Surgical treatment of hidradenitis suppurativa: A 10-year experience

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Cincinnati, Ohio

Background. Hidradenitis suppurativa (HS) is a disease of the apocrine sweat glands resulting in chronic wounds with abscesses, sinuses, and fibrosis. Because many patients referred for treatment have both recurrent and progressive disability, we attempted to determine which factors have the greatest impact on outcome so we could develop an operative treatment algorithm.

Methods. We identified 57 patients with HS who underwent operative treatment for chronic recurrent HS from January 1994 through December 2003. Charts were reviewed for demographic, treatment, and outcome data.

Results. The mean age at presentation was 34 years and the average duration of symptoms was 6.7 years. Two thirds of the patients had undergone 1 or more incision and drainage procedures and 90% had received long-term antibiotic therapy. Axillary involvement was present in 88% of women and was bilateral in half of all patients. Inguinoperineal involvement was present in 87% of men and was bilateral in 92% of all patients. An algorithm for operative treatment was developed based on the extent of involvement, chronicity, and comorbid conditions. Ninety-two operative procedures were performed, 50% involved the axilla, 36% involved the perineum, and 14% involved the inguinal region. Excision and primary closure was used for localized disease; wide excision with or without skin grafting was used for diffuse disease.

Conclusions. HS is a chronic relapsing disease that frequently causes disabling pain, diminished range of motion, and social isolation. Definitive treatment involves operative excision of the involved apocrine tissue and should be individualized based on the stage and location of the disease. (Surgery 2005;138:734-41.)

From the Department of Surgery, University of Cincinnati College of Medicine, Ohio

HIDRADENITIS SUPPURATIVA (HS) is a chronic, relapsing, inflammatory disease of the skin and subcutaneous tissues. It first was described by Velpeau1 in 1839, but it was not until 1922 that Schiefferdecker2 reported its origin in the apocrine sweat glands. Although the pathophysiology is understood poorly, it generally is believed that obstruction of the apocrine and/or follicular pores results in glandular dilatation and bacterial superinfection with subsequent gland rupture disseminating infection throughout the subcutaneous tissue plane. Consequently, hidradenitis is associated with chronic painful abscesses, multiple odiferous draining sinus tracts, and chronic fibrosis with range-limiting scar formation.

Historically, medical management with topical or systemic antibiotics has been the standard of care with referral for operative intervention reserved for those patients with extensive skin and soft-tissue involvement. However, excision of the affected tissues is the only curative treatment and early referral for operative resection may limit the extent of this debilitating disease. We report our 10-year experience treating advanced HS and the results from the use of a defined operative treatment algorithm.

PATIENTS AND METHODS

We identified all patients with HS who underwent operative treatment at the University Hospital from January 1994 through December 2003. Charts were reviewed for demographic, treatment, and outcome data after study approval was obtained from the University of Cincinnati College of Medicine Institutional Review Board. The statistical significance of demographic variables was determined using both chi-square analysis and the Student t test and was defined as a P value of less than .05. Patients presenting to either the emergency
department or outpatient clinic with an acute infection with abscesses treated by incision and drainage and a 10- to 14-day course of oral antibiotics and no further operative treatment were not included in the study.

Factors that influenced the operative approach included the site(s) affected, the extent of skin and soft-tissue involvement, the chronicity of the disease, and the patient's comorbid conditions. All patients with involvement of the buttocks and perianal area underwent preoperative colonoscopy to rule out the coexistence of inflammatory bowel disease. Our experience from the initial 38 procedures performed from 1994 to 2001, combined with our response to increased referrals, led to the development of an operative treatment algorithm (Fig) that was used for patients treated from 2002 to 2003.

Patients with limited disease involving the axilla, breast, or inguinal region were selected for excision and primary closure if the skin and soft tissue could be mobilized adequately. Patients with limited involvement of the perineum, perianal area, and/or buttocks were treated by excision and healing by secondary intention whereas more extensive disease was treated by staged excision and skin grafting. Patients for whom skin grafting was recommended were given the option of excision and healing by secondary intention.

