Massive Lower Gastrointestinal Bleeding Due to Dedifferentiated Retroperitoneal Liposarcoma Mimicking a Renal Cell Carcinoma: A Case Report

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Abstract

Primary retroperitoneal masses encompass a varied and typically uncommon assortment of neoplastic and non-neoplastic conditions that develop within the retroperitoneal space but do not stem from any specific retroperitoneal organ. Soft tissue sarcomas (STS) are the most common type of primary retroperitoneal tumors accounting for 1% of all cancers. Liposarcomas are histologically classified into four types, with dedifferentiated liposarcomas being one of the most frequently observed in the retroperitoneum. Dedifferentiated retroperitoneal liposarcoma (RPLS) is characterized by its biological heterogeneity and diagnostic challenge. A 47-year-old male transferred to a tertiary care hospital with abdominal pain and severe hematochezia. A contrast-enhanced computerized tomography of the abdomen was erroneously reported as a large retroperitoneal mass infiltrating the left kidney suggestive of a renal malignancy infiltrating the colon. Subsequent colonoscopy revealed twisting of the splenic flexure, mucosal congestion as well as luminal compression. At laparotomy, however, the mass was found to originate from the left retroperitoneal region infiltrating the left colon from mid-transverse to the lower sigmoid region. The tumor was resected along with the infiltrated colon, leaving adequate margins, and a Hartmann's procedure was performed. Histopathology of the specimen reported a dedifferentiated liposarcoma. Despite surgery remaining the primary treatment modality, achieving complete resection often remains challenging due to the massive size of the tumor and local infiltration at diagnosis. Early recognition and aggressive surgical intervention are imperative for long-term survival.

Keywords: dedifferentiated retroperitoneal liposarcoma; diagnosis; management; challenge; soft tissue sarcoma

Introduction

Situated amidst the posterior leaf of the peritoneum and the lumbar muscle fascia, the retroperitoneum constitutes a significant cavity within the body, accommodating a diverse range of medical conditions.[1] Soft tissue sarcomas are rare and comprise only 1% of all newly diagnosed malignant tumors. One such condition is retroperitoneal liposarcoma (RPLS), which is the most commonly observed soft tissue sarcoma

in the retroperitoneal space.[2] Originating from mesenchymal tissue, this malignant tumor sees the bulk of its mass differentiating into adipose tissue.[3] Its peak incidence typically occurs between 40–60 years of age with a notable male predominance. No racial predominance is evident.[4] These tumors typically grow to great sizes, expanding slowly and unrestrictedly inside the loose tissue of the retroperitoneal space. There are typically no symptoms until the mass grows to a size large enough to compress or invade adjacent structures or organs. Therefore, most patients frequently present at advanced stages with sizable retroperitoneal masses, presenting to the clinician a variety of therapeutic as well as diagnostic challenges.[5,6] Furthermore, when signs and symptoms do emerge, they are usually vague, such as abdominal pain (60-70%) with or without a palpable abdominal mass (70-80%). Such clinical features are readily dismissed as being caused by other less serious processes.[7,8] External compression of adjacent structures can, at times, lead to genitourinary or other gastrointestinal symptoms such as gastrointestinal hemorrhage.[9] We describe a patient presenting with a large retroperitoneal soft tissue sarcoma, having complex morphological and immuno-histochemical features suggesting a diagnosis of dedifferentiated liposarcoma. The tumor was found to be infiltrating the mid-transverse to lower sigmoid colon and manifested with severe lower gastrointestinal bleeding (LGIB). LGIB is commonly clinically associated with colonic tumors and such a presentation caused by retroperitoneal tumors has been rarely described in published literature, with only two reports published in literature so far throughout the world.[8,10,11] This is the first such presentation reported from the Gulf Cooperation Council (GCC) region.

