



Introduction

Wound epithelialization is commonly used as a clinical endpoint to define healing; however, newly epithelialized tissue may remain biologically fragile and susceptible to breakdown, particularly in high-risk patients or high-stress anatomical locations. Mechanical stress, friction, microclimate imbalance, and residual inflammation may contribute to wound recurrence despite apparent closure. Protective dressings may help support tissue maturation and reduce early post-closure complications.

Wound dehiscence following closure of foot wounds remains a common complication in patients with diabetes, peripheral vascular disease, and other comorbidities that impair healing. Surgical site dehiscence in the foot most frequently occurs during the early postoperative period, typically 4-14 days after closure, when the wound may appear externally healed but underlying tissue strength remains limited². In complex diabetic foot surgery and amputations, reported wound dehiscence rates range from 40-61%, reflecting vascular compromise and increased biomechanical stress in the foot⁴.

During the early remodeling phase of wound healing, collagen deposition remains immature and is predominantly composed of type III collagen, resulting in minimal tensile strength. Tissue strength is estimated to be approximately 3% of normal at one week following closure, increasing to roughly 20% by the third post-closure week as type III collagen is gradually replaced by stronger type I collagen^{2,3}. Because of this biologic vulnerability, protecting newly epithelialized tissue during early remodeling may help reduce mechanical failure and wound breakdown.

The objective of this case series was to describe clinical outcomes associated with the use of a silicone border superabsorbent polymer (SAP) dressing applied following wound epithelialization for protective purposes.

Methods

This retrospective case series included patients with recently epithelialized wounds of varying etiologies who were transitioned to a silicone border SAP dressing following confirmed surface closure. The dressing was selected to provide atraumatic silicone adhesion, microclimate balance and moisture retention, pressure redistribution, and a semipermeable protective backing, consistent with the dressing's described properties and mode of action.

Clinical outcomes assessed included:

- Maintenance of epithelial integrity
 - Incidence of wound recurrence or breakdown
 - Patient tolerance
 - Duration of protective dressing use
- Follow-up occurred during routine clinical visits

Results

Across cases, protective dressing use following epithelialization was associated with maintenance of wound closure during the observation period. No cases of immediate wound breakdown were observed while the dressing remained in place. Clinicians reported favorable dressing conformability, atraumatic removal, and high patient comfort supporting continued use during daily activities. Dressing wear times were consistent with routine outpatient practice, and no adverse skin reactions were reported. Wounds remained closed following several weeks post epithelialization.

Discussion

This case series highlights the potential role of protective silicone border SAP dressings following wound epithelialization to support fragile newly healed tissue. Although wounds may appear clinically closed, the early remodeling phase represents a period of biologic vulnerability, during which tensile strength remains limited, and tissue may be susceptible to mechanical stress. Dressings that balance microclimate, redistribute pressure, provide atraumatic silicone adhesion, and protect from external contaminants may support tissue maturation during this critical phase. Supporting the appropriate environment after epithelialization may allow additional collagen remodeling and strengthening of the wound bed, potentially reducing the risk of early wound breakdown in high-stress areas such as the foot. Further prospective studies are warranted to better define patient selection criteria and optimal duration of protective dressing use following epithelialization.

CASE STUDY 1:

85 year old male with past medical history of coronary artery disease, hypertension, previous STEM, and extensive peripheral vascular disease, presented with a worsening right foot wound for several months duration. Upon full evaluation he was found to have osteomyelitis within the fifth ray including the toe and metatarsal that ultimately required amputation of the toe. Due to blood flow to the foot and failed re-vascularization, this wound became very difficult to heal, taking nearly six months to achieve full closure. To protect the wound following epithelialization, the wound was padded for an additional two weeks with a protective silicone border SAP dressing (Zetuvit® Plus Silicone Border). This allowed more time for tissue remodeling and ultimately helped lead to successful healing without further complication or dehiscence.



Image 1: Right foot wound, post partial fifth ray amputation, with BIOMES of 6+, high risk wound, during the initial stages of wound care



Image 2 and 3: Once epithelialization was achieved, the wound was dressed with a padded silicone border SAP dressing for another two weeks



CASE STUDY 2:

73 year old male with past medical history of type two diabetes and hypertension, with a left ankle and foot wound that had continued to ulcerate for over one year. It had times of improvement, but had difficulty with sustained closure in part due to its location on the body near a bony prominence. At times, moisture was uncontrolled with periods of desiccation and sometimes surrounding tissue maceration which also caused the wound to stall for periods of time and not heal. After applying the BIOMES tool and switching into the proper dressing, healing was achieved. The silicone border SAP dressing (Zetuvit® Plus Silicone Border) was continued for the epithelialized wound for an additional two weeks support the early stage remodeling. This allowed sustained healing even at the two month follow up, with no signs of dehiscence.



Image 1: Difficult wound on left medial ankle. Present greater than one year. BIOMES of 5



Image 2: Close-up of full wound closure / epithelialization



Image 3: Padded dressing used 2 weeks beyond closure

CASE STUDY 3:

44 year old male with past medical history of type two diabetes, obesity, and hypothyroidism. Gas gangrene infection leading to a transmetatarsal amputation of the right foot. Continued wound dehiscence and plantar ulceration with a non-healing wound for over 4 months near the TMA stump site. Once the wound was healed, padding with silicone border SAP dressing (Zetuvit® Plus Silicone Border) was continued, which finally helped achieve wound healing and continued closure even at the three month follow up.



Image 1: Wound dehiscence and plantar ulceration with non-healing wound. BIOMES of 5



Image 2: Padded dressing used 2 weeks beyond closure

Citations

Reference:

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