what is the future of complex wounds

Nanoskin: The ultimate solution for Acute and Chronic Injuries

PIERRE BASMAJI

Nanoskin®


Nanoskin

NANOSKIN

BIONANOTECHNOLOGICAL DRESSINGS OF THE FUTURE
"What's the Future of Wounds…."

INTRODUCTION

Nanotechnologies can be applied in several areas. The confinement of atoms at the nanoscale radically modifies the properties of materials, allowing for the restructuring or manufacture of numerous products.

In the area of health, nanotechnologies have as their main objective the construction of systems identical to those created by nature. Biomaterials, composed of molecular structures at the nanoscale, have the ability to interact with biological systems, performing the same functions as natural mechanisms. Thus, these materials can be used in the conformation of various biomedical components, such as blood vessels, skin and artificial organs, intelligent dressings, vision and hearing devices and drug delivery systems that can be implanted under the skin.

The specificity of the different types of wounds and the constant search for the most suitable treatments for each of them means that, naturally, a wide range of procedures capable of effectively treating these same wounds is currently consolidated. A procedure can be measured based on a relatively small number of parameters: wound healing speed, long-term functionality of the affected tissues and esthetic aspect. Therefore, the constant search for new methods of treating wounds should fundamentally be guided by the optimization of these aspects.

Among the various technologies that emerge and establish themselves as the basis for the creation and development of new products and solutions, nanotechnology will undoubtedly be one of those that will present the greatest potential for growth Generically defined as the engineering of functional systems at a molecular scale , nanotechnology is based on the ability to manipulate and process individual atoms and molecules, something that promises to revolutionize in the short/medium term areas as

diverse as the aerospace industry, tissue engineering, the food industry and medicine, among many others.

The concept of nanomedicine arises, of course, from the application of nanotechnology to the field of medicine. In the midst of an exponential growth phase in several ways, nanomedicine will have in the targeted drug delivery mechanisms one of its main standard bearers, which allow the administration of drugs to the body with a precision at the cellular scale and thus increase its bioavailability.

What is nano?

"Nano" is a prefix that comes from ancient Greek and means "dwarf"

1 nanometer (nm) = 1 billionth of a meter, 10-9m

Purpose of Nanotechnology:

• Create, characterize, produce and apply structures,

devices and systems, controlling form and

size on the nanometer scale.

• Provide conditions for the growing capacity of modern technology to see and manipulate atoms and molecules.

But why!

– Scientific curiosity

— Expected benefits in:

Development of new drugs

• Bionanotechnology refers to molecular-scale properties and applications of biological nanostructures

– Tissue engineering – Molecular engines

– Biomolecules for sensors – Drug delivery

– Discovery of new drugs

• Current and future applications

– Drug delivery

– New drugs

– Cancer treatment

– Implants and prostheses

Chapter 1-Classic Wound healing

Classification of Dressings
What's on the market today; Classic dressings, such as:
• Liabilities - gas
• Interactive - hydrocolloids, Hydrogel
• Bioactives – AGE, Activated Carbon, Calcium Alginate, Collagenase, Papain.

NAMES	INDICATIONS	OBSERVATION
SODIUM ALGINATE	Indicated in infected or uninfected lesions, with medium or high exudation, with bleeding or in the presence of necrosis and fibrin.	Used as a primary dressing, as it is applied over the wound bed, requiring a secondary dressing to occlude or fix it. The exchange frequency must be evaluated according to the amount of exudate present in the wound, which may remain for up to 4 days.
HYDROCOLLOIDS	Indicated in non-infected wounds, with medium and low volumes of exudate. Can be used in the presence of necrotic tissue and fibrin.	Changing the dressing must be performed whenever the gel leaks. It can stay for up to 7 days. The gel formed with wound exudate has a yellowish color and an unpleasant odor that disappears after cleaning the wound.
HYDROCOLLOIDS IN GRANULES	Indicated for deep and highly exudative wounds. They are associated with the use of the boards.	The granules fill the dead space in the wound bed, increase the absorption of exudate, extending the permanence time of the plaques.
PAPAÍN (1%, 5% OR 10%)	Indicated for necrotic wounds and in the presence of fibrin, being contraindicated in cases of ischemic injury.	It should not be used or mixed with substances derived or composed of iron or iodine, as it is easily oxidized.
COLLAGENASE- 10%	Indicated in ischemic lesions	It is indicated for wound

Without CLORANFENICOL	and necrotic wounds.	debridement, digesting and removing necrotic tissue.
ACTIVATED COAL WITH SILVER	Indicated for infected lesions, with medium and high exudation, with or without odor.	Primary dressing, always requiring coverage with a secondary. It must be changed whenever it is saturated, and may remain for up to 7 days.
TRANSPARENT FILM DRESSINGS	Indicated for insertion sites of peripheral catheters, tunneled or untuned central catheters, intracranial pressure catheters, umbilical catheters and for protecting areas of bony prominences in patients at high risk for developing pressure ulcers.	In catheters, it must be changed every 72 hours; in the pressure areas. can stay for 7 days.
POLYURETHANE FOAM	It is indicated for wounds with deep tissue loss, partial or total, and in the cavity it is used as a filling. In wounds with superficial tissue loss or where there is a predominance of necrotic tissue, it is contraindicated.	The frequency of changing this dressing depends on the volume of exudate drained, and it can remain in the wound bed for up to 5 days. In the presentation of wrapping, it is necessary to use secondary coverage, such as sterile double gauze or polyurethane film.
SUGAR	infected wounds	As it is an easy-access and low-cost product, it is widely used. It has numerous inconveniences such as: need for frequent changes every 2 or 4 hours, intense pain due to acidification of the environment.
MEDIUM CHAIN TRIGLYCERIDES AND ESSENTIAL FATTY ACIDS	Indicated for the treatment of wounds, infected or not, previously debrided, medium or little exudative. The wound must be irrigated with the solution and covered with an occlusive dressing.	Changes must be daily.

The risks of classic dressings:

I) Silver and heavy metal dressings

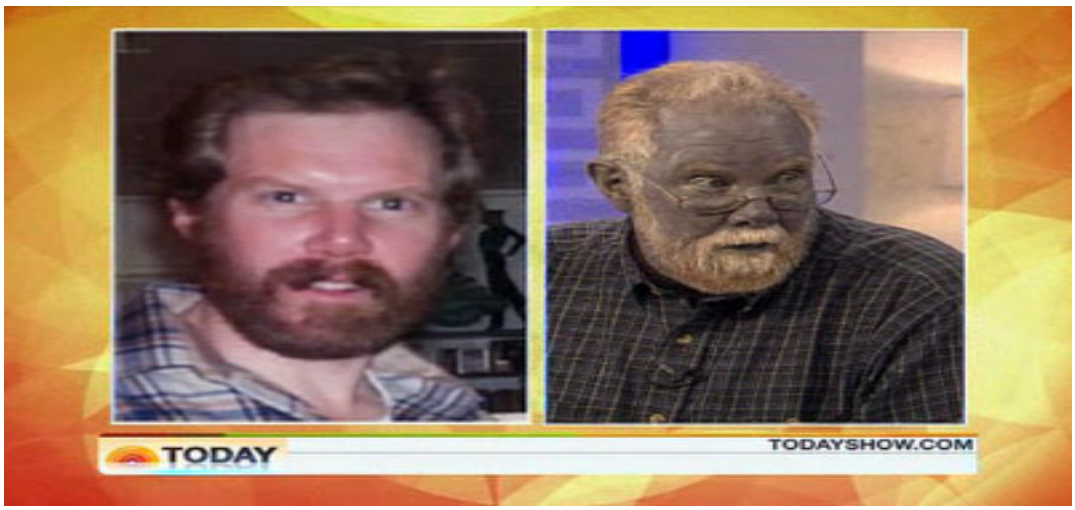
1. Silver dressings cause kidney failure and cancer! For your information: products based on silver, alginate, and zinc oxide (nanoparticulate, ions are prohibited in the United States and Europe, as per the references below

http://www.ncbi.nlm.nih.gov/pubmed/16531870
The Journal of Trauma **2006,** *60* (3),648-652 10.1097/01.ta.0000208126.22089.
http://www.wounds-uk.com/pdf/content_9967.pdf

2. Silver dressings may be responsible for DNA damage from genotoxicity and carcinogenicity.
Elements like Ag, Ca, Zn, iodine, free radicals can react with cellular component products on the same scale and induce DNA damage or disrupt the segregation of chromosomes that fall on mitosis (aeugenic potential).

Examples:

You've heard of Blue Man / because this man exists and is called Paul Karason, he used silver ions because silver is antibacterial and see what happened to him:



He became a blue man because of silver and various kidney problems!

3. Patients with a silver dressing cannot have an X-Ray scan, nor can they be near microwaves or MRI scans.
4.Red lipstick
5. Breast cancer
6. other examples (pgs.9-12)

II) Hydrocolloids

There is some controversy about the use of hydrocolloids in diabetic foot ulcers. Some reports of infections derived from the use of these products in these patients led many to contraindicate their use in these situations. The use of hydrocolloids, partly due to their impermeability characteristic, which encourages the creation of a microenvironment conducive to the proliferation of anaerobic bacteria, common in infections in diabetics. Special attention should also be paid to the condition of the perilesional skin due to the macerative effect of this dressing. A literature review carried out in 2012 suggests that the effectiveness of hydrocolloids in this type of wound is similar to other dressings, even in the presence of bacterial colonization. The recommendation is, therefore, for the diabetic foot, “Use, but with caution and with limitations”.
Referencias

http://www.woundsinternational.com/pdf/content_198.pdf

http://www.worldwidewounds.com/1998/april/Hydrocolloid-FAQ/hydrocolloid-questions.html

http://www.ncbi.nlm.nih.gov/pubmed/22336859

http://cid.oxfordjournals.org/content/39/Supplement_2/S100.full

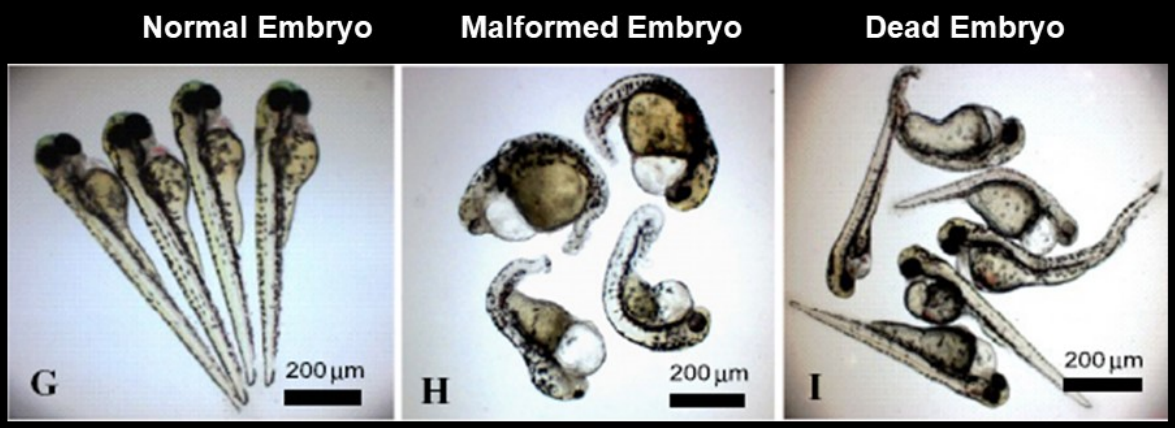
To go deeper into the Risk of using silver nanoparticles and their derivatives on humans: Toxicity of silver and its Health Effects

View my book ALZHEIMER IS EPIGENETIC? Is Alzheimer's disease (AD) driven by epigenetic changes? IS ALZHEIMER EPIGENETIC?

2021

Toxicidade das Nanopartículas de prata

The toxicity of silver nanoparticles was tested using embryos of zebra fish



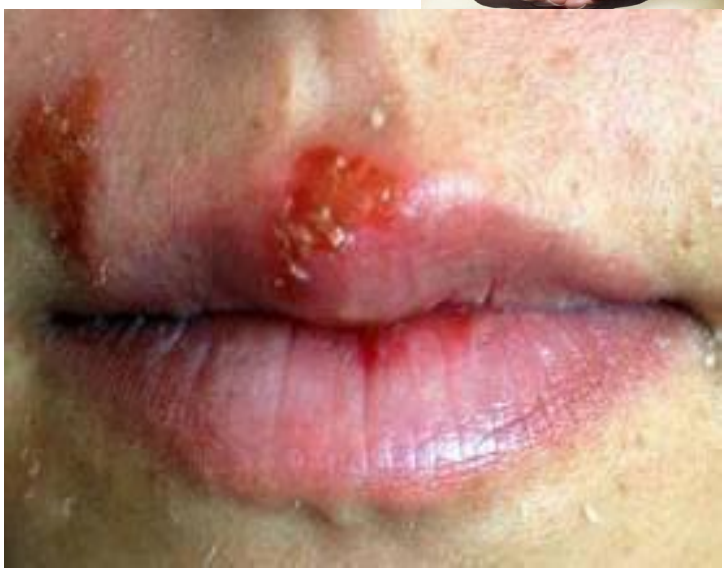
The zebra fish eggs were taken to a 96-well plate, and a solution of silver nanoparticles at different concentrations was added to each well.

The images show the appearance of normal, malformed and dead embryos. Visual counting was made

Nanotechnology (2008) 4, 873

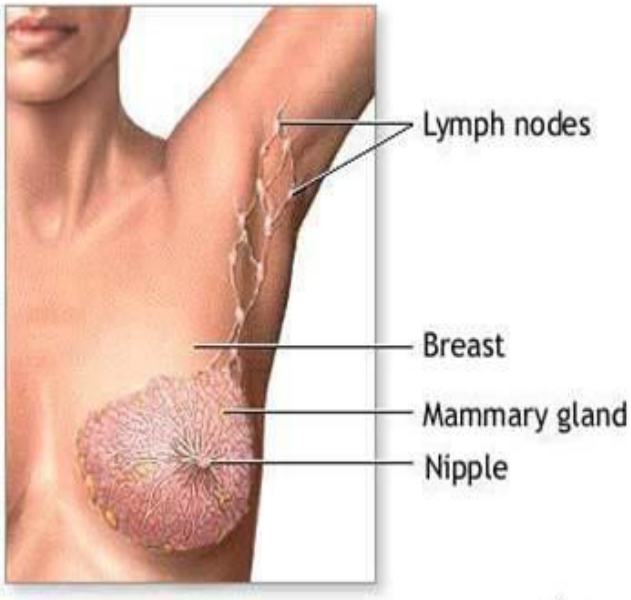
Red lead-based lipstick causes skin cancer

As we know that our body does not metabolize heavy metals, that is, we do not eliminate these types of metals even with small concentrations, which is important is the size of these metals. An easy way to know if your lipstick has lead, just apply the lipstick on the palm of your hand and rub a gold ring, if the red color turns brown or black, throw your lipstick in the trash it has lead and prevents cancer of the skin.see the figure below.



Breast cancer

The use of aluminum antiperspirant deodorant causes breast cancer, see reference below. The study is in agreement with the use of heavy metals such as silver, zinc and lead that our bodies do not absorb.



Beware of crystal and diamond peeling (aluminum hydroxide) and products with heavy metals (silver, lead, zinc and calcium) and Alzheimer's

http://www.cancerresearchuk.org/cancerinfo/healthyliving/cancercontroversies/deodorants/deodorants-and-cancer

HEALTH: CARCINOGENIC TITANIUM NANOPARTICLES IN DAILY USE PRODUCTS

HEALTH - Sun cream, chewing gum, DEODORANT, SOCKS, TOOTHBRUSHES, whey protein or candy and paints...

anses
agence nationale de sécurité sanitaire alimentation, environnement, travail
Connaître, évaluer, protéger

Agência de Segurança Nacional de Saúde Alimentar, Ambiente e Trabalho-France

Bibliographic References

http://www.woundsinternational.com/pdf/content_198.pdf

http://www.worldwidewounds.com/1998/april/Hydrocolloid-FAQ/hydrocolloid-questions.html

http://www.ncbi.nlm.nih.gov/pubmed/22336859

http://cid.oxfordjournals.org/content/39/Supplement_2/S100.full

-ASTM Standard E2456. 2006. Standard terminology relating to Nnaotechnology. ASTM International, West Conshohocken, PA, 2006, DOI: 10.1520/E2456-06.

ATSDR. Agency for Toxic Substances and Disease Registry. 1990. Toxicological profile for silver. Atlanta, GA: US Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (TP-9024).

Buzea, C., Pacheco, I.I., Robbie, K. Nanomaterials and nanoparticles: Sources and toxicity, Biointerphases, 2(4): MR17-MR71, 2007.

Mühling, M., Bradford, A., Readman, J.W., Somerfield, P.J., Handy, R.D. An investigation into the effects of silver nanoparticles on antibiotic resistance of naturally occurring bacteria in an estuarine sediment, Marine Environ. Res., 2009, 68(5):278-283.

Drake P.L., Hazelwood K.J. 2005. Exposure-related health effects of silver and silver compounds: A review. Ann. Occup. Hyg., 49:575-585.

White, J.M.L., Powell, A.M., Brady, K., Russell-Jones, R. 2003. Severe generalized argryia secondary ingestion of colloidal silver protein. Clin. Experim. Dermatol., 28:354-256.

Fung, M.C., Bowen, D.L. 1996. Silver products for medical indication: Risk benefit assessment. Clin. Toxicol. 34:119-126.

Venugopal, B., Luckey, T.D.1978. Metal toxicity in mammals. In: Chemical toxicology of metals and metalloids, Venugopal, B., Luckey, T.D. (Eds.), New York: Academic Press. pp 32-36.

Wadhera, A., Fung, M

. http://dermatology.cdlib.org/111/case_reports/argyria/c11.jpg

Lee, H.J., Yeo, S.Y., Jeong, S.H. 2003. Antibacterial effect of nanosized silver colloidal solution on textile fabrics, J. Mater. Sci., 38:2199-2204.

Lee, K.J., Lee, Y., Shim, I., Joung, J., Oh, Y.S. Direct synthesis and bonding origins of monolayer-protected silver nanocrystals from silver nitrate through in situ ligand exchange. J. Colloid Inter. Sci. 2006, 304, 92-97.

Lee, K.J., Lee, Y., Shim, I., Jun, B.H., Cho, H.J., Joung, J. Large-scale synthesis of polymer-stabilized silver nanoparticles. Sol. St. Phen. 2007, 124-126, 1189-1192.

Lee, K.J., Nallathamby, P.D., Browning, L.M., Osgood, C.J., Xu, X.N. 2007. *In vivo* imaging of transport and biocompatibility of single silver nanoparticles in early development of zebrafish embryos, Am. Chem. Soc. 1(2):133-143.

. Lee, K.J., Park, J.T., Goh, J.H., Kim, J.H. Synthesis of amphiphilic graft copolymer brush and its use as template film for the preparation of silver nanoparticles. J. Polym. Sci. A. 2008, 46, 3911-3918.

Gatti, A.M. Biocompatibility of micro- and nano-particles in the colon. Part II, Biomaterials 25, 385-392, 2004.

Gatti, A.M., Montanari, S., Monari, E., Gambarelli, A., Capitani, F., Parisini, B. Detection of micro- and nano-sized biocompatible particles in the blood. J. Mater. Sci.: Mater. Med. 15(4), 469-472, 2004.

Poon, V.K., Burd, A. 2004. In vitro cytotoxity of silver: Implication for clinical wound care. Burns, 30:140-147.

Asharani, P.V., Nair, G., Zhiyuan, H., Manoor. P., Valiyaveettil, S. 2007. Potential health impacts of silver nanoparticles. Abstracts of Papers, 234th ACS National Meeting, Boston, MA, USA, August 19-23, 2007. pp: TOXI-099.

Braydich-Stolle, L**.; Hussain, S**.; Schlager, J. J.; Hofmann, M. C. In vitro cytotoxicity of nanoparticles in mammalian germline stem cells. Toxicol. Sci. 2005, 88, 412–419

Ji, J.H., Jung, J.H., Kim, S.S., Yoon, J.U., Park, J.D., Choi, B.S., Chung, Y.H., Kwon, I.H., Jeong, J., Han, B.S., Shin, J.H., Sung, J.H., Song, K.S., Yu, I.J. 2007.

El-Ansary, A., Al-Daihan, S. On the toxicity of therapeutically used nanoparticles: An overview, J. Toxicol., Volume 2009, 9 pages. doi:10.1155/2009/754810

Oberdörster, G., Oberdörster, E., Oberdörster, J., 2005a. Nanotoxicology: an emerging discipline evolving from studies of ultrafine particles. Environ. Health Perspect. 113 (7), 823–839.

Oberdörster, G., Maynard, A., Donaldson, K., Castranova, V., Fitzpatrick, J., Ausman, K., Carter, J., Karn, B., Kreyling, W., Lai, D., Olin, S., Monteiro-Riviere, N., Warheit, D., Yang, H. 2005b. Principles for characterizing the potential human health effects from

exposure to nanomaterials: elements of a screening strategy. Particle Fibre Toxicol., 2:8-43.

Oberdörster, G., Sharp, Z., Atudorei, V., Elder, A., Gelein, R., Kreyling, W., Cox,

1. Translocation of inhaled ultrafine particles to the brain, Inhalation Toxicol. 16(67), 437-445, 2004.

Oberdörster, G., Stone, V., Donaldson, K. Toxicology of nanoparticles: a historical perspective. Nanotoxicology 1: 2–25, 2007.

Hagens, W.I., Oomen, A.G., de Jong, W.H., Cassee, F.R., Sips, A.J.A.M. What do we (need to) know about the kinetic properties of nanoparticles in the body?, Regulatory Toxicology and Pharmacology, vol. 49, no. 3, pp. 217–229, 2007.

Moghimi, S.M., Hunter, A.C., Murray, J.C. Nanomedicine: current status and future prospects, FASEB Journal, vol. 19, no. 3, pp. 311–330, 2005.

Trop, M., Novak, M., Rodl, S., Hellbom, B., Kroell, W. Goessler, W. 2006. Silver-coated dressing Acticoat casued raised liver enzymes and argyria-like symptoms in burn patient. J. Trauma 60, 648-652.

Dockery, D.W., Luttmann-Gibson, H., Rich, D.Q., Link, M.S., Mittleman, M.A., Gold, D.R., Koutrakis, P., Schwartz, J.D., Verrier, R.L. Association of air pollution with increased incidence of ventricular tachyarrhythmias recorded by implanted cardioverter defillibrators, Environ. Health Perspect., 113(6), 670-674,2005.

Donaldson, K., Stone, V., Tran, C., Kreyling, W., Borm, P.J.A. Nanotoxicology, Occup. Environ. Med. 61(9):727-728, 2004.

Lippmann, M. Effects of fiber characteristics on lung deposition, retention, and disease, Environ. Health Perspect. 88, 311-317, 1990.

Shah, C.P. Public Health and preventive medicine in Canada, University of Toronto Press, Toronto, Canada. 2007.

Vermylen, J., Nemmar, A., Nemery, B., Hoylaerts, F. Ambient air pollution and acute myocardial infarction, J. Thromb. Haemost. 3, 1955-1961, 2005.

Peters, A. Particulate matter and heart disease: evidence from epidemiological studies, Toxicol. Appl. Pharmacol., 207(2 Suppl), S477-S482, 2005.

Chen, H.W., Su, S.F., Chien, C.T., Lin, W.H., Yu, S.L., Chou, C.C., Chen, J.J., Yang, P.C. Titanium dioxide nanoparticles induce emphysema-like lung injury in mice, The FASEB Journal, vol. 20, no. 13, pp. 2393–2395, 2006.

Chen, J., Tan, M., Nemmar, A., Song, W., Dong, M., Zhang, G., Li, Y. Quantification of extrapulmonary translocation of intratracheal-instilled particles in vivo in rats: effect of lipopolysaccharide, Toxicol., 2006, 222(3):195–201.

Supp, A.P., Neely, A.N., Supp, D.M., Warden, G.D., Boyce, S.T. Evaluation of cytotoxicity and antimicrobial activity of Acticoat® burn dressing for management of microbial contamination in cultured skin substitutes grafted to athymic mice, Journal of Burn Care & Rehabilitation, vol. 26, no. 3, pp. 238–246, 2005.

Wright, J.B., Lam, K., Buret, A.G., Olson, M.E., Burrell, R.E. 2002. Early healing events in a porcine model contaminated wounds: effects of nanocrystalline silver on matrix metalloproteinases, cell apoptosis, and healing. Wound Repair Regen. 10, 141-151.

Paddle-Ledinek, J.E., Nasa, Z., Cleland, H.J. Effect of different wound dressings on cell viability and proliferation, Plastic and Reconstructive Surgery, vol. 117, supplement 7, pp. 110S–118S, 2006.

Wijnhoven, S.W.P., Peijnenburg, W.J.G.M., Herberts, C.A., Hagens, W.I., Oomen, A.G., Heugens, E.H.W., Roszek, B., Bisschops, J., Gosens, I., van de Meent, D., Dekkers, S., de Jong, W.H., van Zijverden, M., Sips, A.J.A.M., Geertsma, R.E. Nanosilver – a review of available data and knowledge gaps in human and environmental risk assessment, Nanotoxicology, 2009, 3(2): 109-138.

Kim, W.-Y., K., Kim, J., Park, J.D., Ryu, H.Y., Yu, I.J. Histological Study of Gender Differences in Accumulation of Silver Nanoparticles in Kidneys of Fischer 344 Rats. J. Toxicol. Environ. Health, Part A. 72: 21-22, 2009, 1279 — 1284.

Kim, Y. S.; Kim, J. S.; Cho, H. S.; Rha, D. S.; Kim, J. M.; Park, J. D.; Choi, B. S.; Lim, R.; Chang, H. K.; Chung, Y. H.; Kwon, I. H.; Jeong, J.; Han, B. S.; Yu, I. J. Twenty-eight-day oral toxicity, genotoxicity, and gender-related tissue distribution of silver nanoparticles in Sprague-Dawley rats. Inhalation Toxicol. 2008, 20, 575– 583.

Holt, K.B., Bard, A.J. 2005. Interaction of silver (I) ions with the respiratory chain of Escherichia coli: An electrochemical and scanning electrochemical microscopy study of the antimicrobial mechanism of micromolar Ag+. Biochemistry 44, 1321413223.

Muangman, P., Chuntrasakul, C., Silthram, S., Suvanchote, S., Benjathanung, R., Kittidacha, S., Rueksomtawin, S. Comparison of efficacy of 1% silver sulfadiazine and Acticoat™ for treatment of partial-thickness burn wounds, Journal of the Medical Association of Thailand, vol. 89, no. 7, pp. 953–958, 2006.

Bragg, P.D., Rainnie, D.J. 1974. The effect of silver ions on the respiratory chain of Escherichia coli. Can. J. Microbiol. 20, 883-889.

Lok, C.-N., Ho, C.-M., Chen, R., He, Q.-Y., Yu, W.-Y., Sun, H., Tam, P.K.-H., Chiu, J.-F., Che, C.-M. 2006. Proteomic analysis of the mode of antibacterial action of silver nanoparticles. J. Proteome Res. 5, 916-924.

Zeiri, I., Bronk, B.V., Shabtai, Y., Eichler, J., Efrima, S. 2004. Surface enhanced Raman spectroscopy as a tool for probing specific biochemical components in bacteria. Appl. Spectroscopy 58, 33-40

silver toxicity and the systemic uptake and deposition of silver in organs such as the liver and kidney has been noted.

- Thurman, R.B., Gerba, C.P., Bitton, G. The molecular mechanisms of copper and

silver ion disinfection of bacteria and viruses. Critical Reviews in Environmental Control 1989; 18: 4, 295-315.

- Russell, A.D., Hugo, W.B. Antimicrobial activity and action of silver. Prog Med Chem 1994; 31: 351-70

- Parsons, D., Bowler, P.G., Myles, V., Jones, S. **Silver antimicrobial dressings in wound** management: a comparison of antibacterial, physical, and chemical characteristics. Wounds 2005; 17: 8, 222–232.