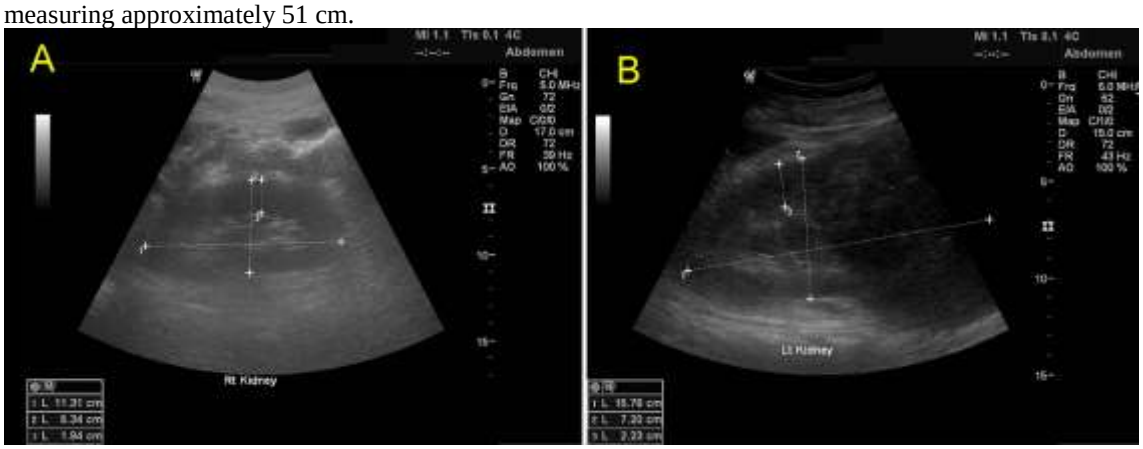
Case Report

A 47-year-old Southeast Asian male patient was transferred to a tertiary care hospital in the United Arab Emirates with an eight-day history of hematochezia and an unstable hemodynamic status. He had been experiencing abdominal pain and distention for two months, but reported to the physician when he noticed blood in his stools. The patient had no medical or surgical history and was not consuming alcohol, non-smoker. No family history of malignancies was reported.

The patient was thin and appeared to be in pain. Clinical examination revealed tachycardia with hypotension, pallor and severe abdominal distension. The patient's weight was 65 kg. A palpable mass, firm in consistency, extending from the left upper quadrant to the umbilicus was noted, filling the entire left side of the abdomen. Digital rectal examination revealed an empty rectum with no palpable masses. Blood-staining was noted on the examining finger.

His white blood cell count was 11.01 × 10^3 /µL, hemoglobin was 7.60 g/dl, platelet count was 240 × 10^3 /µL. Serum biochemistry profile reported a sodium level of 132 mmol/L and a creatinine of 47 µmol/L. All other serum electrolytes and organ function tests were within normal limits.

Abdominal ultrasonography showed a large heterogeneous mass in the lower pole of the left kidney, along with mild dilatation of its pelvicalyceal system. The mass extended into the left retroperitoneal region, measuring approximately 16 x 7 cm, exhibiting high vascularity and featuring a small aneurysm measuring 2.6 x 2.4 cm with turbulent flow. Additionally, fluid accumulation was observed in the left lumbar region, measuring approximately 51 cm.



A **B**

Figure 1: Abdominal USG: Normal right kidney – shown for comparison with the left side (**A**). Large heterogenous mass in the left lumbar region measuring about 16 x 7 cm – mimicking the appearance of an enlarged kidney (**B**).

CECT of the abdomen was done which reported a sizable exophytic retroperitoneal lobulated lesion with a large area of cystic necrosis, involving the middle and lower pole of the left kidney and extending into the pelvic region. It was adherent to the antero-lateral left abdominal wall and crossed the mid-line at the mid-abdomen, measuring approximately (+/- 15 x 17 x 20 cm). The lesion exhibited an infiltrative, poorly defined superior margin, making it challenging to distinguish from the adjacent normal renal parenchyma, with infiltration extending into the renal sinus. Tiny calcifications and an abnormal arterial vascular pattern were noted at the superior part of the lesion. The lesion compressed the left renal vein without clear infiltration and exerted pressure on the left ureter, transverse colon, and descending colon, with no clear demarcation between the lesion and the descending colon.

