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Fat grafting: A novel technique for difficult ostomy management

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Introduction

The creation of fecal or urinary stomas are common surgical procedures. However, even when the operation is done technically well, a spectrum of morbidities can result from contour deformities of the peristomal skin. These often result in poor appliance fitting with leakage, skin erosion, pain, discomfort, and embarrassment. Irregularities in parastomal skin contour can be secondary to scarring, wound contraction, and change in body habitus.

Several techniques in plastic surgery have been developed to address abnormal healing and scarring, which can potentially address such parastomal irregularities, including direct scar revision, subincision, skin excision, suction lipectomy, and fat grafting. We herein report our case series of patients evaluated and treated for peristomal functional deformities. We provide a description of the technique and explore outcomes.

Materials and methods

Patient population

Patients referred by the enterostomal service between January 2015 and January 2019 were considered for this intervention. Eligible patients had failed conventional pouching strategies. The reported stoma appliance wear times were below the recommended 2 to 4 days, and many reported the need to change the appliance more than once a day.[1] Nonsurgical options, including various skin protective strategies, different ostomy products and types such as convexity, barrier rings, pastes, and adhesive sprays, had been exhausted and patients were ineligible for stoma revision surgery. Patients were followed for a minimum of 1 year after correction surgery to allow long-term evaluation of outcomes and ostomy care. Patient outcome information was collected at 1-year follow-up. The study was performed under institutional review board approval and all guidelines were followed.

Technique

All surgical procedures were performed under general anesthesia in an outpatient setting. The goal of the surgical prep was to separate the stoma and peristomal skin from the operative area. Once the stoma was covered, the operative field was prepped using sterile technique, and the clinical contour areas of concern were marked on the patient before applying an antimicrobial incise drape (Ioban; 3M, St. Paul, MN) (Fig 1). The general principle was to correct each specific contour deformity. In some patients, there can be multiple different types of deformity in the same stoma/peristoma area. The surgical incisions were placed >5 cm from the stoma. Tethered scars can be released with sharp and blunt dissectors. Details of fat harvesting and grafting are outlined elsewhere.[2] The fat was prepared for grafting and filled in 10 cc syringes. A blunt 1.7 mm injection tip with a single side port was used to inject the fat in a fan-like manner. Fat was injected while withdrawing the tip (Tulip Medical Products, San Diego, CA). The area was fat grafted in a crosshatch manner, so at least 2 separate incision portals were used. Depressed areas were treated until the area was overcorrected 50%. When indicated, limited liposuction to the raised area was performed using the tumescent technique.[3] Skin excisions were marked, tissue excised, and layered closure

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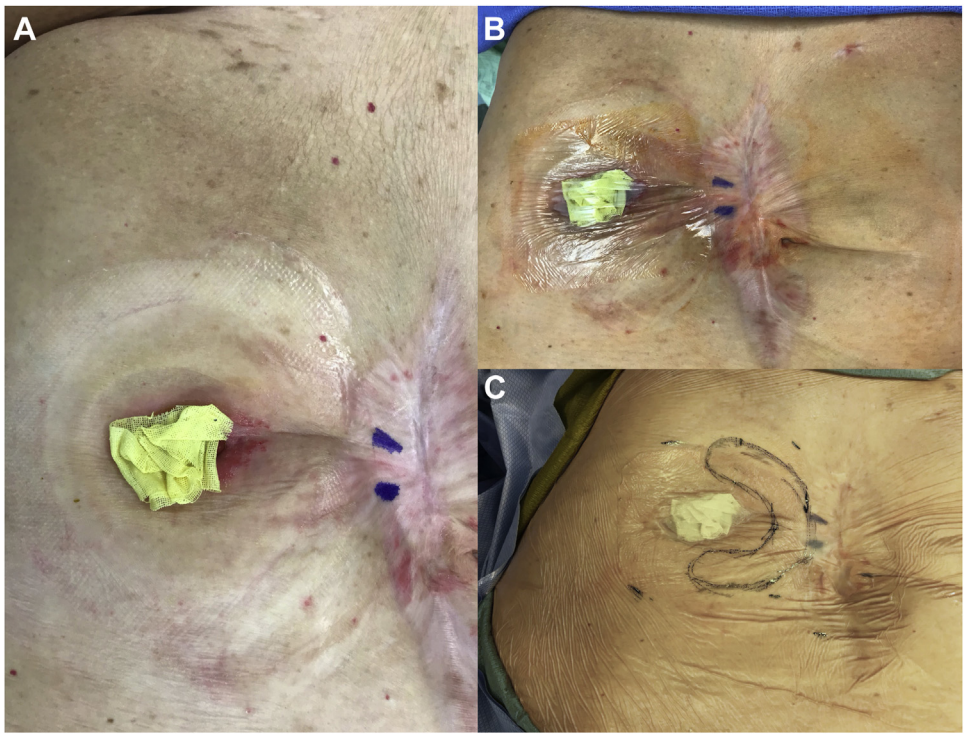

