

## BRIEF CASE REPORT: EXTENDED SMALL BOWEL VOLVULUS ASSOCIATED WITH SIGMA VOLVULUS

VL David<sup>2</sup>, A Radulescu<sup>1,2</sup>, O Adam<sup>2</sup>, M Banateanu<sup>2</sup>, P Tepeneu<sup>2</sup>

<sup>1</sup>Saban Research Institute - Pediatric Surgery Research, Children's Hospital, Los Angeles U.S.A.

<sup>2</sup>Children's Hospital "Louis Turcanu" – Department of Pediatric Surgery, Timisoara, Romania

### Abstract

Volvulus is a common surgical emergency and in most of the cases requires prompt diagnosis and treatment in order to evolve favorably. We present you a case of a 6-year-old male with a massive volvulus involving a large portion of small bowel and sigma that did not evolve favorably. There are no prospective, randomized studies comparing treatment options and the most frequently raised questions are: when to perform the resection if such an intervention is needed and how long should the resected portion of the bowel.

**Key words:** small bowel volvulus, sigma volvulus, laparotomy.

### Introduction

Small bowel obstruction (SBO) is a common cause of emergency surgical admission. The most frequent causes are well known and may often be safely treated conservatively in the first instance. However, some of the most rare causes of small bowel obstruction require prompt diagnosis and treatment so that they will not progress rapidly to gangrene.[1]

Small bowel volvulus (SBV) presents with classical features of intestinal obstruction.

The outstanding symptom is central abdominal pain, the severity of which may be out of proportion to the apparent degree of obstruction. The diagnosis should be particularly considered if the pain does not respond to narcotic analgesia, although in such cases frank gangrene is often already present.[1]

Laboratory tests are often not conclusive for these patients such as the case of the studied patient.

Although the haematocrit, serum liver enzymes, amylase and lactate dehydrogenase are frequently raised, they do not show a consistent correlation with SBV.[1]

A white cell count, greater than 18.000/mm<sup>3</sup>, has been shown to be correlated with the presence of gangrenous bowel.[1,3]

In a review of 229 patients with small bowel obstruction no single hematological test was found to reliably differentiate gangrenous from viable small bowel.

Muchas et al [6], in their series, showed a 55% hyperamylasemia and abnormal serum lactate levels in 86% of patients with gangrenous small bowel, in contrast to 5% and 4%, respectively, in those with other causes of small bowel obstruction.

In contrast to the specific radiological features of colonic volvulus, the plain abdominal radiography in SBV

shows non-specific features of small bowel obstruction with either distended loops or a featureless/gasless abdomen.[7,8,9]

Upper gastrointestinal barium series, angiography, computerized tomography (CT) and magnetic resonance imaging (MRI), however, may be beneficial in establishing the diagnosis of SBV.[1]

### Case report

A 6-year-old male was admitted to the emergency department with acute abdominal pain of several hours' duration accompanied by nausea, vomit and diarrhea.

At the initial examination, the patient had no abdominal distension, no fever and the blood pressure and the pulse were in normal limits.

Results of blood work and urinalysis were, except high blood sugar, between normal limits.

Abdominal radiography showed 2 air-filled structures in the left upper abdomen cavity (fig. 1).

The following hours the patient's abdominal pain increased and the abdomen became distended. We decided that an immediately surgical intervention is necessary. After a median laparotomy we discovered a massive volvulus that involved large portions of small bowel and sigma.

The volvulus was formed by two separate axes: one of the ileum and a small part of the jejunum and the other one of the sigma with both axes forming a common axis. Both the small bowel and the sigma suffered from lack of blood supply and presented changes in color and consistency.

We untwisted the bowel and, because a large part of the intestine was affected, we decided not to perform any intestine resection in order to let some portions revitalize.

We infiltrated the mesentery with Xilina<sup>R</sup>, washed the cavity and placed a drain tube in the Douglas recess and closed the abdomen. After the laparotomy under supportive treatment and antibiotic protection the patient's state was stable.

After 24 hours we reopened the abdomen cavity in order to reevaluate the situation and perform the resection of the non viable parts. We found that a large portion of the small bowel had irreversible necrosis lesions and the sigma presented some modest lesions but still having a decent blood supply.

We performed the resection of 1.2 m of the small bowel with an end ileostomy. For the following 6 days the patient had a favorable evolution in the intensive care unit

but in the 7-th day he presented signs of peritonitis. An iterative laparotomy was performed and founded a perforation of sigma with septic fluid in the cavity. We resected most of the sigma with an end sigmoidostomy. After this surgical intervention the patient's state was satisfying but after another 4 days he presented a silent distended abdomen with involuntary guarding. A 4-th

laparotomy was performed and the resection of the distal portion of sigma, where a large perforation was found.

In the following days the patient's evolution was unsatisfying and after another 4 days, the patient died.

The pathologist report revealed that the death was caused by septic shock with C.I.D. and multiple organ failure.

