, and also the incorporation of a much larger number of tumors that had been labeled as other types of sarcomas and undifferentiated carcinomas [1]. 1065 For example, some previous diagnoses of stomach and small bowel leiomyosarcomas (malignant tumor of smooth muscle) would be reclassified as GISTs on the basis of immunohistochemical staining. All GIST tumors are now considered to have malignant potential, and no GIST tumor can be definitively classified as "benign" [6]. Hence, all GISTs are eligible for cancer staging in the AJCC (7th edition) / UICC [3]. Nonetheless, different GISTs have different risk assessments of their tendency to recur or to metastasize, dependent on their site of origin, size, and number of mitotic figures.

Due to the change in definition, clinical pathways of care before the year 2000 are largely uninformative in the current era [4].

GISTs may present with trouble swallowing, gastrointestinal bleeding, or metastases (mainly in the liver). Intestinal obstruction is rare, due to the tumor's outward pattern of growth. Often, there is a history of vague abdominal pain or discomfort, and the tumor has become rather large by time the diagnosis is made.

GISTs are tumors of connective tissue, i.e. sarcomas; unlike most gastrointestinal tumors, they are nonepithelial. About 70% occur in the stomach, 20% in the small intestine and less than 10% in the esophagus. Small tumors are generally benign, especially when cell division rate is slow, but large tumors disseminate to the liver, omentum and peritoneal cavity. They rarely occur in other abdominal organs. GISTs are thought to arise from interstitial cells of Cajal (ICC), that are normally part of the autonomic nervous system of the intestine [5]. They serve a pacemaker function in controlling motility.

The definitive diagnosis is made with a biopsy, which can be obtained endoscopically, percutaneously with CT or ultrasound guidance or at the time of surgery. A biopsy sample will be investigated under the microscope by a pathologist physician. The pathologist examines the histopathology to identify the characteristics of GISTs (spindle cells in 70-80%, epitheloid aspect in 20-30%). Smaller tumors can usually be confined to the muscularis propria layer of the intestinal wall. Large ones grow, mainly outward, from the bowel wall until the point where they outstrip their blood supply and necrose (die) on the inside, forming a cavity that may eventually come to communicate with the bowel lumen.

In localized, resectable adult GISTs, if anatomically and physiologically feasible, surgery is the primary treatment of choice. Surgery can be potentially curative, but watchful waiting may be considered in small tumors in carefully selected situations. Post-surgical adjuvant treatment may be recommended. Lymph node metastases are rare, and routine removal of lymph nodes is typically not necessary. Laparoscopic surgery, a minimally invasive abdominal surgery using telescopes and specialized instruments, has been shown to be effective for removal of these tumors without needing large incisions. The clinical issues of exact surgical indications for tumor size are controversial. The decision of appropriate laparoscopic surgery is affected by tumor size, location, and growth pattern [5].

Gastro intestinal stromal tumors (GIST) are primary distinctive mesenchymal tumors of the gastro intestinal tract. Early diagnosis is important for better clinical outcome. The objective was to study presentation, age distribution, various diagnostic methods adopted, treatment modalities being used and outcome of gastrointestinal stromal tumors.

Methodology

The present study was done in the Department of Surgical Gastroenterology, Indira Gandhi Institute of Medical Sciences, Sheikhpura, Patna. Total 20 cases of the Gastro intestinal stromal tumors from stomach and duodenum were reviewed retrospectively in the present study from January 2015 to December 2017.

All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Following was the inclusion and exclusion criteria for the present study.

Inclusion Criteria: Patients with cases of GISTs from the stomach and duodenum, stomach and duodenum with multifocal involvement, who underwent surgical management and who's histopathological reports positive for GIST.

Exclusion Criteria: Patients with primary GISTs in GIT other than stomach and duodenum and other GI malignancies excluded by final HPE and IHC reports.

