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Gastrointestinal Stromal Tumor: A Case Report with Risk Assessment

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Abstract: ***Background: Gastrointestinal stromal tumors (GIST) are rare tumors of the gastrointestinal tract arising from the intestinal cells of Cajal. The most common site of origin is the stomach. Case: Here we report a case of gastro intestinal stromal tumor in a 63 years old female who came with chief complaint of pain in abdomen and swelling in left ileac fossa. The radiological diagnosis was a gastro intestinal stromal tumor. Trucut biopsy was taken which revealed benign gastrointestinal stromal tumor. Diagnosis of GIST is made histologically and immunohistochemically. Immunohistochemically, the diagnosis of GISTs is made with CD117 positivity. The gold standard treatment is surgical resection. In patients with locally advanced tumors or metastasis, adjuvant targeted therapy using tyrosine kinase inhibitors (Imatinib) can be used. Conclusion: The histopathological diagnosis of gastrointestinal stromal tumor is required for risk assessment of the tumor and its prognosis.***

Keywords: Gastrointestinal stromal tumor, CD117, Immunohistochemistry, surgical resection, imatinib therapy, histopathological diagnosis

1. Introduction

Gastrointestinal stromal tumor (GIST) are typically benign tumors most commonly occur in gastrointestinal tract. GIST is a mesenchymal neoplasm with variable behavior, characterized by differentiation towards the interstitial cells of Cajal. Fifty four percent of all GISTs arise in the stomach, 30% the small bowel (including the duodenum), 5% in the colon and rectum, and about 1% in the esophagus.

GISTs harbor gain-of-function mutations of the KIT-tyrosine protein kinase also called CD117 or PDGFRA (platelet derived growth factor receptor alpha) oncogene and progress by the stepwise inactivation of tumor suppressor genes.[1]Most gastric GISTs are spindle cell tumors, with epithelioid morphology seen in approximately 20-25% of cases. Some cases feature a combination of spindle cell and epithelioid histology.[1]

GI bleeding can occur in half of the cases and presents with symptoms of anemia, melaena or hematemesis. GI bleeding and abdominal pain are more commonly associated with gastric GIST, whereas acute abdominal symptoms are associated with jejunal/ileal GISTs. Computed tomography (CT) is the gold standard modality for determining the size, location and spread.[2]

This is a case of ileac GIST with CD117 positivity. The risk assessment depending on size, site, and HPE was done and found to be of moderate risk. This would help in assessing the treatment modalities and prognosis. Hence, we present this case to address the importance of risk assessment

2. Case Report

A 63 years old female came with chief complaint of pain in abdomen and swelling in left ileac fossa since 1month. She has increased frequency of micturition, decreased appetite and nausea since 1month. She is a known hypertensive since 1year and on regular medications. There is past history of excision of lipoma on anterior abdominal wall.

Routine blood investigations done which revealed microcytic hypochromic anemia and thrombocytosis.

CECT-Abdominal findings showed a 9.2×9.8×5.4 cm large mass in transverse, cranio-caudal and antero-posteriorly in left lumbar region. It is relatively well-defined circumferential wall thickening with predominantly exophytic component involving distal ileal loop causing luminal narrowing. Anteriorly lesion is abutting antero-lateral abdominal wall and adhered to few collapsed small bowel loops, inferiorly lesion is abutting lateral aspect of urinary bladder, posteriorly lesion causes mass effect on the right distal ureter. few enlarged mesenteric lymph nodes noted along superior mesenteric vessels in umbilical region.

Trucut biopsy revealed a tumor with cells which are arranged in fascicles, individual cells are spindle to ovoid with moderate cytoplasm, vesicular nuclei. Bits of skeletal muscle are seen.

Mitotic activity is 2/50 HPFs. CD117 marker is positive IHC. Exploratory laparotomy with ileal resection and anastomosis done. Intraoperative mass is present 20cm from the ileocaecal junction and sent to HPE. All adhesions of the mass with surroundings are freed. She made uneventful recovery after surgery with no other symptoms.