- Burd, A., Kwok, C.H., Hung, S.C. et al. A comparative study of the **cytotoxicity of silver-based dressings in monolayer cell, tissue explant and animal models. Wound Repair Regen 2007; 15: 1, 94–104.**

Wan, A.T., Conyers, R.A., Coombs, C.J., Masterton, J.P. **Determination of silver in blood, urine and ti**ssues of volunteers and burn patients. Clin Chem 1991; 37: (10), 1683-1687.

Wang, X-Q., Kempf, M., Mott, J. et al. **Silver absorption on burns** after the application of Acticoat: data from pediatric patients and a porcine burn model. J Burn Care Res

2009; 30: 2, 341-348.

- Percival, S.L., Bowler, P.G., Russell, D. **Bacterial resistance to silver in wound care. J Hosp Infect 2005; 60: 1, 1–**

-Loh, J.V., Percival, S.L., Woods, E.J. et al. **Silver resistance in MRSA isolated from wound** and nasal sources in humans and animals. Int Wound J 2009; 6: 1, 32-38.

They are therefore biocides or antiseptics rather than antibiotics. ***Silver can even be toxic for cells that are essential or wound treatment, such as fibroblasts and keratinocytes.*** http://www.woundsuk.com/pdf/content_9967.pdf

Chapter 2

Bionanotechnology-based dressings: Nanoskin

• Nanoskin

Nanoskin® is a new Biotechnology indicated for the treatment of lesions, diabetic foot ulcers, and complex chronic lesions.

Purpose: applications as a drug delivery platform.
Nanoskin® meets an urgent medical demand for the treatment (and prevention) of complex
chronic injuries.

Nanoskin's main Objectives are:
• improve the patient's quality of life
• accelerate healing of chronic injuries
• reduce health care costs

What is Nanoskin®

Nanokin is a patented, 100% natural biological film, the result of many years of research in bionanotechnology. Nanoskin is a nano-sized fiber platform with physical and mechanical properties that dramatically accelerate wound healing.

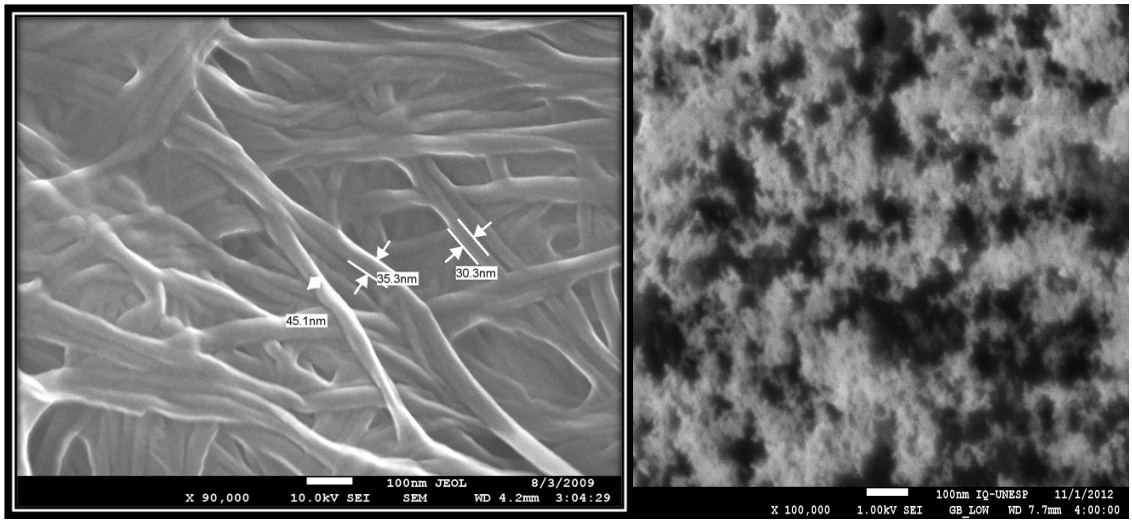


Fig1. Formation of extracellular matrix of Nanoskin fibers (2nm -40nm) seen by scanning microscopy.

How does Nanoskin® work?

The Nanoskin® membrane works by promoting:
-Isolation of exposed nerve endings, resulting in immediate pain relief.
-Direct contact of the membrane with the lesion layer promotes the development of new skin.
-Maintenance of the open area of the moist lesion during the regenerative process, allowing an efficient exchange of oxygen/nitrogen within their area, thus preventing infection by pathogens.
Nanoskin®-Main features

100% natural
Biocompatible and non-allergenic
No adverse reactions
no pain sensation
Perfect occlusion of the injured area
Not permeable to external liquids and contaminants.
Natural antibacterial barrier and lesion nutrition
Rapid reduction of the area of lesions by 95%.

Advantages of using Nanoskin®:

• Ease of application and adaptation to the lesion layer;
• Protection and acceleration of the healing process.
• Absence of adverse reactions;
• Decrease in pain;
• Comfort for the patient;
• Ease of drainage of secretions;
• Visualization and evolutionary control of the lesion;
• Maintenance of physiological moisture between the wound layer and the membrane;
• Occurrence of gas exchanges;
• Lower treatment cost.

Indication of use

• Dermis/skin burns;
• Dermo-abrasions;;
• Excoriations;
• Skin graft donor and recipient areas;
• Nail beds (after nail exeresis);
• diabetic ulcers;
• Venous ulcers;
• arterial ulcers;
• pressure ulcers;
• Evil piercing plantar;
• Infected surgical wounds;
• Decubitus bedsores;
• Physical postcauterization (cryotherapy, term cauterization, with a source of light
.Bullousepidermolysis

WHY Nanoskin is different?

1-Nanoskin ®made from a nano biotechnological biomimetic process.
2-Nanoskin ® is a highly hydrated film made from a random array of tape-shaped fibers between 2-40nm in width.
3-The nanobioprocess produces lactic acid, which is a potent detoxifying substance, in addition to glucuronic acid (glucuronic, lactic, unique, enzymes, vitamin B1, B2, B3, B6 and B12, vitamin C, D, and K, biotin and folic acid).

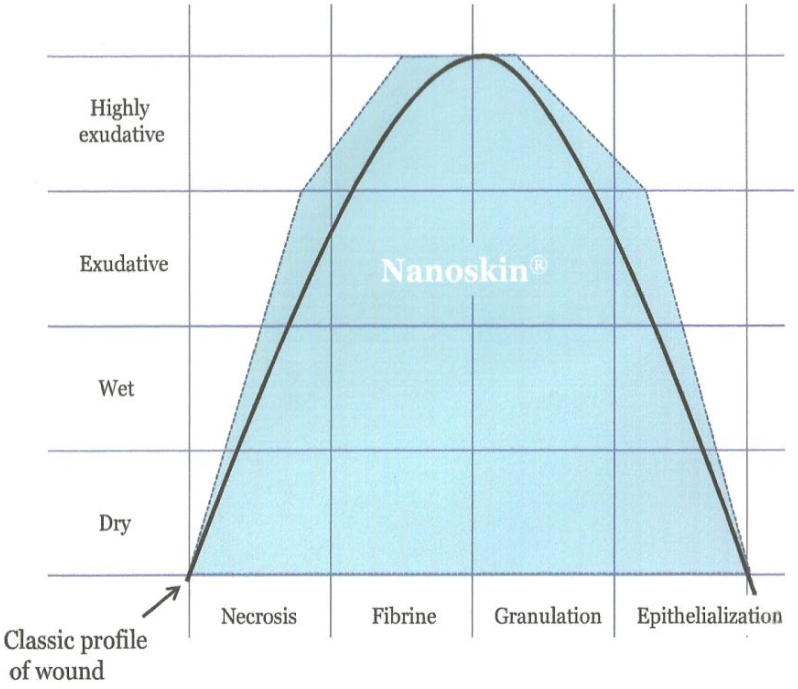
4-Nanoskin e' polysaccharide natural fibers composed of hemicellulose proteins.

5-Nanoskin increase the activity of NK cells (Natural Killer cells), T cells (T cells are a type of lymphocyte-white blood cells) and cells (B cell is a kind of lymphocyte that constitutes the immune system).
6-This polyunsaturated fatty acids and fatty acids derived from Nanoskin®, which activate Peroxisome Proliferator Activated Receptors (PPARs), this receptor increases in keratinocytes after skin damage and becomes important regulators of reepithelialization.

7-Variety of factors, because Nanoskin can activate the intracellular signaling pathways that regulate the various stages of the wound, re-epithelialization and granulation.

The advantages of Nanoskin nano dressings, it works on all types of wounds, this represents economy and comfort for healthcare professionals as well as for the patient. See the figure below;

Wound dressing with Nanoskin®



Nanoskin®

COMMON QUESTIONS

WHAT IS THE NANOSKIN MEMBRANE MADE OF?

THE NANOSKIN MEMBRANE IS MADE FROM TEA STEM CELLS WITH NANO-STRUCTURES IDENTIFIES THE HUMAN SKIN

This membrane is 100% natural obtained through biotechnological process.

HOW DOES NANOSKIN WORK?

Nanoskin acts as a temporary skin replacement, providing ideal and necessary conditions for a faster, high-quality healing process.

Nanoskin works as a protective barrier against microorganisms,

The Nanoskin® membrane works by promoting:

-Isolation of exposed nerve endings, resulting in immediate pain relief.

-Direct contact of the membrane with the lesion layer promotes the development of new skin.

-Maintenance of the raw area of the lesion moist during the regenerative process, allowing an efficient exchange of oxygen/nitrogen within their area, thus preventing infection by pathogens.

WHY DOES NANOSKIN RELIEVE PAIN QUICKLY?

The perfect adhesion of the film to the injured area isolates the nerve endings with immediate pain relief

Why choose Nanoskin membrane? WHY is Nanoskin different?

I- Nanoskin® made from nano-biotechnological biomimetic scaffolding process.
II- -Nanoskin® is a highly hydrated film composed of a random array of fibers in the form of a 2 nm wide ribbon.
III- -This nanobio process produces vitamin complex and potent detoxifying substances.
IV- -Nanoskin is a natural fiber based on polysaccharides composed of hemicellulose proteins.
V- -Increase the activity of NK cells (Natural Killer Cell), T cells (T cells are a kind of lymphocytes - white blood cells) and cells (B cell is a kind of lymphocytes that make up the immune system).
VI- -These polyunsaturated fatty acids present in Nanoskin®, which activate peroxisome proliferator-activated receptors (PPARs); these receptors are increased in keratinocytes after skin injury and are considered important regulators of reepithelialization.
VII- -Nanoskin can activate intracellular signaling pathways that regulate the various stages of the wound: reepithelialization and granulation.

WHAT ARE THE CARE OF NANOSKIN'S CONSERVATION?
Nanoskin must be kept in its original packaging, sealed until ready for use, and stored in a dry and ventilated environment.
.

HOW TO APPLY THE NANOSKIN MEMBRANE?
After cleaning the lesion with saline solution, (the specific quanta biogel can also be used for cleaning) place the membrane over the wound. With the aid of gauze moistened with saline solution, perform gentle compression from the center to the edges of the membrane, to remove air bubbles. If necessary, cut the edges of the membrane, leaving approximately 1 cm. Then place a dry sterile gauze over the membrane. Secure the gauze using bandages, compressive bandages, tape, micropore or similar.

How to remove the membrane?
Moisten the membrane with gauze soaked in saline solution and start the detachment from the edge, with a gentle movement, or with anatomic forceps or even with a sterile glove, pulling the dressing slowly.

IS IT NECESSARY TO USE SECONDARY DRESSING?
Yes, The secondary dressing must be made with gauze in order to ensure the patient's comfort.

WHAT IS THE EXCHANGE PERIOD FOR NANSOKIN?
The exchange time varies according to the amount of exudate and the presence of contamination in the wound. In wounds with a large amount of secretion and/or contaminated, it is advisable to change them within 2 days. The dressing must be changed when the wound presents a strong odor or at the discretion of the professional who is monitoring the case.
In the presence of signs of infection such as significant change in the exudate (becoming purulent), presence of edema (swelling), hyperemia (redness), pain and heat in the region of the lesion, the membrane must be removed immediately and can only be used again after a local infection is cured.

WHAT IS THE IDEAL SIZE OF THE DRESSING IN RELATION TO THE INJURY?
The ideal size of the dressing over the wound should exceed 1 cm along the entire length of the wound edges. If there is a need to use more than one dressing unit, due to the extension of the area to be treated, as the films must also overlap by 1 centimeter.

IS NANOSKIN ABSORBED BY THE BODY?
Not.

CAN I TAKE A BATH WITH THE NANOSKIN MEMBRANE?
It is not recommended to wet the membrane, it can be protected with plastic during the bath.

Can Nanoskin Membrane be used on necrotic tissue?
I-
Yes. The Nanoskin membrane can be used over necrosis, thus favoring an autolytic debridement. It is good to have a healthcare professional evaluating the need to remove the necrosis mechanically.

X-Can Nanoskin Membrane be used in what age group? In which parts of the body?

The Nanoskin membrane can be used in all age groups, including newborns, as it does not have any active ingredient that is 100% natural.
The Nanoskin membrane can be used in any region of the body that will undergo skin removal, following the care

What is the validity of the Nanoskin membrane?
The shelf life of Nanoskin products is two years.

Where can I buy Nanoskin membrane?
On our website nanoskin.healing@gmail.com or via watts apps 16 99441-8006 with Gisleide

II- If the wound has a strong odor, what to do?

Wound odor may be related to colonization and/or contamination by bacteria. Nanoskin has properties to control this contamination by stimulating the migration of white cells to the wound bed such as macrophages, leukocytes and lymphocytes. However, if infection is found, the antibiotic must be used with medical advice and after the soap test (bacterial rate)
systemic therapy is indicated, but for this, consult a physician. In these cases, the most frequent replacement of the membrane (from 5 to 7 days) is indicated. With frequent exchanges, the strong odor should diminish.

Wound Healing Process: Important Factors

Cells:
-Inflammatory cells (neutrophils, lymphocytes, macrophages.....) "cleaning" the wound and providing growth factors
-Skin cells: produce: collagen, reticulin, elastin fibers from the extracellular matrix
-Endothelial cells that regenerate blood vessels (angiogenesis)

Molecules: Growth factors and Citocines

-Plates that form the clot and provide the growth factors, mediators of intercellular communication

	Function	Acute Wound	Chronic Wound
EGF (Pl,Ma, F)	epithelialization	↑	↓
FGF-2 (K,MAS.F.CE,CML.C)	Granulation, epithelialization, extracellular matrix	↑	↓
TGF-β(Pl, K, M,L,F)		↑	↓
PDGF(Pl,K<Ma,CE,F)		↑	↓
VEGF	Granulation	↑	↓
IL-1 (N,M,Ma,K) **IL-6** (N,Ma) **TNF-α(N,Ma)**	inflammation, epithelialization	↑	↑

Metalloproteinases(MMPs) are a family of enzymes that when activated, they degrade extracellular matrix components (ECM) (collagen...) and growth factors. Collectively, these enzymes are capable of degrading all kinds of extracellular matrix proteins, but also can process a number of bioactive molecules. They are known to be involved in the cleavage of cell surface receptors, the release of apoptotic ligands (such as the FAS ligand), and chemokine/cytokine inactivation.

MMPs are also thought to play a major role in cell behaviors such as cell proliferation, migration (adhesion/dispersion), differentiation, angiogenesis, apo ptosis and host defense.

Inflammatory mediators

Prostaglandins, leukotrienes, interleukin-1, Nitric oxide, anti-microbial peptides, Pro-inflammatory and antagonist cytokines.

Clotting protein

All these molecules are influenced by physicochemical conditions, temperature, humidity, pH, pO2, pCO2, so Its operation is facilitated by the hot and humid environment of the fibrin clot.

Extracellular matrix

Three-dimensional structure, It is constantly renewed, whose structure is composed of:

-Collagen, elastin, reticulin produced by fibroblasts...

Fundamental substance: -Proteoglycans, glycosaminoglycans, hyaluranic acid, guide cell migration

Chapter 3

DEFINITIONS AND CLASSIFICATION OF WOUNDS

A wound is a skin lesion represented by a disruption of tissue continuity and a disruption of the skin barrier that requires a complex dynamic process to repair or heal. It can be superficial, involving only the epidermis (erosion), part of the dermis or being deep with exposure of the subcutaneous tissue. Its evolution depends on its extension and depth, but also on local or general factors that can delay or prevent its healing

The acute wound results from a surgical or traumatic injury and progresses through the healing phases in approximately one month.

Chronic wound a wound that has lasted longer than 4-6 weeks. The chronic wound does not go through the stages of healing stages in sequence or over time. Underlying diseases (diabetes, venous/arterial insufficiency) or (diabetes, venous/arterial insufficiency) or external factors contribute to the failure of the healing process. The potential for wound healing will depend on the local conditions and the general condition of the patient. The presence of certain local or general factors can be an indicator of risky wounds with little chance of spontaneous healing.

TYPES OF WOUNDS

SURGICAL WOUND:

Intentionally created skin incision.

ATONIC WOUND

Non-progressive wound, usually dry, usually covered with whitish tissue.

CONTAMINATED WOUND

Microbial presence in the wound, commensal flora

COLONIZED WOUND

Bacterial proliferation in the wound without any systemic immune response.

INFECTED WOUND

Invasion and multiplication of microorganisms causing a local and / or systemic inflammatory response and clinical symptoms and signs of infection (fever, heat, redness, pain, edema).

UNDERMINE WOUND

It contains more or less sinuous and deep cracks under the wound margins.

CAVITY WOUND

Contains a hollow part

FISTULOUS INJURY

It involves communication between a hollow organ and the skin.

Blister

Formed by a displacement between the epidermis and the dermis, full of serosity: the blister is characteristic of second-degree burns.

GENERAL FACTORS THAT Hinder the HEALING PROCESS

Intrinsic factors:

-Age

- Severely malnourished patient

- Concomitant disease (chronic diseases involving the cardiorespiratory system, diabetes,

renal insufficiency...)

- Insufficient tissue oxygenation

- Immunodeficiency

Pathology affecting tissue vascularization and its oxygenation:

- Arteriosclerosis
- Arthritis and small vessel diseases
- Venous insufficiency
- Chronic lung failure
- Lymphatic insufficiency

extrinsic factors

- Medication
- Immunosuppressive treatments
- Corticosteroid therapy
- Radio + chemotherapy
- Infection
- Stress

Iatrogenic factors

- Inadequate wound care
- Local ischemia
- Wound dehydration

-HEALING PROCESS

Healing is a complex and dynamic biological process that leads to wound repair. The duration of healing varies depending on the intensity, contusion or superinfection.

Healing is a complex and dynamic biological process that leads to wound repair. The duration of healing varies depending on the intensity, contusion or superinfection.

The treatment and care of a wound is difficult to delineate. Even in the presence of identical etiological lesions, the course of the healing process can take place in a totally different way depending on the type of wound, the location or the person.

Normal wound healing follows a four-step process

Phase 1: Inflammatory (detersive-inflammatory): After vasodilation with bleeding, there is constriction of the ruptured vascular ends, with coagulation and production of an exudate rich in cells (granulocytes, macrophages, monocytes) that will eliminate (detersion phase), lymphatic and / or by the formation of pus, bacteria, dead tissue and foreign microparticles.
At this stage, the wound shows all the characteristic signs of inflammation: redness, swelling, heat, pain.
The dilation of blood capillaries is responsible for redness and heat. The increase in its permeability, by promoting plasma exudation, is responsible for swelling, heat and pain due to pressure on sensitive nerve endings.
This reactive phase usually lasts between 3 and 6 days.

Phase 2: Granulation or proliferative: This phase corresponds to fibroblast proliferation, angiogenesis and extracellular matrix synthesis.
Immediately after the inflammatory phase, a granulation tissue with capillary neoformation (neovascularization or angiogenesis) begins to organize itself within a network of collagen and elastin (produced by fibroblasts) that will bring in situ oxygen, nutrients and cells necessary for tissue repair.
-Macrophages at this stage still play an essential role in the production of growth factors or cytokines capable of promoting fibroblast proliferation and collagen synthesis. At this stage, the scar is a young fibrosis containing many fibroblasts and a loose fibrillar web on the periphery of the loss of substance.
-The edge of a wound is composed of fibroblasts, an inflammatory infiltrate (monocytes, lymphocytes, polynuclear cells), surface fibrin and new vessels in an swollen fibrillar web.

The contraction of the wound to bring it closer to the edges is closely related to the formation of granulation tissue and the transformation of certain fibroblasts into myofibroblasts capable of contracting and transmitting their contractile activity to the surrounding tissue through the interaction between cytoskeleton and extracellular matrix proteins .
This phase, which is very active from the 7th day onwards, can last up to 3 weeks.

Stage 3: Epithelialization: After tissue repair, the wound retracts and gradually becomes covered by new epithelium = epithelialization process.
Epidermal cells capable of dividing (base layer cells = keratinocytes) multiply and begin to cover the granulation tissue from the edges of the wound. To be able to migrate properly, these keratinocytes need healthy, moist and level granulation tissue. As a result of the formation of this first cell layer, the epithelium thickens by cell division and soon becomes more resistant. the wound is closed

Phase 4: Maturation: This phase called "maturation" starts in the first few days in the case of a sutured wound, but can also last for months in the case of extensive and very open wounds. It is characterized by connective tissue remodeling and scar formation.
The granulation tissue disappears to give way to fibrous connective tissue. Collagen fibers thicken which increases resistance to tensile forces. The number of capillaries decreases, as does the blood flow.
Excess water and blood vessels disappear and the scar becomes firmer.
However, in all cases the scars are less resistant and less elastic than normal skin, in part due to a certain deficit of elastin.
This phase can last for several months.

International Visual Wound Color Scale

The international visual wound color scale describes the different stages of wound healing and allows to use a common language.

BLACK -Necrotic tissue: wound covered by a black plaque, dry or wet
YELLOW- Fibrinous tissue: wound covered by yellowish or whitish tissue, more or less adherent
RED-Granulation tissue: red, vascularized wound, with islets of buds
PINK- Epithelialization tissue: wound covered by a thin epithelium. Is it pink, pearlescent or shiny
GREEN-infected wound

Chapter 4

Nanoskin wound treatment

In this chapter we will present:

1- Wounds in pressure ulcers and others
2- Diabetic Foot Wounds
3- Burn wounds
4- Rare wounds
5- Tumor wounds
6- Wounds in general

Pressure sores

A pressure ulcer is a localized lesion of the skin and/or underlying tissue, usually at the level of a bony prominence, due to pressure or pressure associated with shear or friction. Several contributing factors are associated with pressure ulcers; however, the importance of these factors remains to be determined. Pressure ulcers severely affect patients, interfering with their functional recovery, often causing pain and promoting the development of serious infections. Pressure ulcers are classified into four stages:

Stage I	Skin color is slightly altered, but there are no open wounds.
Stage II	The skin splits, forming an ulcer.
Stage III	The lesion has worsened and forms a crater in the tissue.
Stage IV	The wound is very deep and causes significant tissue destruction; the wound can damage muscles, bones and tendons.

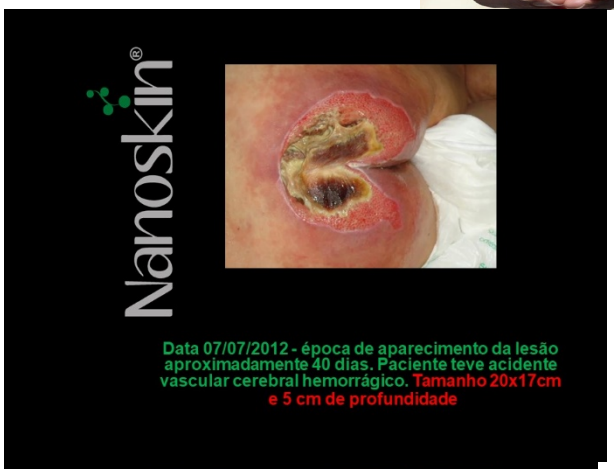
RISK FACTORS

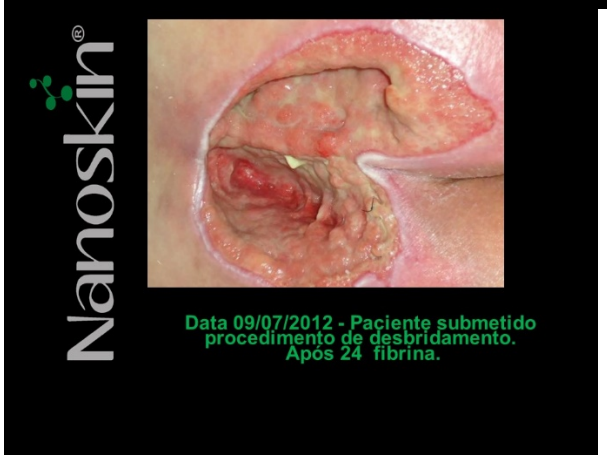
For some categories of patients, the assessment requires the physician to consider certain factors that may increase the risk of skin damage or compromise healing. Advanced age, declining general nutritional and mental health, loss of mobility, deficits in sensory perception, incontinence and changes in skin characteristics were recognized as early signs of pressure-associated injuries. The risk is increased in people with high blood pressure, contractures or a history of stroke. The incidence and prevalence rates of pressure ulcers remain higher in intensive care due to the large number of critically ill patients. It can be difficult to assess skin condition and visualize bony prominences in very obese people. Surgical patients are particularly susceptible to the development of pressure ulcers due to their prolonged intraoperative and immediate postoperative immobility. In many terminal patients, multiple factors and comorbidities increase the risk of developing pressure ulcers and need to be identified.

