

Short Bowel Syndrome: Presentation of Two cases and Review of Literature

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Case Report

Abstract: Short Bowel Syndrome - Massive/ near total resection of small bowel is a rare surgical entity with one to two per million globally and survival rate is much more meagre. Sustained post op TPN being unaffordable in rural population is again a handicap in the prognostic index of the patient. One case from our hospital survived with enteral feeding post operatively with minimal TPN.

Key Words: superior mesenteric artery occlusion, near total small bowel resection, post operative management.

Introduction

Mesenteric ischemia and resulting bowel gangrene is a frequently lethal condition occurring out of critical vascularity to the gastro intestinal tract. Commonly they pose diagnostic difficulties and challenging management decisions. Traumatic injury and vascular occlusion are other pathology that results in loss of 50% or more loss of small intestine leaves the patient for risk of developing short bowel syndrome. mesenteric ischemia accounts 0.1% of hospital admission and 1-2% of abdominal pain. Despite the increase of knowledge on mesenteric ischemia, it still associated with a high mortality rate. (#) In south india the above incidence do not hold good in the past but in recent years , the incidence of vascular thrombotic episodes of the whole body inclusive of cerebral, coronary ,upper and lower limbs and gastro intestinal tract. We report two cases of superior mesenteric artery obstruction with small bowel gangrene with different etiology

1. Superior mesenteric artery thrombosis (idiopathic)
2. Intra abdominal sepsis with organised abscess at root of mesentery compressing the superior mesenteric artery at its origin.

Case 1

A 47 year old lady presented with diffuse abdominal pain and multiple episodes of vomiting since 1 day. She was a Diabetic on medication, no other comorbidities. At admission patient was hemodynamically stable with diffuse tenderness on abdominal palpation without signs of ileus. Over the next few hours she developed progressive abdominal distension and peritoneal signs with hemodynamic instability .Plain X ray imaging were

unremarkable. The patient was taken up for emergency laparotomy. At surgery found to have copious altered peritoneal fluid with extensive small bowel gangrene extending from about 3 feet distal to DJ flexure till caecum with absent mesenteric arterial flow. The superior mesenteric artery was thrombosed right from its origin and on palpation no pulsation was felt throughout per operative period. Gangrenous segment resected and jejuno-colic anastomosis done. Post operative period was uneventful with the patient tolerating enteral feeds. After one year patient is doing well with reglossitis and no other complication with marginal weight gain. The barium contrast study done after one year shows significant intestinal adaptation with lengthening and hypertrophy of both residual jejunum and colon.



After 1 Year



Barium Contrast Study

Case 2

A 40-year-old male presented with intermittent low grade fever for the last one month and progressive abdominal distension with intermittent crampy pain for the last 15 days associated with diarrhoea and no vomiting. He had been on over the counter medication prescribed by a local practitioner. His past medical history was insignificant. Following admission he complained of increasing pain and abdominal distention. He was febrile, tachycardic with a diffusely tender abdomen. The remainder of clinical examination was unremarkable. Ultrasound examinations of abdomen showed dilated loops with inter loop echogenic collections. Plain x-ray abdominal film

