Case Report

Primary malignant gastrointestinal stromal tumor of mesentry — a case report with review of literature

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Gastro intestinal stromal tumors are rare tumors of gastrointestinal tract and mesentry. Peritoneum and omentum comprise only about 5% of these tumors. We hereby report a case of a malignant GIST arising from the mesentry and describe its clinical, radiological, cytological and histopathological and immunohistochemical features and its review of literature.

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Gastro-intestinal stromal tumors (GISTs) are rare tumors of the gastro-intestinal (GI) tract, mesentery, and omentum. However, malignant GIST is the most common sarcoma of the GI tract accounting for 5% of all sarcomas. The estimated annual incidence is 10 to 20 cases per million, of which 20 to 30% are malignant[1].

The most common anatomic sites of its origin are the stomach (60-70%), small intestine (20-30%). Abdominal cavity. Peritoneum and omentum are rarer sites for occurrence of GIST comprising about 5% of the GIST[2]. There are two histological categories of these tumors. The spindle cell variety which comprises more than 70% of GIST were initially classified as leiomyomas or leiomyosarcomas, and the epithelioid variants were labeled as leiomyomas, leiomyoblastomas, or epithelioid leiomyosarcomas. However, recently it has defined by its ultra structural and immunohistochemical similarity to the interstitial cells of Cajal[3].

Majority of Gastro-intestinal stromal tumors are immunoreactive for c-KIT receptor tyrosine kinase (CD117 antigen) and lack the evidence of smooth muscle differentiation[1].

We hereby present a case of malignant GIST arising from the mesentry and describe its radiological, cytological, histopathological and immunohistochemical features.

Case Report

A 52 year old male presented with vague abdominal discomfort since 1 month. The patient did not have any symptoms suggestive of intestinal obstruction. There was no history of fever, weight loss or loss of appetite. On general physical examination the patient had mild pallor. There was no evidence of icterus, clubbing, lymphadenopathy or edema. Per abdomen examination revealed a diffuse large mass extending from the right lumbar region to pelvic region. On palpation the mass was firm in consistency and non tender. The mass was non-pulsatile and did not move with respiration. The cardiovascular, respiratory and nervous system examination findings were within normal limits.

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The complete hemogram showed evidence of mild anemia (Hemoglobin: 10.8 gm%) of normocytic hypochromic type. Routine urine and stool examination were within normal limits. The biochemical investigations including the blood sugar levels, renal function tests, liver function tests and lipid profile were within normal limits.

Plain and contrast computed tomography (CT) of abdomen was done using 10 mm sections. The study revealed a well defined mixed echogenic mass measuring 240 x 170 x 80 mm on the right side of the upper and mid abdomen arising from the space between the under surface of liver and lateral to duodenum and anterior to pancreatic head and extending till upper pelvis. The duodenum was displaced medially. The colon was displaced inferiorly and the rest of the bowel was displaced to the left side. Post contrast studies showed good enhancement of hyper dense component and hypodense component remained the same. The gallbladder, liver, pancreas, spleen, kidneys appeared normal. The stomach, duodenum, small intestine and colon appeared normal. There was no evidence of paraaortic lymphadenopathy. The rest of the peritoneal cavity and retroperitoneal space appeared normal. There was no evidence of ascites. The CT diagnosis of heterogeneous enhancing space occupying lesion (SOL) on the right side of abdomen, suspicious of mesenteric fibroma was given (Fig 1).

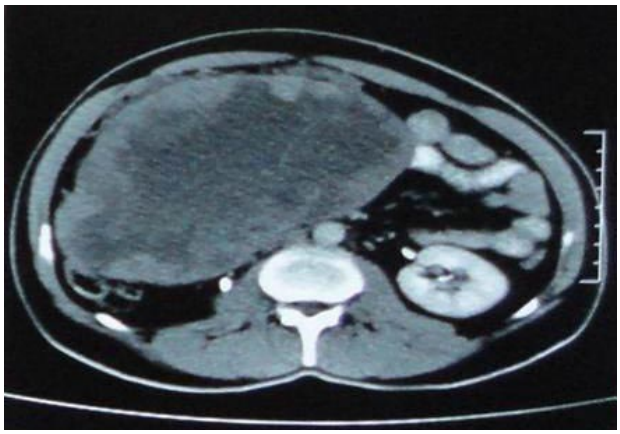

Fig 1 — CT scan showing the location of the lesion in the abdomen

Guided fine needle aspiration of the swelling was done. The papaniculoau and May-Grunwald Giemsa stained smears of the mass revealed cellular aspirate comprising of spindle shaped cells with elongated nuclei and delicate cytoplasmic processes (Fig 2).