Case 1-

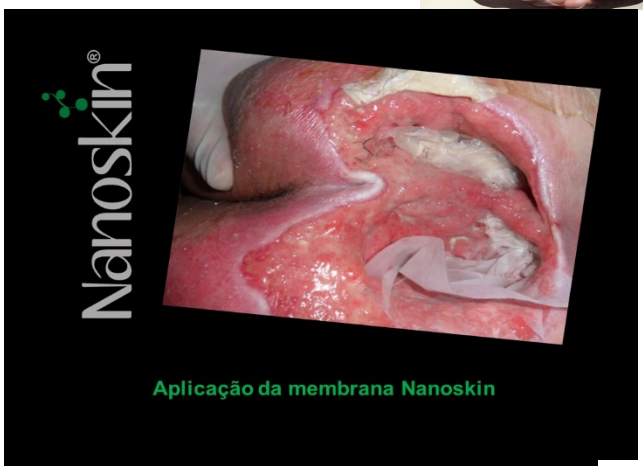
Start 07/07/2012 - Patient had hemorrhagic stroke.
Wound size 20x17cm and 5 cm deep

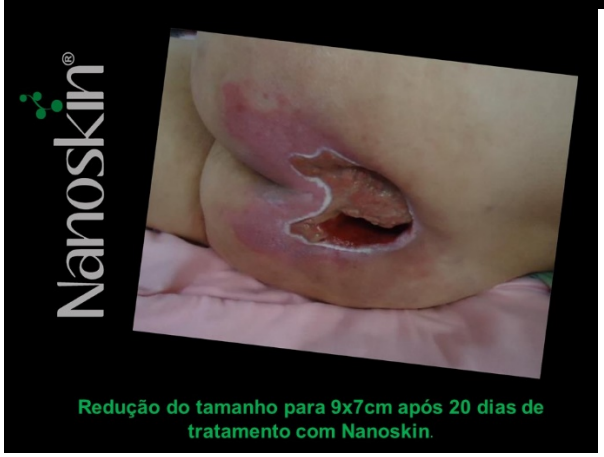

Nanoskin

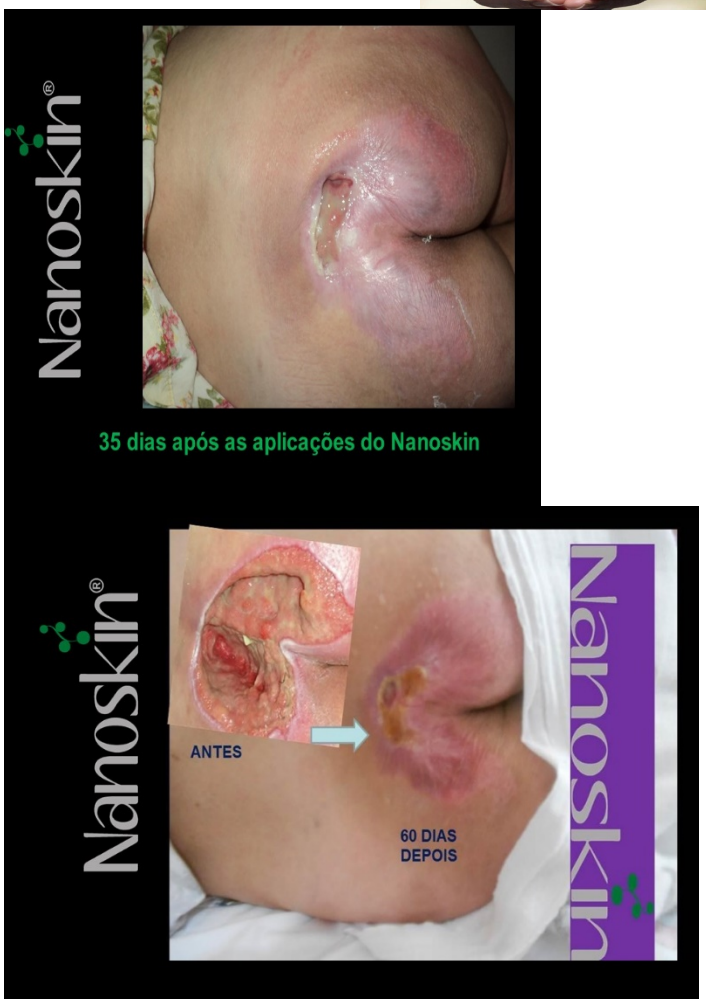

Nanoskin®
Data 07/07/2012 - época de aparecimento da lesão aproximadamente 40 dias. Paciente teve acidente vascular cerebral hemorrágico. Tamanho 20x17cm e 5 cm de profundidade


Nanoskin®
Data 09/07/2012 - Paciente submetido procedimento de desbridamento. Após 24 fibrina.


Nanoskin


Nanoskin®
Aplicação da membrana Nanoskin

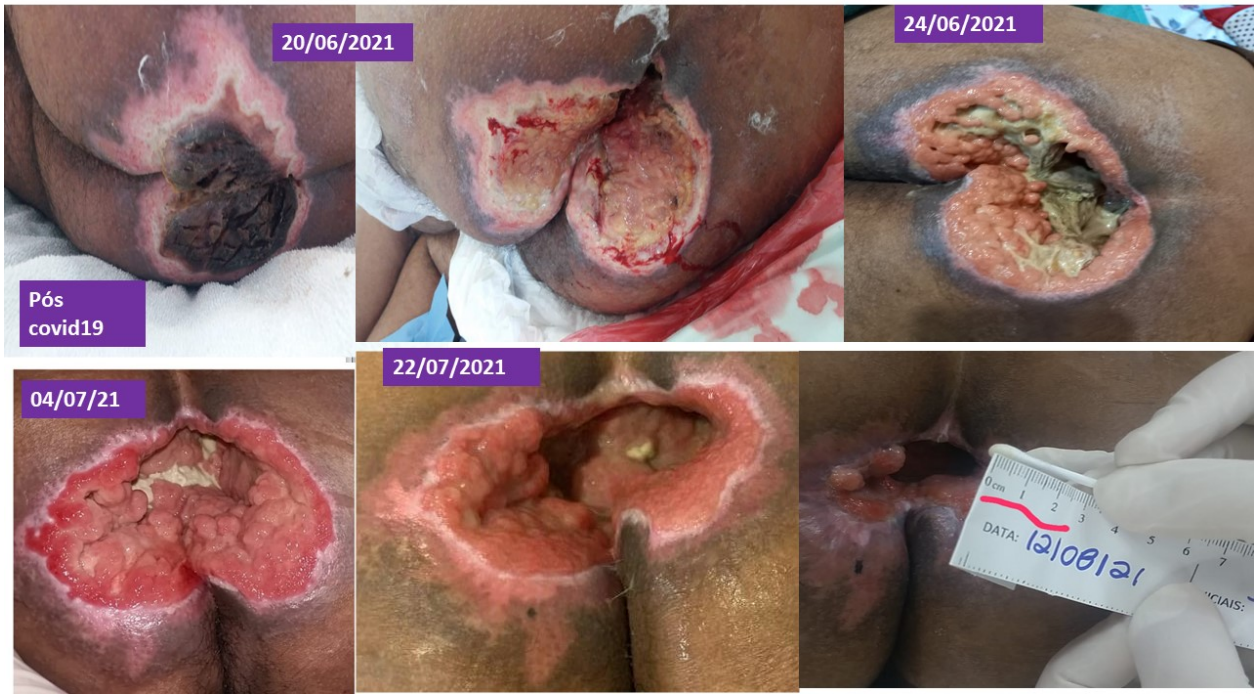

Nanoskin®
Redução do tamanho para 9x7cm após 20 dias de tratamento com Nanoskin.



Case 3
Pressure ulcer after covid 19
Patient was incubated because of covid 19
developed pressure ulcer

Work of nurse Helena Reichert

Other cases: under treatment



A 43-year-old man was admitted at the worst time of the pandemic in Araraquara, in early May, and spent 43 days in hospital, most of them intubated.

The diabetic foot and its affections

The complications of diabetes that affect the feet are closely linked to the decreased sensitivity of the contact nerves, preventing the perception of small lesions or abnormalities of the foot (callus, cracks, cracks, ringworm...), which end up 'amplifying and get infected...with risk of amputation.

Diabetic foot is characterized by ulceration or destruction of foot tissue, infected or not, due to peripheral neuropathy.

Peripheral neuropathy is defined by:
loss of sensation in the feet due to damage to the nerves decreased natural hydration of the foot causing dryness, fissures and calluses bone deformities of the foot resulting in the appearance of pressure points

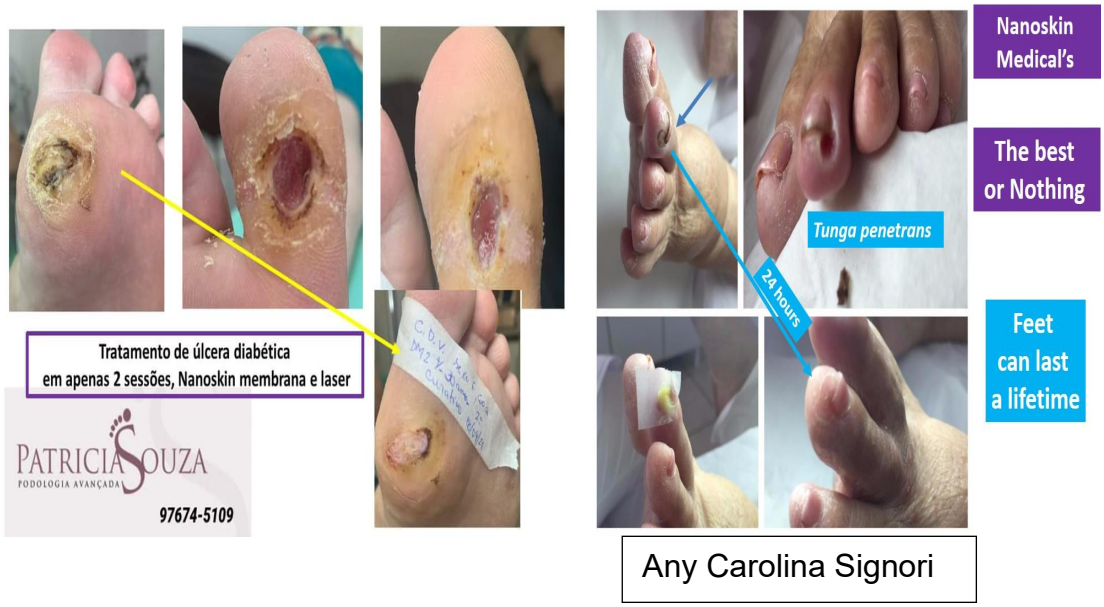
All of these conditions are the basis of diabetic foot ulceration.

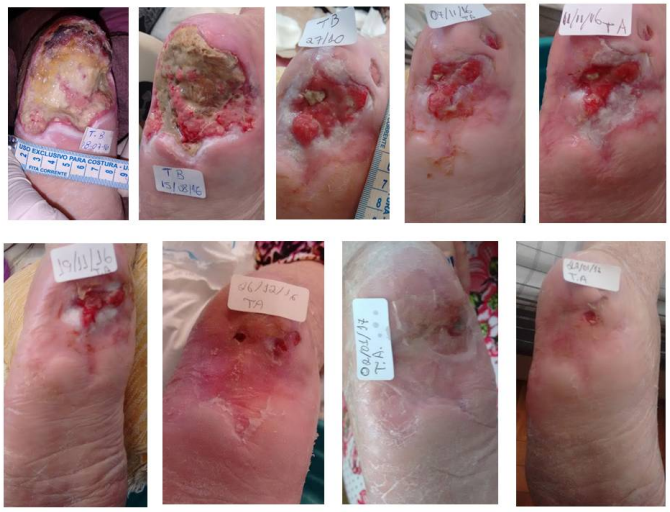
Plantar perforation disease

Neuropathy severely disturbs the static and dynamics of the foot, responsible for hyperkeratosis, the first step which will then cause bleeding (bruising) in depth and which will instead leave ulcerations in the skin: it is the plantar perforating disease.

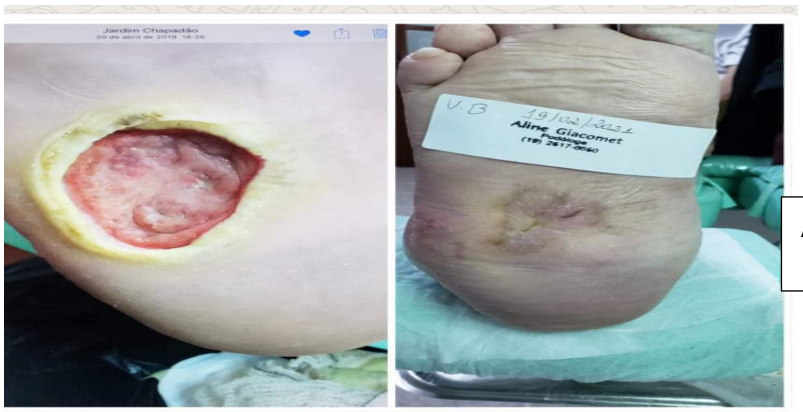
In addition, occlusion of the arteries in the lower limbs (arthritis) causes a deficit of oxygen in the blood needed for healing and, therefore, greatly worsens the process.

Clinical trials





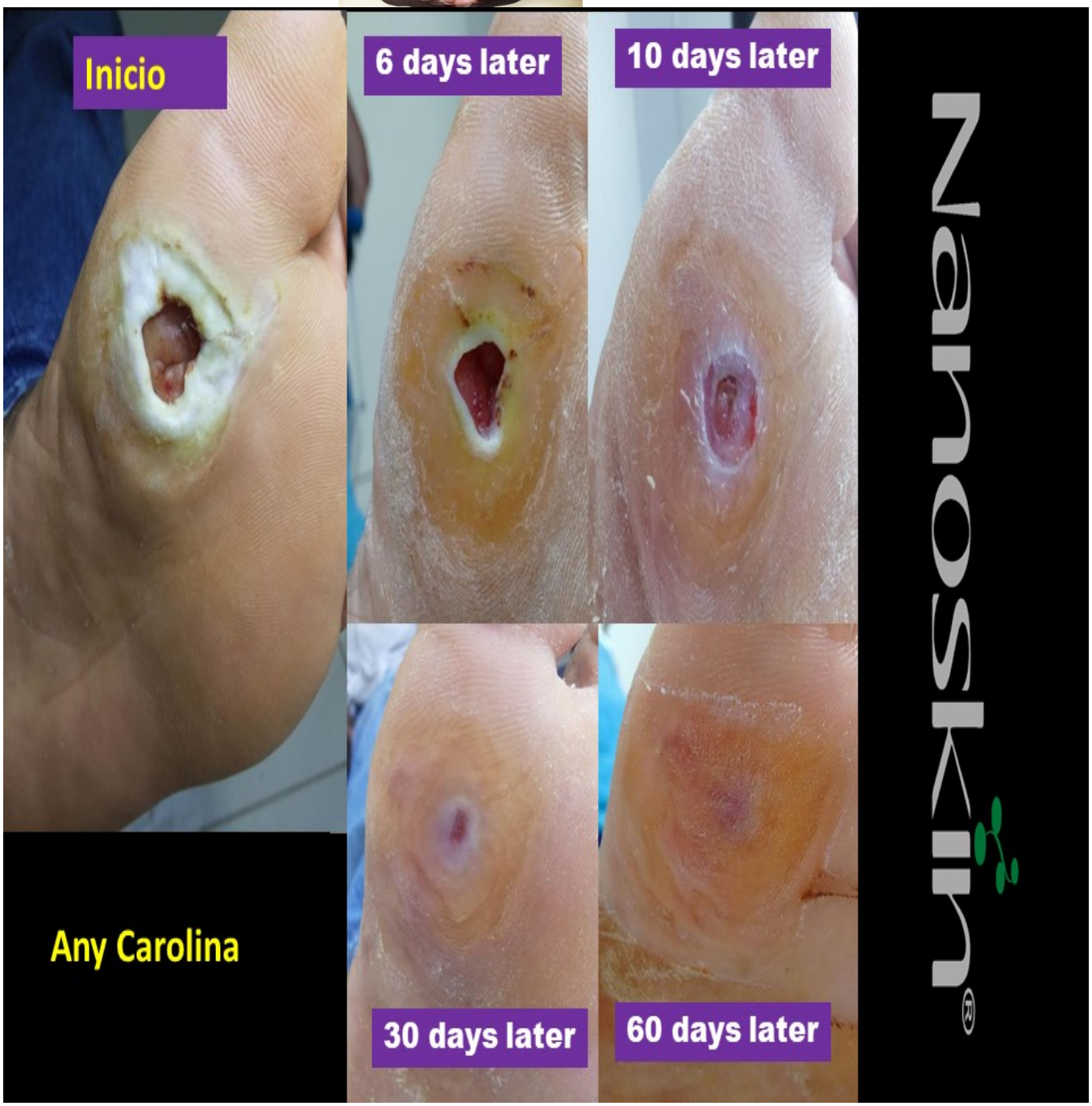
Work of nurse Vicente



Aline Giacomete

Customer satisfaction

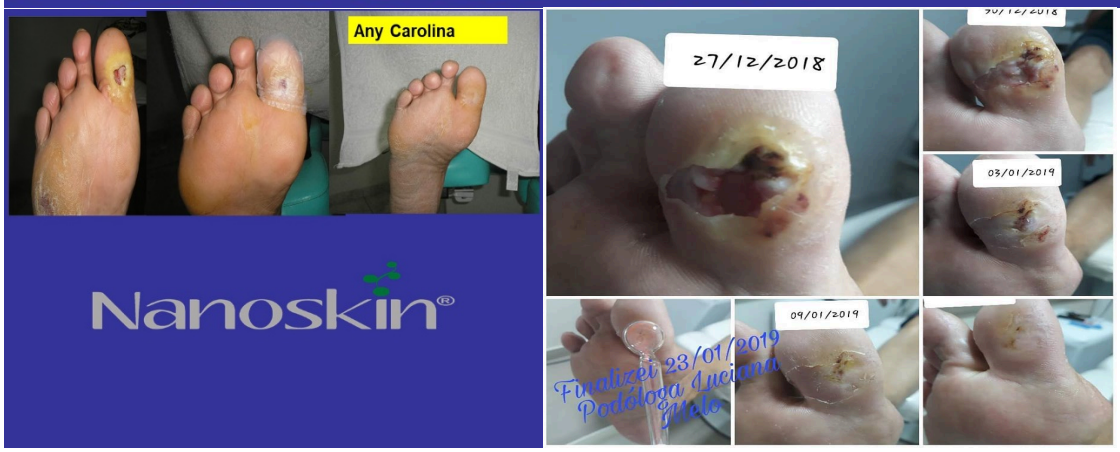

Nanoskin


Inicio
6 days later
10 days later
Any Carolina
30 days later
60 days later
Nanoskin®

Nanoskin®


Nanoskin


Paciente - 87
anosNaturopata (Hansenia)
30 dias
Any Carolina
Nanoskin®


Any Carolina
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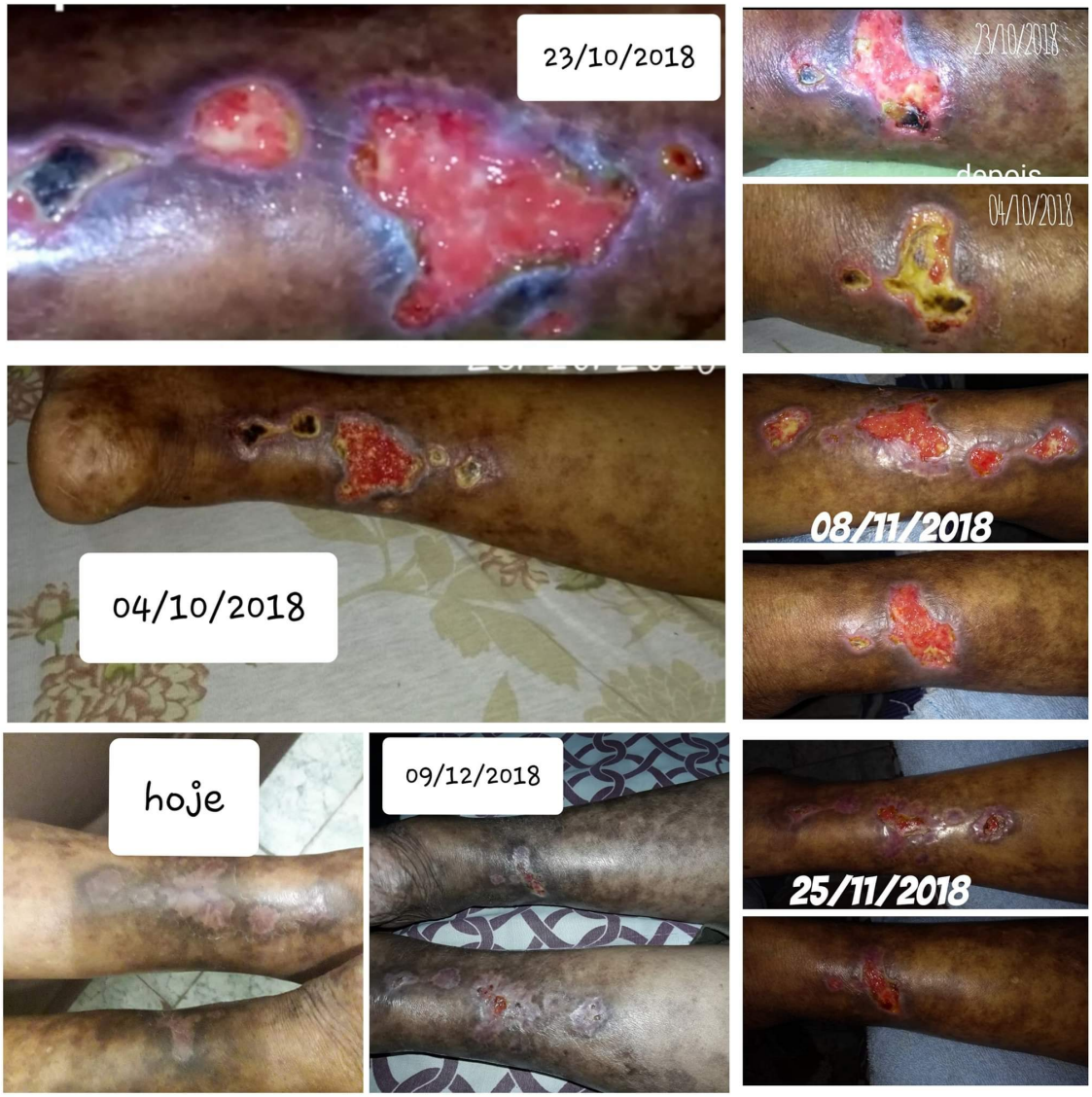
Nanoskin®



Clinical cases of burns

A burn is an injury to body tissues due to contact with heat, electricity, radiation or chemicals.

• Burns cause varying degrees of pain, blisters, swelling, and skin loss.

• People who suffer minor, superficial burns may only need to clean them and apply an antibiotic cream.

• Deep and extensive burns can cause serious complications such as shock and severe infections.

Classification

Burns are classified according to strict and generally accepted definitions. The definitions rank the depth of the burn and the extent of tissue damage.

I- Depth of the burn

The depth of the injury caused by a burn is described as being of the first, second or third degree:

• First-degree burns are the most superficial. These only affect the outer layer of the skin (epidermis).

• Second-degree burns (also called partial-thickness burns) reach the middle layer of the skin (dermis). Second-degree burns are sometimes additionally described as superficial (involving the most superficial part of the dermis) or deep (involving the superficial and deep parts of the dermis).

• Third-degree burns (also called full-thickness burns) involve all three layers of skin (epidermis, dermis, and fat layer). Generally, sweat glands, hair follicles, and nerve endings are also destroyed.

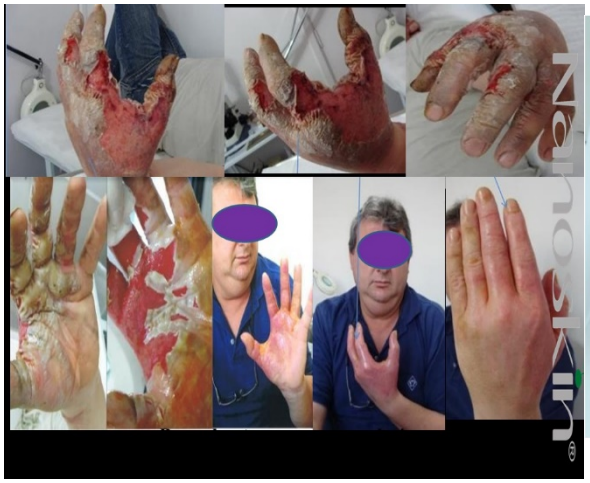
symptoms of a burn wound vary depending on the depth of the burn:

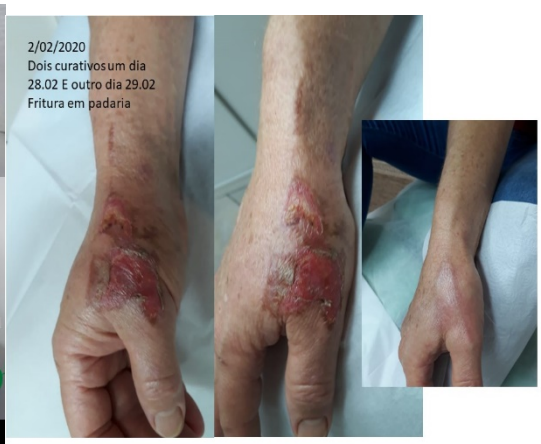
• First-degree burns are red, swollen, and painful. The burnt surface turns pale when gently touched, but no bubbles form.

• Second-degree burns are pink or reddish, swollen, and cause severe pain. Within 24 hours (often within a short time of the burn), blisters appear that release a clear liquid. The burnt surface may turn pale under pressure of touch.

• Third-degree burns are not usually painful because the nerves have been destroyed. The skin becomes dry or may turn white, black or a bright red color. The burnt surface does not turn pale when pressed and the hairs can be easily extracted from its root without pain.

Clinical trials with Nanoskin

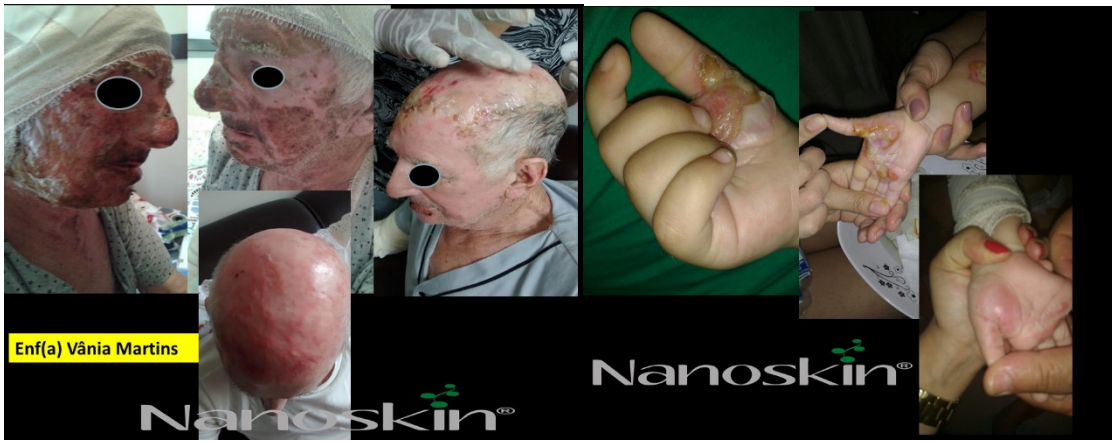


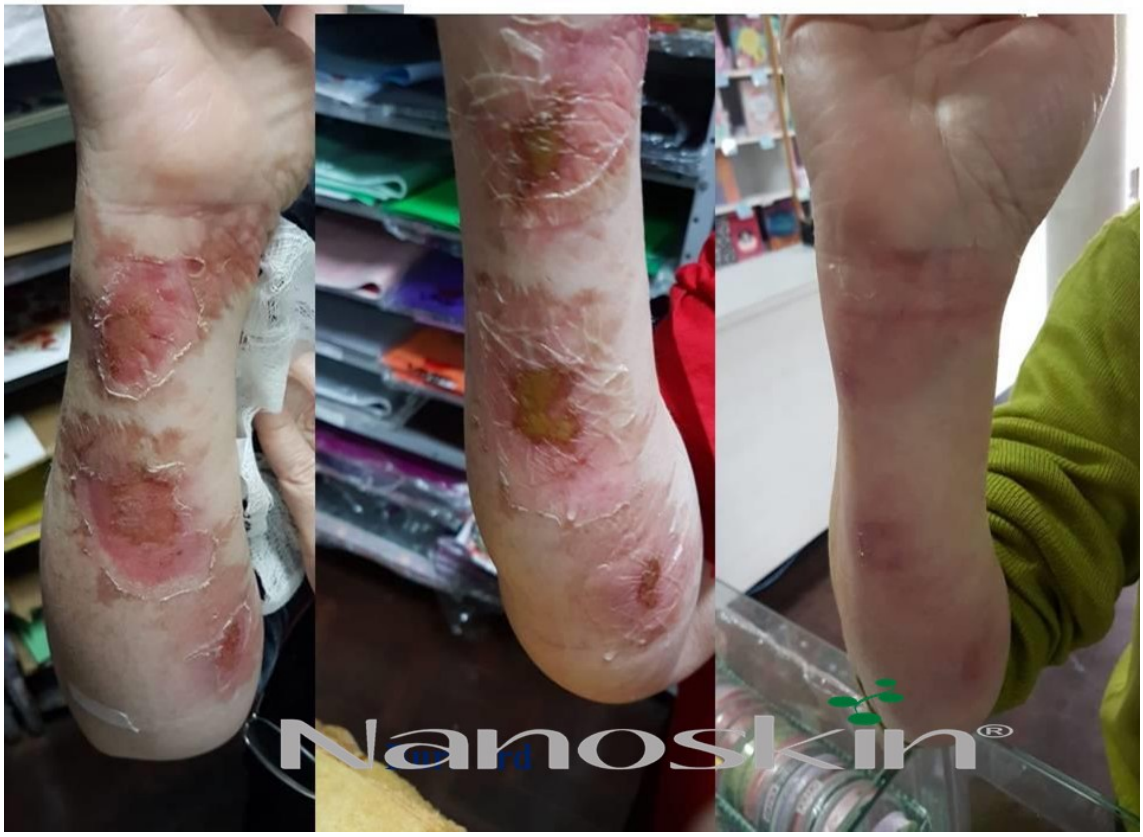


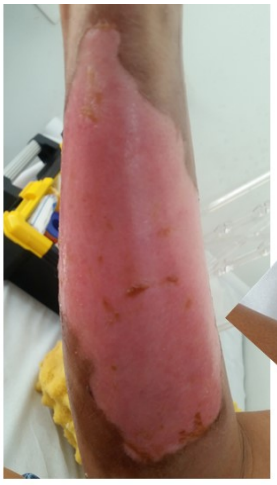

Nanoskin

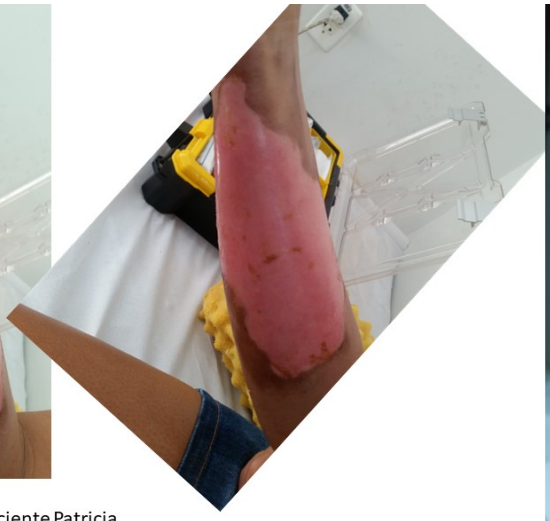

Burn with hot oil
Nanoskin the best or nothing
Burn with hot oil
Nanoskin the best or nothing

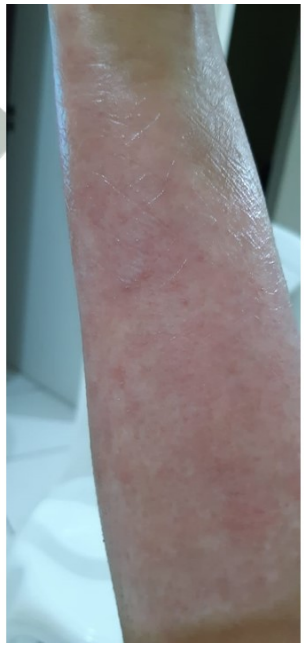

Dois curativos um dia
28.02 E outro dia
29.02
Nanoskin®
Parabéns, Podologa Rose - Santo Pé
Chapéco-SC
Nanoskin®
7 days later


Enf(a) Vânia Martins
Nanoskin®
Nanoskin®









Curativo na paciente Patricia.
Tipo Lesão: Queimadura provocada por vapor.
Tempo de tratamento 07 dias.
Material utilizado: agua destilada, soro fisiológico, biogel e membrana Nanoskin. **Enf. *Jackson Xavier de Jesus***

Rare diseases

Rare diseases are characterized by a wide variety of signs and symptoms and vary not only from disease to disease, but also from person to person affected by the same condition.

