



Meeting the Challenge in Wound Exudate Management

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Abstract

Exudate management is a major concern in the treatment of a variety of wound types. The challenge often is to find products that are highly absorptive and cost effective yet still capable of creating a proper moist environment to promote healing. This presentation discusses the management of three very unique patients, one with Prader-Willi syndrome, a second with a wound secondary to traumatic destruction of a cross leg flap, and a third due wound due to chronic venous insufficiency complicated by rheumatoid arthritis. Each of the patients presented with highly exudative wounds that required frequent (in one case up to 3 times per day) dressing changes to control fluid and minimize periwound maceration. The cases demonstrate how a new dressing was used to effectively manage these wounds. The dressing consists of a hypoallergenic polypropylene outer layer which covers an inner layer of cellulose and super absorbent polymer. Introduction of this dressing to the wound care regimens of these patients reduced the need for dressing changes by greater than 50% and readily gained patient acceptance. The absorptive power of the dressings was remarkable, and in one case, resulted in the complete healing of a recalcitrant ulcer that had been present for greater than three years.

Introduction

Since the seminal work of George Winter in 1962, much has been written on the benefits of a moist environment in facilitating wound healing. The challenge that often faces the wound care clinician however is that of maintaining a proper moisture balance and preventing the scale from slipping toward tissue maceration. Numerous products have subsequently been developed to address absorbency while attempting, at the same time, to minimize chances of tissue desiccation. These include various alginate, hydrofiber, and collagen based products. As new products enter the market, clinicians evaluate them on a variety of criteria including ease of use, patient acceptance, and cost effectiveness, in addition to whether the dressings performs as reported in sales claims.

The following case studies report on a superabsorbent polymer dressing^{*} that was recently introduced to the U.S. market. It consists of a hypoallergenic, polypropylene outer layer which covers an inner layer of cellulose and super absorbent polymer. The dressing essentially functions much like a modern incontinence pad. The superabsorbent polymer granules absorb and enclose the exudate and prevent fluid release even when the dressing is exposed to pressure. The superabsorbent power also minimizes the need for frequent dressing changes thereby minimizing patient discomfort, reducing cost, and facilitating moist wound healing.

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Patient # 1

R. E. is a 32 y.o. African American male who presented for management of chronic, exudative lesions of the left lower extremity. The patient's condition was complicated by his diagnosis of Prader-Willi syndrome. On admission to the wound care center, he was noted to be of short stature and morbidly obese. He walked with a wide base, shuffling gait, but was able to ambulate independently.

The left leg was noted to be markedly edematous. The dorsalis pedis pulse was 2+ and capillary refill in the toes was good. Four superficial wounds were noted on the leg. They ranged in size from 1 to 15 cm² (Figure 1). The largest wound showed evidence of early re-epithelialization. The patient was cognitively incapable of managing his own wound care so dressings were being changed by his mother and grandmother. The dressings consisted of absorbent pads and gauze wraps. These dressings tended not to remain in place well and the patient also had a tendency to scratch the extremity.

Initial treatment consisted of vasopneumatic compression at 60 mmHg for 30 minutes. Alginate dressings were then applied and secured with a short stretch bandage. This regimen did not prove effective as the bandages would not remain in place and wound exudation exceeded the absorbing capacity of the alginate dressings within twenty-four hours. The treatment was therefore changed to hydrofiber dressings which were secured by Unna's boots changed twice weekly. Some progress was noted in the wounds, but exudation continued to be problematic. Superabsorbent polymer dressings were therefore instituted and secured by Unna's boots. The frequency of dressing change was able to be reduced to once weekly. Following 5 months of therapy, all wounds healed (Figure 2) and the condition was able to be managed by compression garments.



Figure 1 – Appearance of extremity at time of initial presentation to the wound care center



Figure 2 – Appearance of extremity at discharge following use of superabsorbent polymer dressing



Figure 3 – Failed cross leg flap prior to the institution of superabsorbent polymer dressing



Figure 4 – Re-epithelialized wound prior to discharge for plastic surgery revision

Patient # 2

P.T. is a 50 y.o. African American male referred to the wound care clinic for management of a wound on the right calf following an avulsed cross leg flap and subsequent unsuccessful split thickness skin graft.