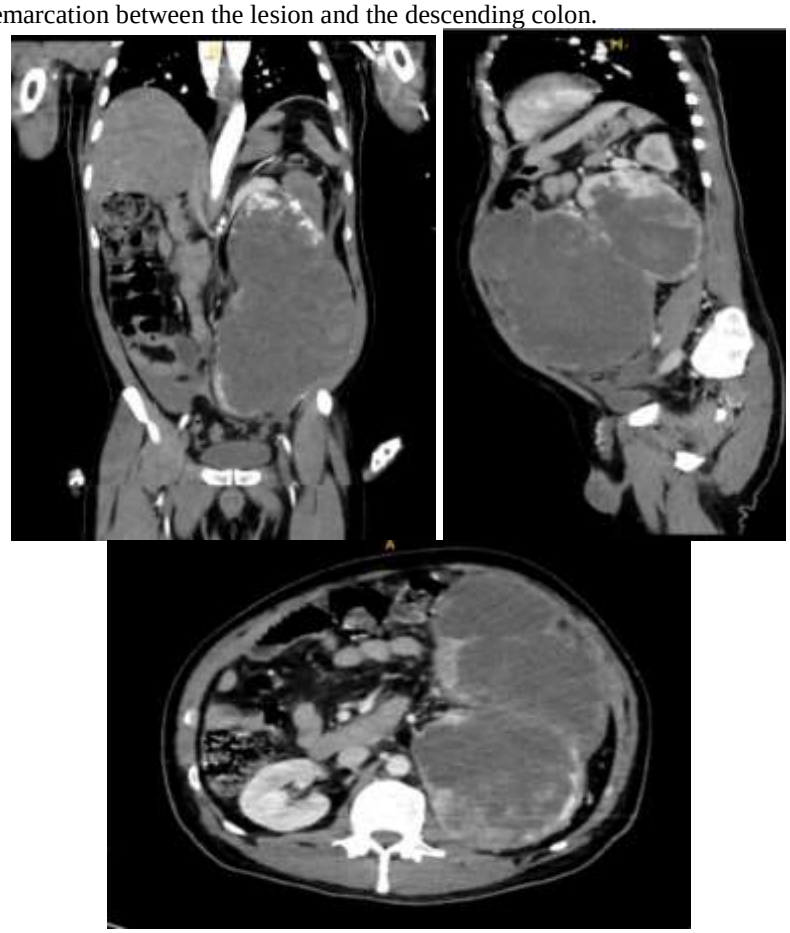


Figure 2: Contrast enhanced CT abdomen and pelvis: Coronal (A), Sagittal – Venous phase (B) and Axial (C) views - showing a large retroperitoneal lesion near the left kidney, with areas of cystic necrosis and indistinct margins compressing the adjacent structures like the left renal vein, ureter, and descending colon.

Colonoscopy showed external haemorrhoids, sigmoid diverticulosis, small 5mm polyp in the descending colon which was removed by forceps and severe twisting of the splenic flexure with severe luminal compression and mucosal congestion in the transverse colon, the colonoscope couldn't pass more than 10 cm through the transverse colon due to external compression and mucosal bleeding on contact with the endoscope. The ascending colon and cecum therefore could not be assessed

An upper gastrointestinal endoscopy, done to rule out a lesion arising from the stomach, showed erythema in the body of stomach and erosions in the antrum with no active bleeding

The tumor was initially determined to be a renal cell carcinoma based on physical examination, endoscopic and imaging evidence.

Other differential diagnoses include tumors with fatty components, such as renal angioleiomyolipoma, adrenal myelolipoma, retroperitoneal lipoma, and teratoma.[12,13]

The patient had been treated for intermittent episodes of hematochezia at another hospital in the United Arab Emirates and was transfused a total of six units of packed red blood cells and six units of fresh frozen plasma before being transferred to the tertiary referral hospital. After extensive inter-departmental consultations, surgery was identified as the best initial treatment modality. After completing the pre-operative evaluation and optimization, obtaining informed consent and prophylactic antibiotic administration, the patient was placed under general anesthesia, and an exploratory laparotomy was performed through a standard midline incision as the anterior approach provides direct and versatile access to retroperitoneal structures especially in large tumors. It provides also better exposure for tumor resection and allows for en-bloc removal of involved structures, including portions of the colon when necessary.

Intra-operative finding: At surgery, a massive, irregularly shaped mass was identified, originate from the left retroperitoneal region and infiltrating the left colon and abdominal wall pushing the whole bowel to the right side. The colon was gently mobilized revealing tumor invasion from the mid- transverse to the lower sigmoid colonic segments.

The distal colon was closed using a GIA stapler (Ethicon Endosurgery Linear Cutter, shaft length of 75 mm, closed staple height of 1.8 mm). The proximal colon at the mid-transverse colon was also transected using a GIA stapler (Ethicon Endosurgery Linear Cutter, shaft length of 75 mm, closed staple height of 1.8 mm, along with debulking excision of the abdominal mass, including the affected colon segments with great difficulty as dissecting it from surrounding tissues posed a challenge. Hemostasis was achieved using Surgicel and packing. A drain was inserted into the left paracolic gutter. An elliptical incision was made in the left upper quadrant, and the proximal end of the colon was brought out as an end-stoma.