Rare diseases are usually chronic, progressive, degenerative and often life-threatening.

What is a rare disease?

Rare diseases are diseases that affect a small number of people compared to the general population and specific questions are raised regarding their rarity.

What are the origins and characteristics of rare diseases?

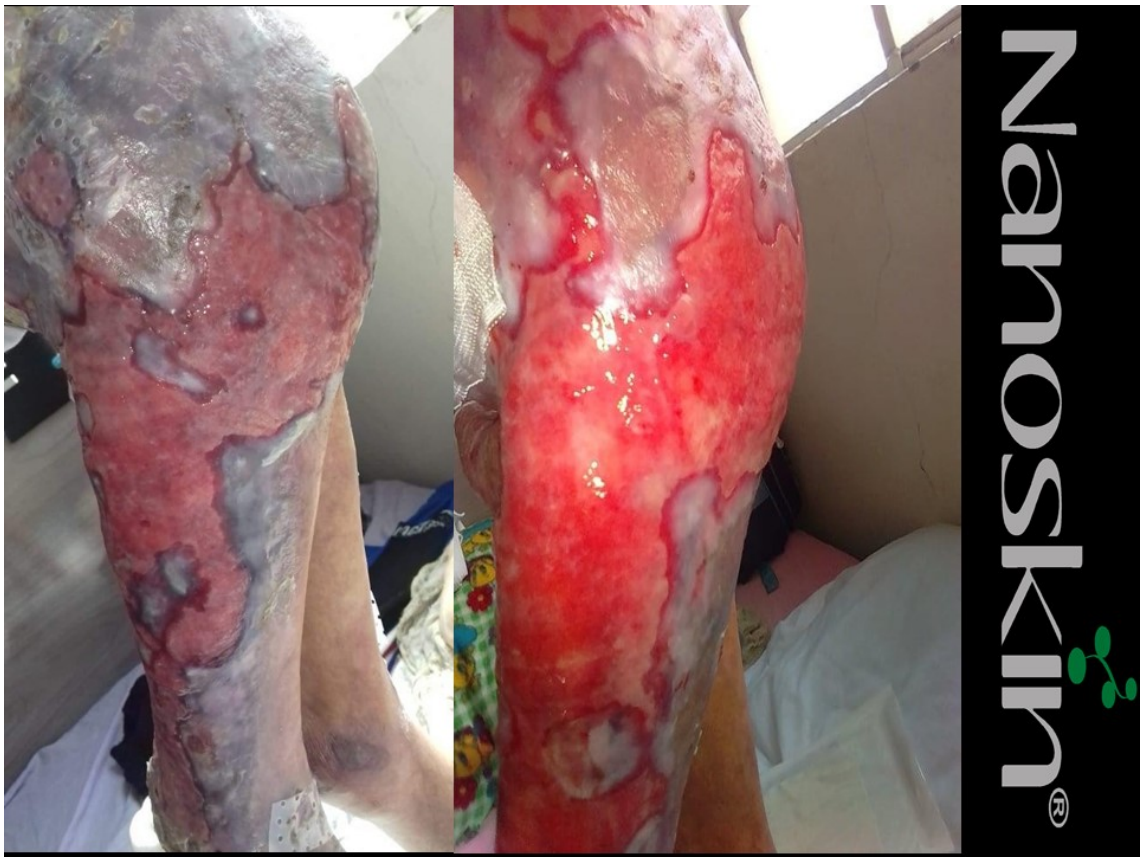
Although almost all genetic diseases are rare diseases, not all rare diseases are genetic diseases. There are also very rare forms of infectious diseases such as autoimmune diseases and rare cancers.

Rare diseases are serious diseases, often chronic and progressive. For many rare diseases, signs can be seen at birth or in infancy, such as proximal spinal muscular atrophy, neurofibromatosis, osteogenesis imperfecta, chondrodysplasia or Rett syndrome. However, more than 50% of rare diseases appear during adulthood, such as Huntington's disease, Crohn's disease, Charcot-Marie-Tooth disease, amyotrophic lateral sclerosis, Kaposi's sarcoma or thyroid cancer, Epidermolysis bullosa (EB) , and Stevens-Johnson

What is Rare Disease Epidermolysis Bullosa (EB)?

Bullosa epidermolysis (EB) is a group of rare medical conditions that result in blistering of the skin and mucous membranes. Blisters occur with minor trauma

or friction and are painful. Its severity can range from mild to fatal. Those with mild cases may not develop symptoms until they start to crawl or walk.



Stevens-Johnson syndrome (SSJ)

Stevens-Johnson syndrome and toxic epidermal necrolysis are two life-threatening forms of the same disease that cause a rash, peeling skin, and blisters on the mucous membranes.

Stevens-Johnson (SSJ) is a rare and serious disease of the skin and mucous membranes. It is usually a reaction to medication that starts with flu-like symptoms, followed by a painful skin rash that spreads and blisters. Then the top layer of affected skin dies, sloughs off and begins to heal after several days.

Cancer wound

What is a tumor wound?

• Neoplastic wounds are formed by the infiltration of malignant tumor cells into skin structures.

Breakage of skin integrity

• Due to the uncontrolled cell proliferation that the oncogenesis process induces, an evolutionarily exophytic wound forms.

How to Treat Cancer Generated Ulcer Using Nanoskin Extracellular Matrix?

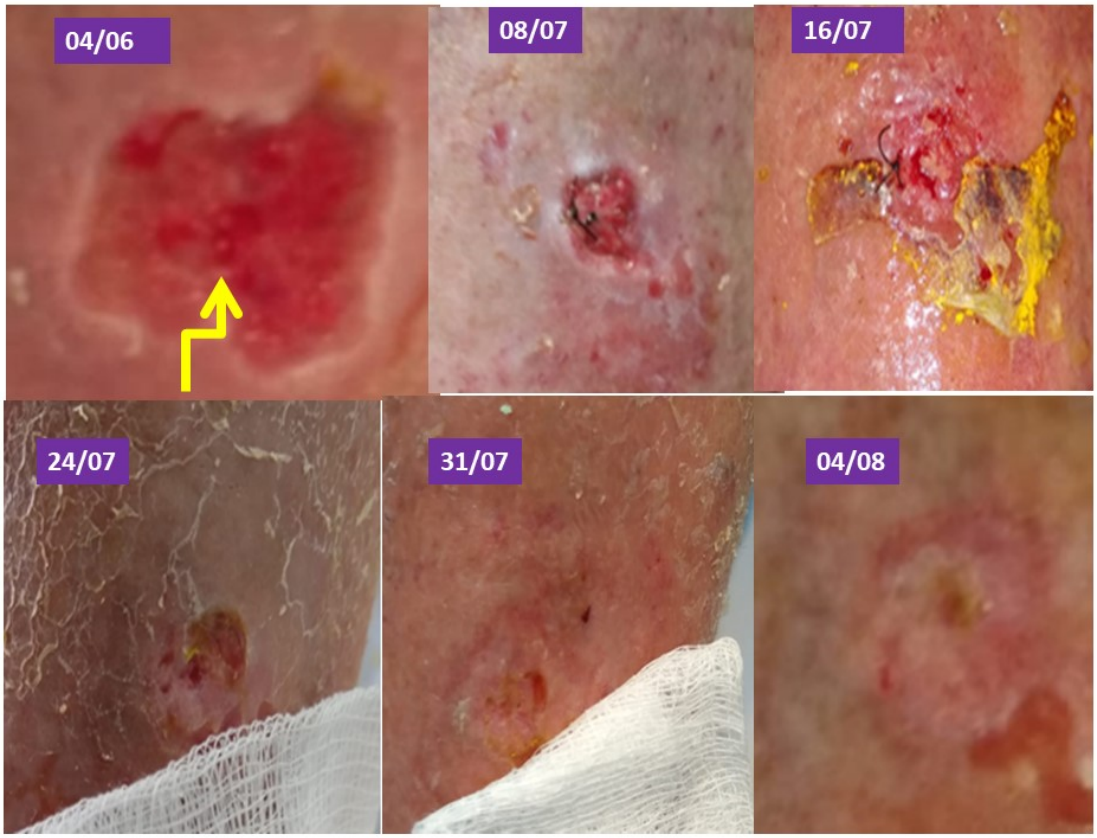
Tumors often extend into deeper structures such as sinuses and fistula.

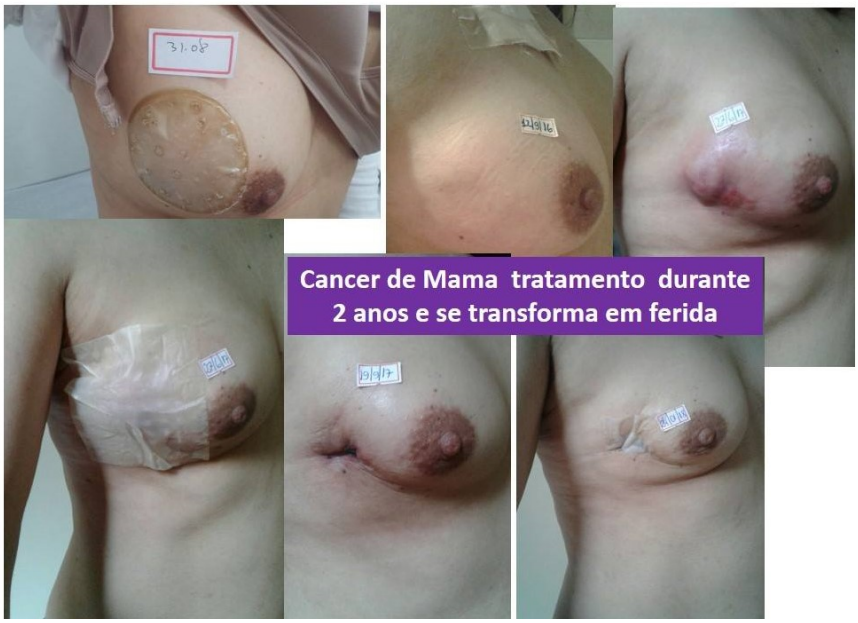
As malignant cells grow and divide, the nodules enlarge – interfere.

Clinical cases with carcinoma treated with Nanoskin

Nanoskin® MEDICAL'S

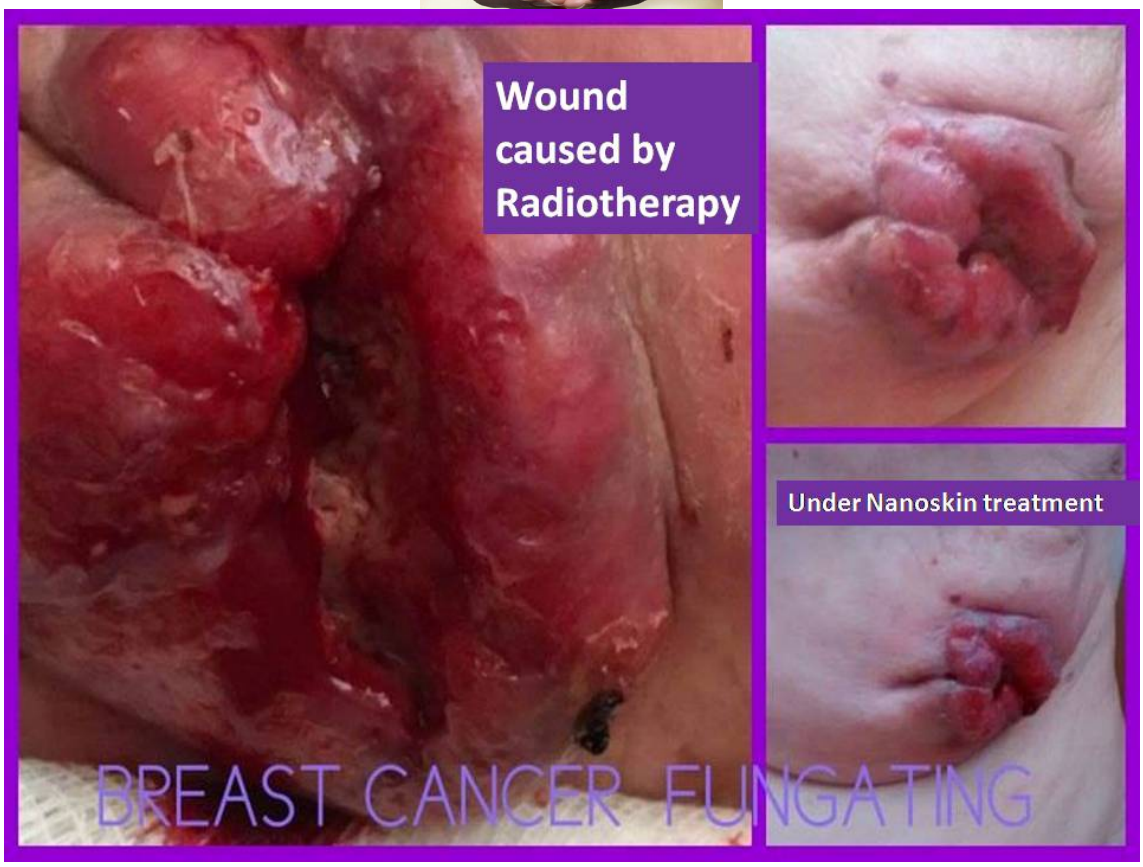

Nanoskin


04/06
08/07
16/07
24/07
31/07
04/08


Cancer de Mama tratamento durante
2 anos e se transforma em ferida

Nanoskin®


Nanoskin

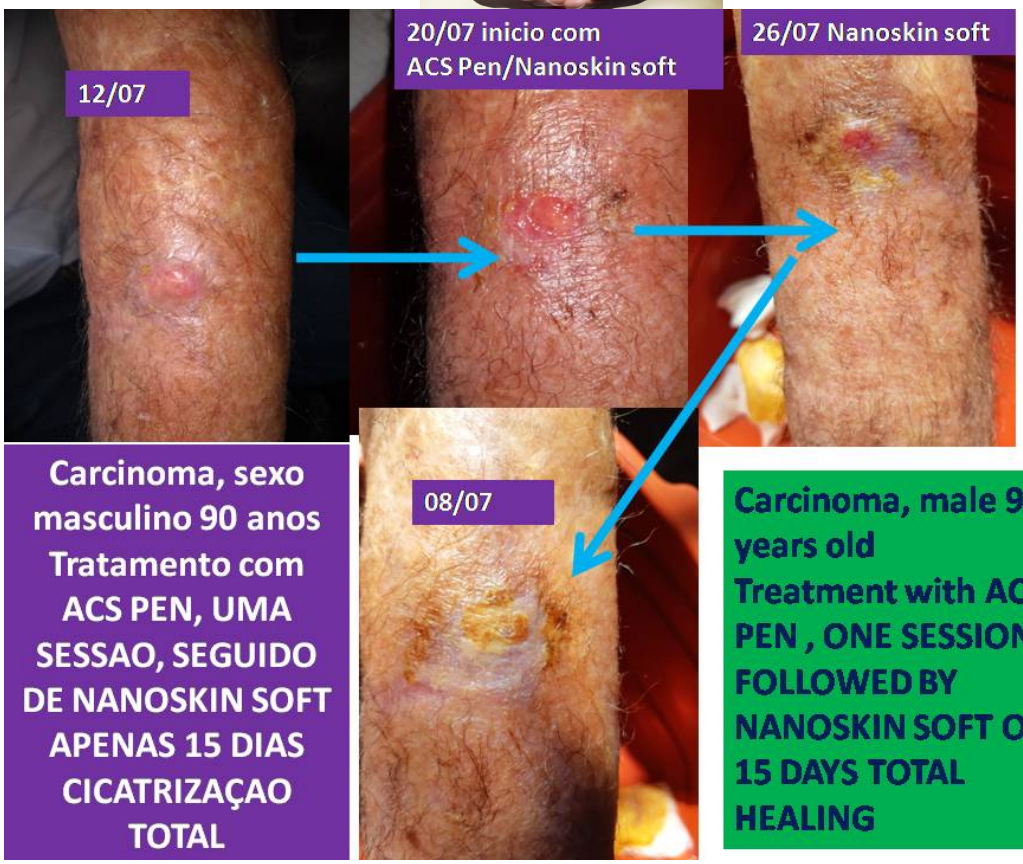

Wound caused by Radiotherapy
Under Nanoskin treatment
BREAST CANCER FUNGATING

Nanoskin®


Nanoskin


MAXILA CANCER
AFTER NANOSKIN TREATMENT
15 DAYS LATER

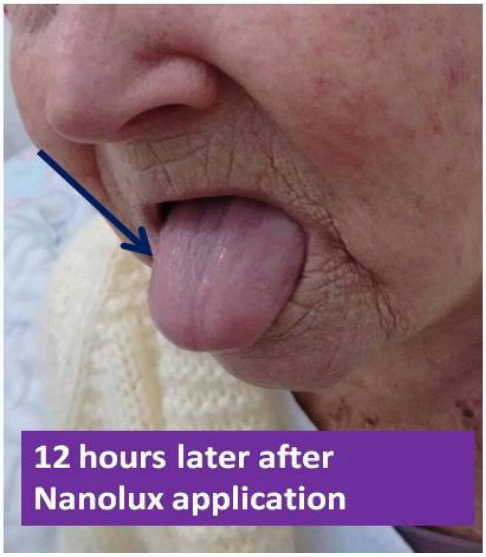

17/05
03/06
18/06
28/06
05/07
15/07
29/07
Carcinoma
Tratamento com
Nanoskin ACT
Nanoskin®

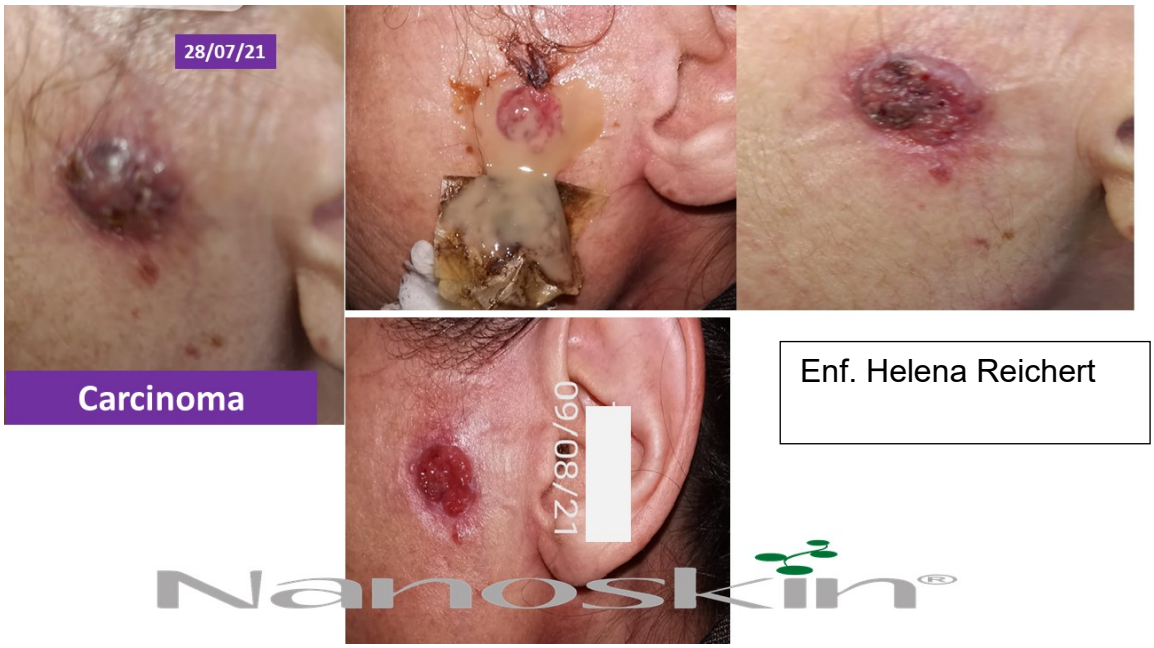


Carcinoma, sexo masculino 90 anos
Tratamento com ACS PEN, UMA SESSAO, SEGUIDO DE NANOSKIN SOFT APENAS 15 DIAS CICATRIZAÇAO TOTAL

Carcinoma, male 90 years old
Treatment with ACS PEN , ONE SESSION, FOLLOWED BY NANOSKIN SOFT ONLY 15 DAYS TOTAL HEALING