showed centrally located multiple dilated loops with free intraperitoneal air. Considering the deteriorating clinical condition of patient no further contrast enhanced CT examination could be done hence, he was taken up for emergency laprotomy with a clinical diagnosis of bowel perforation- probably ileal pathology. At laparotomy copious feculent peritoneal fluid with two large contained perforations sealed off by omentum, mesentery and small bowel seen in the root of mesentery compressing the superior mesenteric pedicle as two large rigid masses pouring out pus on resection. Small bowel was gangrenous extending from the proximal jejunum about two feet distal to DJ flexure till caecum. Resection of nonviable bowel with end jejunostomy done. The ascending colon was closed and decompressed with a percutaneously placed Foley catheter. Post operatively he required ventilatory support for four days and had high stomal output. He was started on enteral feeds which were well tolerated. In view of insurance company's intervention he was referred to another hospital in accordance to insurance requirements. At the referred hospital the patient was started on TPN and initially doing well. But he suddenly deteriorated and succumbed following a blood transfusion. Short bowel syndrome (SBS) is an intestinal failure resulting from an inadequate length of intestine following intestinal resection resulting in inadequate digestion or absorption of nutrients or both, so that an individual becomes malnourished and requires specialized medical and nutritional support.¹ SBS generally is defined by the length of residual intestine. Typically, this refers to less than 200 cm of residual small intestine.² The reported "normal" length of the small intestine varies considerably from 300–850 cm.^{3,4} Global statistical report for Short bowel syndrome stands at 1 to 2 per million as on today.² Short bowel syndrome is always precipitated after surgical resection for post operative bowel obstruction, very often recurrent in nature. Rest of the causes can be mesenteric vascular disease, crohn's disease, Irradiation / malignancy.⁵ Main sequelae after extensive small bowel resection is loss of absorptive surface area, resulting in mal absorption of macro and micro nutrients, electrolytes and water.⁶ Small bowel is unique by well tolerating resection of up to half of whole length. Short bowel syndrome very often develops when the patient loses more than two thirds of small bowel.⁷ Significant loss or resection of small bowel is not always followed by short bowel syndrome in every patient. Hence, co morbid factors responsible can be original normal small intestinal length, extent of bowel being lost, age of the individual, residual length of the small and large bowel and preservation of ileo caecal valve.⁸

Permanent TPN is best not needed if one of the following is present

Type 1 – End Jejunostomy – 100 cms of small bowel.

Type 2 – Jejunocolic anastomosis – 65 cms of small bowel.

Type 3 – Jejunocolic anastomosis – 30 cms of small bowel.^{7a}

Colonic presence after massive small bowel resection has both positive and negative effects. Water absorption from colon increases fivefold with absent small bowel with absent small bowel.⁹

Also, the colon can metabolise the residual carbohydrates by its resident bacterial flora into short chain fatty acids – butyrate, propionate, acetate- which act as energy source. Small bowel adaptation is very impressive after major resections and ileum has more adaptive capacity than jejunum. Some hormones which assist in small bowel changes are growth factors, regulatory peptides, cytokines and local factors like vascularity, neural supply, immunity. Usually it is one to two years when the small bowel adaptation to near normal function with the reduced absorptive mucosal surface. Prominent pathological findings are – 1. Intestinal hyperplasia 2. Readjusted motor activity 3. Earlier disruption followed by adaptation; more by the jejunum rather than ileum.^{10,11,12,13}

Very often near normal bowel functions in short bowel syndrome patients is accomplished in less than two years. Hence, some patients need Intravenous supplementation till such time the bowel becomes nutritionally autonomous.^{14,15,16} Long term complication seen in short bowel syndrome patients are cholelithiasis and renal calculus. Renal calculi are mostly oxalate stone. Fermentation of residual carbohydrate in the colon leads to lactic acidosis due to D – Lactate absorption.^{17,18,19}

Patient survival in early post operative period depends on proper control of sepsis, adequate fluids and electrolytes and early nutritional support. Surpassing the early critical period, future patient survival rests on maintenance of adequate nutritional status and avoid complication.^{20,21} Intestinal hurry and malabsorption can be overcome by reversed intestinal segments, colonic transposition, intestinal valves, recirculating loops, intestinal pouches have been postulated to prolong intestinal transit time.^{22,23}

In difficult situations of short bowel syndrome, to increase the bowel function and absorption, surgical techniques as stricturoplasty and serosal patching for chronic perforation. In case of recurrent resections end to end anastomosis is preferable to prevent blind bowel loops and possibly increase the length available of small bowel.^{24,25} Even though, organ transplantation offers another promise but in Indian rural population with the financial constraints, it cannot be contemplated as

treatment of choice. Even though TPN maintains the life of the patient's progressive liver dysfunction and catheter related sepsis still remains the leading causes of death in patients with short bowel syndrome, as it happened with our male patient after three weeks post operatively.²⁶

Conclusion

In Indian rural scenario, with non availability of critical and costlier essential nutritional products, highly critical morbid conditions of short bowel syndrome are extremely difficult to manage until survival. Fortunately in our first case – lady patient was able to cope up with minimal number of days with TPN and followed by oral enteral nutrition. Till today she is alive after 18 months which is rare by global survival statistics with no grave complications.

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