

THE USE OF A UNIQUE DELIVERY METHOD OF IONIC SILVER: A CASE SERIES

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ABSTRACT

When providing optimal treatment to non-or slowly healing wounds, practitioners may infer high bioburden levels, even without clinically significant wound cultures. Immunosuppressed persons may exhibit symptoms of chronic infection (and poor healing) with reduced amounts of bacteria. Additionally, toxins such as matrix metalloproteases (MMPs) may be present in increased numbers and contribute to slow healing. Ionic silver is known to be an effective broad-spectrum antimicrobial agent. Silver containing gel dressings appear to be effective at reducing bacteria in the wound bed, may affect MMPs, and encourage healing. The silver containing gel dressing makes intimate contact with all surfaces of the wound. The dressings can be applied to dry, moist, or wet wounds of varying depths and etiologies. They have the additional advantage of being easy for patients to use, and are non-sensitizing and non-irritating, and cause no apparent side effects. This case series reports on the advantageous use of innovative silver containing gel dressings to reduce bioburden and enhance healing. Nine persons with chronic wounds entered our outpatient wound clinic after failure to heal using traditional wound care treatments. Once admitted, wounds were cleansed with saline and debrided routinely. At different points in treatment, all used silver containing dressings for an average of 3.1 weeks. Overall, we noted a forty-three percent decrease in wound size; 55% healed completely. Plans are to continue to utilize silver containing gel dressings.

INTRODUCTION

Poorly progressing or non-healing chronic wounds are a common challenge, particularly among elderly and immunosuppressed persons. Toxins, such as matrix metalloproteases (MMPs), are present in higher numbers in chronic wounds and may delay healing. Such wounds may exhibit symptoms of chronic infection and slow healing, even with small amount of bacteria present.

After optimal wound treatment was provided to nine persons with non-or slowly healing wounds, our wound clinic staff implemented new silver antimicrobial dressings*. We suspected heavy colonization or local wound infection. We chose the new silver dressings, since ionic silver is an effective broad-spectrum antimicrobial agent.

Average length of time of use for the dressings was of 3.1 weeks. We routinely cleansed and debrided wounds. The dressings made intimate contact with all wound surfaces. Silver MicroLattice sheet dressings were cut to fit the wound size and applied directly to the wound surface. Silver MicroLattice cavity was packed into cavity wounds, covered with an occlusive or semi-occlusive dressing. Amorphous silver gel was applied directly to the wound surface or impregnated into moist gauze.

Patients were changed to a different therapy if they reached a plateau, if satisfactory progress toward healing was achieved, or if wound characteristics indicated a therapy change.

CASE STUDIES

A. 67 y/o female with multiple sclerosis with a pressure ulcer. She has a history of total incontinence requiring a diverting colostomy and an ileal conduit. Multiple wound care products including negative pressure therapy, hydrogels, hydrocolloids, alginates, saline and gauze were utilized. Exposed bone was positive for osteomyelitis. The wound was covered with 50 % slough. Treatment: Silver cavity* for 7 weeks, wound decreased by 19%. She was discharged for flap surgery.

B. 83 y/o male with a history of diabetes and arterial insufficiency. Surgical wound had been treated with gauze and saline, multi-layered polyacrylate dressing pad. Wound cultured positive for proteus and staph aureus with 100% slough. Treatment: Silver gel for 2 weeks, changed to silver cavity for 4 weeks. Wound closed at 6 weeks.

C. 75 y/o female with a traumatic wound. She has a history of polycythemia vera and steroid use. Previous dressings included gauze and saline as well as silver sheet dressings. The wound cultured positive for enterobacter cloacae and candida. The wound was covered with eschar (90%). Treatment included silver containing gel for 2 weeks. Symptoms resolved and the products were changed to collagen and hydrocolloid. The wound closed and was discharged at 10 weeks.

D. 32 y/o male with a surgical wound. His past medical history includes obesity and smoking. The wound was originally treated with gauze and saline dressings. It cultured positive for staph aureus, staph agalact, group B strep. The wound was covered with 80% slough and 20% granulation tissue. There was an 88% reduction in wound size with silver containing gel for two weeks. At that point, he was lost to follow up.

E. 87 y/o female with a recurrent pressure wound; initially etiology was thought to be trauma. She has a history of diabetes, COPD, with steroid use. Cultures were positive for mycobacterium chelonae and coag negative staph. The wound was covered with 100% slough. After 4 weeks of silver containing gel sheet, the wound was 100% closed.