Nanoskin® MEDICAL'S





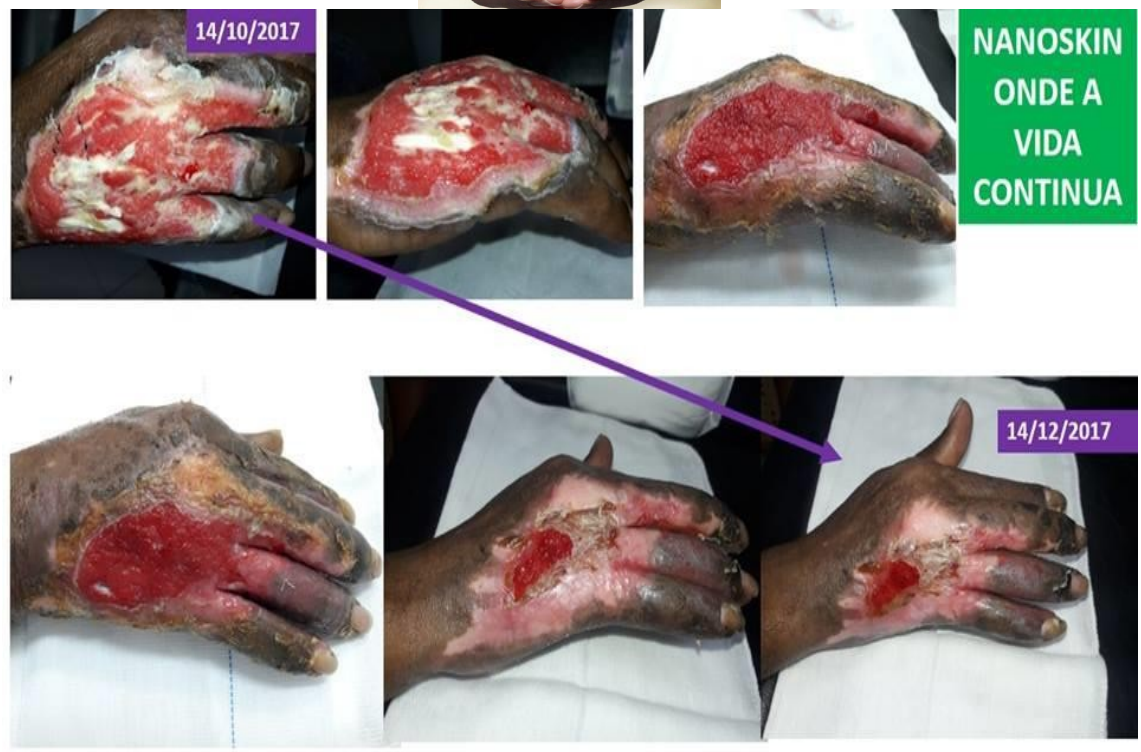
Enf. Helena Reichert

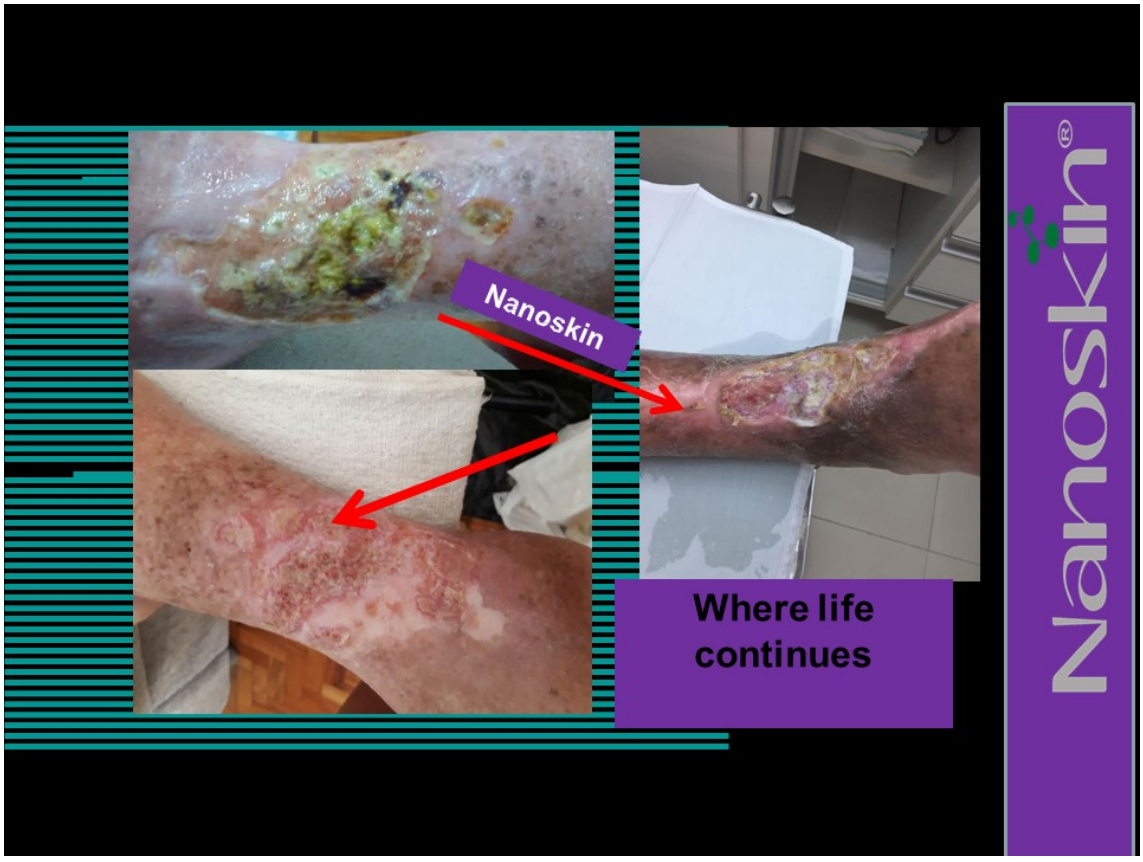
Nanoskin®

Nanoskin®

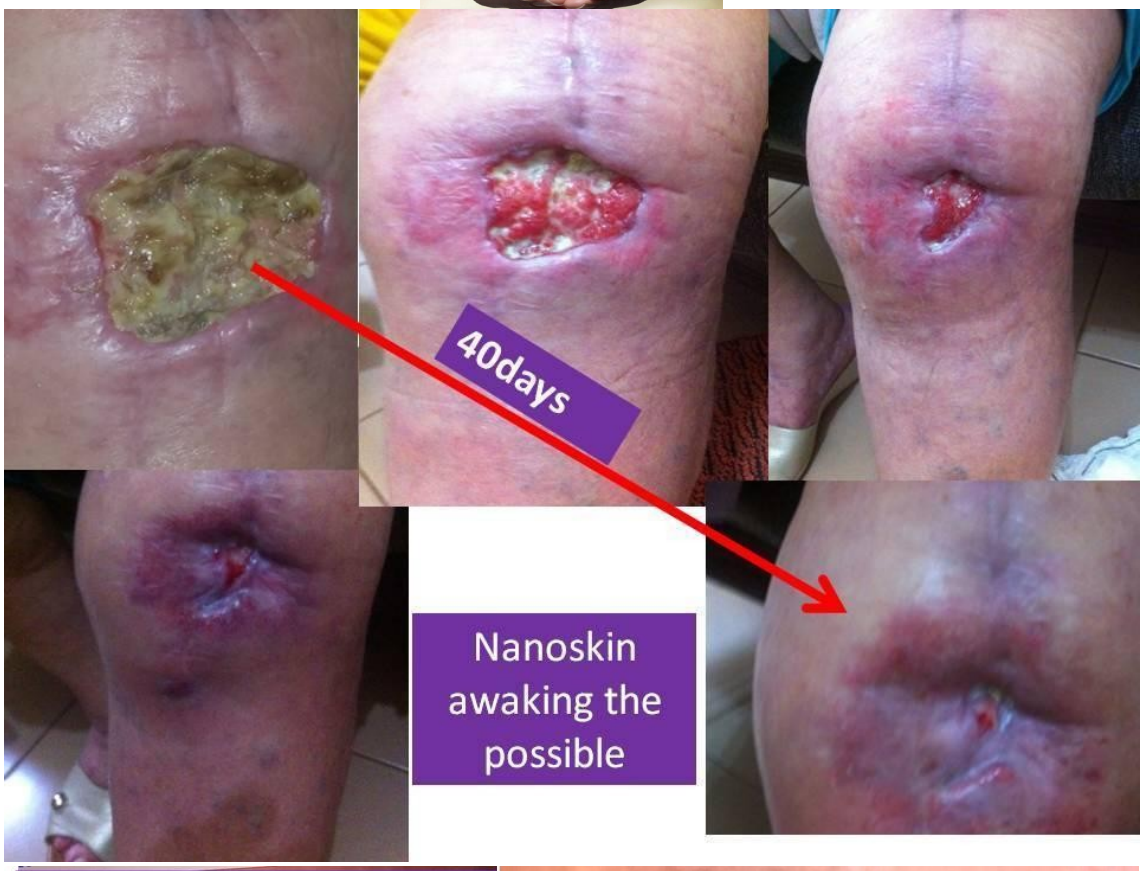
Nanoskin®


Nanoskin


14/10/2017
NANOSKIN
ONDE A
VIDA
CONTINUA
14/12/2017

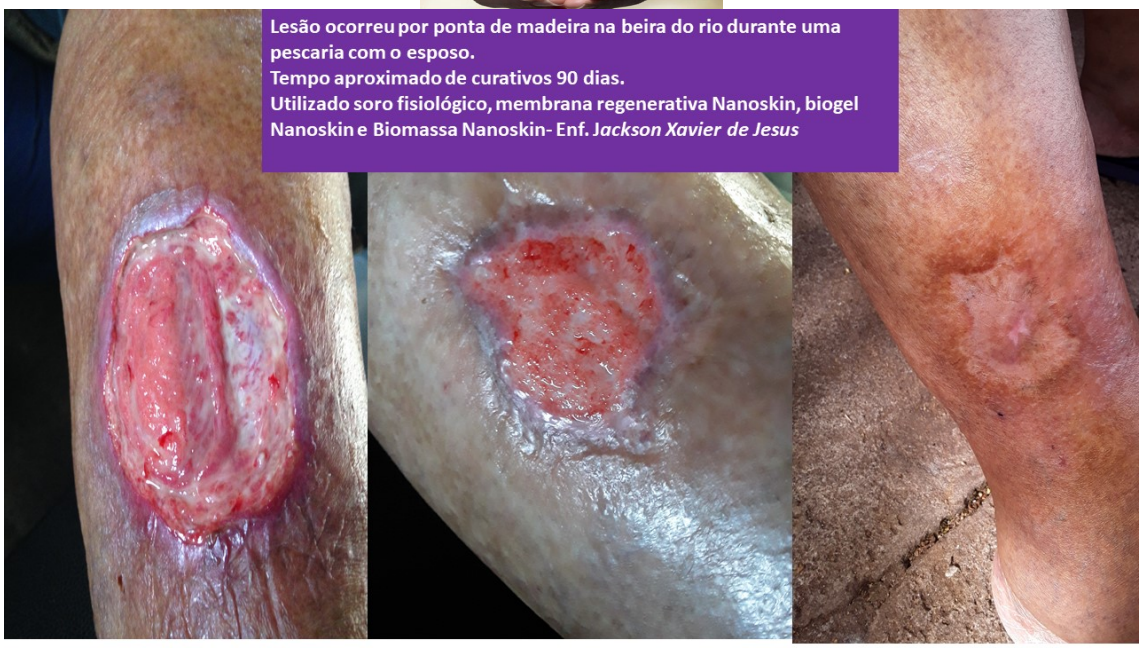

Nanoskin
Where life
continues
Nanoskin®


Nanoskin


40days
Nanoskin awaking the possible


ulcera de córnea- corneal ulcer
Before
3 days After Nanoskin application

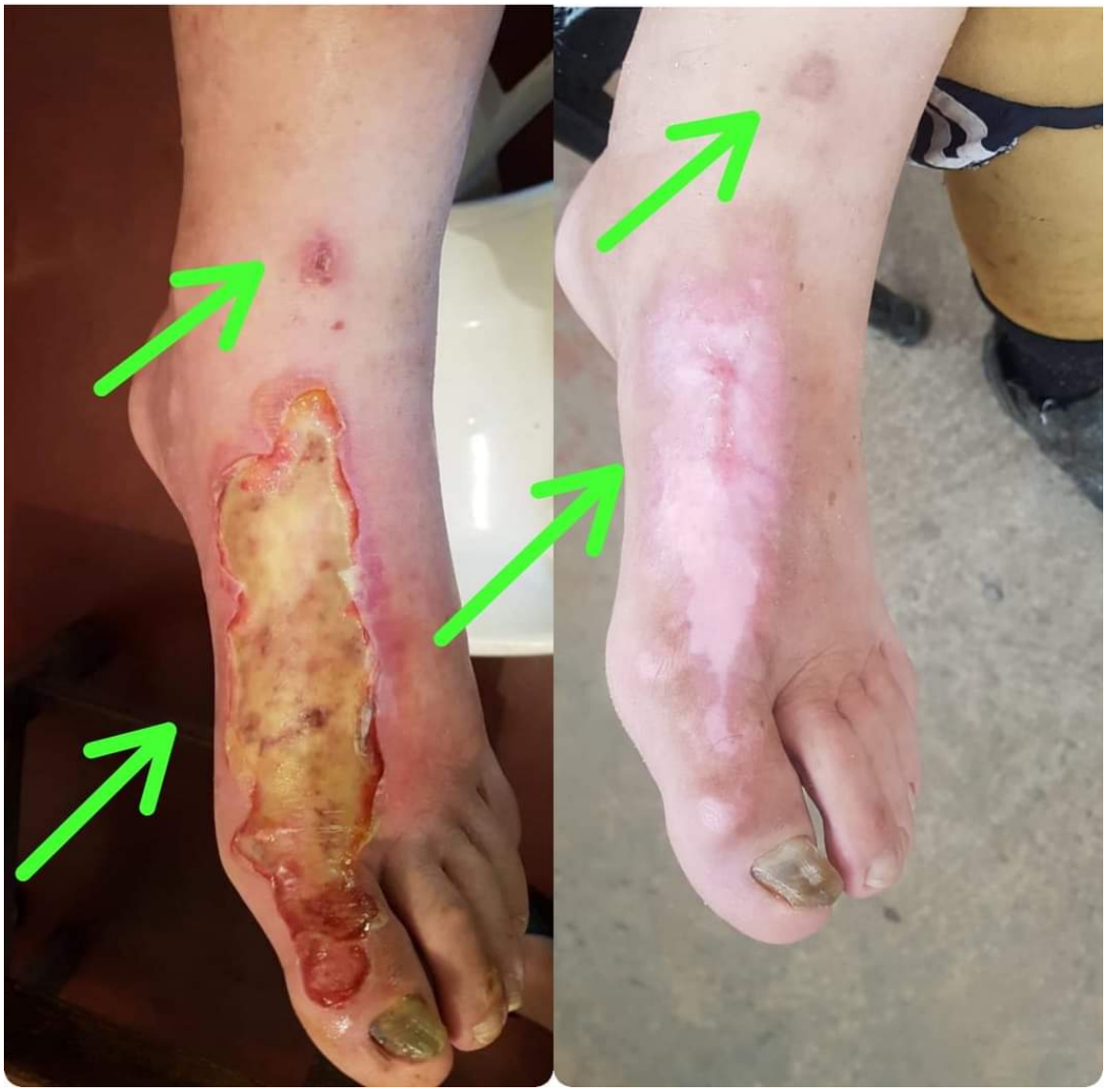
Nanoskin®



Lesão ocorreu por ponta de madeira na beira do rio durante uma pescaria com o esposo.
Tempo aproximado de curativos 90 dias.
Utilizado soro fisiológico, membrana regenerativa Nanoskin, biogel Nanoskin e Biomassa Nanoskin- Enf. *Jackson Xavier de Jesus*

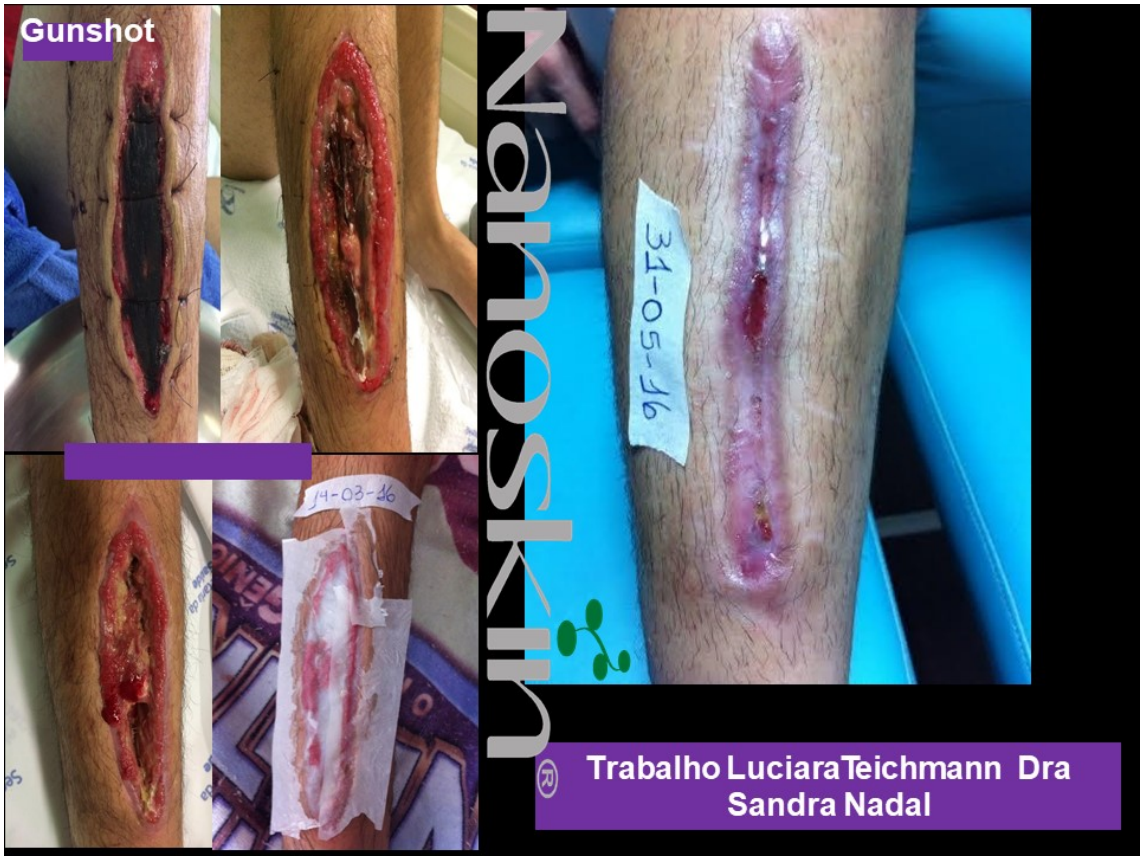
Tipo de lesão: Provocada por àgua fervendo (acidente doméstico).
Tempo de tratamento 15 dias.
Material utilizado: Agua destilada, soro fisiológico, biogel, membrana Nanoskin e biomassa. Enf. *Jackson Xavier de Jesus*

Nanoskin®



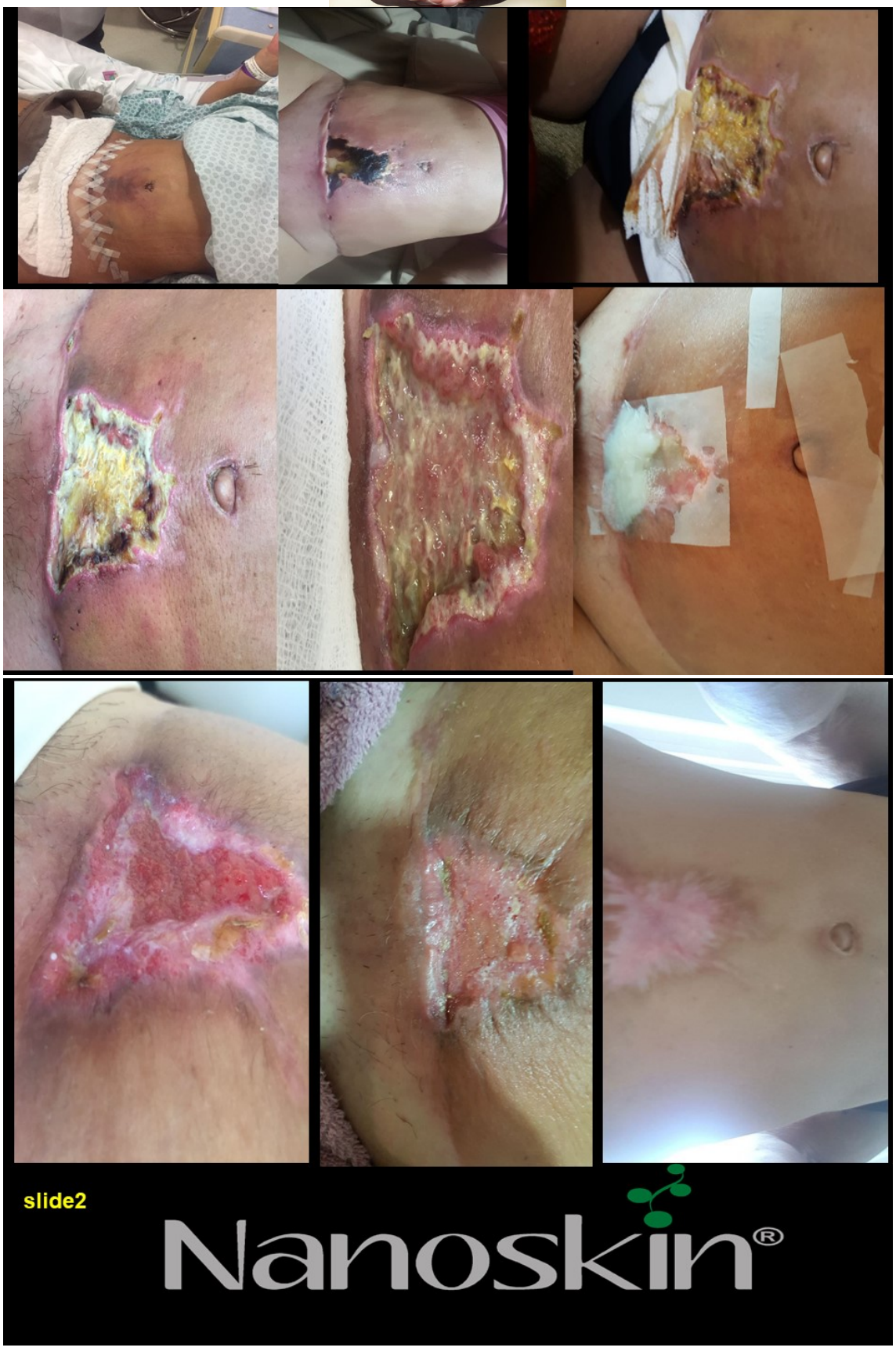

Nanoskin


Ulcera com tendao infecionada
DEBRIDACAO
CIRURGICO
4 semanas
Nanoskin®


Gunshot
Nanoskin®
31-05-16
14-03-16
Trabalho LuciaraTeichmann Dra
Sandra Nadal

Nanoskin®

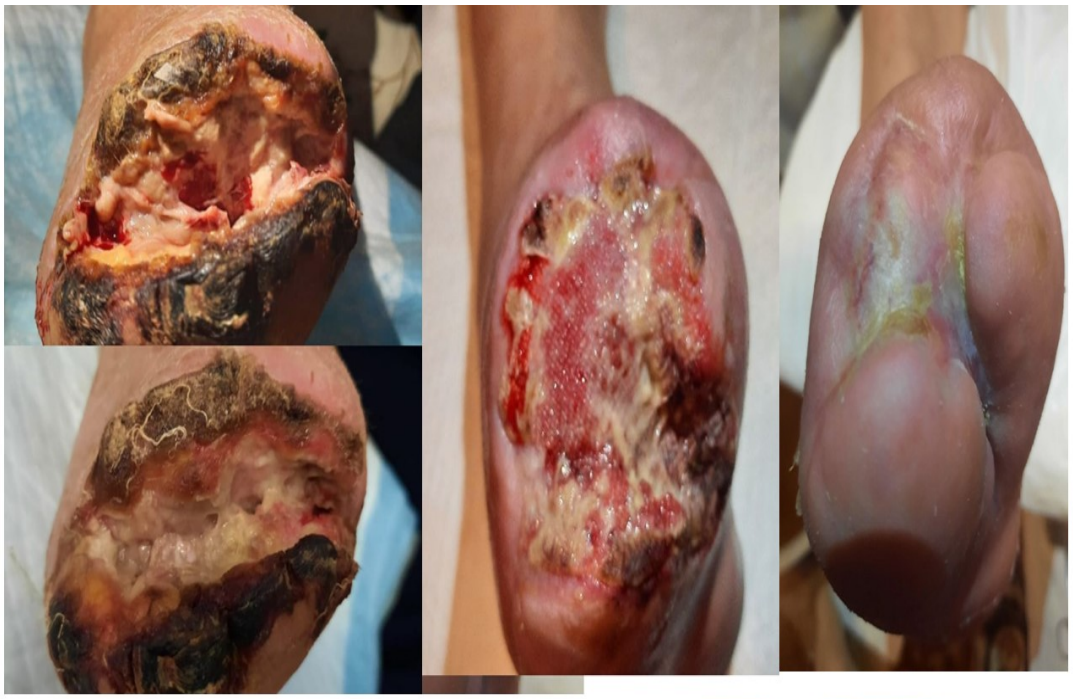

Nanoskin


slide2
Nanoskin®

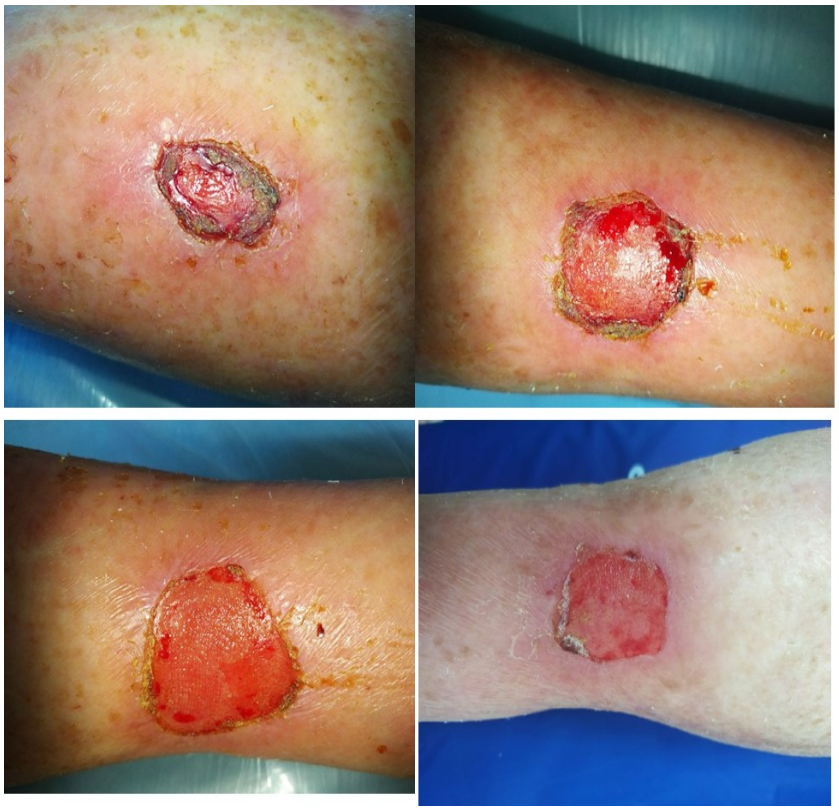
Nanoskin cases at Ukrania

Case 1

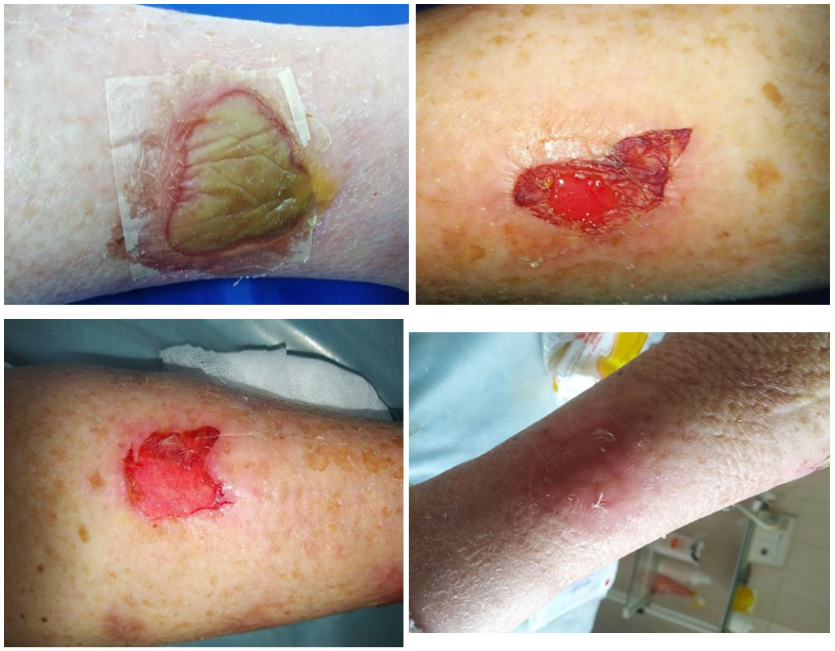
Diabetic foot after amputation. Male 64, Nanoskin ACT soft 2 tube, 8 Nanoskin ACT 10x10cm , 5 months



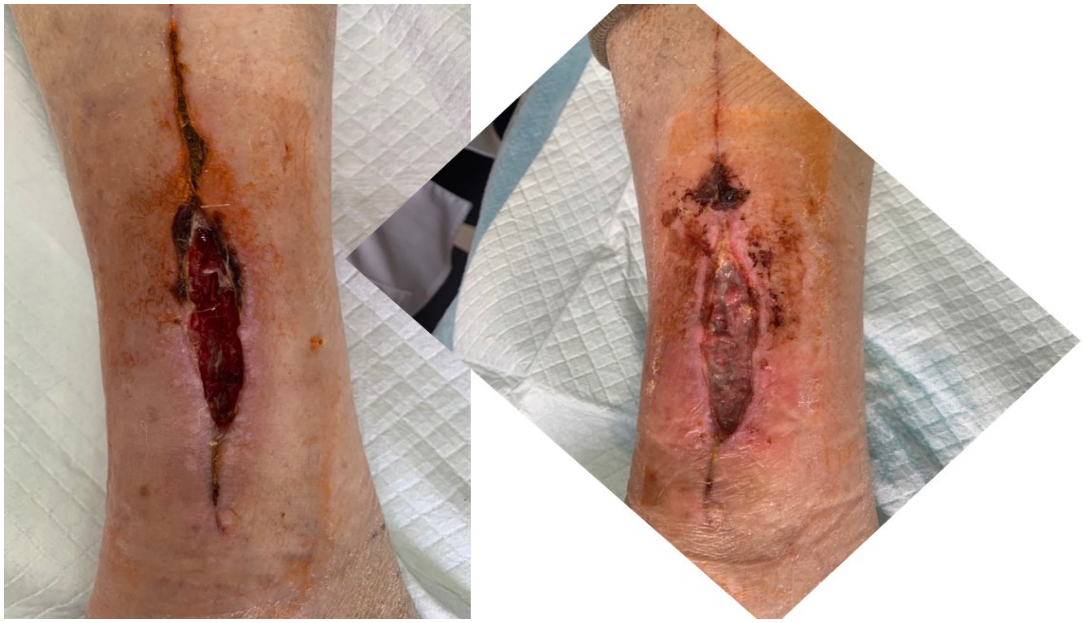
Second case, 4 ulcers in total, age 78, woman, 12 membranes Nanoskin Normal 5*5, 40 days (A)