The resected abdominal mass with colon was sent for pathology examination, with a recorded blood loss of approximately 2 liters.

Gross: Several pieces of tan, friable, necrosed tumor tissue, along with blood clots, measuring approximately 20x20x12cm, were received. Additionally, two large bowel segments were discovered in the same container, measuring 5.5x5cm and 15x4cm respectively, with adherent tan to fatty tissue. No kidneys were identifiable grossly. Upon examination, both bowel segments showed unremarkable lumen with no masses or ulcers. The outer surface exhibited tan tissue with the tumor adhering to the serosal surface at the opened end, while the opposite end was closed with surgical staples.

Histopathology: Tumor cells are arranged in a highly vague storiform pattern, displaying high cellular density and containing pleomorphic and bizarre cells with foamy cytoplasm and marked atypia. The cells also exhibit abundant eosinophilic cytoplasm, tumor giant cells, numerous mitotic figures, osteoclast-like multinucleated giant cells, necrosis with extensive hemorrhagic areas, osteoid, and lipoblastic to leiomyomatous differentiation. The background consists of inflamed collagenous and myxomatous stroma.

In both large bowel segments, the colon wall displays tumor adherent to the serosal surface and invading into the muscular propria. No renal tissue was identified. Immunohistochemistry was done. See **Table 1**.

Table 1: showing immunohistochemistry results for the resected specimen.

Sl.	Immunohistochemical test	Result
1	Dako staining:	Smooth-muscle actin (SMA) positive staining was observed in myogenic differentiated tumor cells
2	Cluster of Differentiation 99 (CD99)	Positive staining was evident in the tumor cells
3	Kiel 67 (Ki-67) index	Indicated a high mitotic rate, with over 50% of cells displaying activity

4	Desmin	Negative
5	Cytokeratin (CK) AE1/AE3	Negative
6	Synaptophysin	Negative
7	S-100	Negative
8	Cluster of differentiation 10 (CD10)	Negative
9	Cluster of differentiation 34 (CD34)	Negative

The immediate postoperative course was uneventful and the patient was put on total parental nutrition with gradual reintroduction of oral intake starting with clear liquids.

His surgical wound and stoma site were regularly inspected for signs of infection and surgical drain was removed on the fifth postoperative day when its output was less than 30 ml serosanguinous fluid.

He was referred to a specialty oncological center in the United Arab Emirates for further treatment.

After completing two months of oncologic treatment, he traveled back to his home country. Unfortunately, he experienced disease recurrence and passed away approximately three months later. Given the aggressive nature of the tumor, this outcome highlights the challenges associated with managing advanced malignancies, especially, retroperitoneal soft tissue malignancies.

Discussion

Retroperitoneal sarcomas form a unique subgroup, representing 10 – 15% of all sarcomatous tumors. The incidence of retroperitoneal sarcomas is estimated to be around 0.3 - 0.5 new cases per 100,000 people each year.[14-17] There is no known cause for retroperitoneal liposarcoma, and it does not develop from a benign lipomatous tumor.[18] It is necessary to have both cellular non-lipogenic sarcomatous and lipogenic well-differentiated sarcomatous components in the same tumor in order to diagnose dedifferentiated liposarcomas, which are defined as the transformation of well-differentiated components into non-fat-derived tumor components. Nonetheless, common genetic abnormalities with amplified sequences originating from the long arm of chromosome 12 (12q13–15), which includes amplifications of Cyclin-dependent kinase 4 (CDK4) and Mouse double minute 2 (MDM2) cell cycle oncogenes, are shared by well-differentiated and dedifferentiated liposarcomas. These similarities also extend to histological features.[19]

Retroperitoneal sarcomas are not a single disease but rather a diverse group of tumors that vary in their biological behavior, treatment responses, and oncological risks. According to a combined analysis of two extensive RPS databases, the most common histological subtypes are well-differentiated liposarcoma (24%), dedifferentiated liposarcoma (40%), leiomyosarcoma (20%), solitary fibrous tumor (5%), and malignant peripheral nerve sheath tumor (3%).[18]

