

An Alternative Approach: Decellularized Dermal Matrices For Pilonidal Sinus When Standard Care Falls Short

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Introduction

A young female patient, referred to by the pseudonym Daisy, presented to a wound care clinic in Northwest Ontario on March 30, 2023, with a wound to her intergluteal cleft. Daisy had a history of pilonidal cysts and, despite undergoing two previous surgeries for pilonidal cyst removal in 2021 and 2022, experienced a recurrence of the sinus after a failed closure. Eventually, the wound did close, but then dehisced, leaving Daisy to depend on ongoing wound care in her remote hometown. Daisy stated that she was

tired of dealing with this issue for over two years, which impacted her life a “great deal,” causing discomfort, embarrassment and absence from work. She also stated her local clinic had tried multiple different wound dressings, such as Gentian Violet, Methylene Blue Antibacterial (GV/MBA) foams and collagen and oxidized regenerated cellulose dressing with silver, but nonetheless, the wound remained open. It seemed that despite using the most advanced standard care dressings, Daisy was not able to achieve the desired outcome.

Desperate for a solution, she chose to travel more than 485 kilometers from her home seeking advanced wound care from an 'expert' in wound healing. This included advanced techniques and therapies (e.g., dermal matrix, or DDM), which were not readily available in her local area. The term 'expert' used here refers to a health-care provider who has undergone specialized training and possesses in-depth knowledge, skills and judgment to make decisions about therapies tailored to specific wound types and characteristics, ensuring the highest level of care and treatment to achieve the desired outcome — wound healing.

What Is Pilonidal Sinus?

Pilonidal sinus wounds (PSW) are characterized by the formation of a sinus tract or small tunnel in the skin, usually around the intergluteal cleft. Each year, numerous young individuals, predominantly young adults (21 years for male and 19 years for female) with predisposing factors such as obesity, family history, excess hair and prolonged sitting, experience discomfort, embarrassment, and workplace absenteeism as a result.^{1,2} Hair follicles play a crucial role in the development of PSWs.¹⁻⁴ Initially, follicles in the gluteal cleft become blocked due to friction and moisture,⁴ leading to an environment prone to inflammation and infection.^{3,4} This blockage results in folliculitis, contributing to abscess formation.⁴ As the infection progresses, it can develop into an acute abscess, often characterized by a painful, pus-filled swelling in the subcutaneous tissue near the follicles.^{3,4} If untreated, the acute abscess can evolve into a chronic abscess, leading to the development of sinus tracts that connect the abscess cavity to the skin surface.³⁻⁵ Hair accumulation within the chronic abscess is considered a secondary phenomenon that perpetuates inflammation and hinders healing.^{4,5} Indeed, in many cases, the wound may fail to heal completely, leading to recurrent infections, drainage and discomfort, and subsequent attempts at wound care may involve various dressings, wound debridement and other interventions—yet the sinus tracts persist,

prolonging the healing process¹ and the suffering.

Despite being a relatively common condition, PSWs can be challenging for both the patient and clinicians to manage, with treatment often involving surgical excision of the sinus tracts and ongoing wound care to prevent recurrence.² The non-healing PSW, and prolonged need for wound care, greatly impact patients' quality of life. Individuals may endure a cycle of healing and recurrence for an extended period, significantly affecting their lifestyle.⁵ Therefore, effective management strategies and ongoing research are needed.

Physical Examination

Upon examination, Daisy appeared otherwise healthy, with no chronic medical conditions. On March 30, 2023, the wound in the intergluteal cleft exhibited moderate serous drainage and keloid scarring at the edges. Despite clean granulation tissue, excoriation of surrounding skin indicated irritation (likely from previous dressings). Unsurprisingly, Daisy reported tenderness during wound care and stated it usually drains and impacts her social life. The wound measured 1.0 x 0.5 x 1.0 cm (l x w x d). At this time, the wound was cleansed with saline and a hypochlorous acid compress was applied for five minutes, followed by GV/MBA foam as the primary dressing, which was then covered with an absorbent wound pad with border.

