

Pure Hypochlorous Acid-Preserved Wound Cleanser (pHA*) in Plastic Surgical Operative Wound Reconstruction; A Case Series

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Background

- Management of chronic wounds is complicated by microbial contamination, complex microbial colony production, and pH derangement^{1,2}
- Basic science research has demonstrated efficacy of pure Hypochlorous Acid (pHA) Preserved Wound Cleanser against microbes and microbial colonies, as well as favorable effects on keratinocyte and fibroblast migration³
- Hypochlorous acid is a component of the innate immune response, aiding in pathogen killing via the neutrophil oxidative burst⁴
- Hypochlorous acid is also currently being investigated in breast pocket irrigation before implant to reduce rates of capsular contracture
- Several new guidelines recommend the use of pHA

Objectives

- This retrospective case series evaluated the efficacy of intraoperative irrigation with pure Hypochlorous Acid Preserved Wound Cleanser on complex and critically colonized wounds
- This series highlights a reconstructive plastic surgeon's practice of using pHA-based cleanser irrigation in these wounds to optimize surgical outcomes and decrease complications
- Variety of wounds were included—specifically breast, perineal, extremity, axillary, pressure ulcers, and pilonidal cysts

Methods

- 20 cases were included over a 60 day period in which pHA-based cleanser was used in intraoperative protocol for wound irrigation
- 3 involved breast reconstruction, 15 chronic or colonized wounds, and 2 surgical wounds
- Surgical methods varied depending on the wound location and characteristics
- Most of the included cases were considered high risk for postoperative infection due to critical colonization
- The pHA-based cleanser was used as an adjunct to surgical reconstruction of these complex wounds, with postoperative results measured either by reduction in wound size, improvement in infection control, or lack of postoperative complications

Results

Age, sex	Date of Operation	Wound Location	Outcome
1			
71 M	1/3/22	Buried penis and pannus	Panniculectomy and reconstruction fully healed with 100% skin graft take by 2/23/22
2			
76 F	1/3/22	Thoracolumbar spine	33cm x 6cm Spinal wound reconstruction→5cm x 1cm x 0.5cm; 100% granulation
3			
56 F	1/10/22	Bilateral breast reconstruction, silicone implants	Successful breast reconstruction; no postoperative infection or capsule contracture at 8 months
4			
21 F	1/17/22	Hidradenitis buttock and thigh	Minor postoperative dehiscence at perianal wound, healed with minor in office wound care by 3/1/22
5			
57 F	1/17/22	Left buttock, groin NSTI	Resolution of osteomyelitis, successful debridement
6			
65 F	1/18/22	Bilateral breast reconstruction, silicone implants	Successful breast reconstruction; no postoperative infection or capsule contracture at 8 months
7			
52 M	1/31/22	Pilonidal cyst	Minor inferior wound dehiscence, 100% healed by 5/4/22
8			
72 M	1/31/22	Pubic wound, local flap	Pelvic fistula healing with local wound care
9			
57 F	1/31/22	Left buttock, groin NSTI	Resolution of osteomyelitis, successful ORAM and skin graft
10			
77 F	1/31/22	Spinal wound debridement, flap	Healed after revision of reconstruction
11			
41 F	2/7/22	L breast ruptured silicone implant	Well healed by 2/23/22, no infection, seroma, or hematoma
12			
66 M	2/8/22	R foot complex open wound	8cm x9cm → 100% healing of ST skin graft by 3/1/22
13			
59 M	2/10/22	Sacral pressure wound, ischial pressure ulcer, thoracolumbar spinal wound	100% healing of previously contaminated infected spinal hardware wound
14			
57 F	2/14/22	L buttock and groin NSTI	Resolution of osteomyelitis, successful ORAM and skin graft
15			
54 M	2/14/22	L foot complex open wound	6cm x 5.5cm → 100% healing of skin graft by 4/20/22
16			
70 M	2/14/22	Infected BLE calciphylaxis wounds	Assist with resolution of wound sepsis, excision calciphylaxis, 40% of granulation at 4 weeks before decided comfort care
17			
56 M	2/17/22	Penile flap and scrotal flap revision	Incision fully healed by 4/20/22, no infection or contraction
18			
57 F	3/14/22	L buttock and groin, ORAM flap	Resolution of osteomyelitis, successful ORAM and skin graft
19			
26 M	2/21/22	Bilateral axillary hidradenitis	19cm x 16cm operative wound→ fully healed
20			
26 M	2/23/22	L axillary hematoma	Axillary wound closed and fully healed

Case 15: Excision of melanoma of foot, split thickness skin graft



Results

Case 5: Left buttock, groin necrotizing soft tissue infection with osteomyelitis of the pubis



Case 9: Same patient after Oblique Rectus Abdominis flap



Case 9: After split thickness skin graft



Results

Case 19: Axillary hidradenitis



Conclusion

- pH is often an under-appreciated variable that can positively impact and promote wound healing. Peer-reviewed, published literature notes chronic wounds have a pH of 7.15-9 as compared to nominal skin pH of 5.5. It is also reported that acute healing wounds have a pH in the acidic range.
- The pHA-based cleanser's formulation results in decrease of pathological bacteria, complex polymicrobial colonies, and necrotic tissue, reducing inflammation and providing an environment for accelerated angiogenesis and wound healing. In this series, the pHA-based cleanser was used for a complex subset of inflammatory, traumatic and colonized wounds with a goal of correcting the wound pH to ~5.5, that of nominal healthy skin, to assist with wound healing and reduce surgical infection and dehiscence rates. This series demonstrated a low rate of complications with successful wound healing.

References

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