INTRODUCTION: Severe skin scarring after multiple abdominal surgeries may lead to serious difficulties in stoma care, especially in patients with IBD. We demonstrate the technique of Donut Island Flap that we used in a female patient with colonic Crohn’s disease that presented with intractable chronic ileostomy leakage. A relocation of the ileostomy was not possible because an alternative stoma site was not available anymore.

TECHNIQUE: The scarred peristomal skin was radially excised up to a diameter of 10 cm. A pedicled anterolateral thigh perforator island flap was elevated from the right leg and was passed behind the rectus femoris muscle and through the inguinal tunnel into the defect. The ileostomy was passed through a small opening in the middle of the flap. The donor site at the thigh was closed primarily.

RESULTS: No postoperative complications occurred. Three months after surgery, the ostomy care is providing no difficulties for the patient.

CONCLUSION: The Donut Island Flap is a reliable and relatively simple technique to provide an adequate surrounding for ileostomy whose care is seriously impeded by severe skin scarring.

A 37-year-old woman who had colonic Crohn’s disease presented with daily leakage of her ileostomy. During the past 8 years, she had undergone more than 20 abdominal surgeries. First, a colectomy and formation of an end-ileostomy were performed 2012. In 2013, the patient underwent a restorative proctocolectomy and IPAA. The closure of the ileostomy later the same year was complicated by severe peritonitis. Because of chronic pelvic sepsis, a diverting ileostomy was created in 2014. After that, the patient developed a severe peristomal pyoderma gangrenosum for the first time. In 2015, pouch excision and formation of an end-ileostomy were necessary after the patient developed extensive anal fistulas. At this point, scarring of abdominal skin at both sides of the median laparotomy already impeded stoma care significantly. In 2017, the patient underwent a continent ileostomy (Kock pouch). During the next 1.5 years, 2 further revision surgeries were performed for valve slippage. Unfortunately, the Kock pouch finally failed due to severe pouchitis and had to be excised in 2019. An end-ileostomy was constructed in the left lower abdomen, the last site that could be found that had enough flat and stable skin surface surrounding the ostomy. Peristomal pyoderma gangrenosum recurrent and was treated by a combination of ustekinumab and adalimumab. In January 2020, a small-bowel obstruction caused by torsion of the ileostomy led to a further laparotomy. The ileostomy was placed in the right lower abdomen.

At this time, the ileostomy was located right beneath severe skin scars (Fig. 1). From this time on, daily ostomy leakage could not be managed either by the patient or by the ostomy nurse. Futile ostomy care and the loss of any ability to leave home led to a severely impaired quality of life. Furthermore, daily change of at least 3 appliances led to serious financial burden for the young patient.

Because of the extended scarring all across the abdominal wall, there was no appropriate alternative for ostomy relocation. Preoperatively, the patient was extensively involved in planning and discussion of the procedure.

Stoma revision was performed. Combined ustekinumab and adalimumab treatment was continued perioperatively to make sure that there would be no
postoperative peristomal pyoderma gangrenosum. The circular scarred peristomal surrounding was radially excised up to a diameter of 10 cm (Fig. 2). The size of the flap chosen was wide enough to provide at least a 3- to 4-cm margin of intact skin all around the ileostomy in addition to a 2-cm opening in the middle of the flap. A tiny, epithelialized cuff of 2 mm was kept directly at the stoma to facilitate the final circumferential skin suture. A pedicled anterolateral thigh perforator island flap was elevated from the right leg. Preoperative CT angiography enabled the detection of reliable perforators and a precise planning of their entry point proximal to the centered ostomy opening in the donut-shaped flap (Fig. 3). After dissection, the adipocutaneous pedicled flap was first passed behind the rectus femoris muscle and then through a subcutaneous inguinal tunnel into the defect to extend the range of the vascular pedicle (Fig. 4). The subcutaneous tunnel was created bluntly with fingers. The ileostomy was passed through the small opening in the middle of the flap 3 cm distally to the insertion point of the perforator. The skin was closed by running intracuticular sutures at the inner and outer perimeter of the flap. The donor site at the thigh was closed primarily. Suction drains were placed in the subcutaneous space at the donor site and under the flap (Fig. 5). Intraoperative indocyanine green perfusion imaging was used to predict flap viability (IC-Flow, DiagnosticGreen, Aschheim-Dornach, Germany). Postoperatively, continuous monitoring by laser Doppler flowmetry and remission spectroscopy (O2C, Lea Medizintechnik, Giessen, Germany) were performed for another 48 hours.
The postoperative course was uneventful. The adherence of the ostomy appliance was unproblematic immediately after the surgery and still is 6 months later (Fig. 6). No additional care was used for flap suture lines. The pyoderma gangrenosum did not recur.

CONCLUSION

The Donut Island Flap is a reliable and simple tool to reconstruct a peristomal adhesive surface when there is no other adequate site that could be used for ostomy relocation, eg, after previous surgeries, trauma, burns, or local skin conditions like pyoderma gangrenosum, which can make stoma relocation impossible. The risk of postoperative morbidity is low and, considering that this maneuver is mainly a skin-level procedure, probably even lower than a laparotomy and relocation of the ileostomy, especially in a patient with extensive intra-abdominal adhesions due to multiple previous surgeries. To our best knowledge, this is the first description of a pedicled anterolateral thigh island flap used to solve problems of ostomy appliance leakage.

Planning the procedure, the identification of a perforator artery in the middle of the thigh or even somewhat more distally is mandatory. Otherwise, the length of the pedicle might be insufficient for tension-free closure of the peristomal defect. The reoccurrence of peristomal pyoderma gangrenosum was a serious concern before surgery. To prevent it, we decided to perform the operation while the patient was taking ustekinumab and adalimumab. Fortunately, pyoderma did not reappear during the follow-up time of 6 months.

Preoperatively, the use of rotational flap was discussed first. However, we decided to use the pedicled flap because a rotational flap is associated with a wide subcutaneous undermining of the region next to the ostomy. In the case of serious postoperative suture dehiscence around the ileostomy, an extensive soft tissue infection at the donor site may occur. In contrast, the inguinal tunnel is quite narrow, reducing the risk of donor site contamination. Also, in the case of a rotation flap, potentially diminished blood supply and tissue tension at the distal end of the flap could lead to skin disruption at a relevant area.

The anterior lateral thigh flap is a standard procedure first described by Song et al that can be used as a pedicled or free flap for defects on the entire body. Its vascular anatomy is reliable and well known. The lateral circumflex femoral vessels are as long as 10 cm. The skin is usually elastic and thin. Thickness of the subcutaneous layer can be adapted to the requirements of the defect. To our best knowledge, this is the first description of a pedicled anterolateral thigh island flap used to solve problems of ostomy appliance leakage.

REFERENCE

1. Song YG, Chen GZ, Song YL. The free thigh flap: a new free flap concept based on the septocutaneous artery. Br J Plast Surg. 1984;37:149–159.