

Case Report

Small Bowel Obstruction caused by a Carcinoid Tumour

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Abstract

We present a rare case of carcinoid tumour presenting as a small bowel obstruction in a young male patient. Pitfalls of diagnosis, including confusion with irritable bowel syndrome are high-lighted. The current management strategies of this tumour are reviewed.

Keywords: irritable bowel, appendicitis, cholecystitis.

Small bowel obstruction ranks high among the commonest causes of acute abdomen. De Dombal found that small bowel obstruction and acute gynaecological disease rank 4th, each accounting for (4%) of acute abdominal cases¹. They were preceded only by non-specific abdominal pain (34%), acute appendicitis (28%), and acute cholecystitis (10%). (table1).

Table 1. The causes of acute abdominal pain seen in hospitals in the developed world (after de Dombal 1991)

Cause of Acute Abdomen	%
Non-specific	34
Acute appendicitis	28
Acute cholecystitis	10
Small bowel obstruction	4
Acute gynaecological disease	4
Acute Pancreatitis	3
Renal colic	3
Perforated peptic ulcer	2
Cancer	2
Diverticular disease	1
Miscellaneous	9

We do not have data from Sudan, but the incidence of small bowel obstruction doesn't seem to be less than in developed countries.

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Common causes of small bowel obstruction include hernias and adhesions secondary to surgical operations on the abdomen². These conditions can be suspected by careful clinical examination. Diagnostic difficulties, however, arise in the absence of an obvious cause of obstruction. Taking a careful history and doing a thorough physical examination are very important initial tools of the diagnosis. Plain abdominal films can confirm the obstruction, and a distinction between dilated small and large bowel loops can be made. However, they do not usually define the cause of the obstruction. Hence, CT scan is extremely valuable in reaching a diagnosis^{3,4}.

Carcinoid tumours are rare, and even more rarely cause small bowel obstruction. They arise from neuroendocrine cells. These cells originate from the ectoderm like neuronal cells, hence the name neuroendocrine cells.

These cells are scattered in the body, but are mainly present in the gastrointestinal (GI) tract, the bronchopulmonary system, and the gonads. They were formerly called APUD cells (Amine Precursor Uptake and Decarboxylation) denoting their physiological activities of up taking amine precursors and manufacturing and secreting aminic substances- such as 5 hydroxytryptamine (serotonin), bradykinin, histamine, and prostaglandin- into the blood stream.

Serotonin is normally metabolized by the liver producing 5-hydroxyindoleacetic acid (5-HIAA), which is excreted in urine.

Carcinoid tumours are considered by some authorities to be benign with malignant potentials while others believe they are all malignant⁵.

When these cells become malignant, they use excess amino acid tryptophan to produce serotonin. This may give rise to carcinoid syndrome if metastasis occurs in the liver or if the tumour arises in the bronchopulmonary system, testis or ovary, and serotonin is secreted directly in the systemic circulation. The syndrome consists of flushing, diarrhea, heart valvular lesions, abdominal pain, telangiectasia, peripheral oedema, wheezing, cyanosis, arthritis, and pellagra (vit B3-niacin-deficiency).

Case Report

A 22-year-old male worker from the North of Sudan presented with colicky abdominal pain, vomiting, and abdominal distension for 10 days prior to admission to the surgical casualty ward at Khartoum North Teaching Hospital. He, however, had been suffering from these episodes on and off for about 1-2 months before traveling to Khartoum, and was suspected of having irritable bowel syndrome.

The pain started around the umbilicus and involved the epigastrium and right hypochondrium. The pain was initiated by eating and was relieved by vomiting. The vomitus was large in amount and contained food. The episodes of pain were also associated with abdominal distension. There was constipation alternating with episodes of diarrhea. There was significant loss of appetite and loss of weight. The patient was admitted several times to a local hospital, where he was treated by intravenous fluids and other medication which gave him temporary relief but no real improvement. He was referred to Khartoum for further investigation and management.

On clinical examination, the patient looked unwell, dehydrated, but was haemodynamically stable. Abdominal examination revealed some tenderness in the

lower quadrants, mainly the right iliac fossa and suprapubic areas. Per rectal examination gave the impression of the presence of a mass. General investigations revealed a haemoglobin of 13.5 gm/dl, and white cell count of 5.9×10^6 /l, urea of 30 mg/dl, creatinine 1.0 mg/dl, sodium 127 mmol/l, and potassium of 3.5 mmol/l. He had a normal random blood sugar, calcium, and bleeding profile. His urine and stools examination showed no abnormalities. Plain supine abdominal x-ray showed dilated small bowel loops, and multiple fluid levels were noted on the erect film.

