



Wound Sleuth

By Katie Krause, MD FRCPC and Carol Ott, MD FRCPC

Pressure Injury in the Older Adult

The Patient

A 95-year-old female, with a left-sided meningioma leading to right-sided weakness and right lower limb paresis causing her to be bed-bound, was seen in a long-term care ward for what was assessed to be a stage 2 pressure injury in the sacral area (see Figure 1) that began 10 days prior. Due to general decline, and respiratory issues including aspiration pneumonia, she was

considered to be palliative and at end of life.

The wound was 4.0 x 2.0 cm in size, very superficial, and contained some exudate (see Figure 1). At the time of the assessment, she was using a foam pressure-relieving mattress and a wheelchair with an offloading cushion and fitted back. Her main complaint at the time of assessment was significant pain at the site of her wound both

while in the chair and in bed. Since there were some concerns that infection was causing her pain, a course of amoxicillin 875 mg/clavulanic acid 125 mg for two weeks was started. It was changed to ciprofloxacin 250 mg for two weeks once the culture came back growing *Pseudomonas*. Upon completion of her antibiotic therapy, the wound was smaller and drier than before, but the pain persisted.

Q What was the cause of the pain, and how would you treat it? What factors need to be considered when setting goals of care?

A referral to the palliative care team to help with pain and symptom relief came with a recommendation for the initiation of gabapentin and hydromorphone. Given the limited time that the patient's son and daughter felt they had with their mother, they were concerned about the side effects of confusion and drowsiness that accompanied adequate pain control.



Figure 1: The Patient's Sacral Ulcer

Her wound was healing well on her current foam mattress; however, the pain did not abate. Her care team, including nurse, occupational therapist, primary care physician and geriatrician/wound care physician, discussed the use of an air-flow bed as a trial to see if it would help with pain in the sacral area. Once the bed was in place, the patient had a profound and virtually immediate improvement in pain. Clinicians were able to decrease the amount of hydromorphone to 0.5 mg at supper-time and 1 mg at bedtime. This allowed her to be more awake and interactive with her family during the day. She continued to take acetaminophen throughout the day and pregabalin at bedtime.

Treating the Patient and the Cause, Not Just the Wound

Pressure injuries can be very painful. Over time, aging skin loses integrity, with flattening of the epidermal-dermal junction and thinning of these layers (see Figure 2). The amount and length of mature elastic fibres within the dermis increases, and trans-epidermal water loss occurs that impacts the skin's ability to resist compressive forces.^{3,4}

Skin contains more sensory nerves than any other organ in the human body.⁵ These nerves are activated by acute trauma or sustained pressure, inflammation, damaged nerve endings, infection, shearing forces with dressing changes, debridement and other topical treatments.⁶

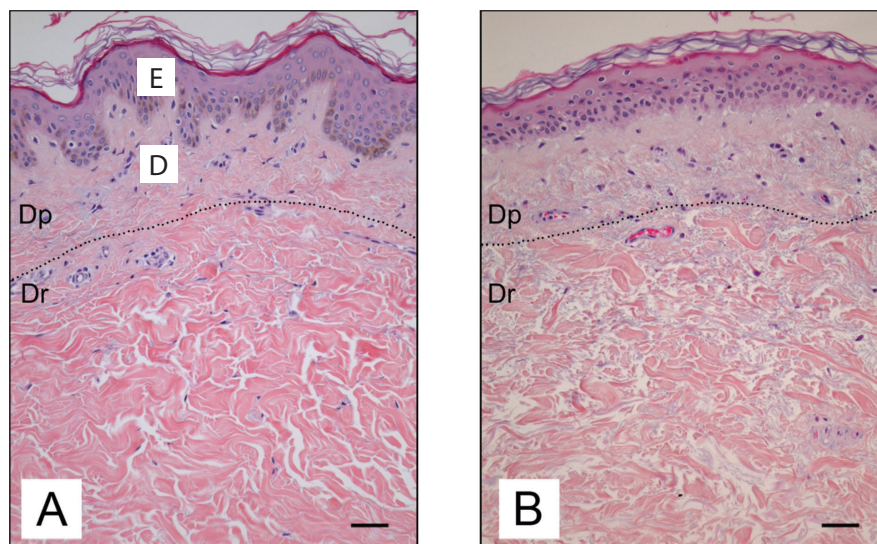


Figure 2: Histological Sections from Skin Biopsy of 19-year-old (A) and 74-year-old (B).

These photographs demonstrate flattening of the epidermal-dermal junction and thinning of these layers. E = epidermis, D = dermis, Dp = papillary dermis, Dr = reticular dermis.^{1,2}

Ulceration and pressure injury can erode tissue planes, creating inflammation and irritated nociceptive nerve terminals. This occurs with mechanical, chemical or thermal insults to the skin. When new nerve terminals are regenerating, they send out signals that may cause heightened sensitivity to pain in the wound (primary hyperalgesia) and in the surrounding skin (secondary hyperalgesia).⁷

Damage to these nerves may cause a neuropathic-type pain, and attempts to control this type of pain involve tricyclic antidepressants such as nortriptyline and amitriptyline, serotonin-norepinephrine re-uptake inhibitors such as duloxetine and venlafaxine, or alpha2-delta ligands such as pregabalin and gabapentin.⁸ Unfortunately, these medications can cause significant drowsiness in older adults, and their anti-cholinergic properties

can precipitate a delirium in more frail populations.

Other analgesics used in the treatment would be acetaminophen, non-steroidal anti-inflammatory drugs (NSAIDs), or opioids. Acetaminophen is a reasonable first-line choice as its side-effect profile in the elderly is minimal as long as liver function is intact. It may, unfortunately, not be adequate to control severe pain in this population. NSAID medications have more contraindications in older adults so therefore have a more limited role and should be used with caution. Opioids are often the chosen agent, but drowsiness can be a limiting side effect, as it was in this patient's case.

The Importance of the Bed Choice

It can at times be difficult to access higher-end beds, so it

was important to involve the physician, occupational therapist and wound care nurses to advocate for the patient within the hospital setting to receive the alternating air-flow mattress. This type of mattress, until recently, was perceived as a treatment for those with stage 3 wounds or worse. The significant improvement in pain that occurred with a change in mattress argues for the use of this type of mattress as a pain-management therapy in itself and it should therefore be considered in any wound stage where pain is a significant complaint or issue.

The Positive Outcome

In the case of this patient, we were pleased that the change in mattress resulted in such remarkable pain relief. Her family

reported that she was reasonably coherent and comfortable for her final days, which allowed them to spend quality time with her before her passing two months later.

Through a multi-disciplinary approach, we were able to find a solution to our patient's pain that had the fewest side effects, keeping in mind that the goal of patient care was comfort and quality time with her family. 🙌

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