ORIGINAL ARTICLES

Emptiness of the left iliac fossa: a new clinical sign of sigmoid volvulus

V Raveenthiran

Abstract

Background—Diagnostic difficulties are common in sigmoid volvulus. This diagnostic delay contributes to high morbidity and mortality.

Aim—This paper recognises visible or palpable emptiness of the left iliac fossa as a new clinical sign of sigmoid volvulus. Predictive accuracy of the sign was assessed in this study.

Methods—519 patients with acute abdomen of non-traumatic origin were prospectively studied.

Results—The new sign was present in 24 out of 86 patients (28%) with sigmoid volvulus. It was absent in all those who did not have sigmoid volvulus. The positive predictive value of the sign was 100%.

Conclusion—Emptiness of the left iliac fossa is a valuable diagnostic adjunct. Positive sign is pathognomonic of sigmoid volvulus. Nevertheless, a negative sign warrants further investigations.

(Postgrad Med J 2000;76:638–641)

Keywords: sigmoid volvulus; diseases of colon; clinical sign

Department of
Surgery, Veer
Surendra Sai Medical
College, Sambalpur,
Orissa, India

Correspondence to:
Dr V Raveenthiran, 190/1
Eighth Street, Sayee Nagar,
Chennai 600 092, India
(email:
venkatsankar@yahoo.com)

Submitted 25 January 2000
Accepted 9 May 2000

Volvulus of sigmoid colon is a common cause of intestinal obstruction in Eastern Europe, Russia, Africa, India, and Iran.¹ Typically, an elderly patient presents with constipation, abdominal pain, and distension of sudden onset. This classical clinical picture together with plain radiographs is usually sufficient to

diagnose the condition. Diagnostic difficulties, however, are not uncommon. A recent report from Finland, where the disease is endemic, confirms the problem of poor diagnostic accuracy.² This paper describes a new physical sign that complements the diagnosis of sigmoid volvulus.

The Sign

Abdominal distension in sigmoid volvulus exhibits a peculiar asymmetry. There is often a relative emptiness in the left iliac fossa (fig 1). It is better appreciated from the foot end of the bed while the patient lies supine with stretched legs. Oblique lighting enhances the perception of emptiness. Alternatively, palpation by trained hands will quickly reveal a relative emptiness of the left iliac fossa compared with that of the right side.

Patients and methods

From March 1994 to November 1996, 519 patients were admitted to the author's department with acute abdominal pain of non-traumatic origin. Patients with a history of blunt or penetrating injury to the abdomen were excluded from the study. Diagnosis was uncertain in 36 patients for two reasons: some of them died soon after arrival and others became well in the absence of a confirmed clinical diagnosis. Mesenteric lymphadenitis, amoebiasis, enterocolitis, dyspepsia, and salpingitis were frequently the clinical diagnosis in the latter group. The remaining 483 patients were prospectively studied. Final diagnosis was made in these patients by either surgical exploration or appropriate investigations such as radiographs and biochemical estimations.

Results

There were 86 patients with sigmoid volvulus. The remaining 397 patients belonged to various diagnostic categories: perforated peptic ulcer (113), acute appendicitis (96), obstructed hernia (51), adhesive bowel obstruction (39), imperforate anus (22), ureteric calculi (18), paralytic ileus (11), acute pancreatitis (7), colorectal carcinoma (6), ileosigmoid knotting (6), jejunoileal volvulus (6), ileal stricture due to tuberculosis (5), caecal volvulus (2), and miscellaneous (15).

The mean age of sigmoid volvulus patients was 49 years (range 19–75) and male to female ratio was 1:1. The mean age of the “non-sigmoid volvulus” group was 27 years (range 0–82) and sex ratio was 2:1. The sign was

Figure 1 Clinical photograph showing emptiness of the left iliac fossa in a case of sigmoid volvulus (reproduced with the patient's permission).