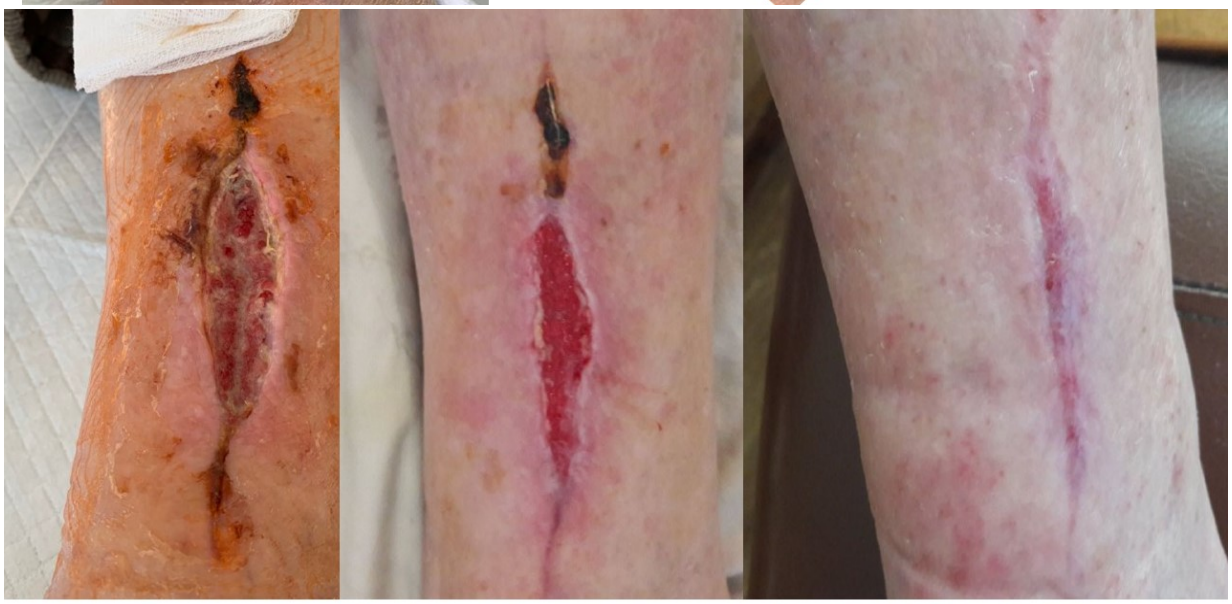


B)



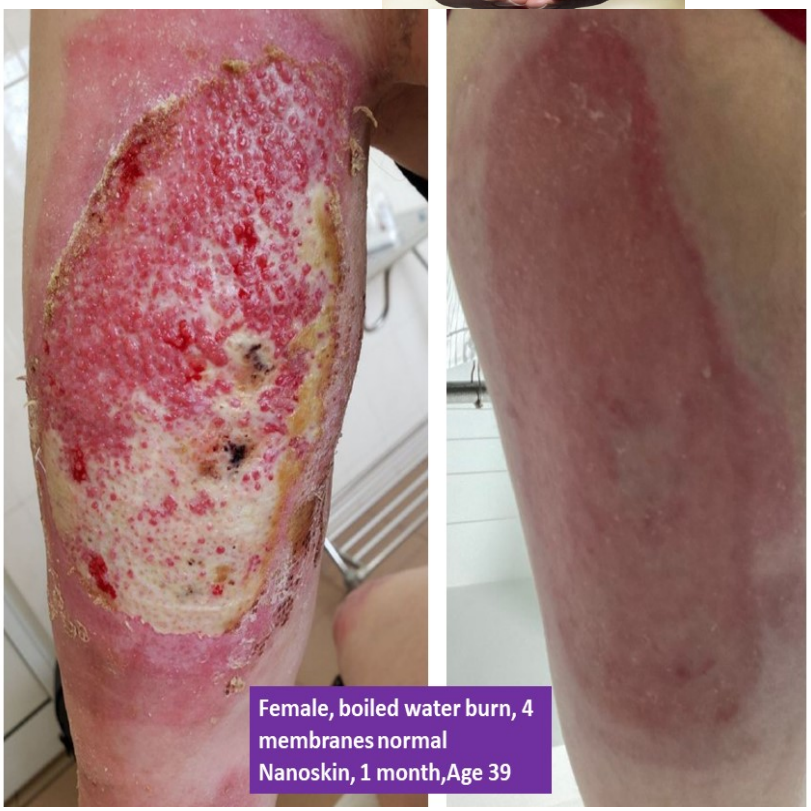
Case 3:
85 years old male, after surgery, 1 tube act soft + 10 membrane, 2 months





NANO MEDICAL


Nanoskin


Female, boiled water burn, 4 membranes normal Nanoskin, 1 month,Age 39

Nanoskin cases from the UAE

G.E.M International & G E M Medical Supplies

A professional modern enterprise with its own development and sale capacity, our company mainly engages in the trading of cosmetic and medical products and equipment which offers wide range of innovative solutions containing latest generations of patented technologies and formulas to meet the most demanding skin and wound protection and restructuring needs

Foundation and history

G.E.M International started in 2012 with accumulative experience of founders for more than 10 years in the field of cosmetic and medical products and technology trading in the GCC and Middle East region. With the profound experience of our team in sales, after sales services and customer support, our clientele data base is continuously growing with confident in our quality service

Vision

GEM products and services perceived by healthcare providers as one of the top reliable companies for its first-class quality products and services

Mission

We strive with passion in our service delivery to achieve the ultimate client satisfaction by sparing no efforts and raising our performance bar to meet our clients' needs with continuous focus on developing and improving our capabilities to the latest available technologies

Services delivery

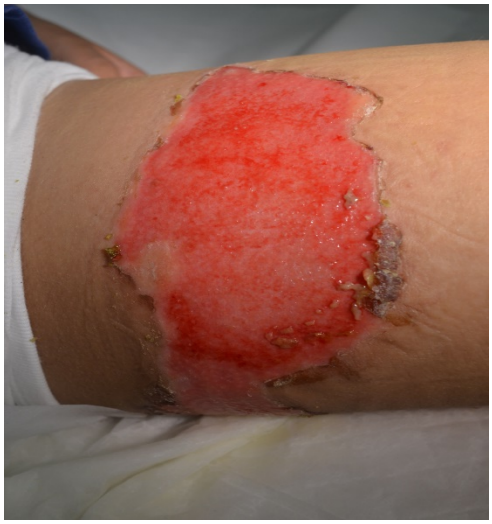
Operating in the UAE is an advantage for international markets and clients in other countries of the GCC region to benefit from our quality products and services; accordingly, we adopt the -no borders- concept in our services delivery

Headquarters: UAE, Sharjah, P.O.Box:9671 Branch: UAE, Dubai
Tel: +971 6 552 8682 , Fax: +971 6 552 8683 Email:info@gemint-co.com

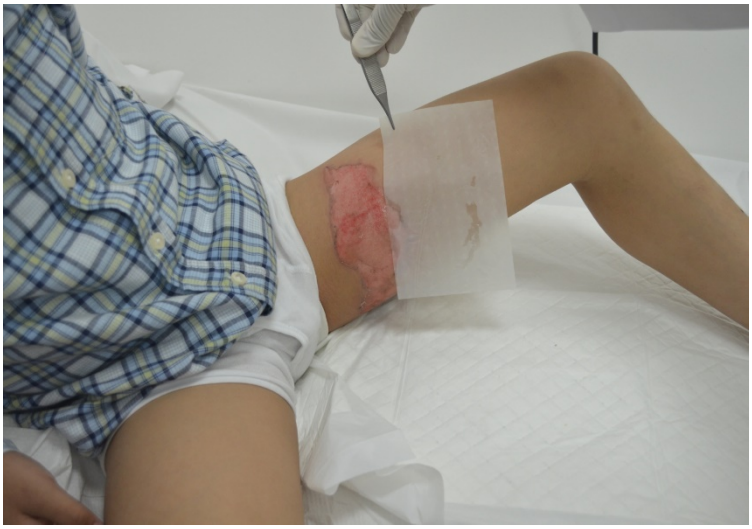
Nanoskin Clinical Cases

- **Burn Cases**

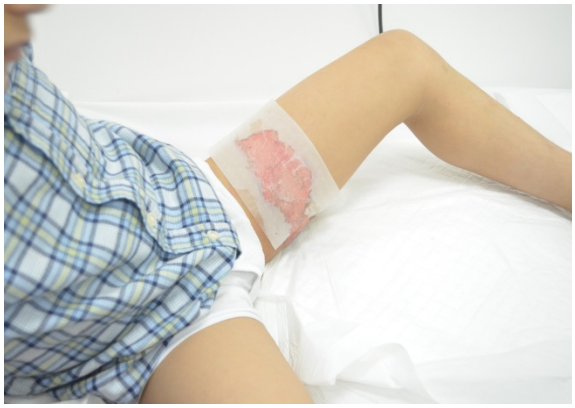
- **2nd Degree Burn (Thigh Area)**
  Treated with Nanoskin in WellCare Hospital:
  - 10 years old child.
  - Patient came in after 3 days of burn.
  - Dressing change done WITHOUT anesthesia.



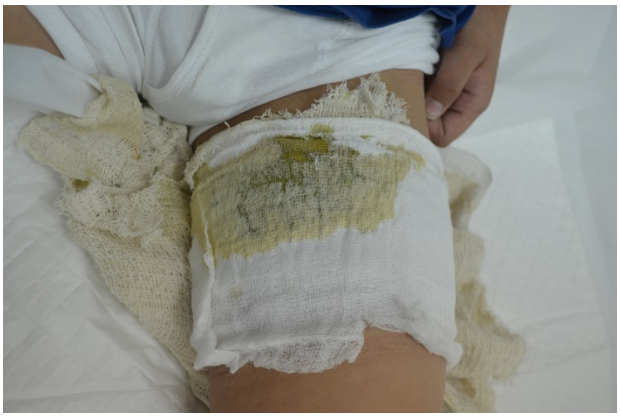
1 - Before starting treatment with Nanoskin



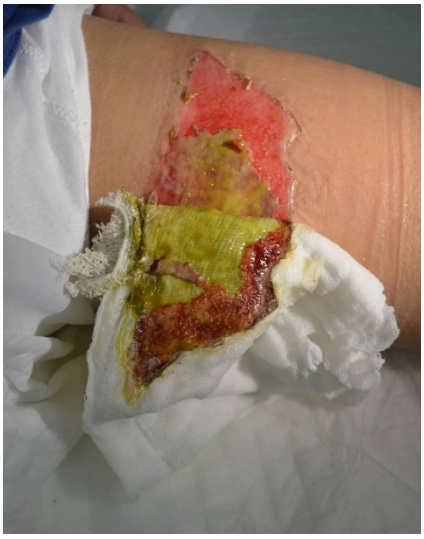
2 - Applying Nanoskin Membrane



3 - Note transparency of Nanoskin Membrane after applying on burn area

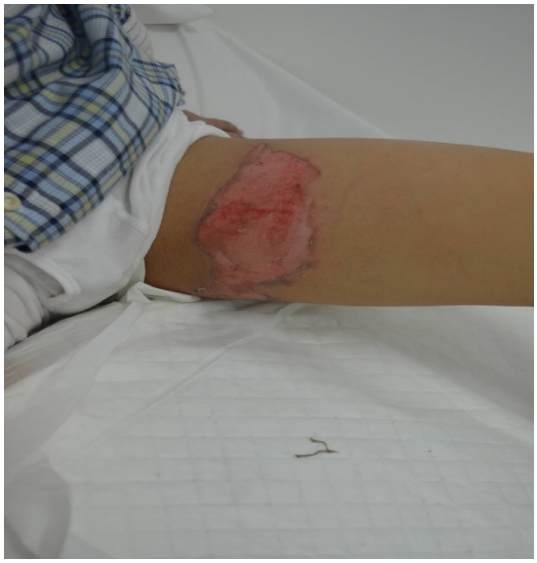


4 - After 7 Days

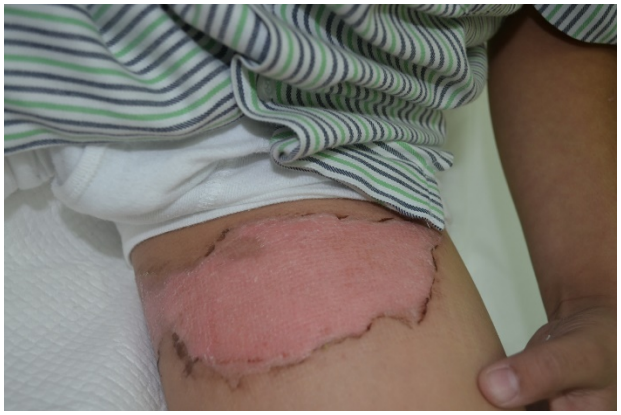


5 - Non-painful removal of dressing

6 - Taking a swap: -ve bacterial infection
(gr+ve and gr–ve)

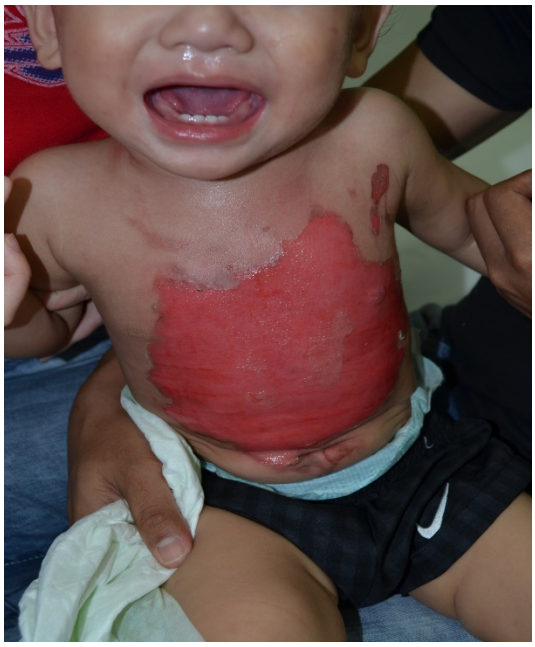


7 - After first dressing left for 7 days

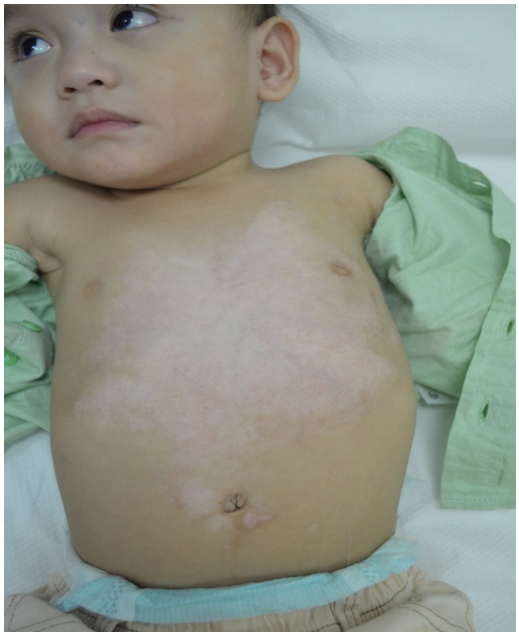


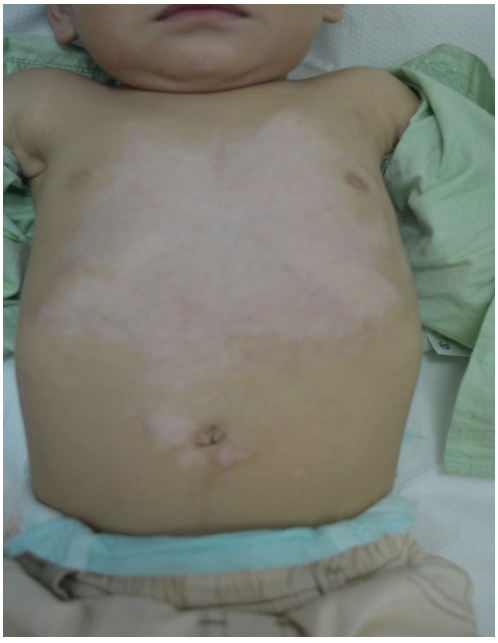
8 - 2nd dressing: Results after 14 days.

- **2nd Degree Pediatric Burn**
  - 10 months old child
  - 2nd Degree burn in abdomen area caused by hot water
  - Healed within 12 days
  - Treated in of Welcare Hospital – Dubai



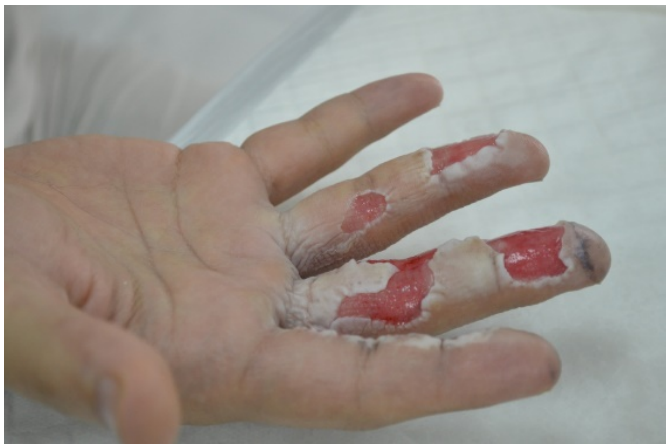
1 – Burn area before treatment



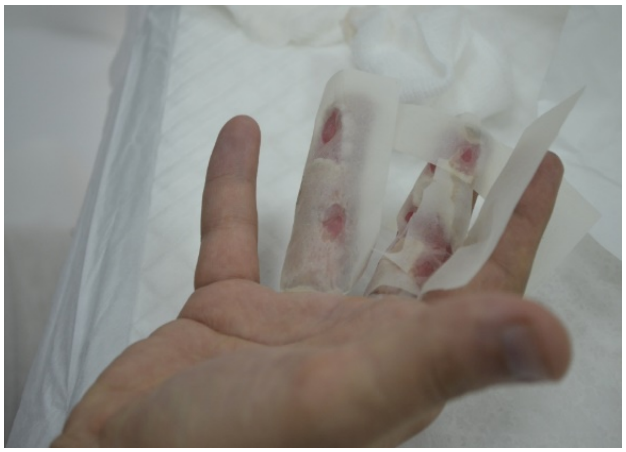


2 – Healed after 12 days using only 1 Nanoskin membrane

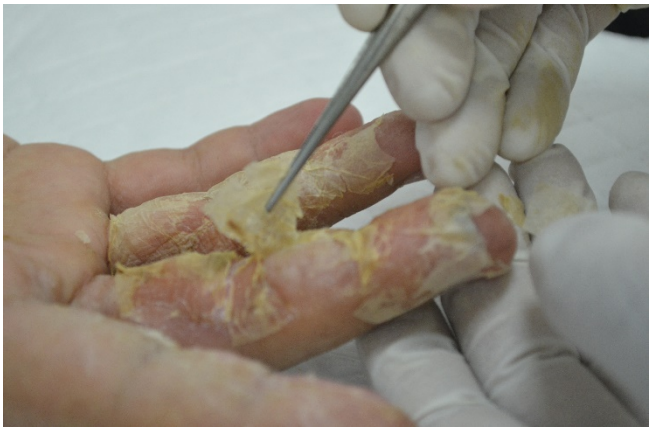
- **2nd Degree Burn Case**
  - 2nd degree burn in right hand
  - Treated using only 1 Nanoskin membrane
  - Treated in of Welcare Hospital – Dubai
  - Nanoskin managed to even restore fingerprints of patient



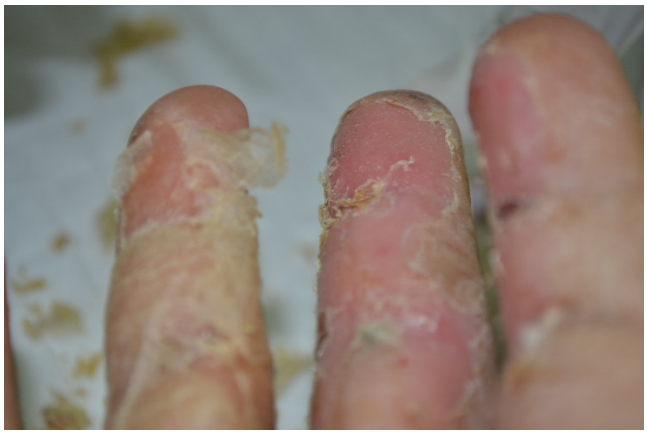
1 – Before Treatment

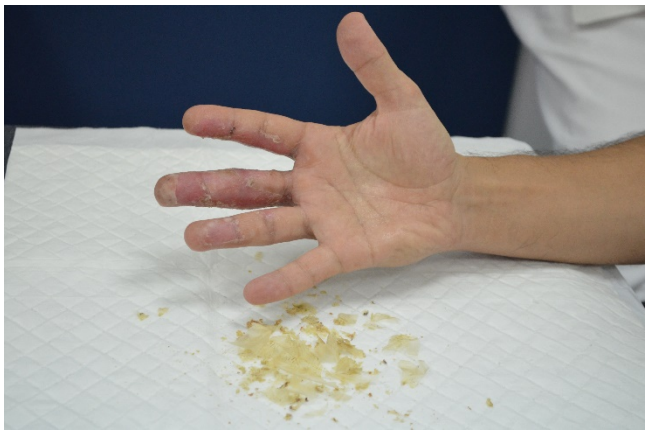


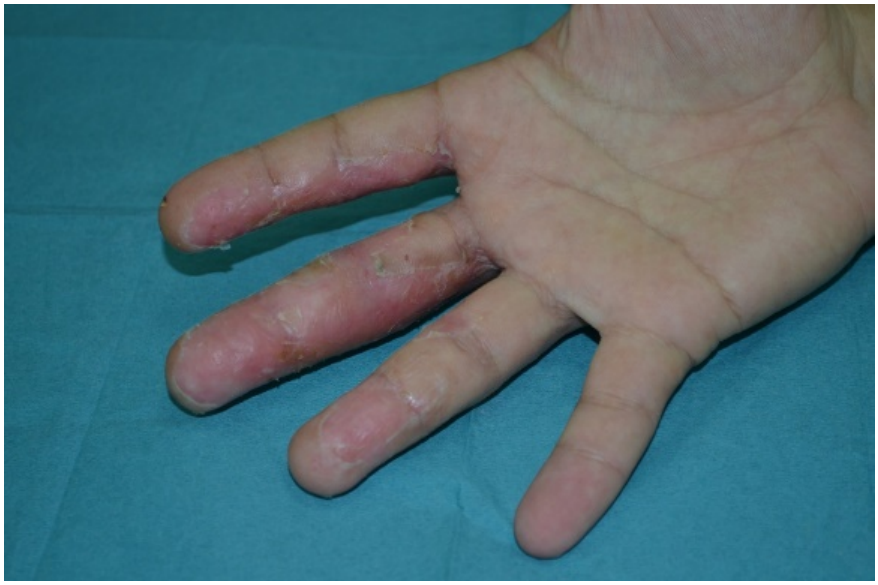
2 – After applying Nanoskin membrane



3 – removal of Nanoskin membrane after healing





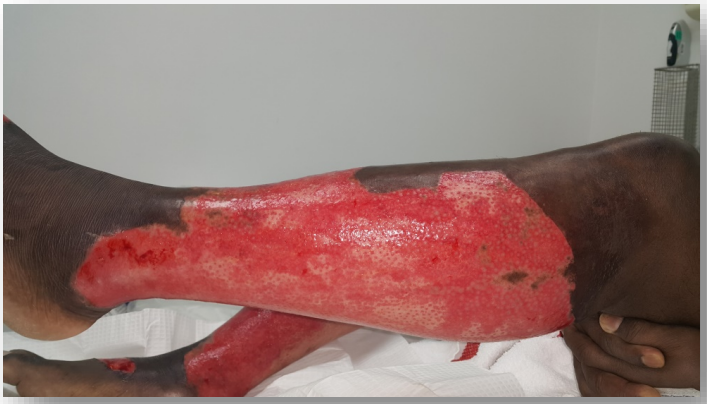


4 – Healed after 7 days using
only 1 Nanoskin membrane

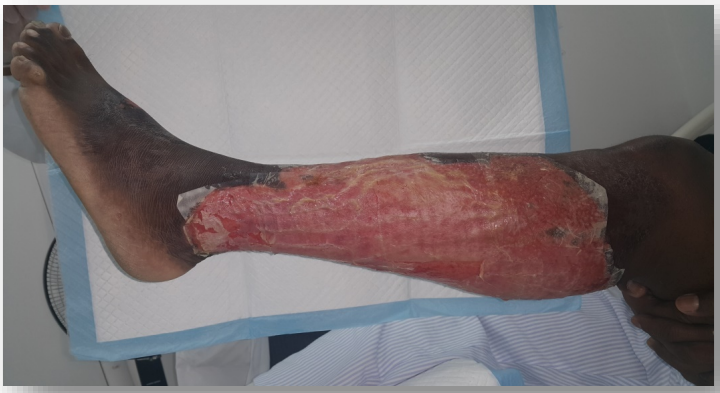
Pilot Report.pdf

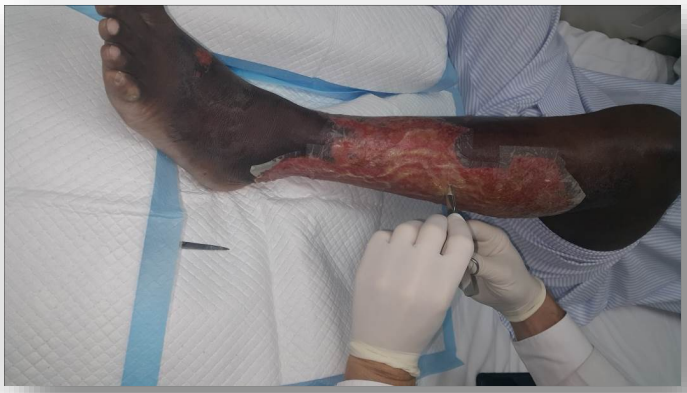
Pilot Report of Doctor Jamil can be found here:

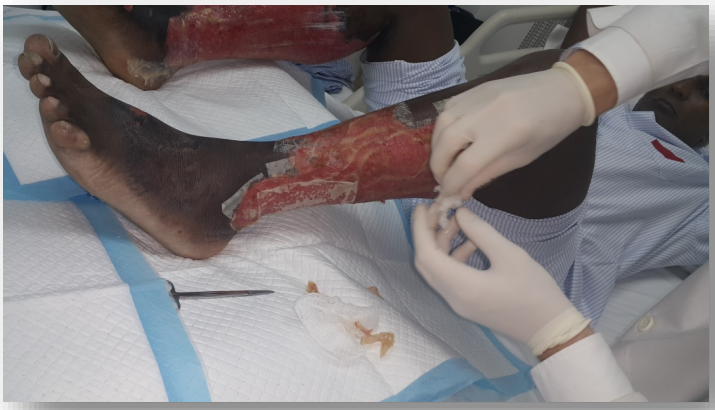
- **2nd Degree Burn Case**
  - A 56 year old patient with 2nd degree burn on both legs
  - Treated with Nanoskin in Rashid Hospital



1 – Before applying first membrane
09/08/2017







2 – First Inspection 10/08/2017:

After one day of application all the dressing was almost adhered replacing lost skin layers.

Only the slippery parts changed using not more than one membrane.

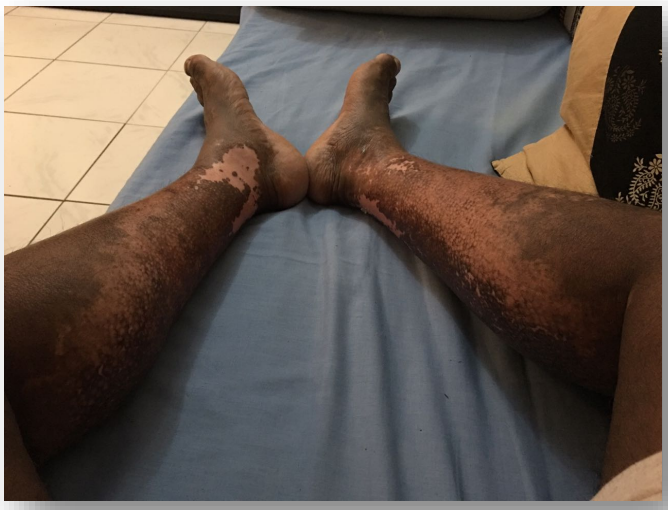
3 – Second Inspection 13/08/2017:

Only some parts are coming out and replaced with Nanoskin ACT due to some slough tissue

4 – Third Inspection 20/08/2017:

Complete healing of the burned are as the Nanoskin starts to flake.

