



Wound Sleuth

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Recurrent Ulcers on the Site of Previous Trauma and Multiple Surgical Procedures

J.K. is a 64-year-old male employed as a promotions expert. At age five he suffered a traumatic injury to the distal left foot after being run over by a train. He has undergone approximately 20 revision operations and numerous skin grafts since that time.

In 1997, he had successful full skin flap surgery. After this procedure, he participated in a number of competitive sporting activities. In 2002, he developed the first of a number of skin ulcers along the margins of the rotational flap and the adjacent skin. Often these ulcers were associated with localized pain.

Questions for the reader:

1. What is the cause/diagnosis and how would you investigate this patient?
2. What other diagnoses would you consider?

First, assess for infection. Local infection would have any three of the NERDS criteria:

- **Non-healing** – wound dimen-

sions have not increased in size or decreased in size over the last four weeks

- **Exudate** – the amount of exudate is increased and should be described as serous, sanguineous (bloody), pustular or a combination of two or three types, with the order being based on the most predominant to least predominant component (e.g., serosanguinous pustular). The exudate should also be quantitated as heavy, moderate, light or absent.
- **Red**, friable tissue is due to increased capillaries on the wound surface. These capillaries are probably stimulated by vascular endothelial growth factor produced from bacteria and produce punctate bleeding points and friable granulation when the wound dressing is removed.
- **Debris** – the surface of the wound may contain dead cells (black, brown or yellow slough on the wound surface), indicating that the surface of the wound is hostile to cell growth.

- **Smell** is the result of the proliferation of gram-negative and anaerobic organisms within the wound.

The deep and surrounding skin compartment may have infection when:

- Size is increasing in the lateral walls of the wound
- Temperature increases more than 3 degrees Fahrenheit compared to a mirror image reading in the absence of vascular disease or deep inflammation
- Exposed, or probing to, bone
- New areas of breakdown existing around the periphery of the main wound (satellites)
- Erythema and edema of the surrounding skin = cellulitis
- Exudate – as above
- Smell, as above, but if both exudate and smell are present, an additional criterion is needed to define superficial infection (treat topically) or deep and surrounding infection (treat systemically)

If the criteria for infection are not present, then superficial



Figure 1: Squamous cell carcinoma appearing along the incision line of the left foot



Figure 2: Squamous cell carcinoma with granulation-like tissue appearing in the base of the lesion



Figure 3: Hyperkeratotic squamous cell on the left foot associated with localized pain

and/or deep inflammation may be the cause of skin breakdown in this case. Infections should be treated, but if the wound persists, chronic inflammation—superficial or deep—should be suspected. Surface inflammation and infection can be treated with silver dressings, and deep inflammation and infection can be treated with agents such as doxycycline, cotrimoxazole (sulfamethoxazole + trimethoprim), trimethoprim alone or erythromycins.

If the wound still fails to respond to these measures, or if the wound is initially suspicious of malignancy, a skin biopsy should be performed, as persistent inflammation can lead to malignant transformation.


Management

The initial biopsy was a squamous cell carcinoma, with 11 subsequent biopsies from different locations (12 in total) diagnosed as squamous cell carcinoma. One biopsy demonstrated

dysplasia that was not adequate enough for the dermatopathologist to call a squamous cell carcinoma. Three biopsies were consistent with an actinic keratosis, indicating some sun-induced changes, and five biopsies were consistent with non-specific inflammation. In total, 21 biopsies with 12 squamous cells, four premalignant biopsies with an element of sun change, and five biopsies having non-specific inflammation that was probably the precursor of malignant transformation. We avoided radiotherapy because of the possibility of secondary squamous cells due to the radiation in a young patient.

To manage these lesions, topical imiquimod was applied topically along the grafting margins to identify subclinical lesions as well as to treat residual disease after local curetting and electrocautery. The imiquimod was applied sparingly, most often two times per week to avoid excessive inflammation. We tried

to avoid surgical excisions due to the prolonged recovery time and the risk of creating more sites for chronic inflammation and malignant transformation. An alternative to imiquimod would be 5-fluorouracil cream that could be applied in a similar fashion or tried daily for one week per month.

J.K. was asked to apply sunscreens if his feet were exposed. The sunscreens should contain an SPF of 30–60 but also have UVA protection, as UVA can penetrate car and other window glass. Sunscreens must be applied before any other cream or ointment. Continued local surveillance and checking for regional lymph nodes (popliteal, femoral, inguinal) was required. Other than the 12 squamous cells on the left foot and ankle, J.K. has had only one other skin cancer: a basal cell carcinoma of the forehead, so that the persistent inflammation is probably most responsible for the malignant transformation in this case. 

RECOGNIZING HS

DO YOU RECOGNIZE PATIENTS WITH HIDRADENITIS SUPPURATIVA (HS)?



DR. NEIL SHEAR

Head of Dermatology, Sunnybrook Hospital

"People with HS come to the emergency room in severe pain and discomfort requiring assistance with the draining of the boils during a flare-up. It's not unusual for patients to go home undiagnosed."



DR. RALPH GEORGE

Associate Professor, University of Toronto,
Division of General Surgery



DR. VU KIET TRAN

ER physician at University Health Network

"HS is a chronic, painful, inflammatory skin disease that affects 1-4% of the general adult population. It is characterized by boils usually occurring where certain sweat glands are located, such as under the breasts, buttocks, and inner thighs."

"There is currently no cure for HS. Early diagnosis and proper management is important for a patient's quality of life. The first step for those with HS is to speak to their dermatologist to get an accurate diagnosis."

To learn more about HS from these specialists, go to www.RecognizingHS.com/WCC

WHEN YOU SEE THESE LESIONS, DO YOU SUSPECT HS? DO YOU ASK ABOUT RECURRENCE?



Photo compliments of Dr. Afsaneh Alavi.



Photo compliments of Dr. Marc Bourcier.

ASSESSING PATIENTS WITH RECURRENT BOILS

Most HS cases can be recognized with high reliability by the presence of 3 main features:¹⁻³

1. **Typical lesions:** nodules, sinus tracts, abscesses, scarring
2. **Typical anatomical location:** axilla, groin, genitals, under the breasts, others (perianal, neck, abdomen, buttocks)
3. **Relapses and chronicity:** ≥ 2 times per 6 months

Questions to ask your patients with suspected HS:²

1. Have you had outbreaks of boils during the last 6 months?
2. Where were the boils and how many did you have?

To confirm an HS diagnosis,
please refer your patient to a dermatologist.

References: 1. Zouboulis CC, et al. European S1 guideline for the treatment of hidradenitis suppurativa/acne inversa. *JEADV* 2015;29:619-44. 2. Lockwood SJ, et al. Diagnostic workup. In: Kimball AB, Jemec GBE, eds. *Hidradenitis Suppurativa: A Disease Primer*. Cham, Switzerland: Springer; 2016:27-37. 3. Poli F, et al. Clinical presentation. In: Jemec GBE, Revuz J, Leyden JJ, eds. *Hidradenitis Suppurativa*. Berlin, Germany: Springer; 2006:11-24.