On his initial visit, the patient ambulated into the clinic with a standard walker. He was accompanied by his wife who indicated her frustration with trying to find a dressing that could successfully manage the drainage he was experiencing from the right calf wound. (Figure 3) She indicated that she had been dressing the wound with gauze and absorbent pads which had to be changed three times per day. The wound measured 98 cm² and had a good granulation base but demonstrated no evidence of epithelialization.

The dressing regimen was changed to the superabsorbent polymer dressing. The dressing was applied, secured with a layer of gauze and then elastic tubular support applied to help hold the dressing in place and provide compression to counteract swelling. With application of the superabsorbent dressing, the patient was now able to go from three time per day dressing changes to every other day changes. Needless to say, the patient and his wife were extremely pleased.

With the initiation of the superabsorbent dressing and external compression, the wound began to respond and within one month had re-epithelialized by 50%. Progress continued steadily and the patient was able to advance to every three day dressing changes. Subsequent hospitalization for other medical problems prevented the patient from being followed in our clinic to full closure, but he was supplied with dressings to continue our previous regimen. At a return visit at 6 mos., the patient had healed all but a 1.5 cm² area (Figure 4) which he indicated had stopped responding for the past month. This area subsequently had to be revised by his plastic surgeon.



Figure 5 – Lower extremity ulcer present for three years and unresponsive to standard care



Figure 6 – Appearance of extremity following management with superabsorbent polymer dressing

Patient # 3

K.M. is a 94 y.o. Caucasian female referred to our clinic for treatment of a nonhealing ulcer on the medial border of the left ankle. The patient indicated that the wound occurred after she struck her ankle on a chair while transferring to a table in her internist's office. The wound had been present for just over three years and was complicated by an associated rheumatoid arthritis. The patient was able to ambulate with a walker but spent much of the day sitting or in a wheelchair.

Over the course of the three years the ulcer had grown from 1 cm² to 24 cm² despite appropriate management with absorbent dressings (alginates, hydrofibers, foams), external compression, and the daily use of a home pneumatic compression pump.

The superabsorbent polymer dressing was instituted in an effort to control exudation and minimize periwound maceration (Figure 5). The dressing was applied and secured with paper tape and a tubular support stocking was worn whenever the patient was upright. Treatment with the vasopneumatic compression device was continued at a pressure of 50 mmHg for one hour daily. The superabsorbent polymer dressing only required changing every three days. After the first week of treatment, the periwound margins were markedly improved. This improvement continued for the next several weeks until week 12 the wound had completely re-epithelialized (Figure 6) The patient was then fitted with compression stockings and there has been no recurrence to date.

Prader-Willi Syndrome

Prader-Willi syndrome (PWS) is a complex, non-hereditary, birth defect involving an abnormality of the 15th chromosome. It is seen equally in males and females of all races. Its prevalence is estimated to be around 1:15,000. Manifestations of the syndrome include low muscle tone, short stature if not treated with growth hormone, incomplete sexual development, and a chronic feeling of hunger. This is coupled with a metabolism that utilizes drastically fewer calories than normal and therefore can lead to excessive eating and life-threatening obesity.

Conclusions

Controlling exudate in a chronic wound can prove challenging. While numerous products exist that can wick fluid away from a wound, problems develop when fluid load exceeds the dressing capacity or, where conversely, the fluid is allowed to dry and therefore not be available to provide the moist healing environment that is desired. Superabsorbent polymer dressings provide a unique answer to these problems. Not only are the dressings highly absorbent, but the collected moisture is situated over the wound bed and prevents tissue desiccation.

Three different and challenging cases have been presented that had failed to respond to standard care that is appropriate for wounds with lesser exudation. The addition of the superabsorbent polymer dressing provided an environment that not only facilitated resolution of the wounds but also decreased the caregiver time and cost in management.