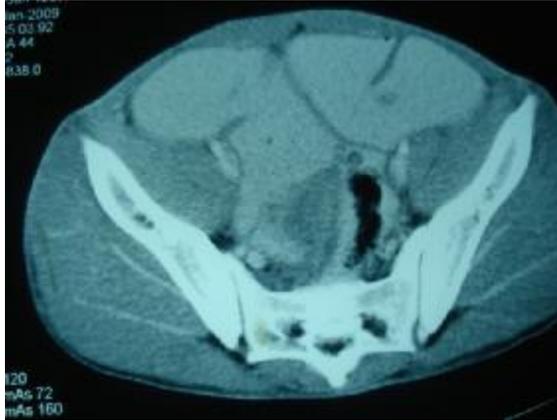
The patient seemed to have responded to conservative management, consisting of nothing by mouth, naso-gastric tube with suction, and intravenous fluids with monitoring of vital signs, urine output and abdominal signs. He was discharged after 48 hours from the casualty ward and was asked to come back for follow up after having a CT scan of the abdomen.

The abdominal CT scan showed a hypodense mass measuring 5x 4x 3 cm situated at the pelvic brim, possibly originating in the ileum and causing external pressure on the rectal wall distorting its lumen. It also confirmed the presence of marked proximal small bowel loop dilatation with fluid levels (Figures 1 & 2).

Figure 1. CT scan abdomen showing dilated loops and multiple fluid levels



Figure 2. CT scan abdomen, showing a hypodense mass in small bowel narrowing the lumen of sigmoid colon at the pelvic brim



There was no ascites and no lymphadenopathy. The liver showed some fatty infiltration, but there was no evidence of focal lesions. The biliary system was normal. A decision was, therefore, taken to do a laparotomy, which was done via a low midline incision extending for about 5 cm above the umbilicus. A tumour in the small bowel was found. This was attached at the pelvic brim to the sigmoid colon. With careful dissection, the tumour was successfully separated from the surrounding tissues and the small bowel was free. The tumour was in the ileum, about 70-80 cm proximal to the ileocaecal junction. It measured about 6-8 cm in diameter. It was hard and extending through the muscle wall of the small bowel (Figures 3 and 4).

Enlarged lymph nodes were noted all over the small bowel mesentery. The small bowel containing the tumour was resected with at least 10 cms on each side and anastomosis of the normal bowel was done using absorbable sutures in 2 layers.

The histopathology examination of the specimen revealed a typical carcinoid tumour with no evidence of angiolymphatic invasion, and free resection margins (Figures 5- 7).



Figure 3: A large tumour after being freed and before resection. Note the dilated part (held between fingers) proximal and the collapsed part distal to the tumour.



Figure 4: Inferior view of the site where the tumour was fixed to the pelvis

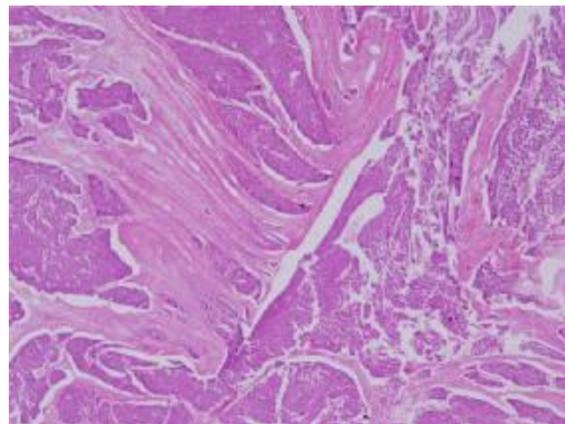


Figure 5. Histopathology x40

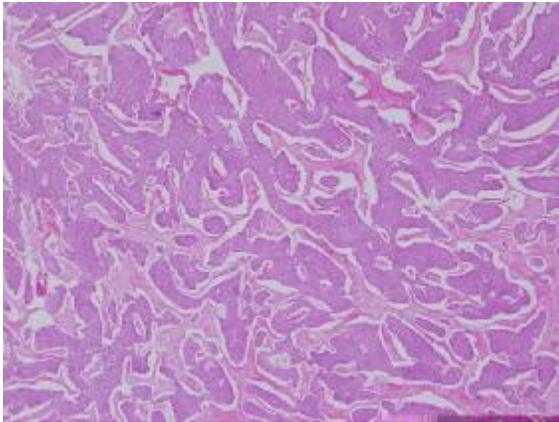


Figure6. Histopathology x40

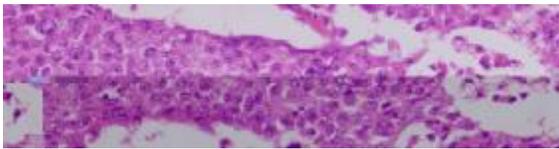


Figure7. Histopathology x400

The lymph nodes showed a reactive reaction with no evidence of malignancy.