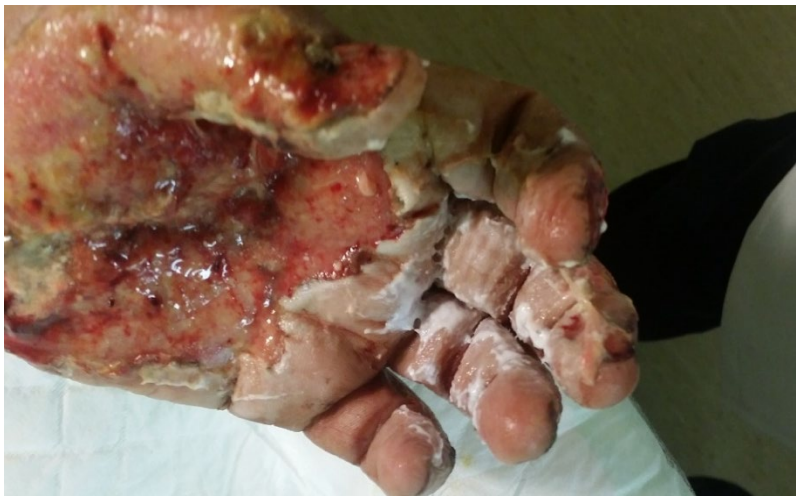
Now it can be kept until it falls on its own.

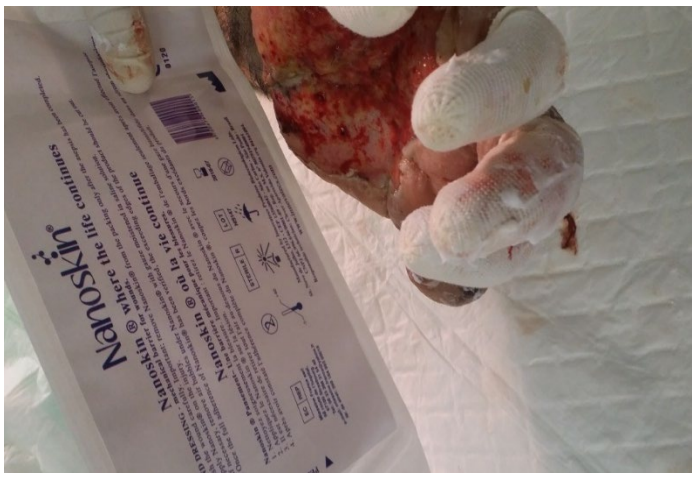


5 – Follow up photo 30/10/2017

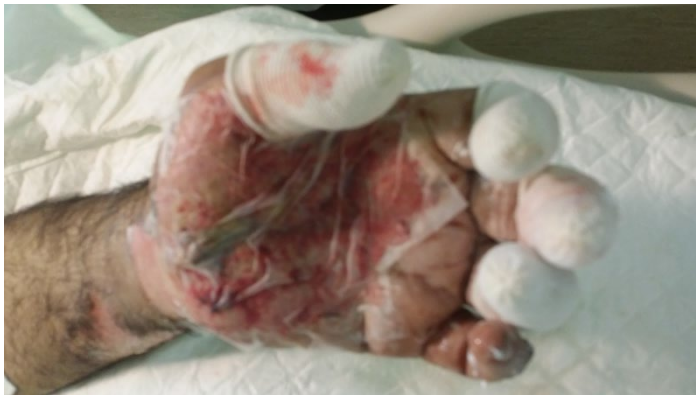
……

- **Extensive Friction Burns**
  - Friction Burns on left hand with skin loss and exposure of muscle and bone tissue
  - Caused by car accident
  - Treated in Al Qassimi Hospital – Sharjah

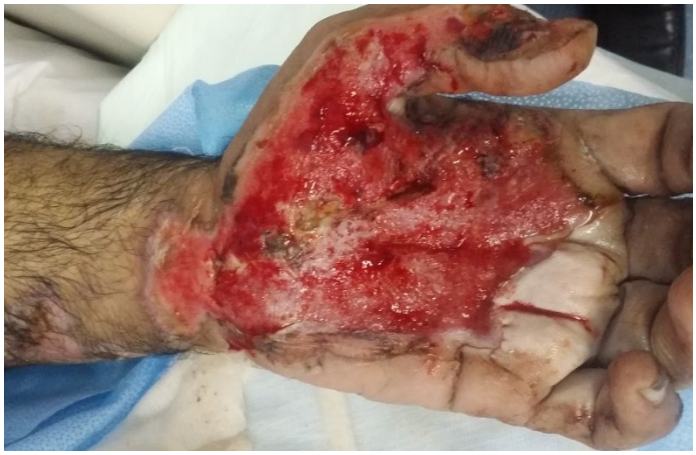




1 – Started treatment with Nanoskin Membrane on 15/10/2014

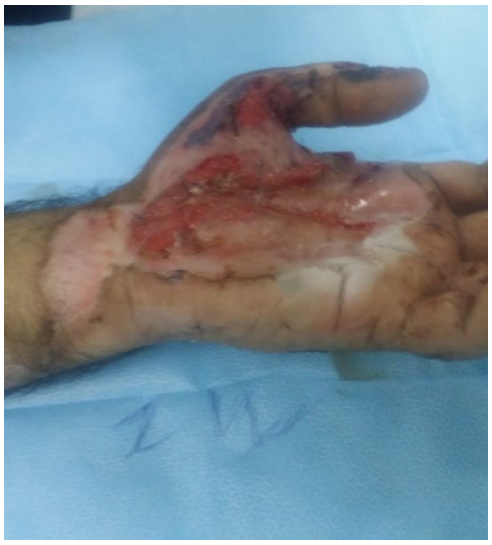


2 – After application of Nanoskin membrane



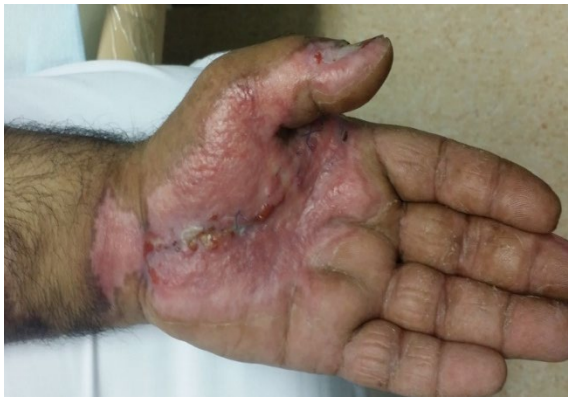
3 – 19/10/2014

Continue treatment with Nanoskin membrane



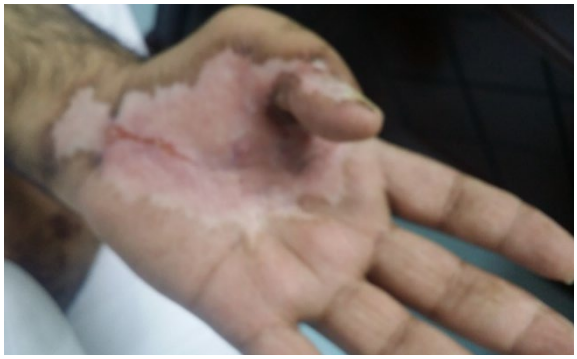
4 – 30/10/2014

Continue Treatment with Nanoskin in Wound Management Clinic



5 – 20/11/2014

Continue Treatment with Nanoskin in Wound Management Clinic



6 – 21/12/2014

Follow up appointment to insure burn completely healed

Evaluation Letter For the Extensive Friction Case

UNITED ARAB EMIRATES
MINISTRY OF HEALTH

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وزارة الصحة

مستشفى القاسمي
AL QASSIMI HOSPITAL

LETTER

B) Patient: [redacted] – MQH: 237058 Age: 34 yrs Nat. - Omani

Contact No. [redacted]

Date of Admission: ICU: October 7, 2014

History: RTA, driver of the car - rolled over

Findings: # ribs bilateral

Lt hand - extensive friction burns volar aspect hand and fracture distal forearm with areas of skin Lost deep laceration extending from wrist across thenar eminence up to base of index finger exposing the thenar muscles and metacarpal bone.

xray shows multiple FB's, but no fracture seen

On examination: ICU: October 8, 2014

The RT hand dorsal and palm sites there were deep full thickness skin loss wound was and same in the RT index. Multiple patial thickness friction burns on left forms and fingers

October 9, 2014: ICU

Wounds both hands examined.

Multiple friction burns on the fingers & forearm with dirty discharge on the dressing.

Still lots of blackish debris on the palm of Right and left upper limbs

Dressings History:

All wounds were cleaned with diluted Betadine solution, then covered with jelonet smeared with flamazine cream dressing. With this treatment patient **still complains of severe pain at all times.**

- All were given poor progress

October 15, 2014: ICU Started: **NANOSkin Dressing**

- Lf hand & forearm debridement
  Lf fingers adaptic &fucidine
- Rt hand & forearm MEBO patch to open on Sunday

Get better but still no granulation over bone

October 16, 2014: transfer to MSW (same dressing)

October 19, 2014: MSW

- All wounds get better with **NanoSkin dressing**

Dramatic change in severity of pain was noted after application of this type of dressing. Patient rarely complains of pain.

Discharge: 23/10/2014

Wound Management Clinic: 30/10/2014

- All wounds get better

November 2, 2014: same NanoSkin dressing

November 6, 2014: same NanoSkin dressing

November 20, 2014:

- Healed; all pigmentation retained

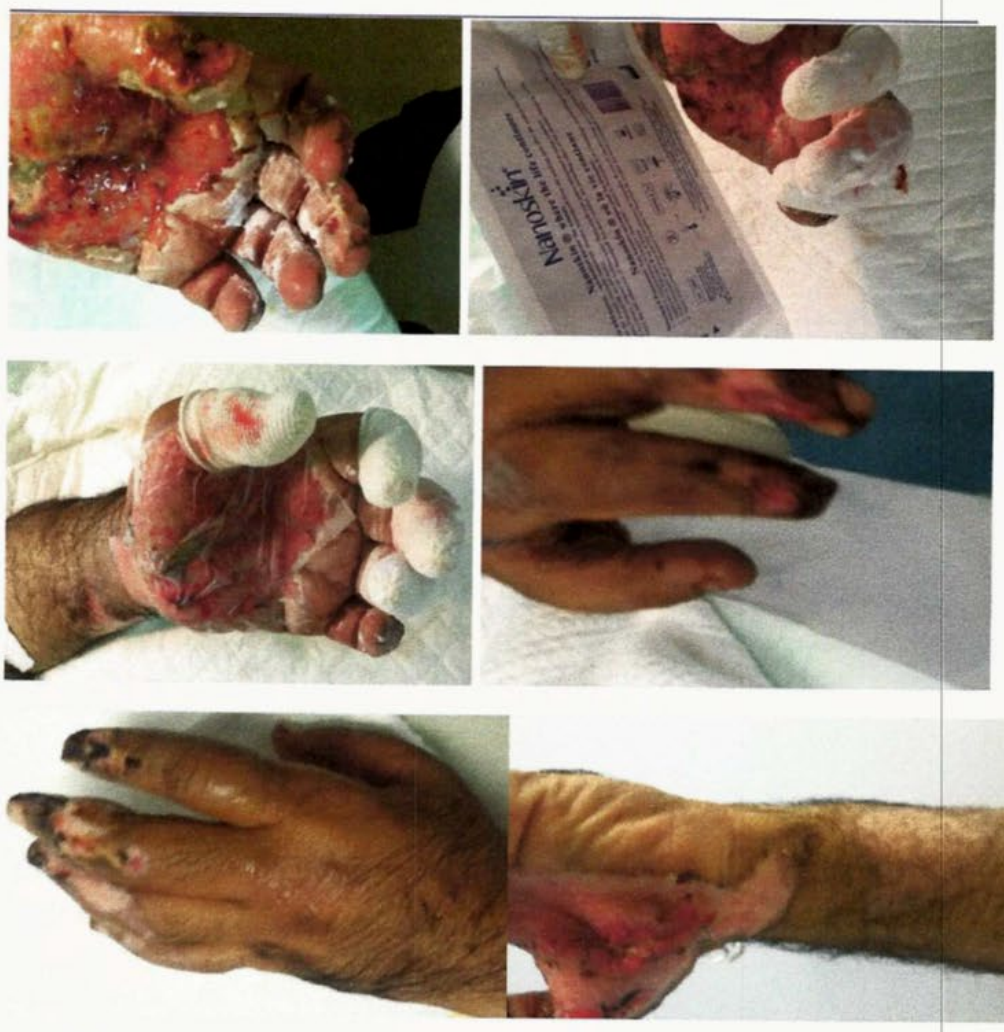
December 21, 2014

- completely healed

LETTER

Summary Report:

Deep Friction burns of both upper limbs sustained after car accident totally healed within 5 week time (1 month & 1week) using NanoSkin dressing. (Date started on Oct. 15, then Oct. 19, Oct. 23 with Daramtic change of pain
Wound Mgt. Clinic: Oct. 30, Nov. 2, Nov. 6, Nov. 20, 2014 last dressing done)



Patient: [redacted]

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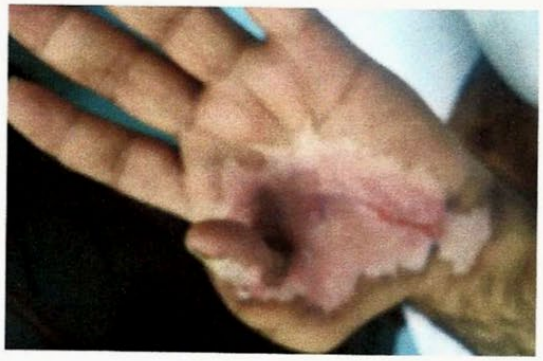
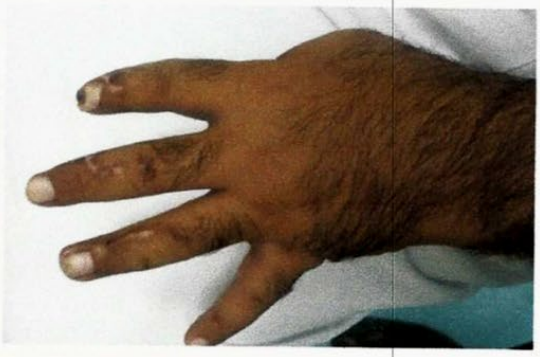
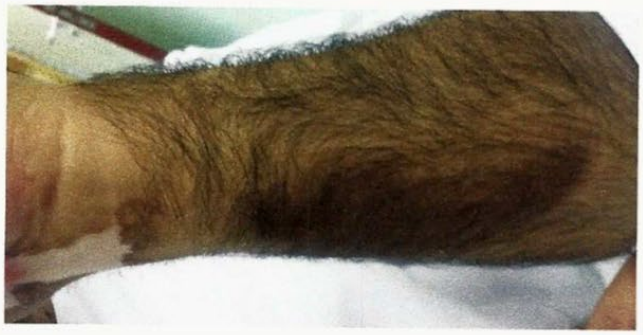
AL QASSIMI HOSPITAL

LETTER

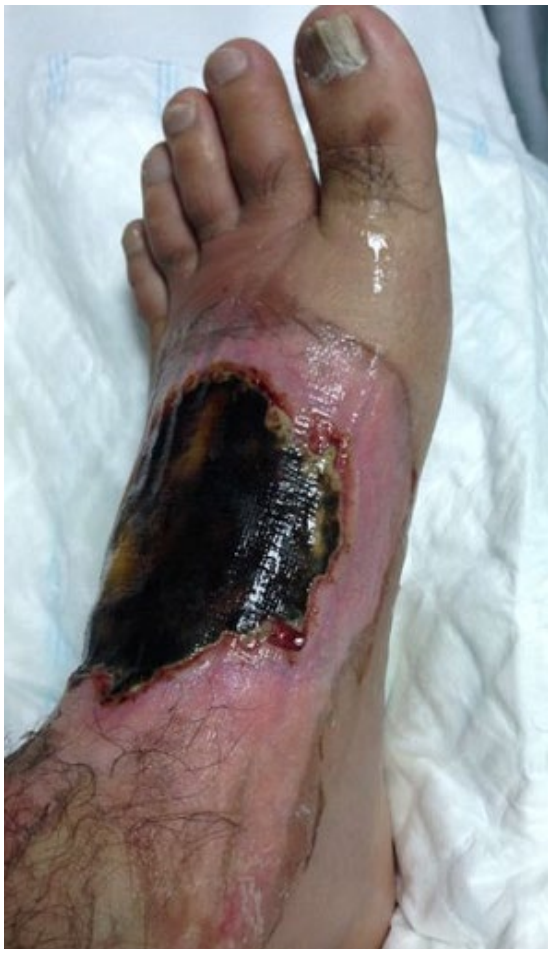




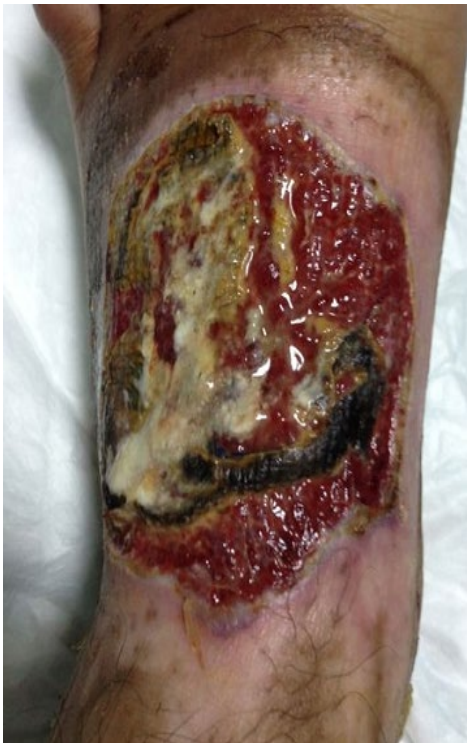


Patient: [redacted]

- **3rd Degree Burns by boiling water**
  - 3rd degree burn on left foot caused by boiling water on 20/08/2013
  - Patient refused to do a skin graft operation and complained of severe pain during walking
  - patient came with thick slough over wound
  - other remedies were used by the patient with no progress

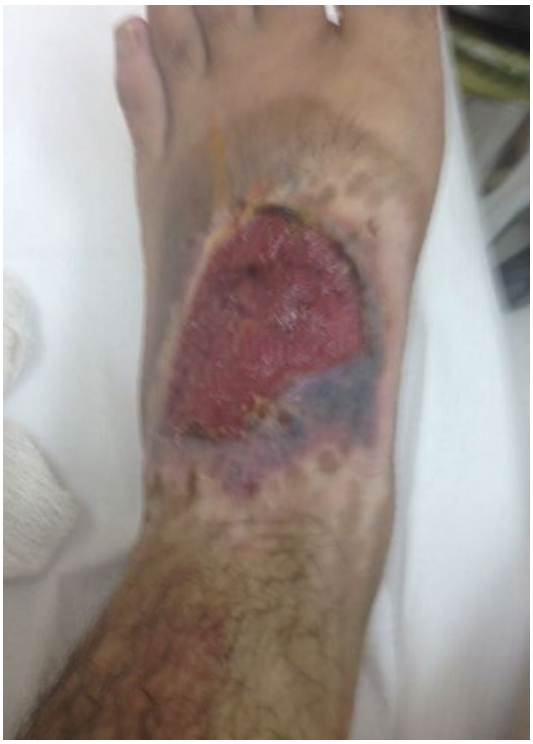


1 – Burn area before treatment

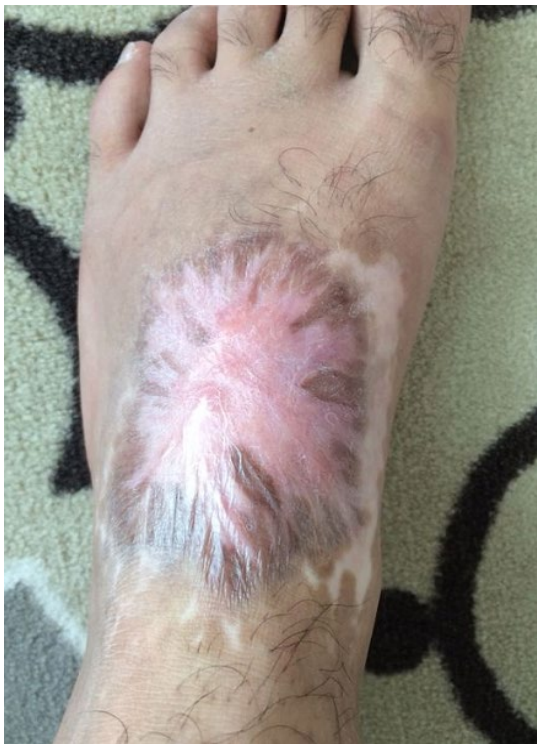


2 – 02/10/2013

Before further debridement and start using Nanoskin membrane



3 – during treatment with Nanoskin membrane



3 – 14/11/2013

follow up appointment after last application. Burn area completely healed.

Evaluation Letter for 3rd Degree burn by boiling water case

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وزارة الصحة

مستشفى القاسمي
AL QASSIMI HOSPITAL

LETTER

To: **Dr.** [redacted]

From: **Wound Management Team**

Date: **February 1, 2015** **Ref. No.** **LI / ICP 24**

Subject: **Recommendation of NANOSKIN Dressing**

Dear Dr. [redacted]

The following patients with photos attached benefited from **NanoSkin** dressing Technology.

A) Patient: [redacted] **– MQH: 181313 Age: 26 yrs. Nat. – UAE**
Contact No [redacted]

History: 3rd degree burns by hot water on dorsum Left foot on 20/8/13
He refused to do skin graft and complain of severe pain during walking

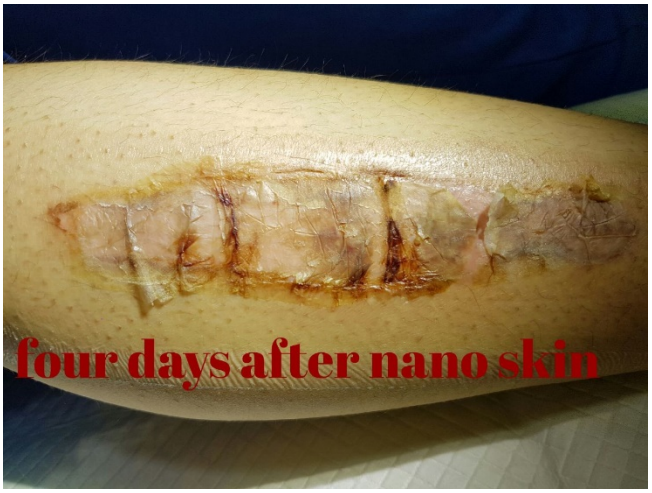
September 8, 2013: Referred to WM Clinic
On examination
- Thick slough
- Debridement done

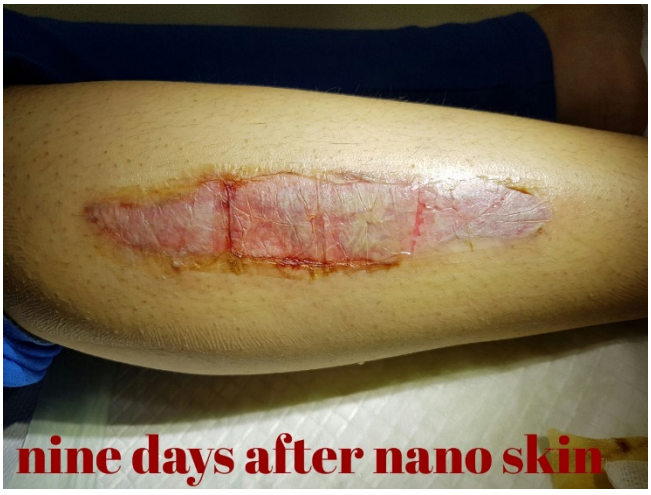
History of other Dressings:
- a) MEBO patch dressing
- b) Baby lotion oil on healed areas
- c) Flamazine cream dressing daily
- All were given poor progress
- **October 2, 2013: Started: NANOSkin dressing**
- Debridement done
- Started: NANOSkin dressing
  Weekly every Thursday follow-up in Wound Mgt. Clinic
- Over-granullation: Locoid cream &Jelonet .

