Received Date : 15-Oct-2009

Revised Date : 10-Dec-2009

Accepted Date : 14-Dec-2009

Article type : Original Article

547-2009.R1

Original Article

Chronic anastomotic sinus after low anterior resection: When can the defunctioning stoma be reversed?

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Abstract

Aim: Anastomotic leakage after low anterior resections may incompletely resolve, resulting in sinus tracts that persist on repeated contrast studies. This case series evaluates the factors that may contribute to sinus healing or safe reversal of the defunctioning ileostomy.

Methods: All patients (n = 8) who developed an anastomotic sinus after low anterior resections over a 8 year period were identified from a prospective database

Results: All had low anterior resections with defunctioning stomas for rectal carcinoma (median follow up 43.5 (13-84) months).Two patients with an unhealed subclinical leak had the stoma reversed successfully. Of the six patients with clinical leakage, two healed spontaneously. one healed after application of fibrin glue. one developed an anastomotic stricture successfully treated by dilatation with, subsequent stoma reversal and one developed recurrent cancer and was not reversed. Onepatient underwent reversal despite persistence of the sinus, followed by rectal perforation requiring laparotomy and faecal diversion Bowel function was satisfactory where the sinus healed spontaneously, but poor where reversal was carried out without sinus healing.

Conclusion: Tracks that persist more than one year are unlikely to heal but the stoma can be reversed if there had been a subclinical leak previously. A persistent anastomotic sinus leading to a cavity may not be suitable for stoma closure.

Introduction

Anastomotic leakage after anterior resection may be subclinical or clinical. Failure of healing results in persistence of the dehiscence, with formation of a chronic sinus tract.Some may appear to have healed on subsequent contrast studies, but others persist. The patient therefore continues to suffer the significant morbidity of an ileostomy as reversal may bring about the undesired consequence of pelvic sepsis requiring operation. Management of the chronic sinus is difficult. Many methods have been described for their treatment, including deroofing mucosal advancement, resection and anastomosis, resection and permanent stoma and sealing of the track with tissue glue[1,2],

.

This case series reports patients who developed a persistent chronic anastomotic sinus after anterior resection and attempts to determine , the factors that may contribute to successful reversal of the covering stoma

Method

A retrospective review of all patients with low anterior resections performed from Jan 2001 to Feb 2008 in a single institution (Tan Tock Seng Hospital, Singapore) was carried out to indentify those with a chronic anastomotic sinus detected on contrast enema prior to stoma closure. Of 193 low anterior resections there were eight patients who met the inclusion criteria. Data on age, race, gender, stage of tumour, distance from anal verge, histological

grade and CEA levels were collected. The modality used to diagnose the leak was considered and both the ASA and POSSUM grading [3]) were reviewed to evaluate the patient's pre-operative physiological condition. Contrast enema studies of the sinus tract were reviewed individually to determine the morphology of the track and recorded according to a classification previously described by Lim et al[4]. Figures 1a, 1b and 1c demonstrate the typical contrast enema findings of the three morphologies encountered during this study (simple posterior, long linear posterior and cavity).

All resections were performed by two senior colorectal surgeons. Total meso-rectal excisions were performed in all patients with an anastomosis using the double stapler technique. All patients were managed post operatively using a pre-determined clinical pathway.

Anastomotic leakage was divided into clinical and subclinical. The former were defined by clinical sepsis , computer tomographic (CT) evidence of a peri-anastomotic collection or active extravasation of contrast during a contrast enema study and evidence of a contained leak on a subsequent water soluble contrast enema study performed at least 3 months later. A subclinical leak was defined by the absence of clinical sepsis but with evidence of sinus formation on a water soluble contrast enema study at least 3 months later. During the study period, routine contrast enemas were performed before stoma closure. All patients were followed by six monthly (or more frequent) water soluble contrast enemas. Spontaneous healing was defined as the absence of a previously noted anastomotic sinus on subsequent water soluble contrast enemas without

intervention. Where the ileostomy was closed, the surgeon's decision to reverse it was reviewed. Any major morbidity and mortality during the period of review were recorded.