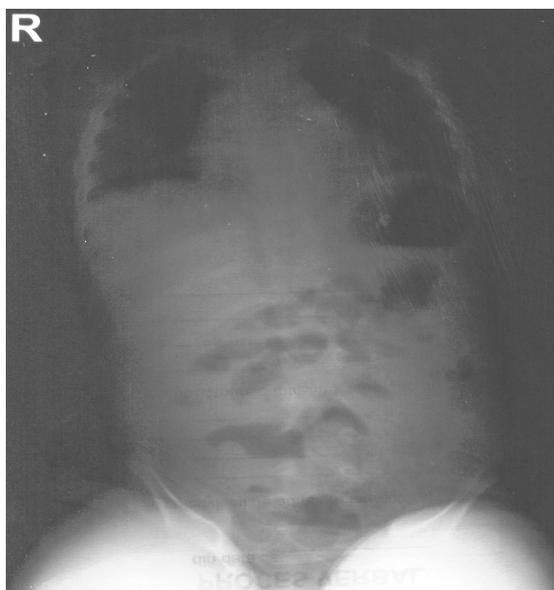


Fig. 1. Abdominal x-ray hours after admission.

### Discussion

The surgical options for SBV consist of derotation, with or without fixation, and resection with anastomosis.

To date, there has been no prospective, randomized study comparing these options, or any study comparing the long term results to the different procedures.

In the presence of gangrenous bowel almost all authors recommend resection, with or without anastomosis.[10] However, the best treatment for non-gangrenous SBV is uncertain.

Simple derotation carries a high risk of recurrence, while fixation of the torted small bowel is technically difficult, due to the length and anatomy of the small bowel. In view of the excellent blood supply of the small bowel, some authors recommend resection and primary

anastomosis in all cases of SBV, regardless of whether gangrene is present or not.

The obvious risk of resectional surgery is the development of short-gut syndrome, which arises from a substantial loss of small bowel length.

The actual treatment at laparotomy depends on whether the bowel is gangrenous or not. The frequency of gangrenous bowel in industrialized countries is less than 10%, [2,3] compared with rates as high as 25% in developing countries.

Many authors compared the rates of success and mortality in the case of viable bowel and gangrenous bowel. The following table presents a comparative study of different authors:

Author (Year)	Viable bowel		Gangrenous bowel	
	Number	Mortality (%)	Number	Mortality (%)
<b>African Series</b>				
Shepherd (1969)	389	8.0	36	47.0
Schagen van Leeuen (1985)	116	1.7	22	18.0
Ejumu (1985)	21	4.8	3	33.0
Sroujeh et al (1985)	20	10.0	3	33.0
Bagarani (1993)	10	5.8		21.0
Udezue (1990)	3	0.0		18.0
<b>Western Series</b>				
Drapanas (1961)	18	17.0	5	60.0
People et al (1990)	50	0.0	4	75.0
Average mortality		5.9		38.0

Mortality rates of between 4-50% have been reported, depending on the general condition of the patient and presence of concomitant disease.[4,5]

Emergency resection carries a high mortality rate, partly because of the poor general condition of the patient and toxemia from necrosis. If the resected bowel is gangrenous, the mortality ranges between 18-75% compared with 4-12% in the case of viable bowel.[4,5]

There are no prospective, randomized studies comparing treatment options and the most frequent raised questions are: when to perform the resection if such an

intervention is needed and how long should the resected portion of the bowel be. If too much of the bowel is resected, this could lead to a short-gut syndrome and all of its long term consequences. On the other side, nonviable bowel, left inside the abdomen cavity, could be the starting point of peritonitis with fatal end in many cases.

In conclusion, studies regarding results of different treatment methods are necessary to be done in order to establish a sequence of treatment that will lead to lower mortality ranges.

#### References

1. O. Iwuagwu , G.T. Deans ,Small bowel volvulus a review ,J.R.Coll.Surg.Edinb., 44, June 1999, 150
2. Sroujeh AS, Farah GR, Jabaiti SK, et al. Volvulus of the sigmoid colon in Jordan. *Dis Colon Rectum* 1992; 35: 64-8
3. Ballantyne GH, Brandner MD, Beart RW, Ilstrup DM ,Shepherd JJ. The epidemiology and clinical presentation of sigmoid volvulus. *Br J Surg* 1969; 56: 353-59
4. Ejumu M. Early resection of the sigmoid colon following volvulus. *Proc Assoc Surg East Africa* 1985; 89-91
5. Gibney EJ. Volvulus of the sigmoid colon. *Surg Gynecol Obstet* 1991; 173: 243-55
6. Mucha P. Small intestinal obstruction. *Surg Clin North Am* 1987; 67: 597-620
7. Izes Bam Scholz FH, Munson JL.Midgut volvulus in an elderly patient. *Gastro Intest Radiol* 1992; 17: 102-4
8. Namasivayam J, Ziervogel MA, Hollman AS. Case report: volvulus of a mesenteric cyst: an unusual complication, diagnosed by C.T. *Clin Radiol* 1992; 46: 211-2
9. Kadir S, Athanasoulis C, Greenfield AJ. Intestinal volvulus: angiographic findings. *Radiology* 1978; 128: 585-99
10. Roggo A, Opffinger Leslie W. Acute small bowel volvulus in adults. A sporadic form of strangulating intestinal obstruction. *Ann Surg* 1992; 216(2):135-41
11. Gough IR. Strangulating adhesive small bowel obstruction with normal radiographs.Br *J Surg* 1978; 65: 431-4
12. Bizer LS, Liebling RW, Delany HM, Gliedman ML. Small bowel obstruction. The role of non-operative treat-ments in simple intestinal obstruction and predictive criteria for strangulation obstruction. *Surgergy* 1981; 89: 407-13

#### Correspondence to:

Vlad Laurentiu David  
 Iosif Nemoianu Street, No. 2,  
 Timisoara 300011,  
 Romania  
 Phone: +40722 647 312  
 E-mail: dutzu\_d2003@yahoo.com