Box 1: Radiographic signs of sigmoid volvulus

- Bent inner tube appearance
- Omega sign (inverted U shaped sigmoid colon)
- Coffee bean sign
- Frimann-Dahl's sign (three linear shadows converging to the left side)
- Y sign
- Horseshoe sign
- Loss of colonic haustrations
- Left flank overlap sign (overlap of sigmoid and descending colon)
- Liver overlap sign
- Apex of sigmoid colon loop above the level of 10th thoracic vertebra
- Apex of sigmoid colon loop under the left dome of diaphragm
- Absence of gas shadow in the left iliac fossa
- Air fluid ratio greater than 2:1
- Thickening of colonic wall
- Northern exposure sign⁹

Box 2: Differential diagnosis of sigmoid volvulus

- Colorectal carcinoma causing obstruction
- Toxic megacolon
- Colorectal strictures
- Hirschsprung's disease
- Caecal volvulus
- Paralytic ileus
- Ileosigmoid knotting
- Ogilvie's disease (colonic pseudo-obstruction)
- Acquired megacolon
- Giant colonic diverticulum

Box 3: Features of sigmoid volvulus in barium enema

- Bird's beak appearance
- Ace of spade sign
- Spiral mucosal pattern (corkscrew sign)
- Redundant atonic sigmoid colon (in recurrent volvulus)

absent in all the 397 patients of the “non-sigmoid volvulus” group. Among the 86 patients with sigmoid volvulus, the sign could not be elicited in 29 because of reflex muscle guarding and advanced peritonitis. Relative emptiness of the left iliac fossa was recorded in 24 of the 57 sigmoid volvulus patients who had soft distension of abdomen. Thus, the specificity and sensitivity of the new sign are 100% and 28% respectively. In five patients with sigmoid volvulus, in whom the clinical and radiological features were equivocal, the correct diagnosis was made entirely based on the new sign.

Discussion

Prognosis of sigmoid volvulus depends upon early diagnosis and prompt intervention. For example, expected mortality of sigmoid volvulus is 10% to 15% in early cases while it rises to 52.9% when the diagnosis is delayed.^{3,4} Mortality above 10% is believed to be the “mortality of delay”.³ Unfortunately, diagnostic difficulties are not uncommon even today.²

There are several reasons why sigmoid volvulus poses a diagnostic difficulty. It is common in psychiatric patients and elderly persons, and lack of proper history is not unusual in these mentally enfeebled groups.⁴ Physical signs vary considerably between the different subtypes of sigmoid volvulus such as acute fulminating and subacute progressive.⁵ There are no clinical signs specific for sigmoid volvulus.⁵ Frequently, bedside examination can suggest nothing more than an abdominal catastrophe. Extensive review of the literature and standard textbooks of clinical methods⁶ did not reveal any signs similar to the one described in this paper.

Clinical cues are often supplemented with plain and/or contrast radiography. Several signs of sigmoid volvulus have been described in plain radiographs (box 1).⁷⁻⁹ However, many of them are non-specific.

Hence, sigmoid volvulus may be mistaken for a variety of conditions or vice versa (box 2). Plain radiographs are diagnostic of sigmoid volvulus in only 30% to 40% cases.^{8,10} Some authors,¹¹ however, claim a diagnostic accuracy of 60% to 80% in plain films. In doubtful cases a barium enema is recommended both as a diagnostic and a therapeutic method (box 3). Several large series agree that barium enema is diagnostic in only 20% to 30% of cases.^{10,11} Moreover, instillation of barium in a case of undiagnosed acute abdomen carries the risk of barium peritonitis.⁸ Diagnostic accuracy of plain and contrast radiography in children with sigmoid volvulus is 29% and 61% respectively.¹² Computed tomographic features of sigmoid volvulus such as whirlpool sign and kissing beak appearance have recently been described.¹³ Although endoscopy has gained popularity as the therapeutic method of choice, it is generally considered as a poor diagnostic tool. Thus, a small subset of patients with sigmoid volvulus is operated upon without a definitive or with an erroneous preoperative diagnosis. The sign described in this paper may be useful in such cases.

Although surgical exploration itself is an accepted mode of diagnosing acute abdomen, accurate preoperative diagnosis will reduce the morbidity and mortality. For example, an ill chosen incision based on an erroneous preoperative diagnosis will interfere with the proper fashioning of a colostomy, should it be necessary in the course of surgery.

Figure 2 Diagrammatic representation of the probable mechanism of the new sign. Normal anatomy is also shown for comparison.