Patients undergoing excision and primary closure were treated on an outpatient basis. Those who had excision only were hospitalized for 2 to 3 days for pain management and instructions in wound care. Patients who had excision and skin grafting were hospitalized in the burn unit for 5 to 7 days to ensure adequate immobilization and graft take. If open wounds were purulent or had chronic granulation tissue, multiple draining sinus tracts, and/or significant induration of the soft tissue at the time of operation, grafting was performed on the day after excisional preparation of the wound bed. Both excised and grafted wounds were irrigated with alternating double antibiotic (neomycin sulfate 40 mg and polymixin B 200,000 U/L of normal saline) and 5% Sulfamylon solutions every 2 hours until the fifth postgrafting day. Pedicle flaps were not used in any patients. One female patient who presented before the development of the treatment algorithm underwent colostomy before excision and grafting for extensive disease involving the buttocks, perineum, and perianal region.

**RESULTS**

We identified 57 patients who underwent operative treatment for chronic recurrent HD during the 10-year study period. Patient demographics are shown in Table I. The mean age at the time of
presentation for operative management was 34 years (range, 19-62 y) and the average duration of symptomatic disease was 6.7 years (range, 0.5-40 y). Forty-two (72%) patients were women. Although there was no association between sex and age at presentation, men had a mean of 10.4 years of symptoms compared with 5.3 years of symptoms in women ($P < .0001$). Overall, 56% of the patients were obese; however, this finding was present in 68% of women compared with 27% of men ($P = .013$).

Forty patients (70%) were African American, 16 were Caucasian (28%), and 1 patient was of Asian origin. There was no difference in age, duration of disease, or sex among the 3 ethnic groups. Although 77% of the patients had a history of tobacco use, this was true for 100% of Caucasians compared with 70% of African Americans ($P < .0001$). There was no association between tobacco use, age, sex, and location or extent of disease. Two thirds of the patients had undergone at least 1 incision and drainage procedure and 90% had received at least 1 period of long-term antibiotic therapy. Only 19% had a history of chronic acne or folliculitis. No patients with perianal hidradenitis were diagnosed with Crohn’s disease during their preoperative assessment or during their postoperative follow-up evaluation.

Anatomic areas with chronic hidradenitis that were treated operatively are described in Table II. Axillary involvement was present in 88% of women but only 13% of men presenting with chronic disease ($P < .0001$). Furthermore, 81% of patients with axillary disease were obese ($P < .05$). Bilateral axillary disease was present in half of the patients regardless of sex. Inguinoperineal involvement was present in 87% of the men ($P < .0001$) and was bilateral in 92% of these patients compared with only 20% of 5 women with disease in this location.

Forty-seven percent of the patients had involvement of bilateral or distant sites with 7 patients requiring staged bilateral axillary procedures and 5 patients requiring staged axillary and inguinoperineal procedures.

A total of 92 operative procedures were performed during the study period, with 50% involving the axilla, 36% involving the perineal/perianal/buttock area, and 14% involving the inguinal region. Excision and primary closure was used for localized disease (76% of axillary cases), whereas wide local excision with or without split-thickness skin grafting was the mainstay of treatment in patients with diffuse disease (86% of inguinoperineal cases). The number and types of procedures by location and sex are listed in Table III. After the introduction of our operative treatment algorithm, 17 of 20 (85%) women underwent excision and primary closure for axillary disease compared with only 7 of 22 (32%) previously ($P < .005$). Although all men underwent excision and primary closure of axillary disease postalgorithm, no statistical comparisons could be made because no men underwent excision and grafting of axillary hidradenitis during the 10-year study period. Women also had a marked change in the treatment used for inguinoperineal disease in the postalgorithm period. Nine of 11 (82%) women who underwent operative resection of inguinoperineal disease postalgorithm were able to have primary wound closure compared with none of 5 women treated previously ($P < .05$).

