

A Novel Technique For Enterocutaneous Fistula Closure- Local Transposition Flap

Sudhir Kumar, Aakash Jain

Abstract

Enterocutaneous fistulae are one of the most dreaded complications of abdominal surgeries which may be due to the result of multiple causes like anastomotic failure, poor blood supply, or iatrogenic bowel injuries. These fistulae are classified based on their output. Most Low output fistulae usually close spontaneously but few remain patent and may require surgical intervention. We are presenting two of our cases where we have used the local transposition flap to cover the enterocutaneous fistulae successfully. It can serve as a good armour in the armamentarium of plastic surgeon.

Keywords: Enterocutaneous Fistula; Laparotomy; Low-Output; Transposition Flap.

Author affiliations:

Department of Plastic Surgery,
Maharani Laxmi Bai Medical College,
Jhansi, India.

Correspondence:

Dr. Aakash Jain, Department of Plastic
Surgery, Maharani Laxmi Bai Medical
College, Jhansi

Email: aakash.awakes@yahoo.com

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Introduction

Enterocutaneous fistula (ECF) is an abnormal communication between a hollow viscera and the skin. Enterocutaneous fistula is a serious and dreaded complication of gastrointestinal (GI) diseases and surgeries. ECF may be catastrophic to the health and quality of life. It is spontaneous in 15-20% cases and postoperative in 75-85% cases.¹ It is classified based on Output: 1) low: 200 ml/24-hour 2) moderate: 200 to 500 ml/24-hour 3) high: 500 ml/24-hour and have progressively poorer prognosis.² It is managed into three phases : Diagnosis and recognition, stabilization and investigation and those failed to respond to medical care for 4-6 weeks are treated with operative interventions. Under operative interventions many things are tried with limited success such as oversewing of the fistula,³ resection of the diseased segment with primary

anastomosis,³ exteriorization,⁴ serosal patch with either jejunum or a defunctionalized Roux.⁵

Here we tried a simple technique of local transposition flap to cover the low output fistula in first case and hypogastric flap to cover low output fistula in second case with successful results.

Case Report

Case 1

A 32 years old lady presented to the general surgery department with post laparotomy (elsewhere operated) supra-umbilical enterocutaneous fistula. She had undergone laparotomy three months back for ileal perforation and a loop ileostomy was made. She then had a burst abdomen

during late post operative period which was then secondarily sutured and closed. Later she developed enterocutaneous fistula at proximal segment of loop ileum communicating to the laparotomy scar. It was a low output fistula with 100 ml output with liquid discharge mostly, also the patient was able to pass stool regularly.

We performed a superiorly based fascio-cutaneous transposition flap to cover the midline enterocutaneous fistula which healed over a period of three weeks. During this procedure, we de-epithelised around 1.5 cms of the skin surrounding the fistula. No bowel handling was done. Then we raised the flap by planing in reverse for the defect thus formed and transposed it to the defect, letting the raw undersurface of flap to cover the fistulae. The fibrosis of flap undersurface seals off the fistula forming a covering wall. The sutures were removed on the 10th day and it remained uneventful.(Figure 1)

Case 2

A 23years old gentleman was presented with lower jejunal perforation which was repaired by emergency laparotomy. One month later the patient developed enterocutaneous fistula from the upper end of the midline laparotomy wound. It was a low output fistula with a discharge of 100-150 ml/day. Initially the patient was managed conservatively on medication and was nutritionally built up. Two months later patient was taken up for fistula closure surgery with flap cover.

We performed a left hypogastric (superficial inferior artery based) to cover the fistula opening. The fistula margin was first de-epithelised and then template of the defect was made. Then by planning in reverse the flap was marked and raised from the adjacent tissue. The flap was placed on the de-epithelised margins of enterocutaneous fistula. The underlying raw area of flap formed the wall for the fistula.



Figure 1. The enterocutaneous fistula present in the laparotomy scar along with ileostomy in case 1(A); Superiorly based transposition flap for ECF closure, with closed donor site over drain (B); Post operative day 7 picture showing removed drain and ileostomy bag insitu (C).