Laporotomy was performed and the mass was excised. Per operatively there was a large mass arising from the mesentery from the space between the undersurface of liver extending up to the pelvis. The duodenum was pushed medially. On gross examination (Fig 3) the mass measured 25 x 17 x 8 cm. The external surface was smooth. The cut surface showed cystic area with areas of hemorrhage and necrosis.

Hematoxylin and Eosin (H & E) stained histopathological sections from the tumor showed a neoplastic lesion comprising of spindle shaped cells arranged in interlacing whorls and fascicles. The cells showed moderate anisonucleosis. Good number of mitotic figures (3-4/ high power field) were also seen (Fig 4 A and B). Areas of hemorrhage and necrosis were evident. The histopathological diagnosis of malignant spindle cell lesion with differential diagnosis of leiomyosarcoma and malignant GIST were considered. Immunohistochemical studies revealed diffuse positivity for CD-117 which confirmed the diagnosis of GIST (Fig 4C).

Discussion

Gastrointestinal stromal tumor (GIST) is the designation for the specific c-kit expressing and Kit-signaling driven mesenchymal tumors, many of which have c-Kit activating mutations. The specific identification of GIST has become increasingly important because a c-Kit selective tyrosine kinase inhibitor, Imatinib, has shown promise as an effective adjuvant therapy[4]. Although the prediction of malignancy in this tumor group is difficult, tumors that have mitotic activity counts exceeding 5 per 50 high power fields (HPF) or those larger than 5 cm have a high frequency of intra-abdominal recurrence and liver metastasis. In contrast, tumors smaller than 2 cm and those with mitotic activity counts <5 per 50 HPF are likely to be benign[5]. GISTs occur throughout the tubular GI-tract from the lower esophagus to the anus. The most common site is by far stomach (60-70%) followed by small intestine, rectum and colon. GIST in mesentry and omentum comprise less than 5% of cases. However, more often GISTs in these sites are metastatic from the GI-tract[6].

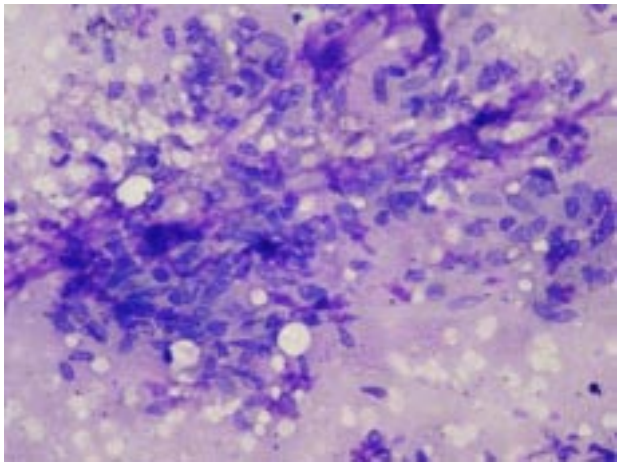

Fig 2 — FNA of the lesion showing cellular smears comprising of cohesive cell group spread out thinly attached to the blood vessel (arrows). The nuclei are relatively uniform in size with a delicate fibrillary cytoplasm (PAP stain 200X)

Fig 3 — Gross photograph showing large thick walled cystic mass with areas of hemorrhage and necrosis