Fig 1. Patient layered surgical prep to peristomal site. The goal of the surgical prep was to separate the stoma and peristomal skin from the operative area. The appliance was removed, and the immediate region 10 cm diameter cleaned with chlorhexidine gluconate (Hibiclens, Norcross, GA), wiped with isopropyl alcohol, and dried. The stoma was covered with a 3% bismuth tribromophenate impregnated petrolatum gauze dressing (Xeroform; Covidien, Fridley, MN) and a transparent adhesive dressing (Tegaderm; 3M, St. Paul, MN). Markings highlighted each layer. (*A*) Appliance removed and area of concern marked. (*B*) Once the stoma was covered, the operative field was prepped using sterile technique, and the adherent dressing was dry and sealed; the entire operative field was prepped in sterile technique with alcohol chlorhexidine gluconate solution (ChloraPrep; CareFusion, Inc, Leawood, KS). (*C*) After prep and drape were completed, the area of presumptive fat grafting was marked. Sites of presumptive incisions for access.

performed without undermining to maintain tension on the skin in such a way to remove redundant skin. We monitored for any succus collection under the dressing that could compromise the separation of the barrier with the incise drape. In these instances, a rubber catheter connected to suction was placed via a stab incision through the plastic drape and sealed with another adherent dressing. The area was re-prepped, and gloves changed before continuing. Before exposing the stoma at the end of the case, all incisions were sealed with liquid adhesive and self-adhering mesh (DERMABOND-PRINEO; Ethicon, New Brunswick, NJ).

Outcomes

The primary outcome was the feasibility and safety of the surgical techniques in the management of peristomal skin irregularities. Secondary outcomes included changes in ostomy care, ostomy supply usage, parastomal skin quality, and wound healing.

Statistical analysis

Continuous variables were expressed as medians and interquartile range (IQR). A Wilcoxon signed-rank test was performed to compare the time in days between stoma changes before and after surgery. All statistical analyses were performed using R Core Team (2013) (R Foundation for Statistical Computing, Vienna, Austria).

Results

A total of 11 patients underwent parastomal acquired contour deformity in the study period. The median age was 48 years old (IQR 43–61). The majority of patients were white (9) and female (7). The median body mass index was 27 kg/m^2 (IQR 24–30). The ostomy types included end ileostomy (8), colostomy (1), enterocutaneous fistula (1), and urostomy (1). The median interval from stoma surgery to presentation was 5 months (IQR 4–8). Nine patients had a distinct fissure or area of skin depression encroaching the ostomy appliance site (Fig 2, *A*). In other cases, the area of involvement was more diffuse. Five patients underwent fat graft only. Three patients had fat grafting with skin excision. Two patients had fat grafting combined with focused suction lipectomy. One patient had a combination of all 3 options. For fat grafting cases, the median amount of fat injected was 174 mL (IQR 145–200). The median length of the resulting incision from the skin excision was 24 cm (IQR 20–34). The number of days between stoma appliance change was significantly lower postoperatively (median days [IQR] 1.0 (0.5–1.0) vs 3.0 (2.3–3.5); $P = .006$). There was no mortality or severe morbidity associated with the procedures. Two of the 4 skin excision patients developed cellulitis of the incision requiring oral antibiotics and partial incision opening. Both were completely healed at 6 weeks postprocedure without requiring a return to the operating room or inpatient care. Nine patients reported improved quality of life concerning better functionality of the ostomy products (Fig 2, *B*). None of the patients reported a deterioration in ostomy care after surgery.

