ISSUES IN CLINICAL MANAGEMENT:
Identification of Candidates for Pressure Ulcer Flap Reconstruction

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INTRODUCTION

There are an estimated 400,000 patients in the United States with a spinal cord injury and, at any one time, one-third may have a pressure ulcer.[1] The surgical treatment of pressure ulcers has evolved over the last several decades. As a plastic surgeon, I am often consulted to provide soft tissue coverage for patients with a pressure ulcer. It is helpful for referring wound care clinics and other specialists to know which patients are good candidates for flap reconstruction.

PREOPERATIVE ASSESSMENT

Patients who have Stage III or IV pressure ulcers are frequently referred for surgical management. This often involves a staged approach with the most important goal first being debridement of infected and/or necrotic tissue. It is also important to assess for osteomyelitis. Ulcers are frequently seen over the sacrum, ischium, and trochanter in paraplegics, quadriplegics, or patients who have had an acute illness. Many patients may have more than one ulcer at the same time. A consultation with an infectious disease specialist is obtained in all patients with bone involvement, and magnetic resonance imaging can be useful in delineating bone infection or soft tissue abscesses. Bone cultures are sent from the remaining bone after debridement to diagnose osteomyelitis definitively and to guide antibiotic therapy.

After the wound has been debrided, it is important to assess the overall health of the patient. Laboratory investigations obtained include albumin, prealbumin, C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), and hemoglobin A1c. For patients to be good candidates for a flap reconstruction, I require an albumin of 3 g/dL and a prealbumin of 15 mg/dL. It is often necessary to perform these tests at several time points to ensure they are trending in the correct direction. These patients almost always have malnutrition. It may take several weeks before the prealbumin trends upward. Protein supplementation is necessary, and the assistance of a nutritionist is critical. Many patients also need a feeding tube because they cannot take in enough protein orally. CRP and ESR are markers of inflammation that can be followed post-flap reconstruction to monitor that they are decreasing; a decrease correlates with flap healing. Uncontrolled diabetes mellitus is an independent risk factor for failure of flap reconstruction.[1] Hemoglobin A1c should ideally be less than 7% before the operation, and tight glucose control after the flap is necessary.

A large component of success with the use of flap reconstruction is patient adherence. The patient must be able to participate in aftercare during the weeks after the operation. If the patient is not agreeable, or is unable to follow the team's instructions due to dementia, then the chance of failure after the flap operation is high.

Another important consideration before doing the flap procedure is to consider a diverting colostomy. If the wound is large and near the rectum, a diverting colostomy is performed before the flap reconstruction to decrease chances of infection and maceration or shearing occurring with cleaning the patient after surgery.

Additionally, any uncontrolled muscle spasticity in the hips, thighs, and lower extremities should be treated preoperatively to decrease the chances of complications such as wound dehiscence. This may include adjusting the baclofen dose and/or considering a baclofen pump.

RECONSTRUCTION OPTIONS

Often, one to three pressure ulcers may be present at the same time. Considerations before planning a flap operation include assessing scar tissue from previous flap operations or debridements, assessing the ambulatory status of the patient, and documenting the muscle flaps that are available.

Most of the flaps that I perform are either muscle or myocutaneous flaps, as these flaps provide good blood flow to promote healing, fill the dead space of the wound, and provide bulk to pad bony prominences. Common muscle flaps used include gluteus maximus myocutaneous flaps for sacral wounds and biceps femoris myocutaneous flaps for ischial wounds. These flaps are made large and either rotated or advanced in a V-Y closure fashion. I have found making these flaps large is critical, because patients tend to have recurrences of ulcers over the years, and these flaps can be re-elevated and re-rotated or re-advanced.

POSTOPERATIVE CARE AND COMPLICATIONS

Wound dehiscence and early recurrence of the pressure ulcer are the main concerns postoperatively. I keep the patient at an intermediate-care facility and, with the assistance of excellent wound care nurses, follow a strict protocol. The patients are kept on a low-air-loss mattress for at least 3 weeks, and longer if tension on the closure is high. The head of the bed is only elevated 20° in the first week, and the patient's head may be placed on a wedge. Each week after the first week, the head is allowed to be elevated 30°, 60°, and finally 90° for 2 hours at a time.

CONCLUSIONS

Taking care of patients with pressure ulcers can be very rewarding. It is important to optimize the patient's health status and perform flap reconstruction on adherent patients to assure long-term success of the treatment of osteomyelitis, prevention of dehiscence, and reductions in the chances of recurrence.

Reference:

1. Keys KA, Daniali LN, Warner KJ, et al. Multivariate predictors of failure after flap coverage of pressure ulcers. Plast Reconstr Surg. 2010;125(6):1725-34.