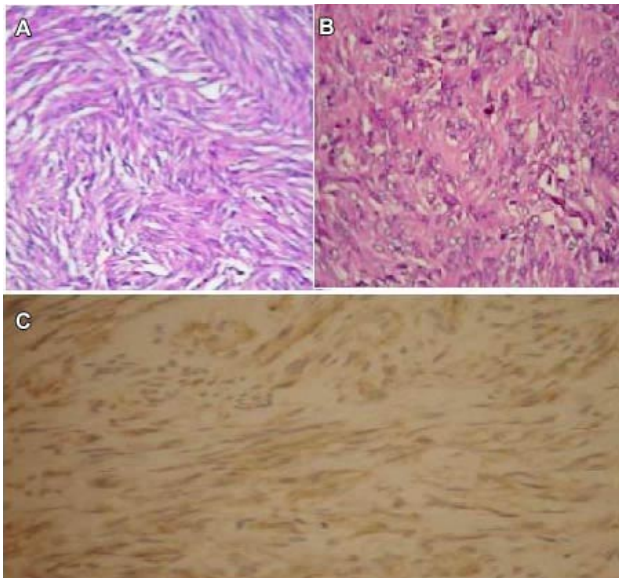

Fig 4 — A and B: H&E stained photomicrograph showing spindle cells arranged in interlacing fascicles with nuclei showing moderate nuclear pleomorphism and numerous mitotic figures and C: Immunohistochemical stain showing diffuse membranous positivity for CD-117 (200X H&E and IHC for CD -117)

When small these tumors are usually detected incidentally during laporotomy, endoscopy or imaging for other reasons. However when symptomatic these usually present as a vague abdominal mass, a feeling of abdominal fullness, or with secondary symptoms from tumor bleeding and an associated anemia. Other presenting symptoms include altered bowel functions, bowel obstruction or perforation, dysphagia, and fever[7]. Isolated reports have described the varied clinical presentations of mesenteric GIST. Gupta *et al* reported a rare a case of primary mesenteric GIST with Metastasis to

cervix uteri[8]. Engin *et al* described a case of GIST of small bowel with mesenteric and retroperitoneal invasion[2]. Another report by Krishnagopal *et al* the primary mesenteric GIST with features of acute abdomen[9]. The present case presented with abdominal mass with vague abdominal discomfort. The well described CT findings of GISTs include the presence of typically extra luminal, large (>5 cm), well-circumscribed, heterogeneous, centrally necrotic tumors in contrast to those of benign GISTS with regular contours, homogeneous density, and intraluminal growth patterns[2]. The preoperative radiologic findings by CT scan or magnetic resonance imaging help in determining the tumor contour and its extension and relationship with adjacent organs[6]. The gross patterns of GISTs range from hemispherical submucosal or serosal nodule to large cystic tumor forming pseudo diverticles with plaque like lesions in rare cases[6].

The cytological features of GIST that are described in literature include cellular smears, cohesive clusters with prominent vascular network, delicate fibrillary quality with wispy cytoplasmic extension and usually uniform ovoid to spindly nuclei. Presence of cellular discohesion, nuclear pleomorphism, intranuclear pseudoinclusions, prominent nucleoli, mitosis and necrosis are more commonly seen in malignant, metastatic and recurrent tumors and these features help to predict the malignant behaviour preoperatively[3,10].

The histologic features of GIST vary and the commonly described patterns include a spindle cell pattern which is seen in 60-70% cases and the epitheloid is seen in 20-30% of cases and pleomorphic which is the rarely described pattern (5%) pattern .degree this variation is site-dependent. Most commonly, GISTs have a spindle cell pattern (60-70%), whereas epithelioid cytology is seen in 20-30% of cases exclusively or focally, and a pleomorphic pattern rarely (<5%)[6].

Though the GISTs are known to occur spontaneously, three syndrome including Familial GISTs, Neurofibromatosis Type I and Carneys Triad are described to present with GIST as a manifestation[6].

The key immunohistochemical feature of GIST is its positivity for c-kit (CD-117). KIT-positivity in GISTs is typically strong and global. Membrane positivity is often seen and better appreciated in epitheloid GISTs. Pancytoplasmic appearing staining pattern is described in spindle cell types. Some GISTS have a paranuclear KIT –positive dots. In the present case, strong and global membrane positivity was seen. The other markers which are positively expressed in GIST are CD-34 and Nestin. However these markers lack the specificity as nestin is also positive in GI schwannomas[6].

Important criteria for evaluation of the malignant potential of GIST include the tumor size and mitotic activity. Generally tumor intestinal tumors with maximum diameter of 2 cm and gastric GISTs of maximum diameter of 5 cm and </5 mitoses per 50 HPF are considered probably benign. Intestinal tumors up to 5 cm and gastric tumors up to 10 cm and mitotic count of more than 5 /50 HPFs are probably malignant. Intestinal tumors 2-5 cm and Gastric tumors 5-10 cm mitotic count of less than 5/50 HPF are of uncertain or low malignant potential[5].

Conclusion

The present case highlights the importance of considering GIST as an important differential diagnosis in mesenteric neoplasms and has reviewed its preoperative and postoperative diagnostic clues which will help in diagnosis and evaluating the prognosis of GIST.

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