Retroperitoneal liposarcoma frequently shows no symptoms, although when it does, it can cause pain, obstruction, and bleeding in the lower gastrointestinal tract as a result of its mass effect on nearby structures. They are often incidentally found during imaging studies for unrelated conditions or symptoms.[20] Due to its slow rate of growth and nonspecific symptoms, retroperitoneal liposarcoma is nearly always massive at the time of diagnosis. Presentation with lower gastrointestinal bleeding is extremely rare. Till date, only two cases of lower gastrointestinal bleeding due to retroperitoneal sarcoma have been reported in literature.[8,11]

Focusing on retroperitoneal liposarcoma, the differential diagnosis includes tumors with fatty components, such as renal angioleiomyolipoma, adrenal myelolipoma, retroperitoneal lipoma, renal cell carcinoma, and teratoma.[12,13,21]

Initially, an abdominal ultrasound (US) can suggest a mass in the mid-abdomen but typically cannot pinpoint the tumor's primary site or its details. While US is mainly used for measuring tumor size, it can also help identify retroperitoneal liposarcomas. Ishida et al. observed that well-differentiated liposarcomas often exhibit a 'wind-and-waves' pattern of fine echogenic lines, indicating fatty components. However, US has limitations in fully characterizing larger or more complex tumors.[22] Therefore, Abdominal CECT is the

most effective imaging modality for preoperative assessment; nevertheless, in certain situations, where the CECT suggests the presence of unresectable structures, MRI may be helpful. Additionally, selective angiography has proven effective in pinpointing the blood vessels that supply the tumor and in minimizing blood loss during surgery.[23]

When treating these patients with the goal of curing them, a CECT scan of the chest is also recommended for the assessment of metastases.[15] Dedifferentiated liposarcoma is characterized by its typical imaging appearance, which is a mass with coexisting fatty and non-fatty tissue, frequently accompanied by a focal nodular non-lipomatous component that is larger than 1 cm. Calcifications may be seen and often indicate a bad prognosis.[24]

Surgical excision continues to be the cornerstone of curative treatment.[21,25] Patients with tumors more than 5 cm and high-grade round cell or pleomorphic subtypes may benefit from either neoadjuvant or adjuvant chemotherapy. Local control of large high-grade liposarcomas may be achieved with neoadjuvant or adjuvant radiation therapy.[26] However, the role of adjuvant and neoadjuvant radiation or chemotherapy is disputed.[27,28]

Tumor histology and the degree of tumor invasion determine the overall 5-year survival rate of retroperitoneal sarcomas, which ranges from 36% to 58%.[11,16] Recurrence rates for retroperitoneal well-differentiated liposarcomas are over 90%, whereas those for dedifferentiated liposarcomas are over 100%. This is explained by the challenge of attaining negative surgical margins. This emphasizes the need to detect these tumors at their initial stages.[29,30] About 18% of cases of dedifferentiated liposarcomas have the potential for metastasis, most frequently to the lung and liver.[8]

For early diagnosis of such rare causes of LGIB, a high index of suspicion is required in all patients presenting with unusual or non-typical features. An early threshold to order CECT of the abdomen is required to diagnose these presentations early. This is especially to be noted if the classical investigations like colonoscopy do not yield immediate confirmation of the cause of the bleed. CT guided biopsy must be submitted for routine histopathology and immune-histochemistry to delineate the cell of origin. If the lesion is diagnosed early, aggressive and early resection is the sole chance to improve the prognosis in these patients.[7-9,11,14,16,17,20,27,29,30]

Conclusion

This case underscores the importance of considering retroperitoneal sarcomas in the differential diagnosis of lower gastrointestinal bleeding, especially in older adults. Retroperitoneal liposarcoma, although rare and malignant with a high recurrence rate, typically manifests asymptomatically initially, only being detected incidentally on imaging. As the tumor progresses, it can lead to symptoms ranging from abdominal discomfort to lower gastrointestinal hemorrhage. Retroperitoneal liposarcomas, even though extremely rare, must be considered in the differential diagnosis of abdominal masses presenting with gastrointestinal symptoms, especially complicated by gastrointestinal bleeding. The rarity is illustrated by the fact that this is the index case reported from the entire GCC region. Imaging modalities, particularly CECT of the abdomen, play a crucial role in assessment and preoperative planning. Currently, surgical intervention is the recommended treatment approach, with the value of adjuvant and neoadjuvant radiation or chemotherapy still disputed. Because of the high recurrence rate of retroperitoneal liposarcoma, regular monitoring, earlier detection, and timely intervention are critical in improving patients' quality of life and extending their survival time. Recommendations for clinical practice

Disclosure

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