The exact mechanism of the new sign is not known (fig 2). Redundancy of mesosigmoid is a predisposing factor of volvulus.¹ Due to its long mesentery, the twisted loop of sigmoid colon rises out of the pelvis and tends to occupy the right side of the abdomen (figs 2 and 3). Because of this migration, emptiness is created in the left iliac fossa. Operating experience suggests that the migratory segment of sigmoid sweeps the coils of small intestine to the right side. Thus, they are prevented from occupying the left iliac fossa. Moreover, when the ileocaecal valve is competent, closed loop obstruction occurs not only in the twisted loop of the sigmoid but also in the colon proximal to it. As in any other colonic obstruction, the caecum bears the brunt and distends maximally. The caecal distension on the right side probably contributes to the relative emptiness of the left iliac fossa by exaggerating the asymmetry of abdominal distension (fig 2).

Like any other physical sign, limitations and fallacies of this new sign must be understood to appreciate its usefulness. Predictive value of positive sign is 100%, but its sensitivity is only 28%. Thus, when the sign is positive it is pathognomonic of sigmoid volvulus and further investigations are probably unnecessary. Absence of the sign, however, does not predict anything. Asymmetric distension of abdomen is a theoretical possibility in adhesive obstruction. Nevertheless, it was not encountered in any of the 39 cases in this series. Other types of volvulus such as caecal volvulus may possibly produce asymmetric distension, but not emptiness of the left iliac fossa. Reason for the absence of the sign in some cases is not known. It depends probably on the migratory nature of the twisted colon. In some cases, the loop migrates to the right side of abdomen (fig 3)

Figure 3 Plain radiograph of patient with sigmoid volvulus explaining why the sign is present in some cases. Twisted loop of sigmoid has migrated to the right upper quadrant leaving the left iliac fossa empty. The new sign was present in this patient.

Figure 4 Plain radiograph of patient with sigmoid volvulus explaining why the sign is absent in some cases. Twisted loop remains in the left flank. The new sign was absent in this case.

while in others it remains in the left flank (fig 4). Conceivably, the sign is positive in the former and negative in the latter.

In conclusion, emptiness of the left iliac fossa is recommended as a valuable diagnostic adjunct. The sign is highly specific but poorly sensitive of sigmoid volvulus. Negative sign warrants further investigations and a positive sign is pathognomonic of sigmoid volvulus.

- 1 Shepherd JJ. The epidemiology and clinical presentation of sigmoid volvulus. *Br J Surg* 1969;**56**:353–9.
- 2 Hiltunen KM, Syrjä H, Matikainen M. Colonic volvulus: diagnosis and results of treatment in 82 patients. *Eur J Surg* 1992;**158**:607–11.
- 3 Ballantyne GH. Review of sigmoid volvulus. *Dis Colon Rectum* 1982;**25**:494–501.
- 4 String ST, DeCosse JJ. Sigmoid volvulus: an examination of the mortality. *Am J Surg* 1971;**121**:293–7.
- 5 Hinshaw DB, Carter R. Surgical management of acute volvulus of the sigmoid colon: a study of 55 cases. *Ann Surg* 1957;**146**:52–60.
- 6 Clain A. *Hamilton Bailey's demonstration of physical signs in clinical surgery*. 17th Ed. Bristol: John Wright, 1986: 314–15.
- 7 Burrell HC, Baker DM, Wardrop P, *et al*. Significant plain film findings in sigmoid volvulus. *Clin Radiol* 1994;**49**:317–19.
- 8 Field S. The acute abdomen. In: Sutton D, ed. *A textbook of radiology and imaging*. Vol 2. 5th Ed. London: Churchill Livingstone, 1993: 881–909.
- 9 Javors BR, Baker SR, Miller JA. The northern exposure sign: a newly described finding in sigmoid volvulus. *AJR* 1999;**173**:571–4.
- 10 Ballantyne GH, Brandner MD, Beart RW, *et al*. Volvulus of the colon: incidence and mortality. *Ann Surg* 1985;**202**:83–92.
- 11 Arnold GJ, Nance FC. Volvulus of the sigmoid colon. *Ann Surg* 1973;**177**:527–34.
- 12 Smith SD, Golladay ES, Wagner C, *et al*. Sigmoid volvulus in childhood. *South Med J* 1990;**83**:778–81.
- 13 Catalano O. Computed tomographic appearance of sigmoid volvulus. *Abdom Imaging* 1996;**21**:314–17.