Patients treated before 2002 have been followed-up for a mean of 21.2 months whereas patients subsequently treated using the algorithm have been followed-up for a mean of 8.4 months. There have been no operative site recurrences, although there have been patients in whom glands that were not involved at the time of operative treatment developed local inflammation and required incision and drainage and/or oral antibiotic therapy or required an additional excisional

### Table I. Comparison of sex in patients undergoing operative treatment of chronic HS

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>15</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Age, y</td>
<td>$39 \pm 3$</td>
<td>$32 \pm 1$</td>
<td>NS</td>
</tr>
<tr>
<td>Duration of symptoms, y</td>
<td>$10.4 \pm 3.2$</td>
<td>$5.3 \pm 0.8$</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Obesity</td>
<td>27%</td>
<td>68%</td>
<td>.013</td>
</tr>
<tr>
<td>African American</td>
<td>60%</td>
<td>74%</td>
<td>NS</td>
</tr>
<tr>
<td>Smoking</td>
<td>93%</td>
<td>73%</td>
<td>NS</td>
</tr>
<tr>
<td>Acne</td>
<td>33%</td>
<td>15%</td>
<td>NS</td>
</tr>
</tbody>
</table>

Results are expressed as mean ± SEM or percent, where appropriate. NS, Not significant.

### Table II. Comparison of sex by disease location

<table>
<thead>
<tr>
<th>Area(s) of involvement</th>
<th>Male (n = 15)</th>
<th>Female (n = 42)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axilla</td>
<td>2 (13%)</td>
<td>37 (88%)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Unilateral</td>
<td>1 (50)</td>
<td>19 (51)</td>
<td>NS</td>
</tr>
<tr>
<td>Bilateral</td>
<td>1 (50)</td>
<td>18 (49)</td>
<td></td>
</tr>
<tr>
<td>Inguinoperineal</td>
<td>13 (87)</td>
<td>5 (12)</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Unilateral</td>
<td>1 (8)</td>
<td>4 (80)</td>
<td>.013</td>
</tr>
<tr>
<td>Bilateral</td>
<td>12 (92)</td>
<td>1 (20)</td>
<td>NS</td>
</tr>
<tr>
<td>Axilla and inguinoperineal</td>
<td>1 (7)</td>
<td>5 (8)</td>
<td>NS</td>
</tr>
</tbody>
</table>

NS, Not significant.
procedure. Wound complications including cellulitis, partial graft loss, or wound dehiscence were managed on an outpatient basis without need for readmission or reoperation. One patient developed a unilateral femoral vein thrombosis while hospitalized on bed rest during the postoperative period after skin grafting of extensive axillary disease despite appropriate prophylaxis. None of the operative specimens showed histologic evidence of squamous cell carcinoma or other malignancy.

DISCUSSION

HS is a chronic suppurative disease of the apocrine sweat glands, skin, and subcutaneous tissues. Although its true prevalence is unknown, it has been estimated to afflict approximately 1 in every 300 adults.3 The disease has been reported to be more common among African Americans,3,4 which may be because of the presence of a greater number of apocrine glands than are present in Caucasians.5 Although 70% of our patients were African American, this may have been a result of referral patterns from local emergency physicians, surgeons, and dermatologists, or regional population demographics. Because HS rarely is seen before puberty or after menopause, and recurrence of acute disease has appeared after hormone administration,6 several investigators have suggested that the condition may be caused by an endocrine abnormality,7 or, more specifically, may be androgen dependent.8-11 Obesity, diabetes, and a genetic tendency to acne have been identified as predisposing factors, as has cigarette smoking,12,13 which has been hypothesized to inhibit glandular function and lead to obstruction of the glandular ducts. Previous claims that poor hygiene, excessive shaving, tight-fitting clothes, and the use of depilatories or deodorants were causative agents have not been substantiated.14-16

The diagnosis and operative treatment of HS is based on the presence of recurrent disease, multifocal involvement, and scarring. Obstruction of the apocrine glands from follicular keratin plugs results in glandular dilatation, bacterial overgrowth with abscess formation, and subsequent rupture and sinus formation. Patients typically present with abscesses, sinuses, and intermittent acute infections. Symptoms include pain, decreased mobility of the involved area, strictures, and malodorous drainage. The areas most frequently requiring operative intervention are the axillae, groin, perineum, and perianal area. Other areas of involvement include the breast areola, umbilicus, scalp, face, neck, shoulders, and the external auditory meatus. The disease may involve 1 or more sites and frequently is bilateral.