Results

The patient demographic data are shown in table 1. Table 2 summarizes the presentation of the leak, the modality used for diagnosis, morphology of the track, details relating to sinus healing as well as eventual bowel function of all eight patients. Of the 8 patients identified, two presented sub-clinically (patients 1 and 2). Both sinuses failed to heal spontaneously but the stoma was reversed nevertheless at 11 and 15 months. Both patients recovered well from surgery but bowel function was poor.Six patients presented with clinical leakage. two sinuses (patient 3 and 4) closed spontaneously at 10 and 11 months. The defunctioning stoma was reversed one month later. Subsequent bowel function was good. These were the only sinuses in this series, to show a long and linear morphology. Of the four remaining sinuses which presented with clinical leaage and failed to close spontaneously, one (patient 5) underwent the instillation of fibrin glue into the sinus at 25 months (figure 2). This resulted in successful closure. Stoma reversal was performed 1 month later with good bowel function and no recurrence of the sinus..Another sinus (patient 6) failed to heal in a patient who developed anastomotic stricture. This was dilated successfully and the ileostomy reversed at 42 months after surgery. Bowel function was poor.

Another sinus failed to heal but the stoma was reversed at 13 months (patient 7). This was followed by pelvic sepsis from a rectal perforation two years later and the patient underwent Hartmann's procedure with recreation of a stoma.. The radiological morphology

of this sinus had been that of a cavity in the initial contrast study. Finally in patient 8 the sinus failed to heal and the stoma was not reversed owing to recurrence of the tumour.

Discussion

The natural history of anastomotic sinuses is difficult to ascertain due to the rarity of the condition. Its exact incidence is not known, but approximately 4-8% of patients who do not have a clinically evident leak are found to have an anastomotic sinus on routine post operative water soluble contrast enema[1,4,5,6]. This rate is not reduced when inflammatory bowel disease is excluded[4,6].

After ileal pouch-anal anastomoses (IPAA), the literature suggests that reversal of the ileostomy in the presence of a subclinical sinus is not followed by a high complication rate[7,8]. The incidence of the condition in the present series is 4% And the data in the international literature are limited. This series is one of the largest to have been published.

The main limitation of this paper is its retrospective nature and the small numbersof patients studied. Furthermore the duration of follow up was short for some patients. The data should therefore be interpreted with caution.

There was no obvious evidence that development of a sinus was related to the POSSUM score or to other patient or disease-related factors (table 1),

The case series has however shown that the defunctioning stoma can be reversed despite persistence of an anastomotic sinus. This was the case with the patients with a subclinical

leak where both patients had a good outcome despite a persisting sinus. In another study, on the other hand, a greater proportion of patients with a subclinical leak in the study of Lim et al healed spontaneously (7 out of 10, within 5 months). It is possible that the greater proportion of subclinical leaks that healed spontaneously in Lim's paper was due to the shorter interval between discharge and the diagnosing water soluble contrast enema.

Both sinuses that healed spontaneously occurred within a year, as also noted by Arumainayagam et al [(9)] . A year may therefore be a reasonable time frame to wait for spontaneous healing, beyond which, it is unlikely to occur.

Both sinuses in our series that spontaneously healed were of the long and linear variety. We postulate that a narrow, long track would be a natural barrier to the passage of rectal contents and is analogous to the spontaneous closure of a T-tube track or a low output entero-cutaneous fistula, although a long and linear track had no effect on healing in the experience of Lim et al [(4)].

The only morbidity occurred when reversal of ileostomy was performed despite radiological evidence of a persistent sinus. It is unlikely that the track could have healed spontaneously given more time. Lim et al[4] described only 4 out of 13 patients with clinical leakage that eventually healed . There is no convincing literature that delaying stoma reversal might be associated with greater success The morphological feature of a cavity in this patient probably contributed to failure of healing and the pelvic sepsis which resulted after stoma closure. A sinus with this morphology may therefore benefit from a definitive surgical procedure such as Whitlow's operation of deroofing[1], mucosal advancement, resection and reanastomosis, resection and permanent stoma or sealing the track with tissue glue.