The patient's recovery was uneventful and was discharged home after a week to be followed up in the outpatient clinic.

A search for evidence of metastasis was done by measuring the level of hydroxy-indole acetic acid (HIAA) in urine. A 24 hours-collection of urine was made, of which 30 mls were taken and sent to the lab. This test is available in Khartoum and is not expensive, although the sample is sent to Germany. The HIAA urine level was normal at 3.9 mg/24hours (normal between 2.0-9.0 mg /24hrs)

A search for a synchronous tumour of the small bowel was attempted using a contrast CT scan enterography, which was free. The patient was reassured and allowed to travel home after giving him an appointment for follow up after 3 months.

Discussion

This case illustrates the initial delay of diagnosis. This is because recurrent abdominal pain in a young patient (male and female) has frequently been attributed to irritable bowel syndrome (IBS)⁶. In this way

some serious organic problems, such as cancer, are missed or the diagnosis is delayed. IBS should not be diagnosed except after adequate investigations have been carried out and organic problems excluded.

Carcinoid tumours are rare. Studies are therefore few and far in between.

Modlin et al analysed 8305 tumours that were diagnosed during the period from 1973-1991⁷. The most frequent sites for carcinoids were the GI tract (73.7%) and the bronchopulmonary system (25.1%). Within the GI tract, most occurred in the small bowel (28.7%), appendix (18.9%), and rectum (12.6%). For all sites, age-adjusted incidence rates were highest in African American males (2.12 per 100,000 populations per year). They noted an increase in the incidence of tumour during the period of the study. This was attributed mainly to more awareness and better diagnostic technology.

The important role of CT scan in diagnosis of acute abdominal pain cannot be overemphasized^{3,4}. In this case, it showed a tumour mass and made laparotomy mandatory, despite the fact that the patient appeared to be settling on conservative management.

The differential diagnosis of a small bowel mass seen on a CT scan includes the more common tuberculosis, lymphoma, and adenocarcinoma.

Most carcinoid tumours have somatostatin receptors. Hence, radioactive somatostatin can be injected and radionuclide scanning is used to detect the tumour

Carcinoids of mid and hindgut are usually silent or give vague symptoms. Therefore, they are usually diagnosed retrospectively, after surgical removal and histopathological examination⁸.

The prognosis depends on the site and size of tumour. Lymph node involvement was noted in 20-45% of small bowel tumours. Hence wide resection is advocated including the nodes draining the area. Also, in this regard,

appendix carcinoid less than 1 cm rarely metastasise to liver, hence appendectomy alone suffices. On the other hand those larger than 2 cm in diameter have 30% risk of lymph node metastasis providing a rationale for right hemicolectomy.

Once diagnosed, care should be taken to search for a synchronous tumour in the small bowel and metastasis. Synchronous primary tumours has a high incidence of (17 %) ⁹. This search can be done either by a contrast CT scan, or capsule endoscopy which has recently been introduced in Sudan.

Search for metastasis is done by measuring the level of HIAA in a 24 hour collection, of which 30 mls of the urine is taken as a sample. This test is available but a bit expensive as the sample is sent to Germany.

The only treatment of carcinoid tumours is surgical excision and hence the importance of early diagnosis and treatment. Prognosis is good if the tumour was small and removed early.

Metastatic tumours are treated by adjuvant chemotherapy and biotherapy. Chemotherapy includes streptozotocin-based combinations such as 5-fluorouracil and doxyrubicin, as well as cisplatin and etoposide ¹⁰. Biotherapy includes somatostatin analogue (octreotide) and alpha interferon. Biotherapy was found to benefit patients with midgut tumours ¹¹. Trials of combined therapy are promising with good relief of symptoms, but the prognosis is not good ^{10,11}.

Conclusion

Small bowel obstruction (acute or subacute) with no obvious cause, such as a hernia or a scar of abdominal operation, should be taken seriously and investigated thoroughly. Diagnosis of irritable bowel syndrome should not be made except after exclusion of organic causes. CT scan of the abdomen is a very useful diagnostic tool in acute and subacute abdominal pain and is available in many centres. Young patients as well as older

patients are prone to develop tumours, which can be treated more efficiently and have a better prognosis if diagnosed early.

Carcinoid tumours are rare and are usually diagnosed retrospectively after removal of the tumour mass. Once diagnosed, a search for evidence of metastasis and/or the presence of a synchronous small bowel tumour must be carried out as outlined above. Surgical excision remains the only curative treatment. The prognosis is good for early small non-metastasising tumours.

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