Discussion

Surgical correction, including fat grafting, of parastomal contour irregularities is feasible and can be performed safely with improvements in ostomy care maintained for a minimum of a 1-year follow-up. There was a significantly increased time interval between stoma appliance changes after the procedure.

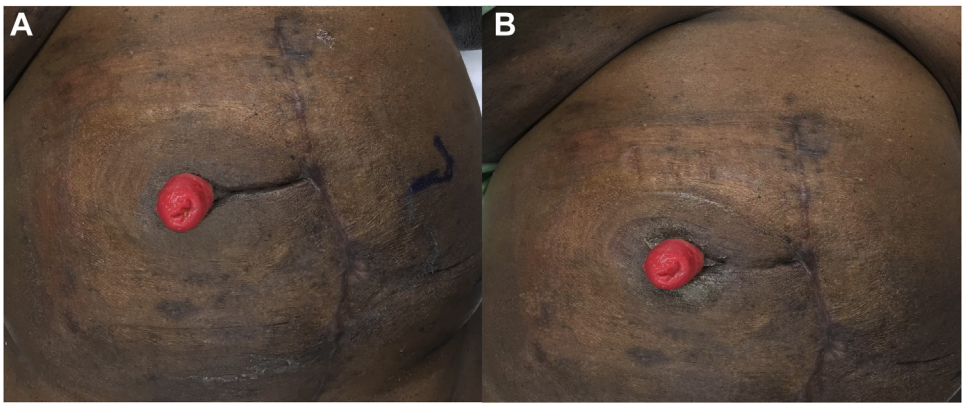

Fig 2. Fat graft correction of peristomal contour deformity. (*A*) Patient preoperative picture. (*B*) Two years postoperatively.

Stoma-related complications represent a significant source of morbidity and have been reported to be as high as 72%.[4] Peristomal skin complications represent the highest incidence of all stoma-related complications across all stoma types (up to 46.2%).[5] Though some mitigation can be achieved with modern stoma equipment and dedicated stoma nursing, options are limited in patients who have already undergone a stoma creation or experience weight and body habitus changes. Stoma relocation may be undesirable as it represents a second major surgical intervention with the potential for significant morbidity and mortality. We have found that fat grafting, scar release focused suction lipectomy, and excision of redundant skin is safe and can improve peristomal skin contour irregularities. Though not directly measured in this study, patient interviews and comments imply a positive impact on the quality of life, a reduction in health care spending, and an obviation of additional abdominal operations. Moreover, improved stoma fitting and stoma care will result in patients requiring fewer stomal appliances, fewer ostomy nurse consultations, and hospital visits. Limitations of the study include its small sample size and retrospective nature. Given the feasibility and safety design of this study, the cohort consists of patients with various types of ostomies. There is no control group, precluding an evaluation of the comparative effectiveness of the intervention.

In conclusion, this represents the largest case series to date using fat grafting for correcting parastomal contour irregularities and highlights its safety and feasibility. Postprocedural ostomy care and skin abnormalities are improved up to at least 1 year. Fat grafting represents readily available and relatively inexpensive technique in the surgical armamentarium for the management of parastomal soft-tissue contour irregularities. It should be considered in such patients.

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Conflict of interest/Disclosure

None of the authors have any conflicts of interest.

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