Mucinous adenocarcinoma can arise from anorectal fistula and sinus tracks[9, [10,11,12]. In the present series, the single patient with recurrence developed this within a year of surgery and was probably derived form the disease(Stage IIIC).

In summary, the case series suggests that spontaneous healing of an anastomotic sinus can occur but may take up to a year.It is p ossible safely to reverse the ileostomy if the sinus is sub-clinical. Bowel function may be poor in reversed patients with a persistent sinus. Closure of the stoma when there is a persisting sinus leading to a cavity may not be advisable.

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Factor	Results (n = 8)
Age (median) (years)	56.6 (33 – 70)
Gender (M : F)	7 : 1
Differentiation	All moderately differentiated adenocarcinomas
Distance from anal verge (median) (cm)	8 (4 – 10)
Stage	Stage 1: 1/8 Stage 3: 7/8
Tumour dimension (longest) (cm)	6 (4 – 12)
Lymph nodes harvested (median)	16 (9 – 34)*
ASA grade	Grade 1: 1/8 Grade 2: 7/8
POSSUM Score	Expected mortality < 10%: 6/7 Expected morbidity < 30%: 4/7
Duration of follow up (median) (months)	47 (13 – 84)

Table 1: Patient and tumour characteristics.

Table 2: Details of patients with persistent anastomotic sinus

No.	Days to Leak	Presentation of Leak	Modality used to detect Leak	Morphology	Months to sinus healing	Months to ileostomy reversal	Function	Status (length of follow up in months)
1	NA (Subclinical)	NA (Subclinical)	NA	Simple posterior	Not healed	15	Diarrhoea	NED (73)
2	NA (Subclinical)	NA (Subclinical)	NA	Simple posterior	Not healed	11	Diarrhoea	NED (84)
3	29	Readmision for abdominal pain, Per-rectal bleeding	CT	Long linear posterior	10	11	Good	NED (60)
4	7	Prolonged ileus	CT	Long linear, posterior	11	12	Good	NED (47)
5	5	Sepsis	CT	Simple posterior	25 (fibrin glue applied)	26	Good	NED (35)
6	10	Readmission for abdominal pain, per-rectal bleeding	CT	Simple posterior	Not healed	42 After dilatation of stricture	Diarrhoea	NED (47)
7	7	Readmission for intestinal obstruction	CT	Simple posterior, cavity	Not healed	13 Emergency laparotomy for rectal perforation 2 years later	Inconti-nence Stoma*	NED (40)
8	5	Sepsis	CT	Simple posterior	Not healed	Not reversed	Stoma	AWD (13)

AWD: alive with disease. NED: no evidence of disease.