Patients with HS typically present with symptomatic disease during the second to fourth decade of life, as was the case in our series. Interestingly, although the average duration of disease before presentation for operative treatment was approximately 7 years, men presented with a 5-year greater duration of symptoms than women. This delay in presentation may reflect social embarrassment associated with disease location because men were more likely to have inguinoperineal disease. The majority of our patients were women, a finding that could be attributed to the prevalence of axillary disease in our patient population. Our experience is consistent with that reported by Rogers and Ryan15 and Cornbleet17 in that women represented 88% of the patients with axillary disease and men represented 87% of the patients with inguinoperineal disease. We also noted more frequent tobacco use among patients with perineal disease, a finding that has been reported to be as high as 70% in patients with disease in this location.4

Medical treatment for mild acute disease includes oral antibiotics, topical antiseptics, and warm compresses. Other medical treatment options include topical clindamycin,18 topical or intralesional steroids,19 retinoid therapy,20,21 anti-androgens,22 immunosuppressive agents,23,24 and radiotherapy.25 The success of these therapies, however, often is limited because of the indolent and recurrent nature of the disease.

### Table III. Number and types of procedures by location and sex

<table>
<thead>
<tr>
<th>Area(s) of involvement</th>
<th>Primary closure</th>
<th>Wide excision and skin grafting</th>
<th>Other procedures*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Number of procedures</td>
<td>7</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>Axilla</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-algorithm</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Post-algorithm</td>
<td>4</td>
<td>17†</td>
<td>0</td>
</tr>
<tr>
<td>Inguinoperineal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-algorithm</td>
<td>1</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Post-algorithm</td>
<td>2</td>
<td>9‡</td>
<td>13</td>
</tr>
</tbody>
</table>

*One man underwent 2 incision and drainage procedures and another man underwent excision only; 1 woman underwent diverting colostomy before staged excision and skin grafting.

†p < .005 for women with axillary disease postalgorithm versus pre-algorithm.

‡p < .05 for women with inguinoperineal disease postalgorithm versus pre-algorithm.
Operative excision of the involved follicles and inflammatory process is the only curative treatment. Although there is general agreement that wide excision of all involved skin and soft tissue is key, both the extent of the skin excision and the management of the subsequent wound remain controversial.\textsuperscript{17,26,27} Parks and Parks have\textsuperscript{28} recommended excision of all hair-bearing skin and excision to the deep underlying fascia to ensure removal of all apocrine glands. Both Parks and Parks\textsuperscript{28} and Banerjee\textsuperscript{29} recommended the use of an iodine-starch method to define the apocrine gland–bearing area, especially for axillary resections. This mapping technique was not used in the management of any of our patients and only the grossly involved skin and soft tissue were excised.

Greeley,\textsuperscript{30} Paletta,\textsuperscript{31} Pollock et al,\textsuperscript{32} and Anderson and Perry\textsuperscript{33} have advocated excision and primary closure for localized axillary disease noting decreased operative morbidity, complications, length of hospitalization, and postoperative disability compared with more extensive procedures. They have recommended split-thickness skin grafting only when the disease is so extensive as to preclude primary closure. Knaysi et al,\textsuperscript{34} citing a 20% recurrence rate after primary closure for axillary disease, noted no recurrences after total excision of the hair-bearing area and split-thickness skin grafting. This approach also has been advocated by Watson,\textsuperscript{35} who documented recurrence rates of 54% and 19% with primary and flap closure, respectively. Watson\textsuperscript{35} also noted that patients who had primary closure had the poorest outcomes even though they had the least severe disease, and theorized that this was owing to compromised excision of the hair-bearing and glandular area. Harrison et al\textsuperscript{36} and Morgan et al\textsuperscript{16} have advocated excision and healing by secondary intention. Harrison et al\textsuperscript{36} hypothesized that the low recurrence rate observed in his patients with axillary disease was the result of removal of the entire hair-bearing area. Morgan et al\textsuperscript{16} did not graft the excised wounds, citing poor wound vascularity and bacterial contamination, and noted that many of his patients preferred secondary healing rather than the discomfort and scarring associated with skin grafts and their donor sites.