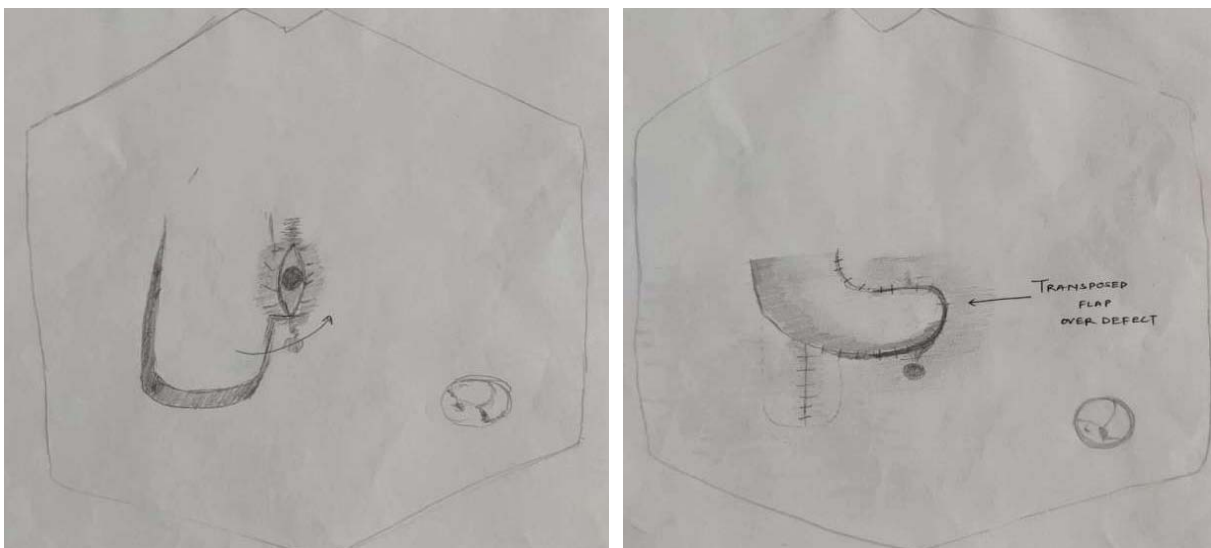


Figure 2. Illustration of case 1 showing the flap marking with location of ECF (A); Illustration of case 1 showing the transposed superiorly based random pattern flap to cover the fistula and donor suture line (B).

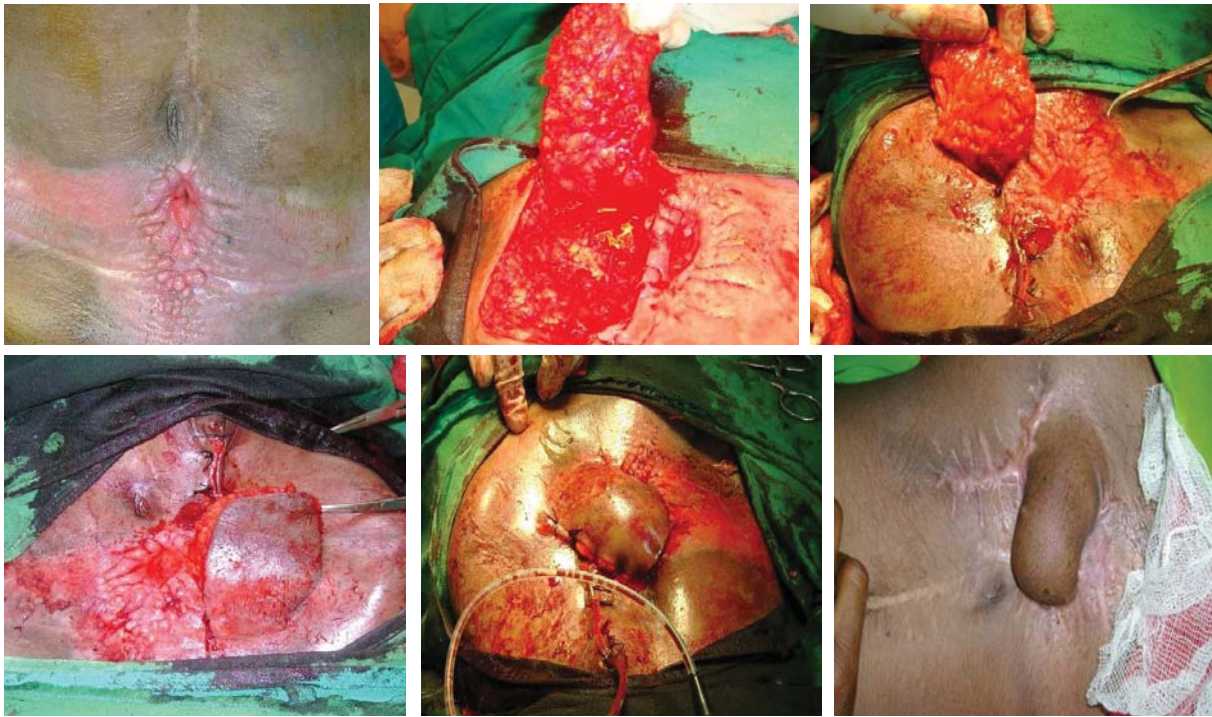


Figure 3. Below umbilicus midline located ECF (A); Inferiorly based Transposition flap raised adjacent to the enterocutaneous fistula (B); Flap donor site primarily closed (C); Transposing the flap over de-epithelised ECF (D); Closure of ECF with Flap with suction drain (E); healed ECF and Flap at post op 1 month placed in the donor site (F).

