

Minimally Invasive Advanced Wound Care Diagnostics and Therapeutics Research Summary

Fabric-Based Tissue Debridement, Sampling, Collection, Storage and Transport Systems (Kylon®) Device Research

1. Frictional Fabric-Based Tissue Biopsy Sampling for Wound Organism Analysis

Lonky NM, Schultz G

This was a case study utilizing a novel hooked fabric-based biopsy brush to remove and trap a tangential broad based biopsy from the wound for molecular analysis (SoftBiopsy®). The benefits of a less invasive biopsy in contrast to a sharp curette tangential biopsy or a superficial flocked swab was discussed. The tissue yield and method was reviewed as were the multiple robust pathogen findings from the brush tangential biopsy. The authors concluded that frictional “abrasion” by a hooked brush could trap and collect such tissue for analysis. Friction as a means for immune stimulation that was shown with cervical mucosal biopsy in a referenced study was discussed and the need to study wound repair from friction was proposed.

Proceedings of the Symposium on Advanced Wound Care, October 2021, Las Vegas, NV

2. Case Study of Fabric-Based Brush-Curette for Toe and Foot Crevice Wound Debridement and Tissue Sampling

Lonky NM, Levine B

Hard to reach chronic wounds recessed in crevices in the skin can be a challenge to debride adequately with conventional curettes. The authors review a case of a chronic wound on and around the first toe was debrided using a device like what is used to perform canal biopsies of the endocervix (wound debridement and tissue collection device; Soft K-Rette®). The appearance of the wound before and after debridement was demonstrated and the ability to collect tissue from the wound for histopathologic or molecular analysis was also documented.

Proceedings of the Symposium on Advanced Wound Care, April 2022, Phoenix, AZ

3. In-situ Autologous Whole Blood Clot Formation in Dermal Ulceration Using a Novel Wound Bed Stimulation Method for Enhanced Vascularization and the Perpetuation of the Proliferative Phase in Wound Healing.

Kimball T, Lonky NM

In this case study, a new variant of “micro-needling” is introduced in a case series that included other standards of care (cleansing, dressings, wound-vac care). The wound was cleansed with hypochlorous acid and punctured using manual stamping using the fabric-based hook curette (Kylon® on SoftBiopsy®, Histologics LLC, Anaheim CA) that is arranged in an array of on average 25 evenly (1 mm) separated sickle-hooks mounted on a round, convex applicator platform. When hooks are flattened into tissue, the shallow tips are exposed and can perforate into disrupted skin (wounds, epithelium, dermis, subcutaneous tissue, muscle), Micro-punctate bleeding occurs and an in situ autologous whole blood clot is allowed to form in the wound base. Extracellular matrix devices or cellular based tissue products may be applied per their respective indications for use following clot formation. This principal investigator teaches that this procedure is repeated weekly until a confluent layer of epithelial cells develops.

Proceedings of the Symposium on Advanced Wound Care, October 2022, Las Vegas, NV

4. Avoiding Hospital OR Surgical Debridement and Tissue Sampling Using a Novel Fabric-Based Technology

Vincent E, Bach D, Lonky NM

This case study involved a patient with a history of Type 2 Diabetes, vascular ulcer, wound vacuum therapy, and squamous cell cancer (excised) who could not tolerate in-office procedures. He repeatedly had to have debridements and repeat biopsies in the operating room. The lead investigator was able to consent and treat topically with 2% lidocaine pre-therapy, then debride the wound with the Kylon® fabric finger cot (Soft K-Cot®) and clear an area of suspicion for infection or neoplasia and perform a tangential biopsy with the applicator device SoftBiopsy®. A molecular PCR profile for biofilm organisms and histopathology specimen (devoid of cancer) was obtained, simply showing inflamed benign dermis and squamous elements. Thus, the Kylon® platform and topical anesthetic allowed the patient to tolerate both non-selective sharp debridement and tangential biopsy.

Proceedings of the Symposium on Advanced Wound Care, October 2023, Las Vegas, NV

5. Disrupting the Wound Management Paradigm: Two Taw Tools in the Toolbox

Kimball T

A case study presented in a 65 year old with a peri-stomal wound who underwent multimodal therapy as follows: The wound was approached with an intent to treat and wound closure. Wound hygiene was performed using a nylon array of sickle hooks, on a finger cot. 100% of the wound base was debrided using a gentle sweeping technique margin to margin. Micro-punctate bleeding of the epithelial transition and wound base occurred. Hemostasis was achieved with pressure. The wound was dressed with a collagen, hyaluronic acid and phytocompound wound gel then covered with a hydrocolloid absorbent secondary dressing. The author concluded that the debridement and the frictional heat induced micro-punctate bleeding and vasodilation, and with regular deployment the wound transformed to proliferative and repair phase and healed (was re-surfaced) in 10 days.