Diarrhoea= frequency >4/24 hr

Good function= no incontinence, frequency 3/24hr

Figure 1a: Simple posterior sinus

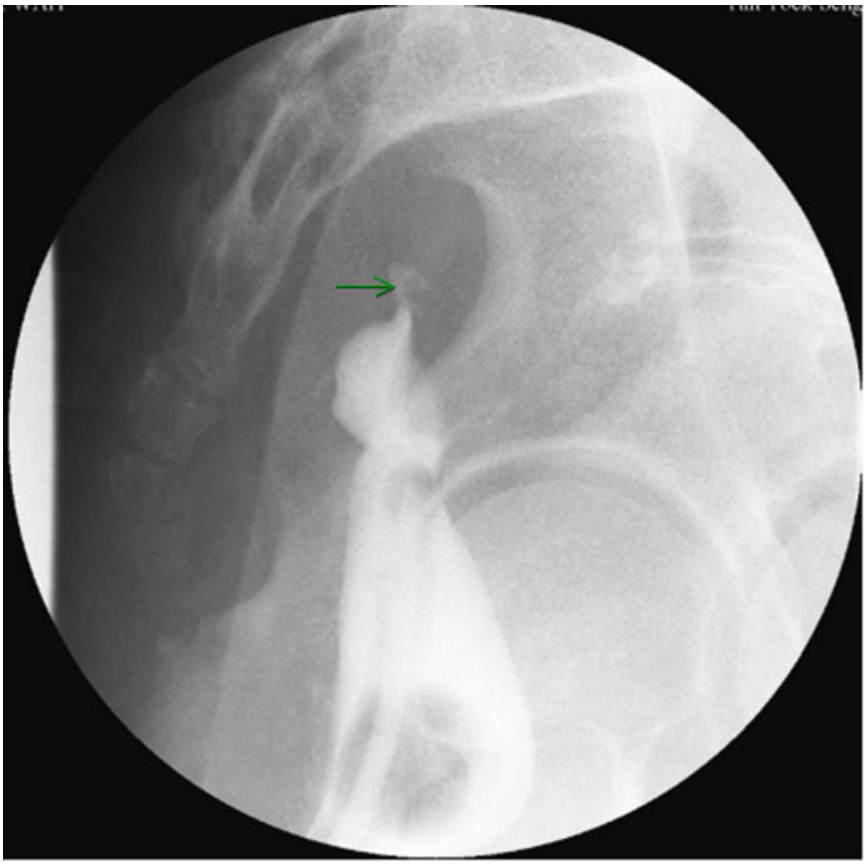


Figure 1b: Long linear sinus

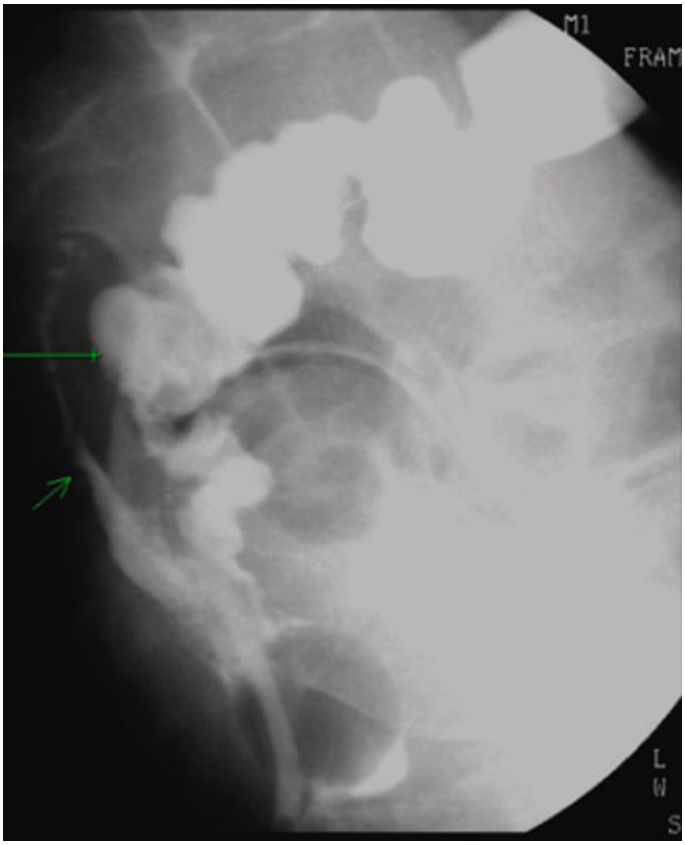
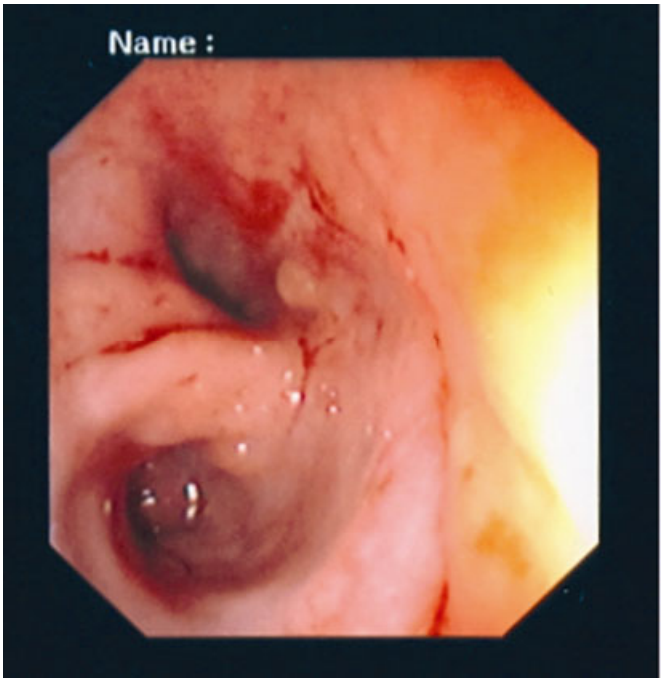