Key Questions

As the wound care provider:

- What would you do if standard care wasn't effective?
- Are you open to trying different options to help patients with challenging wounds?

An Innovative Approach: Treatment With DDM

Decellularized dermal matrix (DDM) grafts are relatively new to wound care.^{6,7} Although there is emerging evidence of DDM efficacy in diabetic foot ulcers,^{6,7} there is comparatively little research on their applicability to PSWs in clinical practice.

Yet, in Daisy’s case, it was clear that an innovative treatment modality was necessary, and DDM grafts offer a biologically active scaffold that supports tissue regeneration and wound closure by providing a framework for cell ingrowth and deposition of the extracellular matrix. It was thought that by applying a DDM, we could enhance the wound healing process and promote tissue repair in the recurrent PSW. Thus, after receiving patient consent, on March 31, 2023, a trained specialist applied a DDM graft to facilitate wound healing (See Figure 1). Health teaching points included offloading and using a cushion with a hole in the middle to prevent shearing on the wound location and dislocating the DDM from the place. While using a cushion to offload pressure on the gluteus area is not considered best practice, in this particular case, it served the sole purpose of mitigating direct contact between a seating surface and the affected area, thus preventing displacement of the DDM. This was especially important during a five-hour journey, undertaken one week after the application of DDM, between her remote hometown and the clinic for follow-up appointments. The patient was

aware that she could gently move her gluteus while using the cushion. At home, she was advised to minimize pressure on her gluteus and to only use the cushion when necessary.

Follow-Up And Management Timeline

April 5, 2023 (five days post application): The DDM remained intact, and the edges were well attached within week one. Once the bandage was removed, minimal serosanguinous drainage was noted, and Daisy denied experiencing pain since the DDM application, stating that she had been offloading the area as much as she could. For treatment, the DDM was left intact and covered with a secondary dressing, and all were held in place with medical tape.

April 12, 2023: Daisy returned for a dressing change, stating the area had been itchy, and was advised to take an oral antihistamine. The right edge of the DDM had started to lift but remained intact (See Figure 2). The area around the DDM was cleansed with saline, and skin prep was applied to the surrounding area. The wound

was covered with a new secondary dressing and secured with medical tape.

April 15, 2023: Daisy had returned home and was being treated through virtual care when she sent a picture stating that she noticed a “tiny hole” with moderate amounts of serosanguinous exudate (See Figure 3). Daisy was instructed to remove the dressing carefully, but when she did, the DDM came off with the bandage. She was advised to cleanse the wound and apply a secondary dressing until her next appointment in two

