INTRODUCTION
Approximately 6.5 million people in the United States suffer from chronic wounds, with over $25 billion spent on wound related complications each year (1). Charcot neuroarthropathy is a destructive disease of the bones and joints due to sensory neuropathy. Diabetic neuropathy is the most common cause of Charcot neuroarthropathy, with the foot and ankle most commonly affected (2). Risk factors for development of a foot ulcer in persons with diabetes include neuropathy, peripheral vascular disease, history of previous ulceration, foot deformity, type of footwear, and body weight (3). Wound healing is optimized with prevention of infection, off-loading, debridement, dressings, and managing health problems. Once an ulcer has formed, healing may be delayed chronically unless the ulcerated area is off-loaded (4). Successful healing of diabetic foot ulcers often requires long treatment periods that can be both painful and demanding. A considerable amount of time must be spent on clinic visits, hospitalizations, and frequent changes of ulcer dressings. The presence of a foot ulcer also creates anxiety due to the possibility of amputation (5). Research has lead to an increase in wound care products available today. Negative pressure wound therapy promotes wound healing by removing exudate, drawing wound edges together, reducing edema, increasing granulation tissue formation by facilitating cell migration and proliferation. There is also strong evidence that living cell-based skin substitutes increase the success rate of healing chronic foot wound compared to standard therapy (6). We present a case of a chronic wound healed through the use of cellular human repair matrix grafts in combination with mechanically powered negative pressure wound therapy (MPNPWT*).

CASE REPORT
A 64 year old male with poorly controlled noninsulin dependent diabetes mellitus (NIDDM) and a rocker-bottom foot type (Figure 1), presented to Southern Arizona Veterans Affairs HealthCare System with a chronic diabetic foot ulceration to his left lower extremity for 3.5 years. His comorbidities include Charcot arthropathy, chronic kidney disease, hypertension, venous insufficiency, and morbid obesity. He has a body mass index of 46.21 and hemoglobin A1c of 10.7. After multiple failed treatments and discussions of below knee amputation, he sought a second opinion. Previous treatments of local wound care, topical oxygen, and multiple skin grafts failed.

Twice weekly applications of MPNPWT* combined with weekly and biweekly applications of cellular human repair matrix grafts** were applied to the wound per company protocol. He continued to ambulate in his modified crutch walker during treatment. To maintain a proper seal on the plantar aspect of the foot, a hydrocolloid secure ring was used with the MPNPWT*.

RESULTS
Upon treatment with MPNPWT and cellular human repair matrix, the wound measured 3.6cmx1.5cmx0.1cm (Figure 2). Within four weeks, the wound size decreased by 50% (Figure 3). MPNPWT was applied twice weekly. A total of nine cellular human repair matrix grafts were applied. The wound healed at 20 weeks (Figure 5). There were no complications of infection during the treatment period.

CONCLUSION
In utilization of combined MPNPWT with the hydrocolloid secure ring, cellular human repair matrix and adherence to gold standard offloading, we were able to heal this patient’s limb threatening wound without interruption. The patient was able to remain home and maintain an ambulatory status during treatment. We were able to prevent a high level amputation and improve the patient’s quality of life.

REFERENCES

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*Snap Wound Care System by Spiracure  **Graftix Prime by Osiris Therapeutics

Figure (1): Rocker-bottom foot type.
Figure (2) Wound at initiation of MPNPWT* and cellular human repair matrix ** measuring 3.6cmx1.5cmx1.0cm; (3) Week 4: 3.5cmx1.3cmx0.5cm; (4) Week 14: 2.8cmx0.5cmx0.5cm; (5) Week 20: wound healed.