Results & Discussion

Gastrointestinal stromal tumours were first defined by Mazur and Clark [7] after they detected a subgroup of gastrointestinal mesenchimal tumours that did not originate from smooth muscle or have neurogenic basis. In 1998, Kindblom and colleagues [8] showed that these tumours originated from Cajal interstitial cells (pacemaker cells of myenteric plexus) or multipotent mesenchymal stem cells.

Gastrointestinal stromal tumours may not cause symptoms; they may cause nonspecific symptoms depending on the location of the tumour and they may be detected incidentally during investigation of these symptoms or during autopsy. [9-10] abdominal pain, melena and weight loss are the most common symptoms in patients with GISTs [11]. Rarely, an abdominal mass is palpable.

Gastrointestinal stromal tumours rarely cause acute gastrointestinal haemorrhage or obstruction. Obstruction can result from intraluminal growth of an endophytic tumour or from luminal compression of an exophytic lesion. Gastrointestinal bleeding is produced by pressure necrosis and ulceration of the overlying mucosa with resulting haemorrhage from disrupted vessels.

Table 1: Demographic Details of Patients

Indication	No. of patients
Age	
20 - 30 years	00
31 - 40 years	03
41 – 50 years	08
51 – 60 years	07
61 years and above	02
Sex	
Males	14
Females	06
Total Cases	20

Table 2: Distribution of cases as per clinical presentation.

Clinical features	Observed in Number of Cases
Pain abdomen	13
Lump abdomen	05
Hematemesis	01
Melena	01
Luminal obstruction	00
Incidental	00

Table 3: Distribution of cases as per site of the GIST in GIT**.**

Site	No. of Cases
Stomach	
GE junction	02
Fundus	05
Body	02
Antrum	03
Lesser curvature	02
Pylorus	01
Duodenum	
First part	01
0Second part	02
Third part	02
Total	20

Table 4: Tumor size and malignant status

Tumor size	Incidence	Benign	Malignant
<2cm	00	00	00
>2≤5cm	12	10	02
>5≤10cm	06	02	04
>10cm	02	01	01
Total	20	13	07

Table 5: Distribution of cases as per cell type in benign and malignant lesions.

Cell type	Malignant	Benign
Spindle cell type	03	08
Epithelioid cell type	02	04
Mixed cell type	02	01
Total	07	13

GIST risk stratification systems are mainly based on tumor size that leads to assessment of the malignancy. The National Institutes of Health (NIH) consensus criteria, also known as Fletcher's criteria, were the first risk stratification system developed [12]. Eight prognostic categories based on tumor size and mitotic activity with four subdivisions of risk groups was used to assess the malignant potential. The 5 cm size was the cut-off value to define low and non-low risk tumors [13].

Surgical resection is the effective and established mode of treatment for GISTs. Neoplastic mass and gastric wall excision with sufficient surgical margins can be achieved with different surgical techniques which depend on the tumor dimension and localization [14].

Gastrointestinal stromal tumors are uncommon malignant tumors that occur throughout the entire alimentary tract. These tumors appear most commonly during the sixth and seventh decades of life, but they can also occur in the earlier age of the life also.

Curative treatments for GIST consist of surgical resection with negative surgical margins without tumor rupture. The probability of undergoing pancreaticoduodenectomy increased when DGIST was large or located in the descending of duodenum, because the ampulla of Vater and pancreatic head were often involved. However, disagreements exist over the optimal surgical procedures for DGIST [16]. In this study, no surgery-related death was noted. Thus, we assumed that these operations were safe and reliable. We also drew conclusion from survival analysis that the type of surgical procedure did not affect the prognosis of GIST, which is consistent with existing research [15].

The most frequent initial symptoms in this series are pain, discomfort, a palpable mass, and bleeding. Patients who had intestinal bleeding were the most likely to undergo a complete resection of the tumor, suggesting that bleeding might be a fortuitous event leading to an earlier diagnosis. However, the patients' initial signs were generally nonspecific, and even after endoscopy and radiological imaging, the surgeon did not know the diagnosis prior to surgery in more than half of the cases. This implies that an adequate therapy for a rare disease needs to be formulated at the time of surgery.