The optimal operative management of localized inguinal hidradenitis also is unclear. Watson\textsuperscript{35} noted the need for reoperation in approximately 20% of patients with inguinal disease whether they were treated with excision and primary closure or excision and skin grafting. Harrison et al\textsuperscript{36} reported a 37% recurrence rate of inguino-perineal disease after wide excision without skin grafting; however, Ariyan and Krizek\textsuperscript{37} and Thornton and Abcarian\textsuperscript{38} recommended excision and secondary healing for patients with more extensive inguino-perineal and/or perianal-perineal disease, respectively, noting that the need for colostomy was rare. We concur with this opinion because only 1 patient in our series underwent diverting colostomy. Furthermore, patients who had excision and grafting of extensive perineal/perianal disease without fecal diversion had equivalent graft take and time to definitive wound closure as the 1 patient who had been diverted. In addition, although most investigators have reported healing times of fewer than 3 to 7 weeks, Silverberg et al\textsuperscript{39} noted that healing often took 2 to 5 months, during which time open wound management and analgesics were necessary. Finally, Hyland and Neale\textsuperscript{40} and Ramasastry et al\textsuperscript{11} recommended wide excision of perineal disease with delayed skin grafting as a means of reducing patient discomfort and effecting more rapid and stable wound closure.

It is important to note that the majority of these studies were performed 10 to 20 years ago. Since then, there have been substantive changes in health care, patient education, and patient decision making. As a consequence, our algorithm was developed in consideration of not only the extent and location of disease and comorbid conditions, but also patient preference. Our patients were advised of the risks for recurrence but preferred more limited procedures because they interfered minimally with their lifestyles, limited the need for postoperative pain and wound management, and required minimal time off work. Patients were offered long-term follow-up evaluation with the dermatology and burn operation clinics and were advised of alternative treatment options if there was recurrence in areas adjacent to the excision site or in distant areas. As such, we have advocated early excision of localized disease with primary closure to minimize pain and disability. Patients with more widespread disease have been treated with staged excision and split-thickness skin grafting and rarely with excision and secondary healing. We do not believe that a more aggressive approach of excision of all unaffected apocrine tissue is necessary. Furthermore, our results with simple procedures such as primary closure or split-thickness skin grafts suggest that these patients almost always can be treated without the need for regional adjacent tissue transfers or musculocutaneous flaps and that definitive wound closure and maintenance of functional activity can be achieved without increasing the risk for local disease recurrence.
Patients managed using our algorithm have been followed-up for an average of 8.5 months, during which time a limited number of minor infectious and wound-related complications have been treated on an outpatient basis. There have been no operative site recurrences requiring additional operative treatment. We understand that our follow-up period is relatively short compared with other studies that showed local or distant disease recurrence over a period of 24 months; however, it our belief that our operative approach is most comfortable for the patients, does not require hospitalization, and returns the patients to their personal, professional, and social environments most expeditiously without the morbidities associated with secondary wound healing or skin grafting.

CONCLUSIONS

HS presents with a wide spectrum of severity. When diagnosed early, the disease may be amenable to nonoperative treatment with topical and/or systemic agents; however, as the disease becomes chronic and progressive, operative excision is the only treatment modality that has a significant affect on the course of the disease. Although there have been many suggested approaches to the operative treatment of this disease, our algorithm attempts to provide a rational approach to treatment based on the extent and location of disease. This allows the surgeon and patient to individualize treatment based on the anatomic features of the disease and the patient’s personal and socioeconomic preferences. Follow-up evaluation and collaboration among surgeons and dermatologists are important for the successful long-term management of patients afflicted with this complex, debilitating, and socially isolating disease.

REFERENCES

How much disease do you excise at once, particularly for patients that have multiple sites of involvement?

Do you ever use primary closure in the inguinal areas? If so, when?

Could you define for us better the difference between localized and extensive disease?

Finally, how many patients develop hidradenitis suppurativa at a new site after they have had a successful operation?