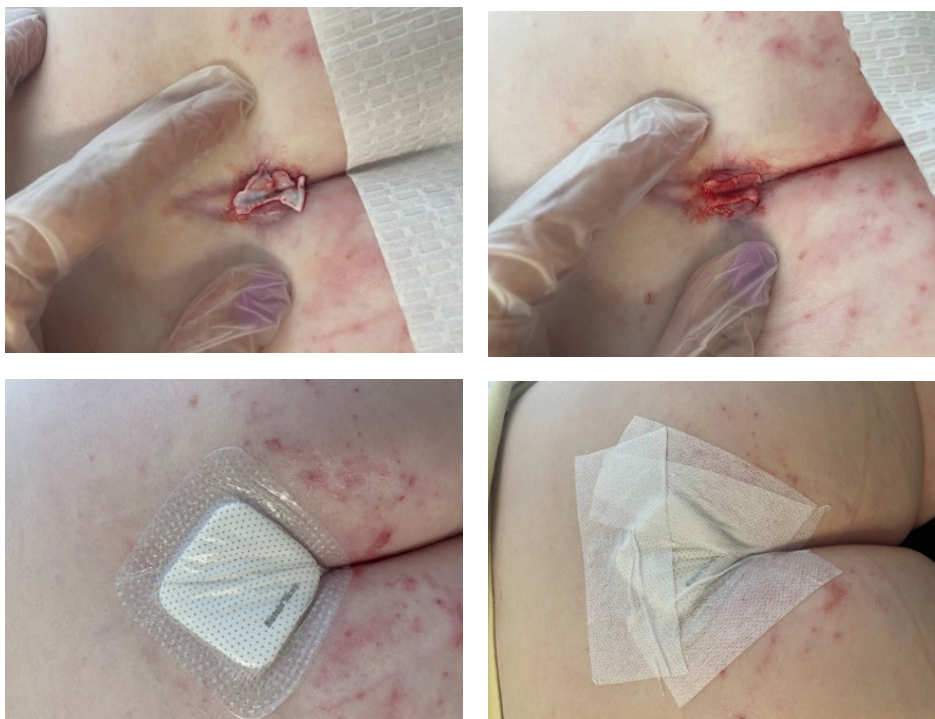


Figure 1. Treatment day; secondary dressing to hold DDM in place



Figure 2. Week 1



Figure 3. Week 2



Figure 4. Week 3



Figure 5. Closure

days.

April 17, 2023: Daisy was seen in the clinic for follow-up, post-DDM accidental removal. The wound appeared to be closed with minimal drainage noted. However, when Daisy left the appointment, she stated that she sat down and noticed the wound began to bleed. The wound was reassessed that same day and a very superficial opening measuring 0.5 x 0.1 x 0.1 was noticed (See Figure 4). The area was cleansed, and a barrier cream was applied to the peri-wound area. Daisy returned home and her mother assisted with dressing changes as per virtual care from a specialized clinician at the clinic.

April 18, 2023: Daisy sent a picture taken by her mother (Figure 5). Both Daisy and her mom were happy to report that the wound appeared to be closed.

April 22, 2023: Daisy had a home care nurse at her side changing her dressing who confirmed that her wound was completely healed.

Then, Daisy sent the following message to the wound specialist through virtual care: *“Hey just letting you know that am fully healed now. Thank you very much for helping me heal this wound.”*

Outcome

Despite a temporary setback during treatment with DDM, the wound healed and was completely closed 24 days post-treatment on April 22, 2023, as confirmed by Daisy’s report, which is faster than standard care for open healing.¹ Importantly, home care and support from family members helped lead to Daisy’s full recovery.

Conclusion

Daisy’s case highlights the challenges associated with recurrent pilonidal wounds and the importance of accessing advanced wound care experts and interventions. Additionally, it is important to stress that through a person-centred approach, successful wound management and healing can be achieved. We firmly believe that the utilization of DDMs holds promise in addressing not only diabetic foot ulcers but also other ‘off-label’ wounds, such as PSWs, where conventional treatments may fall short to the point of prolonging patient suffering and impacting their quality of life. The integral role played by virtual care in supporting healing in remote areas, home care and Daisy’s informal caregiver (her mother) cannot be overstated. All in all, by integrating novel approaches into practice, we can facilitate successful wound healing, thereby mitigating the risk of experiencing negative outcomes and ultimately enhancing patient quality of life.

Editor’s Note: The dermal matrix (DDM) used in this case report, DermGEN™, is approved by both Health Canada and the FDA for all cutaneous wounds. While it was initially targeted for diabetic foot ulcers (DFUs) due to the abundance of data supporting its efficacy in this indication, efforts are underway to explore its use for other wound types. The first author has been collaborating as a clinical expert for the use of DermGEN and has received trial products to provide for free to patients that meet the criteria, with the goal of developing best-use protocols for different wounds. At present, the product in Canada is provided for DFUs through hospitals in their

wound care clinics. For other clinics, there would be a cost to the patient for the product.

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Editorial deadline for Fall 2024 issue: September 30.



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