Percutaneous Endoscopic Colostomy (PEC): An Effective Alternative in High Risk Patients with Recurrent Sigmoid Volvulus

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ABSTRACT
Treatment of recurrent sigmoid volvulus is a major challenge in frail and elderly patients with multiple co-morbidities. Early management involves endoscopic decompression with high success rate, however, its recurrence make it a real challenge as most of these patients are not suitable for major colonic resection. The aim of this study was to assess the role of percutaneous endoscopic colostomy (PEC) in the treatment of recurrent sigmoid volvulus in these patients. Twelve PEC procedures were performed in 8 patients under our care. This prevented major colonic resection in 7 patients. One patient underwent sigmoid resection and died with postoperative complications. Two patients experienced minor complications. Three patients required repeat procedures for permanent PEC tube placement. Six patients managed permanently with PEC procedure. PEC is an effective treatment for recurrent sigmoid volvulus in high-risk elderly patients.

Key Words: Recurrent sigmoid volvulus. Percutaneous endoscopic colostomy (PEC). Endoscopic decompression.

INTRODUCTION
Twisting of the bowel on its mesenteric axis results in intestinal volvulus and it may result in complete or partial intestinal obstruction. Sigmoid volvulus is the commonest large intestinal volvulus as its incidence is reported between 60 – 76%. In UK, sigmoid volvulus accounts for 4 – 5% of intestinal obstruction and mostly seen in elderly population, patients with neuropsychiatric disorders and constipation. In contrast, it is an important cause of intestinal obstruction in young and middle aged patients in Asia and Africa. Endoscopic decompression is successful in 70 – 90% of patients; however, significant recurrence rate (40 – 60%) makes it difficult for long-term cure in elderly patients. In such cases, emergency sigmoid resection is considered as a treatment option, which, however, comes at the expense of very high morbidity and mortality in elderly patients. The aim of this report is to document the results of percutaneous endoscopic colostomy (PEC) as an alternative procedure in frail and elderly patients.

METHODOLOGY
Elderly patients with recurrent sigmoid volvulus were considered suitable for this inclusion criteria included elderly, frail patients with multiple co-morbidities and at least four previous endoscopic decompressions. After exclusion of peritonitis, initial management was commenced, which included decompression with flexible sigmoidoscopy and rectal tube for 24 – 48 hours. PEC was performed during the same hospital admission within next few days. Routine bowel preparation (sodium picosulphate) was used as a measure to visualise the colon during the procedure. Prophylactic antibiotics (cefuroxime 750 mg and metronidazole 500 mg) were administered. Procedures were carried out under light sedation (midazolam, 2 – 5 mg) and local anaesthesia (0.5 – 1% lignocaine according to patients weight) under colonoscopy and fluoroscopy the proximal and distal of sigmoid loop were identified. Percutaneous endoscopic gastrostomy tubes size 15 FR (Freka, Frenius, Warrington, UK) were inserted and secured at these two sites under local anaesthesia (Figure 1). Patients were allowed diet and fluids on the same day and were discharged as soon as the social circumstances permitted. An information leaflet for future community nursing and hospital care was given to the patients/relatives/carers.

RESULTS
A total of 12 PEC procedures were performed on 8 patients (5 male, 3 female) with median age of 88 years (ranging from 85 – 95 years). Their median follow-up
Chiulli et al. 1993 as colonoscopic decompressions in these patients of choice. This resulted in repeated admissions and patients; therefore, it was not considered as a procedure inevitably result in high mortality and morbidity in these of them with ASA 3. Major surgical resection will

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Sigmoid volvulus is a life threatening condition in elderly patients. If untreated, this may proceed to major complications including intestinal obstruction, peritonitis, bowel perforation, bowel ischaemia.3 This will inevitably result in high morbidity and mortality. The conventional definitive treatment for recurrent sigmoid volvulus is sigmoid resection; however, most of these patients in UK are elderly and frail patients with multiple co-morbidities and suffer from dementia and immobility. They are not deemed to be appropriate candidates for major sigmoid resection as surgery in these cases will also result in high morbidity and mortality. A mortality of 42% is reported in patients above 65 years undergoing sigmoid resection for recurrent volvulus.7 In contrast, it is successful procedure in patients with younger age groups and a mortality rate of 6.3% reported in a series of cases from Asian subcontinent.8 The median age of patients in this study is 88 years, 6 of them were American Society of Anaesthesia (ASA) grade 4, and 2 of them with ASA 3. Major surgical resection will inevitably result in high mortality and morbidity in these patients; therefore, it was not considered as a procedure of choice. This resulted in repeated admissions and colonoscopic decompressions in these patients.

