

Aesthetic Insights

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HYPOCHLOROUS ACID (HOCl): AN IMPORTANT EMERGING OPTION FOR PERIPROCEDURAL CARE

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Most aesthetic procedures produce—and in many cases depend upon—injury to the skin, ranging from tiny punctures to large excisions. Superior outcomes require optimal wound healing, which necessitates three primary elements: eradication of pathogenic bacteria and biofilm, the proper immunological healing factors to support wound healing, and excellent blood supply for proper oxygenation. Together, these factors contribute to minimal scarring, rapid healing, and good structure and function of the healed wound site. Topical formulations containing hypochlorous acid (HOCl) are emerging as important options to prepare the skin prior to procedures and support skin health in the post-procedural healing period in order to achieve these aims and allow for best outcomes.

ANTIMICROBIAL EFFECTS

Sterility is an essential element of any surgical or device-based procedure that cuts the skin, and as aesthetic physicians become increasingly conscious of the role of the microbiome, there are implications for injection-based procedures, as well. The antiseptic preparations most commonly used before surgery in the US—iodopovidone and chlorhexidine—have notable limitations. Iodopovidone dyes the clothing and the hair and can be irritating; The smell is noxious for some patients. Chlorhexidine can be toxic to tissues, especially the cornea.

Post-procedurally, use of topical antibiotic preparations is increasingly unpopular, due to concerns about the development of bacterial resistance. Of further concern, topical antibiotics confer no activity against yeasts that reside on the skin and may infect wounds. Additionally, some topical antibiotic formulations are associated with risks for allergic contact dermatitis. The associated inflammation in the wound site is detrimental to wound healing and may contribute to scar formation or hyperpigmentation.

Topical formulations of HOCl are now available for both pre-procedural skin preparation and post-procedural wound management. HOCl, a naturally-occurring, weak acid, is produced by the

human body as part of the neutrophil's innate immunity and has anti-bacterial effects. *In vitro* studies have demonstrated that HOCl can break down the cell wall of bacteria, spores, and many viruses.

HOCl is now available from IntraDerm, which provides a line of stable topical formulations for peri-procedural use. HOCl is antimicrobial, antipruritic, anti-inflammatory, non-irritating, and breaks down biofilm. In fact, it is even approved for application to the eyelid for management of blepharitis. It is worth noting, in light of potential patient confusion, that topical HOCl replicates the endogenous agent produced by the human body's own immune system and is not the same as sodium hypochlorite (NaOCl) or common bleach.

PROPER IMMUNOLOGICAL HEALING FACTORS

The body's innate response to injury is fundamental to efficient wound healing. However, a delicate balance is essential. Excess inflammation is problematic, leading to overproduction of healing factors, as well as certain types of collagen, which can lead to scarring. Proliferation of cytokines and mast cells can lead to excess inflammation that results in pain. Mast cells release histamines that produce itch. Scratching leads to physical trauma to the site, and may undermine healing.

Of note, research has shown that the presence of pathogens—even without frank infection—instigates proliferation of cytokines and mast cells. The biofilm may be likened to a force field that helps protect bacteria, allowing them to colonize to the point that they become pathologic. Dysbiosis, or imbalance in the microbiota, leads to inflammation, potential for infection, and increased risk of scarring. Conversely, the presence of certain healthy skin microbes may benefit skin health and support efficient healing.

A benefit of HOCl is that it is not a harsh antibacterial. It is especially effective at degrading biofilm to reduce the load of bacteria that may hyperproliferate, while simultaneously supporting a healthy, balanced microbiome. It has anti-inflammatory and anti-pruritic effects that confer direct benefit for

healing wounds. Together, these benefits support formation of healthy granulation tissue and wound healing, improve patient comfort, and reduce the likelihood that patients will manipulate the wound site by scratching.

BLOOD SUPPLY AND OXYGENATION

Alternative approaches to wound management and infection prevention have been emerging. The use of platelet rich plasma (PRP), which is increasingly being adopted into cosmetic practices for a range of potential aesthetic benefits, was first developed as a way to support wound healing and augment the body's natural defenses against infection. PRP is sterile and non-toxic, therefore it poses little to no risk to patients and has been adopted despite a paucity of rigorous studies. When used, PRP is typically applied immediately after a procedure. This may provide a beneficial boost to the natural healing process, but PRP plays no role in long-term wound management.

HOCl compounds, in contrast, can be used throughout the post-operative healing period to support a balanced and beneficial microbiome, reduce inflammation, increase oxygenation (TCPO₂ levels) and optimize skin health.

HOCl IN PRACTICE

IntraDerm markets a range of topical HOCl products that have broad utility for aesthetic procedures. These are available for in-office use by the surgeon and can also be dispensed through the practice for home use. Prescription formulations are also available.

Pre-procedure use: A spray formulation, such as Levicycyn Dermal Spray or Lasercycyn Dermal Spray, is especially useful before a procedure to prep the surgical site and eliminate surface bacteria. The spray is easy to apply directly to the site and can simply be left on the skin. However, it is beneficial to also use a gauze pad to wipe the skin after application (spray the gauze with additional product), to mechanically remove bacteria and biofilm. An added benefit of this mechanical cleansing is that it will also remove any residual make-up or topically applied products that may not be readily removed with soap-and-water cleansing.

In addition, HOCl also works as an anti-inflammatory and increases blood flow to enhance healing.

For more intensive planned surgical procedures patients may be advised to prep the skin for several days or even weeks in

HOCl IN PRACTICE	
<p><i>Pre-procedure:</i> Levicycyn Dermal Spray or Lasercycyn Dermal Spray Antimicrobial, Removes biofilm, Anti-inflammatory, Increases blood flow</p> 	<p><i>Post Procedure:</i> Celacycyn Gel or Regenacycyn Gel Antimicrobial, Anti-inflammatory, Increases blood flow, Scar management</p> 

advance using any of the IntraDerm HOCl products.

Post-procedure: Silicone-based scar gel formulations, such as Celacycyn Gel or Regenacycyn Gel, can be applied immediately after any procedure and through the healing phase. A benefit of these formulations is that they can be readily applied to tender skin without requiring that patients touch a healing wound site.

Celacycyn or Regenacycyn Scar Gel can be added to the wound site immediately post-procedure and petrolatum or Aquaphor can be applied over top to add to the hydration.

Another aspect of wound healing is scar prevention. Especially in individuals with a history of scarring and especially hypertrophic scarring, strategies to reduce scar formation are a primary focus. Silicone has emerged as a widely used option to reduce risk of scarring, with options ranging from silicone sheeting to silicone-based topical products. The Celacycyn/Regenacycyn line of products contains silicone. It can be used alone as a topical wound product or in conjunction with silicone sheets or silicone-infused dressings.

ASSURING SUCCESS

Even as technical advancement and new technologies have led to less invasive surgical approaches and barely-invasive cosmetic interventions, optimal wound healing remains a primary concern for surgeons and patients. HOCl has emerged as an important and convenient option for use in the peri-procedural period and for scar management. Its range of effects—antimicrobial, anti-inflammatory, and anti-pruritic—and its ability to support healthy skin healing makes it an ideal agent for use in the aesthetic practice. ■



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