3. Discussion

GISTs are common mesenchymal tumors of the gastrointestinal tract, thought to arise from a common precursor cell of the interstitial cells of cajal which are pacemaker cells of GI tract. Approximately 85% of these

neoplasms result from activating mutations in any of the receptor protein tyrosine kinase, KIT(CD117) or PDGFRA.[1]

GISTs are categorized as low, intermediate, high risk for malignant potential based on size, mitotic index, anatomic location and presence of rupture.[3]

The high risk of malignant potential and recurrence are seen in tumors more than 5-10 cm in size with a mitotic count of more than 10/50 HPF. Recurrences reach up to 80% in these high-risk groups. The prognosis initially rested upon the risk factors of the size of the tumor and its mitotic activity. One of the earliest schemes of predicting risk factors was stratified by Fletcher et al. in 2002.[4] (Table1)

Many studies revealed that GISTs arise more commonly in the stomach (40–70%) followed by the small intestine (15–44%) and rarely seen in intra-abdominal sites (2–11%) such as omentum, mesentery, and retroperitoneum.[5]

GISTs can occur anywhere in GI tract, it has more predominance in stomach and then less commonly in small intestine including duodenum, ileum, rarely seen in caecum also. Small intestinal and colonic GISTs are usually spindle cell tumours with diffuse sheets or vague storiform arrangements of tumor cells. Sporadic GISTs can occur at any age, with a peak incidence in the sixth decade of life (median age: 60-65 years) and a slight male predominance[1], as this contradicted in our case where patient is female, while the age is concordant which is 63 years.

In a narrative review by El-Menyar et al [5] suggests Population-based studies have shown that the annual incidence of GISTs is 11–20 per million population. Both c-KIT and PDGFRA genes are located in the fourth chromosome in humans which encodes tyrosine kinase receptors. The risk of GIST increases with the inheritance of mutations. Tumor makers are very much important for GIST identification. The National Comprehensive Cancer Network (NCCN) reported the proportion of positivity of GISTs toward various markers as KIT (95%), CD34 (60–70%), SMA (40%), S-100 (5%), desmin (1–2%), and keratin (1–2%). In our case CD117 marker is positive in IHC test which indicates typical, highly occurring GISTs.

GIST are generally benign growths with endophytic and exophytic growths, these growths are of various sizes. The curative intent in the treatment is operative excision with a clear margin(R0). Similar management is done for our patient where complete resection of exophytic growth is done. [4]

Numerous authors have found a relationship between the risk of recurrence and metastases showing variance to the anatomical location of the primary GIST. Miettinen and Lasota in 2006 have refined the risk table on follow- up information of 1900 patients having GIST over time. From this data benign ileal GIST of this patient can have a risk of metastasis moderately as the tumour size is around 10cm.[4]

In a more recent retrospective study in a tertiary hospital in India between 1999-2012, 63 patients were evaluated.[6](Table3) Data from this study supports this case in some clinico-pathological factors but contradicting in age, sex distribution as our patient is 63 years old and patient is female.

GIST associated symptoms vary with the site and size of the lesion. Small-sized GISTs often do not have any symptoms. Increase in size may develop mass-related symptoms such as abdominal pain, digestive discomfort, and sensations of fullness of the abdomen which are seen in our case as she complains about some of them. The most frequently noted clinical manifestation for GISTs was GI bleeding that resulted from mucosal ulceration which occurs in nearly half of the GIST cases. Chronic bleeding may lead to anemia which causes fatigue and in some cases tachycardia.[5]

Although it was not statistically significant, gastric GISTs showed abdominal pain as the main symptom was larger in size compared to gastric GISTs with bleeding as main symptom. Similarly, acute abdominal symptoms, which include appendicitis-like pain, GI obstruction, or tumor rupture, were frequent with larger jejunal/ileal GISTs. Acute abdomen symptoms require emergency medical attention. GIST rupture was very rare in previous reports.[5]

Management of GIST is mainly by surgical resection to avoid malignancy; Guidelines indicate that radical surgical resection is the gold standard for localized primary GIST. The tumors with exon 9 mutations may benefit from higher doses of imatinib. Recent studies have shown the risk of recurrence is high if tumor spillage occurs during surgery. The present consensus is that patients who have histological profile of intermediate, moderate, or high risk and those with R1 and R2 (microscopic and macroscopic tumor residue) or tumor rupture should receive long-term adjuvant therapy with imatinib.[4]

Patient underwent follow-up after GIST surgery, taking medication for two weeks without needing further chemotherapy or radiotherapy. She had complete recovery without complications currently, the patient is in normal condition

4. Conclusion

GISTs are benign tumours which can present in an atypical fashion and can be difficult to diagnose. Multivariate analysis showed higher mitotic rate and non-gastric primary to correlate with worse outcome. A successful outcome requires a multidisciplinary approach, postoperative targeted molecular therapy in intermediate and high-risk patients, and continued surveillance. Surgical resection remains as the gold standard in the treatment. Complete resection is related to the better postoperative survival in patients.