Conclusion

From the present study and the reported literature it can be concluded that GIST is more a disease of elder age group. CECT abdomen is a good diagnostic modality in detection of GIST with an acceptable risk of missing small lesions (<1cm) which usually carries minimal risk of metastasis. Also carries risk of down staging with small sized peritoneal deposits being missed and being diagnosed intraoperatively. Wide excision with negative margins (2cm from tumor margin) is adequate and treatment of choice for benign tumors.

References

1. https://rarediseases.org/rare-diseases/gastrointestinal-stromal-tumors/
2. Burkill GJ, Badran M, Al-Muderis O, Meirion Thomas J, Judson IR, Fisher C *et al*. Malignant gastrointestinal stromal tumor: distribution, imaging features, and pattern of metastatic spread. Radiology. 2003; 226(2):527-32.
3. The American Joint Committee on Cancer Manual
4. Demetri, G., chapter author; DeVita, L; Lawrence, TS; Rosenberg, SA, editors. "Chapter 87". DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology (9th ed.). ISBN 978-1-4511-0545-2, 2011.
5. Miettinen M, Lasota J. "Gastrointestinal stromal tumors: review on morphology, molecular pathology, prognosis, and differential diagnosis". Arch Pathol Lab Med. 2006; 130(10):1466–78.
6. Lee Chung-Ho, Hyun Myung-Han, Kwon Ye-Ji, Cho Sung-Il, Park Sung-Soo. "Deciding Laparoscopic Approaches for Wedge Resection in Gastric Submucosal Tumors: A Suggestive Flow Chart Using Three Major Determinants". Journal of the American

College of Surgeons. 215, 831–840.
7. Mazur MT, Clark HB. Gastric stromal tumors. Reappraisal of histogenesis. Am J Surg Pathol 1983; 7:507-19.
8. Kindblom LG, Remotti HE, Aldenborg F, *et al.* Gastrointestinal pacemaker cell tumor (GIPACT): gastrointestinal stromal tumors show phenotypic characteristics of the interstitial cells of Cajal. Am J Pathol. 1998; 152:1259-69.
9. El-Zohairy M, Khalil el-SA, Fakhr I, *et al.* Gastrointestinal stromal tumor (GIST)'s surgical treatment, NCI experience. J Egypt Natl Canc Inst 2005; 17:56-66. [PubMed]
10. Gold JS, Dematteo RP. Combined surgical and molecular therapy: the gastrointestinal stromal tumor model. Ann Surg. 2006; 244:176-84. [PMC free article] [PubMed]
11. Miller TA. Leimyosarcoma: Not all gastric malignancies have a dismal prognosis. Gastroenterology. 1993; 104:940-1. [PubMed]
12. A. Agaimy Gastrointestinal stromal tumors (GIST) from risk stratification systems to the new TNM proposal: more questions than answers? A review emphasizing the need for a standardized GIST reporting Int. J. Clin. Exp. Pathol. 2010, 461-471.
13. Fletcher CD, Berman JJ, Corless C *et al.* Diagnosis of gastrointestinal stromal tumors: a consensus approach Hum. Pathol, 2002, 459-465.
14. Gervaz P, Huber O, Morel P. Surgical management of gastrointestinal stromal tumours Br. J. Surg. 2009; 96:567-578.
15. Johnston FM, Kneuertz PJ, Cameron JL, *et al.* Presentation and management of gastrointestinal stromal tumors of the duodenum: a multi-institutional analysis, Annals of Surgical Oncology. 2012; 19:3351–3360.
16. Yip D, Zalcberg J, Ackland S, *et al.*, Controversies in the management of gastrointestinal stromal tumors, Asia-Pacific Journal of Clinical Oncology. 2014; 10(3): 216–227.