Figure 1c: Sinus with cavity

Figure 2: Endoscopic view of sinus prior to fibrin glue injection



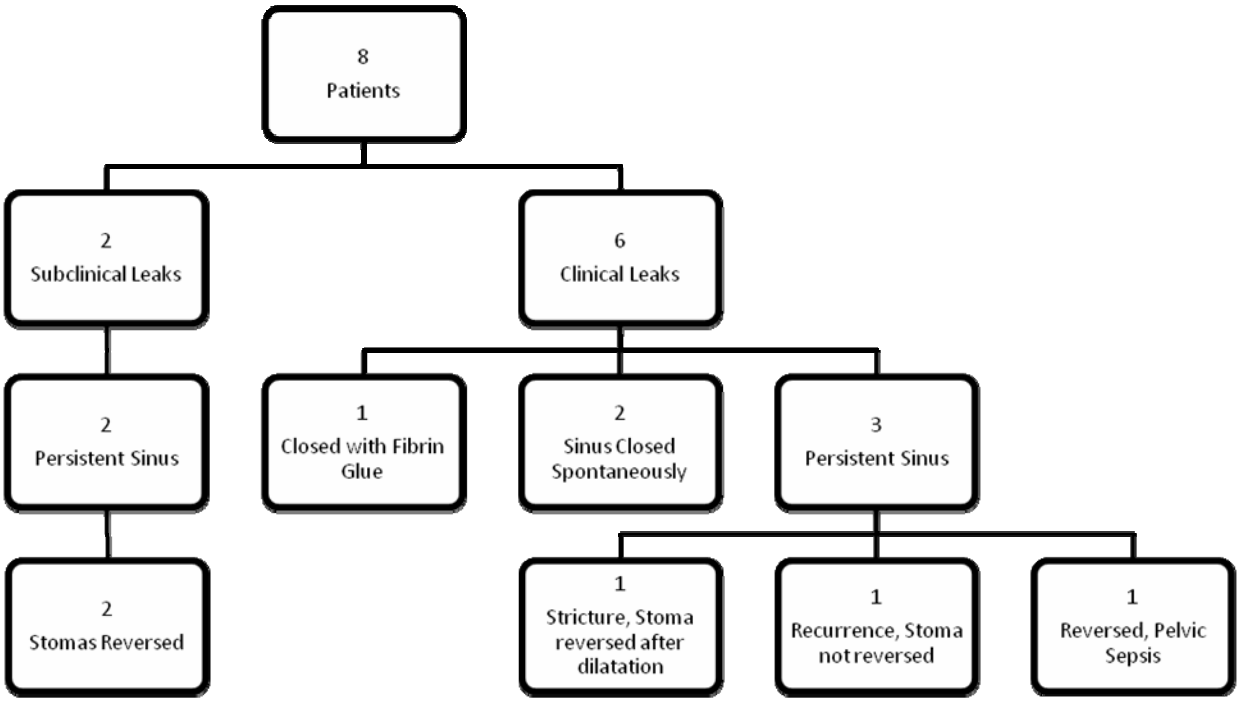


Figure 3: Flowchart demonstrating outcome of 8 patients with anastomotic sinuses.