**Dr Richard J. Kagan.** The decision as to the extent of excision is dependent upon multiple factors, including the sites involved, the extent of disease, and the severity of the location-specific symptoms. If there is bilateral axillary disease, which is amenable to excision and primary closure, we generally excise the more symptomatic side at the initial operation and perform the procedure on the contralateral side 2 to 3 months later. On occasion, if the disease is limited, we may perform bilateral excisions at 1 operative setting. If the patient has advanced inguino-perineal disease and less symptomatic axillary disease, we will usually address the inguino-perineal disease at the initial operation and address the axillary disease at a later date. In general, the most debilitating disease socially or functionally is addressed at the initial operation.

Our definition of an extensive wound, or one that requires skin grafting, is based upon our ability to approximate the wound margins following adequate excision of the skin and grossly involved apocrine tissue. This generally is limited to 5 cm; however, in a number of instances, larger wounds can be closed without tension on the suture line. We have not found the need to utilize flaps and have generally grafted those wounds that cannot be easily approximated. These issues are discussed with the patients preoperatively as it is not always possible to predict which wounds may not be amenable to primary closure. Some patients have preferred to allow healing by secondary intention rather than have skin grafts taken.

We have generally defined a localized wound as one that is less than 5 cm in diameter; however, there is a significant difference in the mobility of the adjacent skin when one compares the axilla and inguino-perineal areas. This results in the increased need for skin grafting for inguino-perineal disease. In this area, we prefer the 2-stage technique that we have utilized in our management of extensive burn injuries. This involves excision to fascia of all of the involved skin and soft tissue that is accessible, irrigation of the wound overnight with topical antibiotics, such as Sulfamylon, and returning the patient to the operating room on the following day for skin grafting.

To address your last question, many of these patients return with disease in other or multiple sites. It is important to remember that the average duration of symptoms prior to surgical referral was approximately 7 years; thus, most of the patients had well defined areas of involvement at the time of their initial presentation. In general, the areas of involvement were recognized before the initial procedure was performed. There
were some patients, however, who returned with disease in an area that was not previously symptomatic. Importantly, we have not had any patients return with local recurrence at the site of previous excision, whether the wound was closed primarily or grafted.

**Dr Janice F. Rafferty** (Cincinnati, Ohio). Dr. Kagan, can you tell us a bit more about their postoperative activity restrictions, how you get these grafts in this very difficult constantly moving area to take, and what is your graft success rate in the perianal area?

**Dr Richard J. Kagan.** All of our patients with inguino-perineal disease undergo preoperative colonoscopy to rule out the coexistence of Crohn’s disease as this has been reported to be present in 39% of patients with inguino-perineal hidradenitis. Parenthetically, none of the patients in our series had Crohn’s disease.

We only had 1 patient in our series that underwent fecal diversion. This patient had severe inguinoperineal disease extending to her buttocks and her colostomy was performed by the referring surgeon prior to our initial evaluation and subsequent treatment. In general, it has been our practice to not perform fecal diversion as we have been able to achieve excellent results without the added morbidity and costs related to colostomy. Our skin graft take rate has generally been 85% to 95% and is comparable to our experience in grafting burns involving this area of the body. Patients undergoing staged excision and grafting of inguino-perineal hidradenitis remain at bed rest and are cared for by the burn unit nursing staff who are familiar with managing such wounds. The skin grafts are inspected on postoperative day 5, following which time the patients are allowed to ambulate to the shower for twice daily dressing changes in preparation for hospital discharge. I would add that we only utilize DVT prophylaxis on those patients who require bed rest following skin grafting.

**Dr Wendy L. Wahl** (Ann Arbor, Mich). For patients who have large debridements of their perineum and have significant contour abnormality, do you use a VAC before or after grafting to improve skin graft take or to improve the contour abnormality?

**Dr Richard J. Kagan.** We have not utilized the VAC dressing in the care of our patients who undergo skin grafts, as our moist antibiotic dressing promotes epithelialization across the mesh grafts and appears to control the microbial load in the wound. We have not had to change many of our dressings prior to day 5, except for those rare occasions when the dressing became malodorous or was grossly soiled by stool. In addition, since it is frequently impossible to excise all of the disease that involves both the perineum and buttocks, there are often small areas where graft take is poor due to the residual inflammatory tissue. These areas are generally left to heal by secondary intention and the patients scheduled to return later to address the remaining disease of the buttocks at which time the patient is maintained prone.