F. 62 y/o female with a long - standing pressure wound. She has a history of CHF, COPD, urinary incontinence, arthritis and morbid obesity. The wound was covered with 20% slough and cultured positive for peptostreptococcus and coag negative staph. Initial treatment contained silver containing gel for 1 week. Changed to amorphous hydrogel. 100% closed in 4 weeks.

G. 24 y/o male in his usual state of good health until he received a deep partial thickness burn. Prior treatment included silver sulfadiazine cream. Wound 90% eschar. The treatment was silver containing gel for three weeks. The wound decreased in size by 59%. Pt lost to follow up.

H. 69 y/o male with a traumatic wound. His medical history is significant for venous insufficiency, CHF, atrial fibrillation, COPD, smoking. Historical treatment included gauze and saline. Wound was covered with 40% slough. Silver containing gel for two weeks was initiated and the wound size decreased by 11%. The dressing was changed to hydrocolloid and alginate. 100% healed at 5 weeks.

I. 71 y/o female. Surgical wound. Medical history includes: arterial and venous insufficiency (ABI of .67), diabetes, hypertension, CVA and MI. Original treatment included betadine and topical antibiotic ointment. Wound cultures were positive for staph intermedius and beta strep group G. The wound bed was 40% slough. Treatment changed to silver containing gel for one week which revealed a 75% reduction in size. The treatment was then changed to plain amorphous hydrogel. Patient refused further treatment and expired.

J. 51 y/o female with a surgical wound. Her medical history includes HTN, obesity, smoking, arthritis, having suffered an MI. This long-standing wound had been treated with gauze and saline for four years. Wound bed is 100% clean, with exposed mesh. Current treatment is silver containing gel for four weeks. The wound has decreased in size by 51%.

CONCLUSION

Overall, we noted a 43% decrease in wound size for the group; 55% healed completely. We found these dressings to be simple to apply, comfortable for the patient, and an effective way to provide moist wound healing.

Silver antimicrobial dressings appear to be effective at reducing bacteria in the wound bed, which may decrease MMPs and encourage healing. When used in conjunction with other appropriate measures such as debridement, compression, pressure management, diabetes control, moisture control, etc., we have seen good clinical results. Based on these findings, we plan to continue using silver antimicrobial dressings in our wound clinic.

REFERENCES

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Data

Pt	Age, sex Wound type	Microbial Content	Start size (cm)	End size	Dressing used	Time used	% decreased	Outcome
A	67, F PU	Osteomyelitis	4.5 x 3.3 x 2.0	4.3 x 3.1 x 1.8	Cavity	7 weeks	19%	Wound condition improved Sent for flap, successful
B	83, M surgical	Proteus, staph a	1 x 4.5 x 3.5	0 x 0 x 0	Gel, Cavity	6 weeks	100%	Healed at 6 weeks
C	75, F trauma	Enterobacter cloacae, candida	1.5 x 1 x .2	1.4 x .8 .25	Gel	2 weeks	25.3%	Discharged; healed at 10 weeks
D	32, M surgical	Staph a, staph agalact, type B strep group B	.8 x 1.7 x 1.5	.4 x .6 .8	Gel	2 weeks	88.4%	Discharged self at 3 weeks
E	87, F trauma	Mycobacterium chelonae	.5 x .5	0 x 0	Sheet	4 weeks	100%	Healed at 4 weeks
F	62, F pressure	Peptostreptococcus, coag negative staph	.6 x .9 x .1	1 x 1	Gel	1 week	-85%	Healed in 4 weeks
G	24, M burn		4.1 x 4.3	2.4 x 3	Gel	3 weeks	59.16%	Discharged self
H	69, M trauma		3.5 x 2.9	3 x 3	Gel	2 weeks	11%	Healed at 5 weeks
I	71, F surgical	Staph intermedius, beta strep group G	.8 x .6 x .7	.3 x .4 .5	Gel	1 Week	75%	Expired dit foot gangrene
J	51, F Surgical	Pseudomonas, staph a, strep C	5.4 x 3.7 .5	4.4 x 2.2 x .2	Gel	4 weeks	51%	Currently under treatment

PATIENT B



right embolectomy site, dehiscent surgical wound culture positive for Proteus and staph aureus



after 4 weeks of antimicrobial silver therapy, significant bioburden reduction, wound closed

PATIENT D



spontaneous rupture of an axillary abscess, cultured positive for staph aureus, staph agalact and group B strep



88% closure, using silver containing gel for 3 weeks.