PEC was reported as a treatment option in 1993 as Chiulli et al. reported this technique for the treatment of recurrent sigmoid volvulus.9 They used one point colonic fixation to the abdominal wall.9 Future studies; however, recommended 2 point fixations as a mean to avoid axial rotation and the same technique was adopted in these cases.10,11 It was an effective treatment as it prevented major resection in 7 patients. Three patients required re-procedures as their PEC tubes were removed with the impression that colon fixation have matured and will not result in recurrence of the volvulus. However; recurrent volvulus resulted in re-procedure and permanent PEC tube placement in them. This was also experienced in Daniels et al. as some of their patients required re-procedure and permanent PEC tube placement.11 In subsequent patients, PEC tubes were not removed and the patients did not develop sigmoid volvulus; therefore, we suggest that PEC tubes should be left in place permanently.

In one of these patients, sigmoid volvulus could not be treated with PEC resulting in sigmoid colectomy. The patient subsequently died because of co-morbidities, surgical trauma and postoperative complications. Two patients experienced minor complications (leakage from PEC site and pain at PEC site in one each); both of them were managed conservatively and did not require PEC removal and/or sigmoid resection. Another patient died with cardiovascular co-morbidities 5 days after PEC tube placement. In consideration to their age (85 – 95 years) and co-morbidities, PEC is a safe and effective procedure. In authors’ opinion. We also suggest that 2-point fixation and permanent PEC placement may result in better outcome. National Institute of Clinical Excellence (NICE) states that current evidence on the safety and efficacy of percutaneous endoscopic colostomy (PEC) appears to be adequate to support it in elderly and frail patients with recurrent sigmoid volvulus and colonic motility problems provided that the normal arrangements are in place for audit and clinical governance.12 It should, therefore, be performed under strict guidance and audited.

There were certain limitations of this study as it was a single centre experience on small number of cases. Results on large number of patients from multiple centres will help to generalise the recommendations.

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**Table I: Summary of results of all procedures (Major resection avoided in 7 cases. Three patients required repeat PEC procedures for permanent PEC tube placement. Six patients treated successfully with this procedure).**

<table>
<thead>
<tr>
<th>N</th>
<th>PEC placement</th>
<th>Recurrence</th>
<th>Number of procedures</th>
<th>Complications</th>
<th>Major resection required</th>
<th>30 day mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Successful</td>
<td>Yes</td>
<td>2*</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Successful</td>
<td>No</td>
<td>1</td>
<td>No</td>
<td>No</td>
<td>Died</td>
</tr>
<tr>
<td>3</td>
<td>Successful</td>
<td>Yes</td>
<td>3*</td>
<td>No</td>
<td>Yes (sigmoid)</td>
<td>Died</td>
</tr>
<tr>
<td>4</td>
<td>Successful</td>
<td>No</td>
<td>1</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Successful</td>
<td>No</td>
<td>2*</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>Successful</td>
<td>No</td>
<td>1</td>
<td>Localised peritonitis</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>Successful</td>
<td>No</td>
<td>1</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Successful</td>
<td>No</td>
<td>1</td>
<td>Pain at PEC site</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

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**DISCUSSION**

was 12 (6 – 24) months. Three patients required multiple PEC procedures because of technical reasons/failure and/or poor bowel preparation. Two patients experienced minor postoperative complications (leakage at PEC site and postoperative pain in one case each) both of them were successfully treated with conservative management (analgesia and or antibiotics). Two patients developed recurrence of the volvulus following removal of PEC tubes necessitating further attempts to re-site PEC tubes; failure to reinsert resulted in sigmoid colectomy in one patient who died with postoperative complications. Another patient died 5 days following PEC with cardiovascular co-morbidities. Rest of them had resolution of symptoms and did not require sigmoid resection (Table I).
CONCLUSION

Percutaneous endoscopic colostomy (PEC) is a safe and effective treatment for recurrent sigmoid volvulus in elderly, frail patients with co-morbidities. Two-point fixations may be more effective and PEC tubes should be left in situ to prevent future recurrence.

REFERENCES