

Closure of a left heel stage IV pressure injury in a 6-year-old with a congenital defect utilising EpiFix®

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Pressure ulcers, which have undergone definition revisions and been re-termed “pressure injuries” by the National Pressure Ulcer Advisory Panel (NPUAP, Edsberg et al, 2016), can have a significant negative impact on the quality of life of patients. Furthermore, pressure injuries are a growing financial burden on healthcare systems globally due to extended inpatient length of stays, increased hospital readmissions and overall escalating utilisation of healthcare resources. Populations at risk of pressure injuries include those with decreased mobility, inadequate nutrition, incontinence and altered consciousness (Allman, 1997). This case report highlights the case of a 6-year-old boy with a congenital spinal defect who developed a pressure injury during a prolonged hospitalisation. He was treated successfully in the outpatient setting using EpiFix® (MiMedx) which is a dehydrated human amnion/chorion membrane allograft (dHCAM).

Many individuals with limited mobility secondary to trauma or a congenital spinal defect, such as spina bifida, will at some point in their life develop a pressure injury. Factors contributing to the formation of pressure injuries in people who are bed or wheelchair bound include decreased peripheral sensation impairing the protective pain feedback pathway, insufficient circulation below the waist resulting in compromised oxygen and nutrition delivery, as well as insufficient removal of fluid in gravity-dependent regions, causing increased oedema.

Comorbidities, such as these, present concurrently, mean that pressure injuries can develop rapidly and heal very slowly. The longer stage IV pressure injuries remain open with exposed deep tissues (i.e. bone, tendon, joint capsule), the higher the risk for a complicating adverse event to occur, such as an infection, amputation and increased morbidity. Rational use of regenerative therapies should be considered when ulcers do not respond sufficiently to good standard care, in order to re-initiate the wound healing cascade.

Case study

A 6-year-old boy with a history of a congenital spinal defect developed a stage IV pressure injury during an extended stay in a paediatric

ward where he had been admitted for an orthopaedic procedure at another hospital. The patient presented to the outpatient wound department at Qassimi Hospital with an unstageable left heel pressure ulcer covered with black eschar. The patient's parents did not desire further surgical intervention in the operating room. The ulcer originally measured 4 cm x 5 cm (20 cm²). Once the ulcer was debrided using a scalpel and an endo-scan scanner laser, the base of the Achilles tendon and exposed bone was observed [Figure 1]. The pressure injury was then re-classified as a stage IV pressure injury. A 4 cm x 4.5 cm EpiFix® (MiMedx) allograft was applied to the wound bed and covered with a moist secondary dressing with a light pressure bandage. The heels were to be floated for offloading.

On day 6, the wound was further cleansed and irrigated. Increased granulation tissue was noted in the ulcer base. A second EpiFix allograft was applied along with the moist secondary dressing and light compression bandage was continued [Figure 2].

On day 19, the ulcer has significantly decreased in size. There was no exudate. The ulcer was irrigated and a fourth EpiFix allograft was applied to the base. Again, a moist secondary dressing and light compression bandage was continued [Figure 3].

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Figure 1. Pre- and post-debridement pressure ulcer on left heel – Day 0.



Figure 2 (left). EpiFix sheet number two applied to left heel — Day 6. Figure 3 (right). EpiFix® sheet number four applied to left heel — Day 19.



Figure 4. Complete resolution of left heel pressure injury — Day 29.

Disclosure: William Tettelbach is employed by MiMedx Group, Inc.

Results

Despite the presence of exposed bone, poor circulation due to paraplegia and the ulcer being positioned over a bony prominence, the stage IV pressure injury completely resolved after 29 days from presentation with four applications of topical EpiFix allograft therapy. Minimal scarring of healthy tissue without significant contraction at the healed ulcer site was noted on the last day of follow-up [Figure 4].

Conclusion

Stage IV pressure injuries are difficult to heal. On an individual wound basis, the most expensive mean spending per Medicare beneficiary in the United States was for arterial ulcers followed by pressure injuries (Nussbaum et al, 2018). The successful closure highlighted

in this case report underscores the need for appropriate debridement, offloading, wound bed preparation and the utilisation regenerative therapies to improve outcomes. Whenever possible, inpatients with stage IV pressure injuries should be discharged and treated in the outpatient setting.

Under the supervision of a knowledgeable clinician outpatient, wound care can be more cost effective than inpatient care. It is also important to note that family members and caregivers should be educated about basic pressure injury treatment techniques, such as offloading and moisture control. These cases support the use of EpiFix as a treatment to heal stage IV pressure injuries. Dehydrated human amnion/chorion membrane (dHACM) has been shown to contain growth factors that help in wound healing, including PDGF--AA, PDGF--BB, bFGF, TGF--β1, EGF, VEGF, and PIGF, as well as anti-inflammatory interleukins (IL--1ra, IL--4, IL--10), and TIMP--1, TIMP--2, TIMP--4, which help regulate the matrix metalloproteinase activity.

Results from *in vitro* and *in vivo* experiments established that dHACM contains factors capable of stimulating mesenchymal stem cell migration and recruitment (Koob et al, 2014a;b). Larger, controlled studies are warranted to assess the wider use of dHACM as a treatment for pressure injuries. WME

References

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