

# Case Report

## The short - bowel syndrome

The short-bowel syndrome (SBS) is a disorder culminating in severe malabsorption usually from functional or anatomical loss of small intestinal length. The modalities of management are complex and resource-dependent so that cases that occur in low socio-economic environments automatically have high morbidity and mortality.

This paper presents 2 cases of SBS in adult men and the difficulties in their respective management, with a review of the current literature.

### Case 1

A 59-year-old man was seen at the surgical outpatient department with a history and clinical features suggestive of a neoplasm of the sigmoid colon. He subsequently had a sigmoid colectomy and end-to-end anastomosis as a one-stage procedure after adequate preparation. His postoperative period was uneventful and he had adjuvant treatment of weekly intravenous 5-fluorouracil with oral levamisole for 1 year.

Sixteen months postoperatively he developed recurrent episodes of severe colicky abdominal pain with distension. There was associated anal pain after defecation but no bleeding. The clinical diagnosis was recurrent adhesive bowel obstruction and possible recurrence of the colonic tumour. Flexible fiberoptic sigmoidoscopy showed a recurrent tumour at the site of the anastomosis. Bowel preparation was commenced and an exploratory laparotomy was planned within the following 3 days. The night before surgery, he was recorded to have had another episode of severe abdominal pain for which he was given parenteral analgesia. At surgery, it was discovered that he had a volvulus of the entire small bowel around a fibrous band extending from the transverse colon to the pelvis. There was a recurrent tumour at the anastomotic site and a synchronous tumour at the mid-portion of the transverse colon.

After resection of these diseased areas, all that was left was about 30 cm of jejunum, 20 cm of ileum and about 50 cm of colon. About 320 cm of his bowel was removed. He had jejunio-ileal and colocolonic anastomoses respectively. His problems started about the 3rd day

after surgery when he could tolerate food orally; he developed severe diarrhoea, and bowel motions 12 - 20 times a day were common, with malabsorption. He rapidly lost weight, was always dehydrated and developed opportunistic infections. He was confined to bed because of his diarrhoea. Gastroenterologists were consulted; they recommended intravenous hyperalimentation, Lomotil, mist kaolin with morphine, and oral codeine at various times, without success. He gradually deteriorated over 3 months, chronic renal failure supervened, and he finally passed away 4 months after the operation.

### Case 2

A 39-year-old man was seen at the accident and emergency department with a history and clinical features suggestive of acute intestinal obstruction. He was resuscitated and scheduled for an emergency exploratory laparotomy. At surgery a tumour was found obstructing the distal jejunum. This was resected and an end-to-end anastomosis was performed. His postoperative period was uneventful and he was discharged 1 week after surgery. A histopathological report of the tumour was available 4 weeks later; it showed a well-differentiated adenocarcinoma of the jejunum. He was subsequently commenced on intravenous 5-fluorouracil weekly for want of an ideal drug.

He re-presented 4 months later with features of intestinal obstruction and was started on conservative management for adhesive bowel obstruction. He did not improve on this mode of management and had to be scheduled for an exploratory laparotomy. At surgery it was found that his small bowel was matted together with nodules of malignant tissue; the caecum, ascending colon and proximal transverse colon were also involved. Only about 30 cm of proximal jejunum was free of tumour. We performed a side-to-side jejunio-transverse anastomosis and closed the abdomen in 2 layers. His immediate postoperative period was uneventful; however, by the 4th day after surgery he developed diarrhoea up to 8 times a day. He was placed on Lomotil and mist kaolin with morphine without relief of his diarrhoea. He gradually deteriorated and succumbed about 4 weeks after the operation.

## Discussion

SBS, short gut, and short small bowel are all terms referring to one and the same symptom complex. This condition is characterised by rapid intestinal transit time leading to malabsorption of nutrients and diarrhoea, with growth retardation in children or weight loss in adults.<sup>1-4</sup>

Anatomically, the normal length of the small bowel in adulthood has a mean of 550 cm with a wide range of 350 - 700 cm depending on race, body weight and size of the patient.<sup>1-3</sup> The first patient had 320 cm of bowel removed surgically, while the second underwent bypass surgery of the whole of the diseased small bowel and half of the large bowel.