Proceedings of the Symposium on Advanced Wound Care, April 2023, National Harbor, MD.

6. Novel use of a Nylon Hooked Medical Fabric for Compassionate Debridement and Wound Bed Preparation Prior to Grafting

Swoboda, L

In this case series, a novel debridement device (SoftBiopsy®, Histologics LLC, Anaheim CA) that deploy a nylon hooked medical fabric capable of debridement or tangential biopsy) of patients with the following conditions; diabetic foot ulcer, chronic buttock pressure ulcer and sacro-coccygeal pressure ulcer, All patients required wound bed preparation and placement of a graft. The authors concluded; The nylon medical fabric is coated in plastic hooks become micro-curettes with pressure and can remove varying levels of tissue dependent on technique. Initially developed to create an option with increased tolerance during ecto and endo-cervical biopsy, the technology was noted to be able to debride tissue in wounds with the similar qualities of decreased pain and maintenance of efficacy. The hooked fabric debridement tool can also be utilized to collect specimens for molecular DNA analysis, culture, and anatomic pathology analysis.

Proceedings of the Symposium on Advanced Wound Care, October 2023, Las Vegas, NV

7. Wound Hygiene and Debridement in Variable Resource Settings

Swoboda L

The aim of the study was to demonstrate the clinical utility of the hooked-medical fabric deployed on a non-latex finger glove-cot (Kylon®, Soft K-Cot®, Histologics LLC, Anaheim CA) to support wound bed preparation in resource limited settings. The case series regarding its use for various chronic wounds took place in Gaza, Palestine. Its minimally invasive nature was confirmed as was its rapid ease of use. The nylon plastic hooks became micro curettes with pressure and were used to remove varying levels of tissue including slough, hyper-granulation, biofilm, and fibrin. The author concluded that compassionate debridement with nylon medical fabric was consistently successful and allows for low cost, clean, and expeditious wound bed preparation that is well tolerated. Standard peacetime health services are already limited or lacking in many low-income countries. With the addition of weapon wounded and those affected by adverse environmental conditions such as sanitation, housing, and poor nutrition, the hospital systems are quickly overwhelmed. The ease of use, disposal, and toleration of this device makes it a good choice for these settings.

Proceedings of the Symposium on Advanced Wound Care, October 2024, Las Vegas, NV.

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8. IRB Approved Retrospective Study Assessing the Effectiveness of a Nylon Hook-Array Device for Diagnostic Tangential Shave Biopsy

Kimball T, Low M

This was a retrospective study where 25 cases utilizing the hooked-medical fabric biopsy device (SoftBiopsy®, Histologics LLC) of lesions within a chronic wound were conducted for anatomic pathology. Other than the package insert instructions to press the device into target areas which convert the bristles to a micro-curette array capable of removing and retaining tangentially removed tissue specimens and trapping them for microscopic analysis. The distal tip of the device containing the tissue is placed in formalin fixative and sent to the lab. The authors removed tissue from the lower extremity, abdomen, upper leg/thigh, chest, buttock, and pelvis. 9 of 25 cases were devoid of diagnostic tissue (36%) and a histopathologic diagnosis was not possible. Only fibrinopurulent slough was noted. The authors concluded that debridement to clear the field of slough is indicated to obtain tissue samples from potentially pathologic lesion targets of the wound base or margin and further research is needed.

Proceedings of the Symposium on Advanced Wound Care, September 2025, Las Vegas, NV.

9. Retrospective Case Series Comparing the Flocked Swab to the Nylon Hooked Fabric Curettage for the Detection of Infection in Chronic Wounds

Rahimian P, Lonky NM, Low M

This was a retrospective study of 8 cases where chronic wounds were assessed for infection by nurses or physicians during wound care who sampled using both a flocked swab and biopsy devices (Kylon® Fabric Soft-Biopsy, Histologics LLC, Anaheim CA). Neither the lab or the clinician knew there would be an audit comparing the two samples for PCR wound infection detection. Both sampling methods detected wound pathogens; however, the nylon curettage biopsy brush demonstrated superior nucleic acid recovery and diagnostic yield. By more accurately measuring microbial burden, this minimally invasive biopsy technique may enhance infection detection and support targeted therapy in chronic wound care.

Proceedings of the Symposium on Advanced Wound Care, April 2026, Charlotte, NC.

Journal of Wound Care, Volume 35, Number 8, August 2026. <https://doi.org/10.12968/jowc.2025.0575>

10. Advancing Chronic Wound Healing: Innovations in Hooked Array Nylon Fabric for Wound Hygiene, Debridement, and Tissue Sampling,

Kimball T, Swoboda L, Aviles F, Lonky NM.

A comprehensive review of the historical evidence behind versatile tissue removal using the novel Kylon® fabric micro-curette brush, clinical evidence and utility, and applications in clinical practice. This includes proper coding of procedures according to clinical need and compliant documentation.

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