Negative prognostic factors are young age, higher tumor size, increased mitotic index, aneuploidy and tumor location. Though GIST do not cause diagnostic dilemma, risk assessment has to done to plan for further treatment.

5. Highlights

- Gastrointestinal stromal tumors have to be considered in intestinal tumors.

- Risk assessment of these tumors would help in assessing the prognosis.
- Hence risk assessment has to be mandatorily included in the histopathology report.

References

[1] Antonescu CR, Bridge JA, Cunha IW, Dei Tos AP, Fletcher CDM, Folpe AL, Goldblum JR, Hornick JL, Miettinen M, Oda Y; WHO Classification of Soft Tissue and Bone Tumours 5th ed.216-221

[2] Fahreyar Alam*, Matthew How Saw Keng, Harry R. Haynes, Filip Tsvetkov, Mohamed Tourky and Richard Payne. An atypical presentation of gastrointestinal stroma tumor. Journal of surgical case reports, 2022; 10, 1-3

[3] El-menyar A, Mekkodathil A, Al-Thani H. Diagnosis and manage- ment of gastrointestinal stromal tumor: an up-to-date literature review. J Can Res Ther 2017; 13: 889–900

[4] Palankezhe Sashidharan, Apoorva Matele, Usha Matele, Nowfel Al Felahi, and Khalid F. Kassem. Gastrointestinal Stromal Tumors: A Case Report: Oman Medical Journal (2014) Vol. 29, No. 2:138-141

[5] El-Menyar A, Mekkodathil A, Al-Thani H. Diagnosis and management of gastrointestinal stromal tumors: An up-to-date literature review. J Can Res Ther 2017; 13:889-900.

[6] Kanuj Malik1 & Ramakrishnan A. Seshadri1,2 & Shirley Sundersingh3 & Manikandan Dhanushkodi, Gastrointestinal Stromal Tumours (GIST): Indian Experience of Rare Malignancy. Indian Journal of Surgical Oncology (September 2020) 11(3):348–354.

Table 1: A Scheme of Predicting Risk Factors

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

Table 2: Risk Table on Follow up Information

Tumour parameters			Percent of patients with progressive disease during long-term follow-up and characterization of risk for metastasis			
Group	Tumour size	Mitotic rate	Gastric GISTs	Jejunal and Ileal GISTs	Duodenal GISTs	Rectal GISTs
1	≤2 cm	≤5-/-50-HPFs	0% none	0% none	0% none	0% none
2	>2 cm ≤5 cm	≤5-/-50-HPFs	1.9% very low	4.3% low	8.3% low	8.5% low
3a	>5 cm ≤10 cm	≤5-/-50-HPFs	3.6% low	24% moderate	34% high ‡	57% high ‡
3b	>10 cm	≤5-/-50-HPFs	12% moderate	52% high	34% high ‡	57% high ‡
4	≤2 cm	>5 / 50 HPFs	0% †	50% †	§	54% high
5	>2 cm ≤5 cm	>5 / 50 HPFs	16% moderate	73% high	50% high	52% high
6a	>5 cm ≤10 cm	>5 / 50 HPFs	55% high	85% high	86% high	71% high ‡
6b	>10 cm	>5 / 50 HPFs	86% high	90% high	86% high	71% high ‡

Table 3: Clinicopathological Profile of the Patients

Age	Median age (range) > 60 years < 60 years	52.19 years (14–83) 17 (26.9%) 46 (73.1%)
sex	Males females	39 (61.9%) 24 (38.1%)
Site of disease	Stomach Small bowel other	32 (50.7%) 18 (28.5%) 13 (20.6%)
Status at presentation	Non-metastatic Metastastic Locally recurrent	38 (60.3%) 24 (38.1%) 01 (1.6%)
mitosis	<5/50 hpf 5-10 hpf >10/50 hpf	28 (47.4%) 08 (13.5%) 23 (38.9%)
necrosis	Present absent	22 (41.5%) 31 (58.5%)
Histological subtype	Epitheliod Spindle type Epitheloid+spindle	6 (9.5%) 42 (66.7%) 6 (9.5%