SBS is usually a sequela of massive intestinal resection.<sup>1,2,5,6</sup> Whereas a loss of 30 - 50% of jejunio-ileal length will usually result in short-term diarrhoea and malabsorption, long-term disease manifestation with serious nutritional consequences will ensue after loss of more than 70% of small intestine or if less than 100 cm of small bowel remains.<sup>1,2</sup> However, it is difficult to predict a specific intestinal length at which this clinical entity will manifest.<sup>1</sup> It is particularly severe after resection of the ileocaecal region or if the colon has also been removed.<sup>2</sup>

Vascular lesions leading to intestinal ischaemia and necrosis, and inflammatory bowel disease, now comprise the most frequent causes of SBS and intestinal failure in adults.<sup>1</sup>

### Effects of SBS

SBS is associated with low quality of life.<sup>2</sup> The dominant clinical problem in the acute phase is massive diarrhoea, treatment of which is a demanding challenge to the physician and the patient.<sup>2</sup> An interesting phenomenon, i.e. adaptation, sometimes occurs in these patients and may ameliorate the condition.<sup>2,5</sup> Adaptation of the remaining intestine is stimulated by exposure of the residual mucosa to macronutrients. This occurs on several levels; the remaining bowel increases in length and diameter, and there is hyperplasia of small intestinal mucosa with increased number and size of crypts and villi.<sup>2,5</sup> However, this important mechanism only occurs if the ileocaecal region is preserved, which partially explains why these patients fare so much better. In combination, adaptive responses

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increase absorptive capacity by several hundred per cent and are the basis of long-term management.<sup>6</sup> They develop over 1-2 years after the onset of SBS.<sup>2</sup>

The management of this condition is both medical and surgical. The massive diarrhoea may be treated by parenteral nutritional support, gastric acid secretion inhibitors, e.g. H<sub>2</sub>-receptor blockers and proton pump inhibitors. In severe cases the somatostatin-analogue octreotide strongly reduces the intraluminal fluid load and can be helpful in patients with very little remaining bowel. Cholestyramine reduces cholerrhoeic diarrhoea but may worsen steatorrhoea. Broad-spectrum antibiotics are of value for the control of bacterial overgrowth. Because of an average malabsorption rate of 30% most SBS patients need hyperalimentation, including adequate and regular supplementation of vitamins, minerals, e.g. calcium, and trace elements. Diets need to contain sufficient amounts of fat to achieve adequate energy supply and pancreatin preparations may improve digestion.<sup>2-4</sup> The primary goal of conventional surgical interventions is to increase nutrient and water absorption by slowing gastrointestinal transit and/or increasing the absorptive surface. The following surgical procedures have so far been performed in small groups of patients, with limited success: interposition of antiperistaltic small-bowel segment or of colon, construction of valve mechanisms, lengthening procedures and electrical retrograde small-bowel stimulation. If non-tolerable complications of long-term parenteral nutrition occur, small-bowel transplantation may be considered as high-risk therapy of last choice in young patients. Apparent or pending liver failure is the most important indication. The 5-year survival rate of isolated small-bowel transplantation is 45%.<sup>2-4</sup>

## Prevention

SBS is a potential postoperative complication of intra-abdominal procedures and accounts for a considerable proportion of tertiary referrals for the condition. Surgical treatment of postoperative obstruction after common surgical procedures is the most frequent cause. Preventing adhesions, avoiding technical errors, diagnosing a potentially ischaemic intestine in a timely manner, and approaching the frozen abdomen cautiously are important strategies for preventing this condition.<sup>6</sup>

The two case reports underscore the pathophysiology of SBS; the first case was an anatomical loss of small bowel, while the second was a functional loss. Both resulted in severe malabsorption of fluids and nutrients that could not be controlled by the methods available in this institution. It is also obvious that when several operative procedures are described for the same entity, with limited success, treatment is unsatisfactory and no consensus on the appropriate treatment has been reached. In the two patients presented SBS could not have been prevented because of the pathologies involved; i.e. there were no other surgical choices available at that time. They probably would have had a chance of prolonging their lives if they had access to centres where the abovementioned facilities are available.

## Summary

SBS occurs when a significant length of the small and large gut has been removed or rendered non-functional. It results in diarrhoea, malabsorption and malnutrition, and may lead to death. The most common cause in surgical practice is massive resection of the gut. Management of this problem is complex and involves access to many medical resources – chiefly intravenous hyperalimentation and supplementation with essential nutrients.

A physiological response called adaptation has been described in some patients, especially if they have been kept alive by medical management, which ameliorates the condition.

A myriad of surgical operations have been described, none of which is the gold standard. This lends credence to the difficulty in managing this group of patients.

Two patients are presented, the first had massive gut resection from ischaemic changes due to volvulus and the second had jejunosigmoid colon bypass because of malignant intestinal obstruction from massive tumour infiltration of the small and proximal large bowel.

## References

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