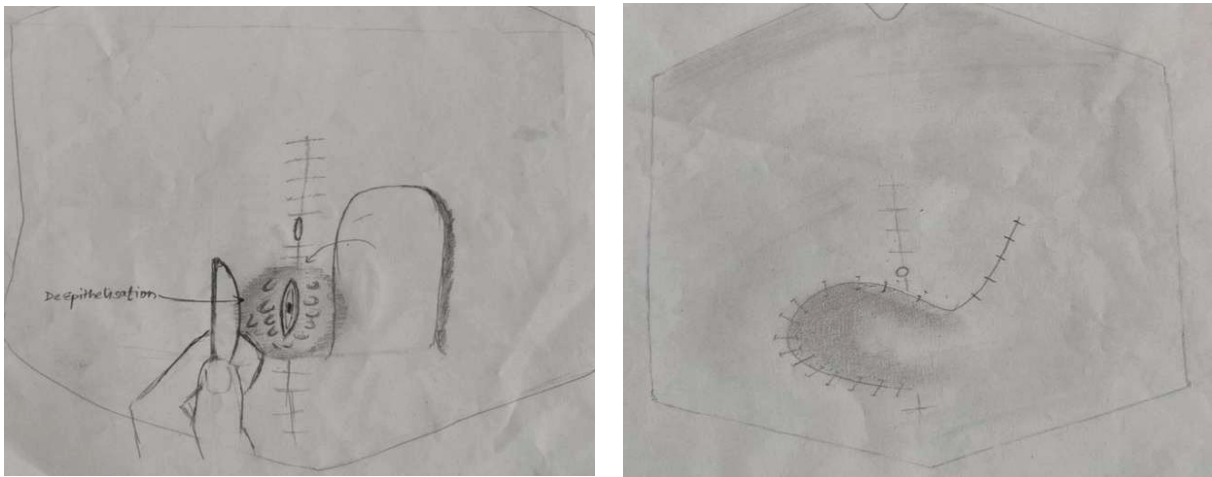


Figure 4. Illustration of case 2. Flap design and de-epithelisation of surrounding skin of ECF (A); Transposed flap over the ECF (B).

The flap was well taken and it completely closed the fistula opening in four weeks. Now patient is living symptoms free.

Discussion

ECF are closed with reconstruction of intestinal mucosa with re-anastomosis wherever possible. However, if re-anastomosis is impossible, other methods can be used. Some reports note the closure of the small intestine skin fistula using the muscle flaps, including the rectus abdominis muscle.⁶⁻⁸

In our cases we have performed simple transposition flap for the closure of enterocutaneous fistula. Firstly we de-epithelised the surrounding skin of the fistula then did the planning in reverse to raise a random pattern fasciocutaneous transposition flap to cover the mouth of enterocutaneous fistula. The under surface of flap probably get mucosalised and get closed with this vascularised flap. Thus in our technique, we prevented the complications of bowel handling during re-exploration and probability of inter-bowel adhesion, anastomosis breakage etc. Moreover this can be done under regional anaesthesia without abdominal exploration. Similar attempt was taken by Stephensen et al

where they managed enterocutaneous fistulae in the open abdomen using a pedicle flap.⁹

With well take of flap we averted the need for laparotomy and resection of enterocutaneous fistula in both of our patients. Patients with a wedge repair or oversewing of an ECF have recurrence rate of 32.7%, compared to 18.4% if the ECF is resected or the anastomosis revised. The overall mortality in patients with all types of enterocutaneous fistulas is 6.5% to 21%.^{10,11}

Chitale et al also used the surrounding tissue as a turnover flap which were further reinforced by a muscle flap or local flaps in their three cases of enterocutaneous fistula.¹² Hashiguchi et al in their study of using hinged rectus abdominis musculocutaneous flap used a vertical incision in the abdominal skin surrounding the fistula, and

subcutaneous undermining was not performed to preserve marginal circulation. Also they have used flap 20% larger than the defect margin which ensures the enlargement of the lumen of reconstructed intestine thus preventing stenosis.¹³ Keeping all these points in mind along with the simple principles of transposing flap one can easily close a low output enterocutaneous fistula. Thus making it a simple solution to a more complex problem.

Conclusion

The transposition flap is a simple solution to a very complex problem of enterocutaneous fistula which doesn't require high surgical or microsurgical skills. This simple procedure helps in improving the quality of life of these patients.

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