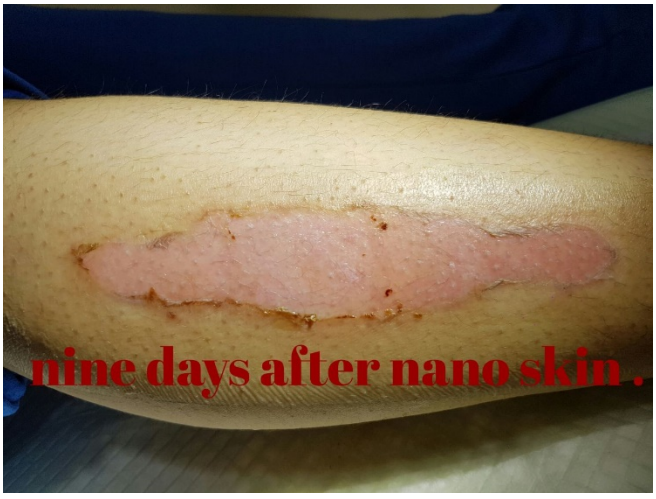
Last seen:
- **Nov. 14, 2014**
- Burns healed completely

Summary Report:
Third degree burns sustained on Left Foot with hot water totally healed within 6 week time (1 month & 2 weeks) using NanoSkin dressing.
(Wound Mgt. Clinic:Date started on Oct. 2, then Oct 9. 16, 23,30, 15, Nov. 7. Last consultation on Nov. 14, burns totally healed)

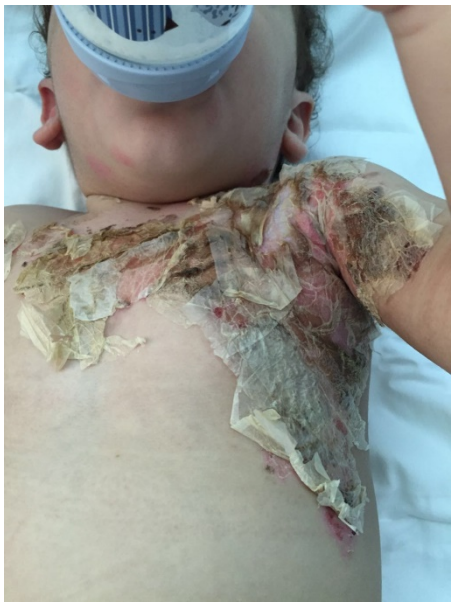
- **2nd Degree Burn Case**
  - Burn case on right leg
  - Treated with Nanoskin and healed in 9 days
  - Treated in Al Zahra Hospital

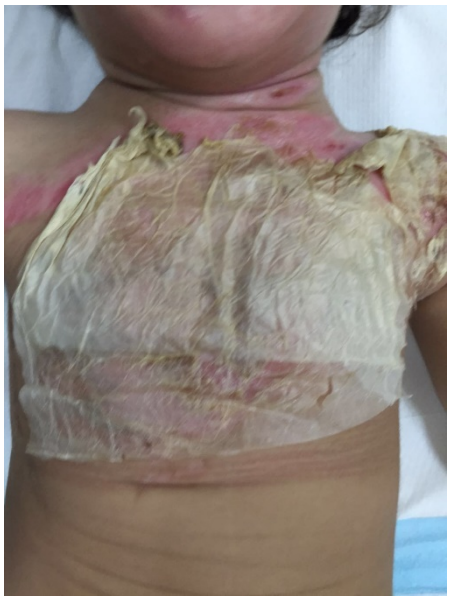


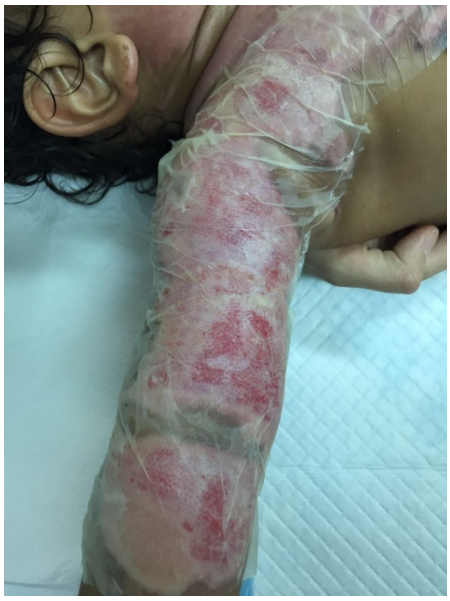


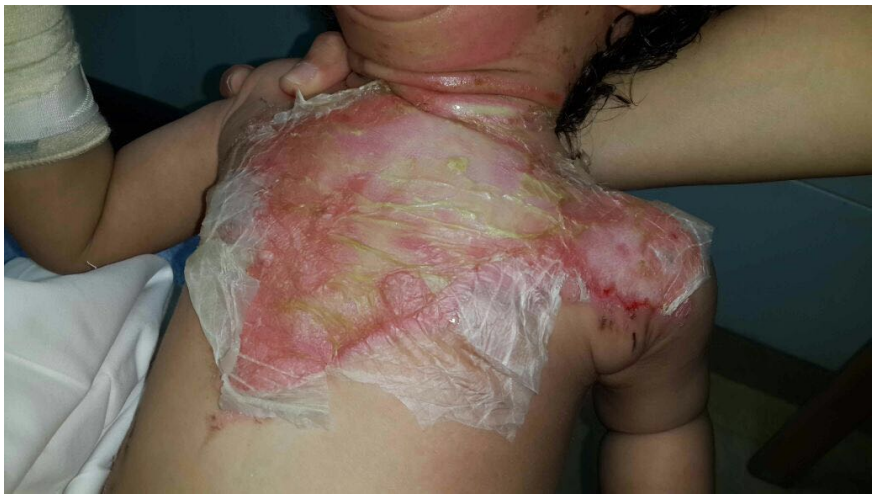


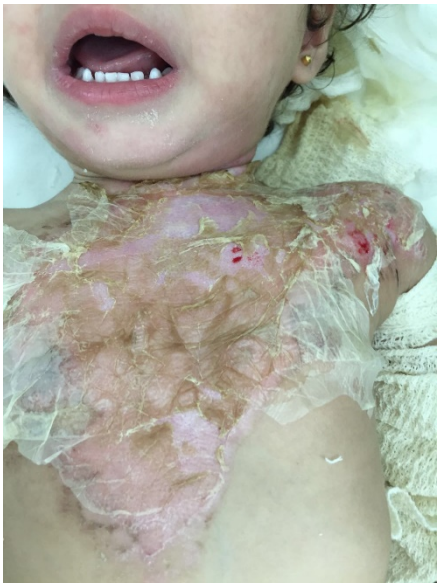
- **2nd Degree Burn Pediatric Case**
  - 2nd degree burn on abdomen and chest area of a child
  - Treatment with Nanoskin in Latifa Hospital

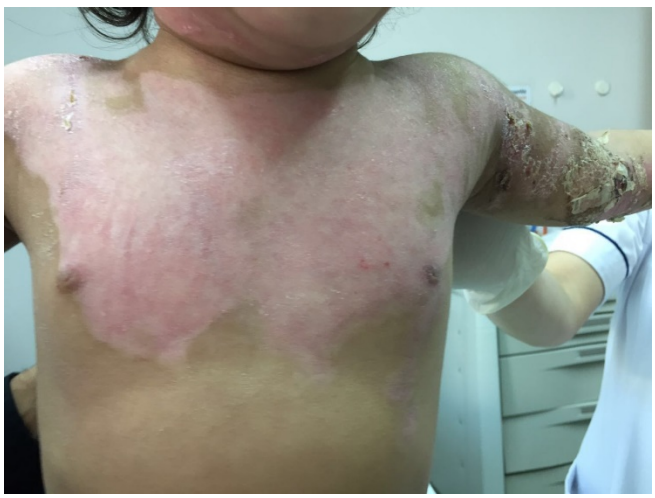




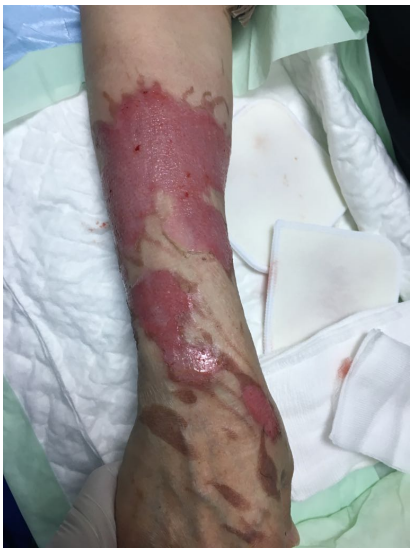


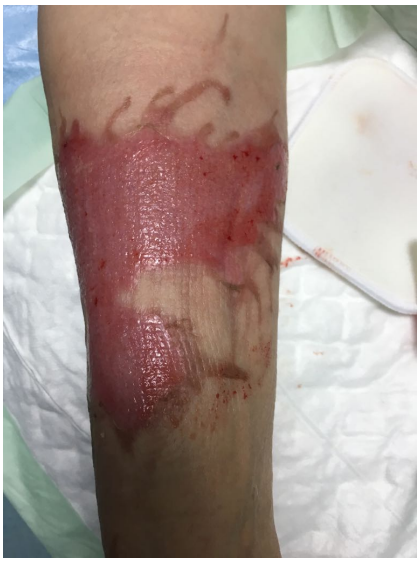






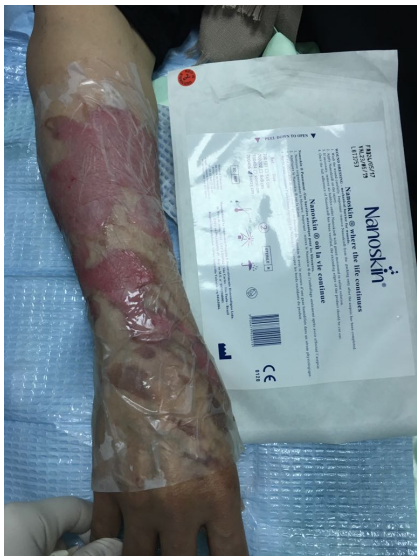
- **2nd Degree Burn Case**
  - Treated with Nanoskin
  - Treated in Al Qassimi Hospital

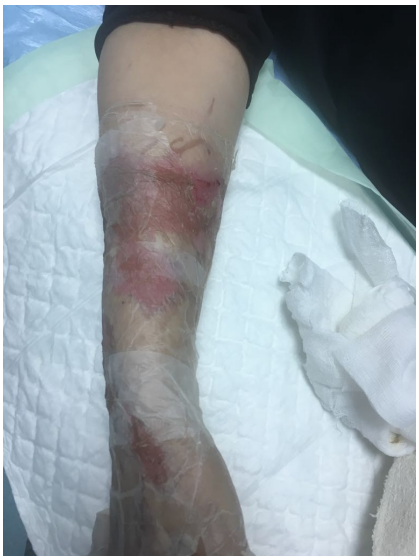




1 – 05/11/2017

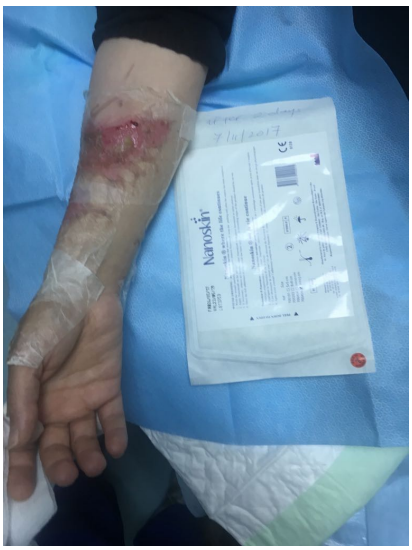
Before treatment with Nanoskin membrane





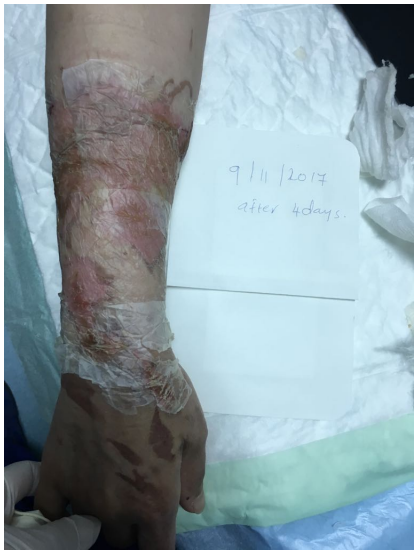
2 – 05/11/2017

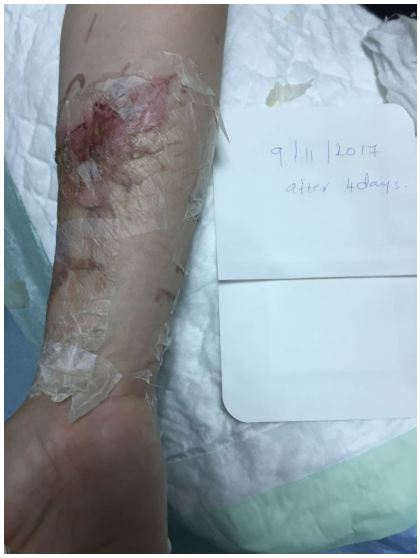
First application with Nanoskin membrane



3 – 07/11/2017

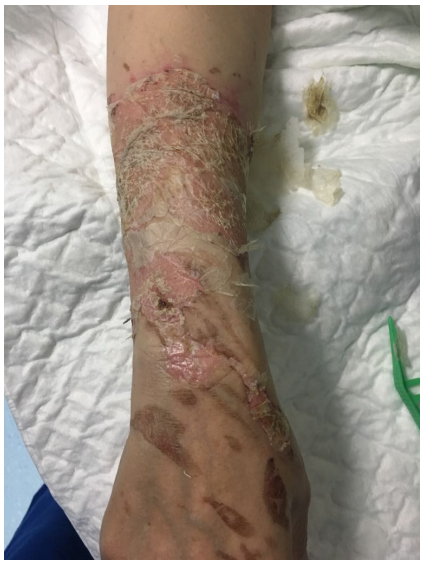
First inspection after applying Nanoskin membrane

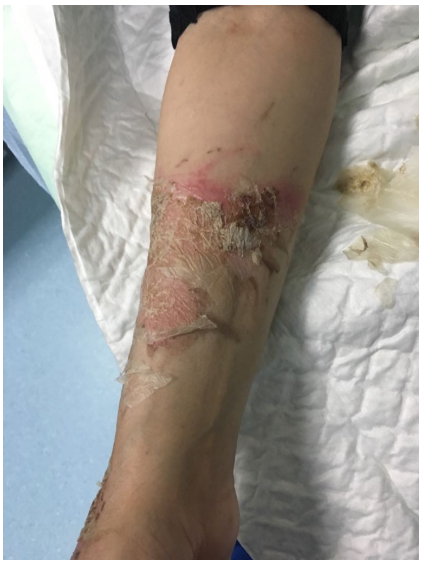




4 – 09/11/2017

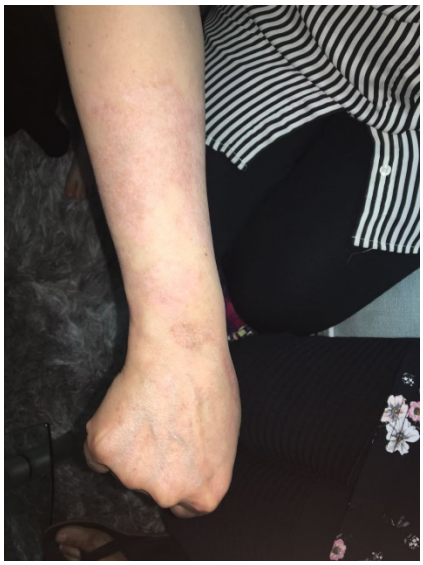
Second inspection after applying Nanoskin membrane

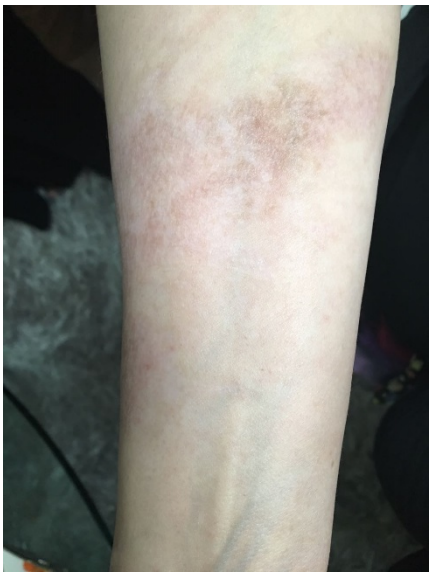




5 – 13/11/2017

Complete healing of burn area





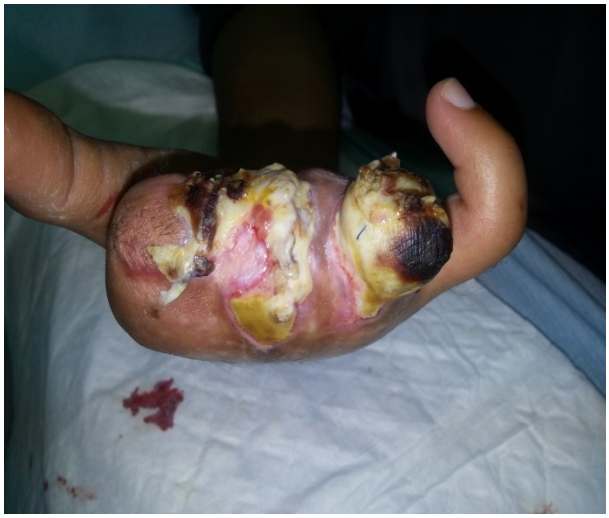
6 – follow up appointment

Complete healing with minimal scars and patient satisfied

Nanoskin Clinical Cases

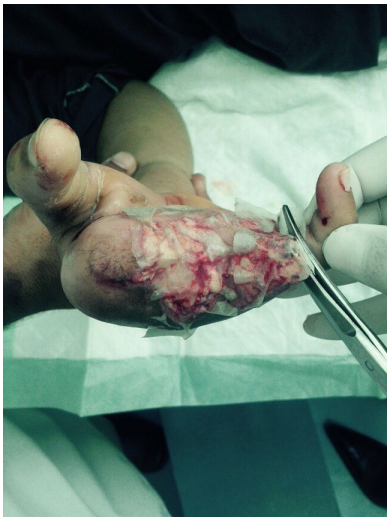
- **Wound Cases**

- **Trauma Case (Work Accident)**
  - Crushed fingers caused by work accident, with amputation of the Index ,Middle and Ring fingers of the right hand
  - Wound bed shows necrotic tissue with black parts and bad odor with small amount of pus
  - The wound was initially being prepared for a skin graft but the Doctors then chose to use Nanoskin
  - Treated in Al Qassimi Hospital



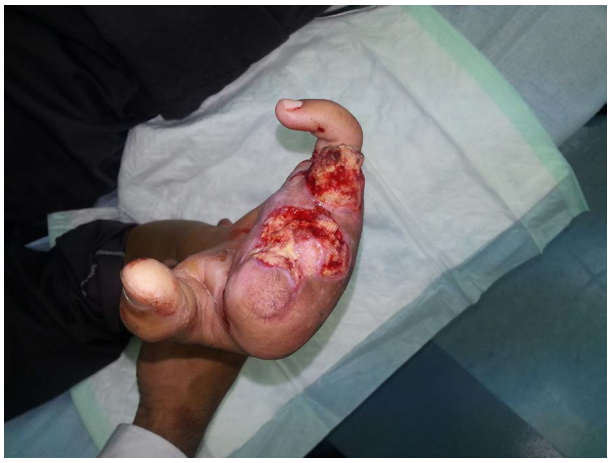
1 – 10/12/2014

Debridement of wound bed planned before treatment with Nanoskin membrane

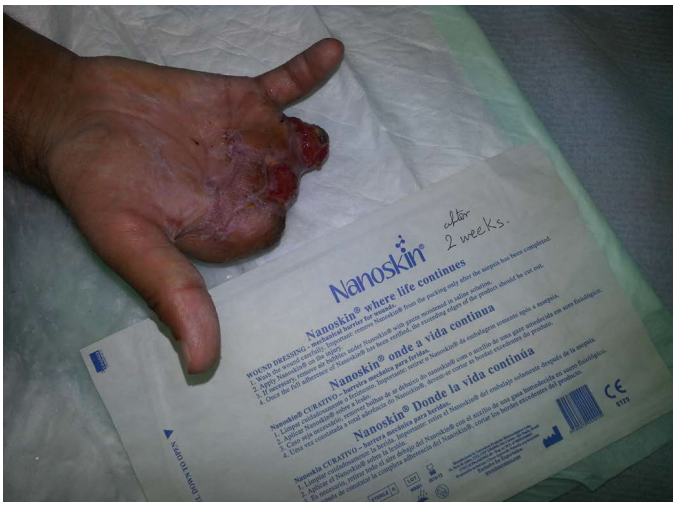


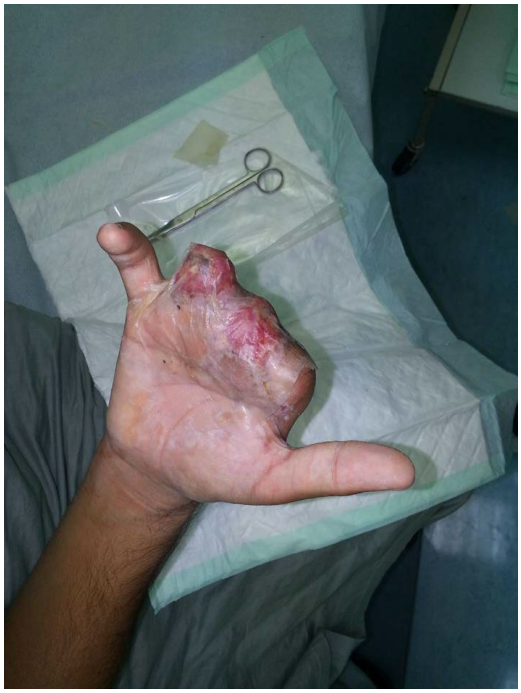
2 – 15/12/2014

Begin treatment with Nanoskin membrane after debridement

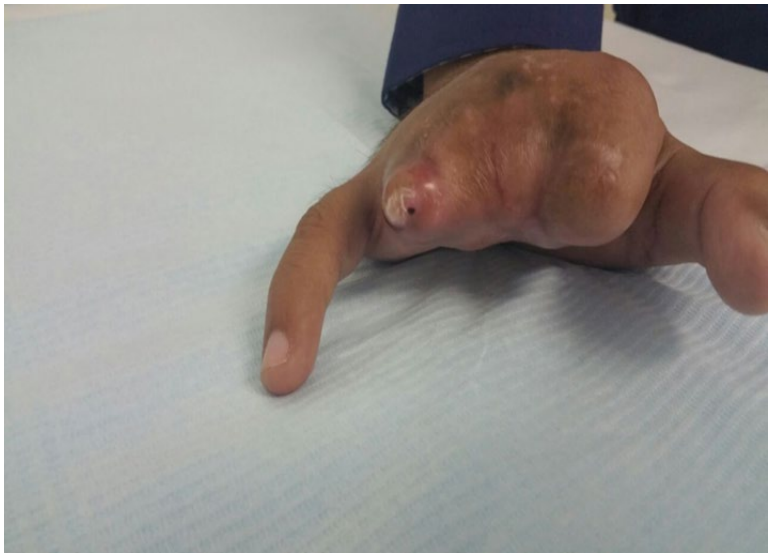


3 – After 1st week the wound was better with necrotic debridement done and applying Nanoskin membrane





3 – two weeks after beginning treatment with Nanoskin membrane with healthy granulation tissue and no odor, and decrease in wound size.



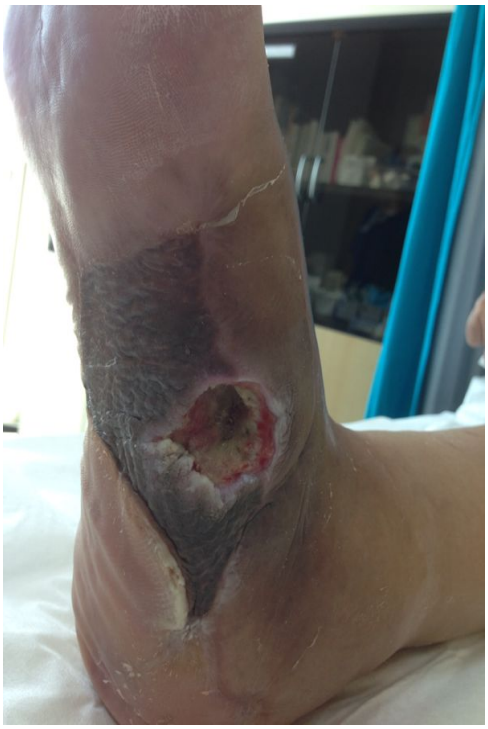
3 – Complete healing in 19 days using Nanoskin membrane

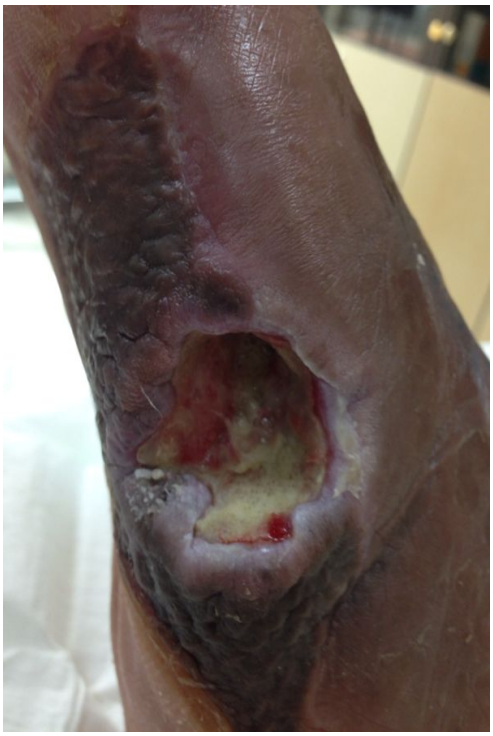
Conclusion:

Using Nanoskin membrane led to the following:

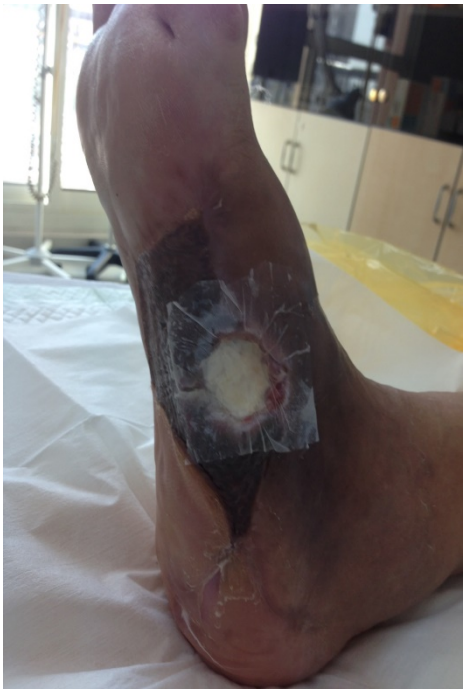
- Accelerate the healing process
- Eliminate skin deformity and pigmentation
- Decrease in recovery time and frequency of dressing change, thus reducing the overall cost of treatment.

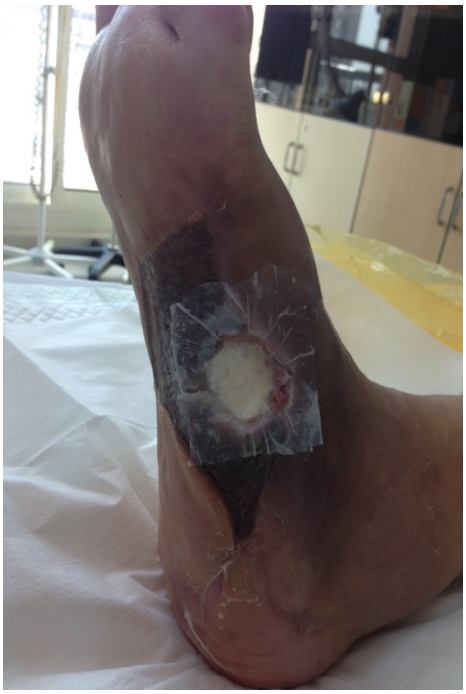
- **Chronic Diabetic foot ulcer case**
  - 55 years old male
  - History of Cancer
  - History of Renal failure and kidney transplant
  - Removal of multiple ulceration on his left foot led to a skin graft operation in 2010
  - Severe necrosis in skin graft area and underlying boney prominence had to be excised and treated again, this time with Nanoskin. Treatment began in November 2013
  - Treated in Dr. Suleiman Al Habib Hospital



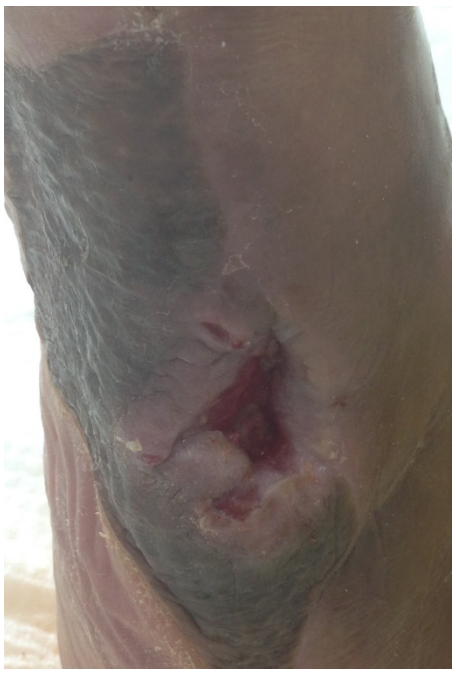


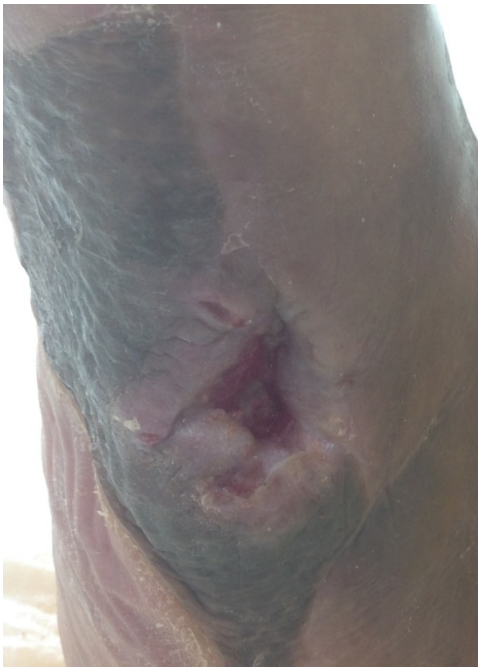
1 – Wound bed after debridement of necrotic tissue to start treatment with Nanoskin membrane



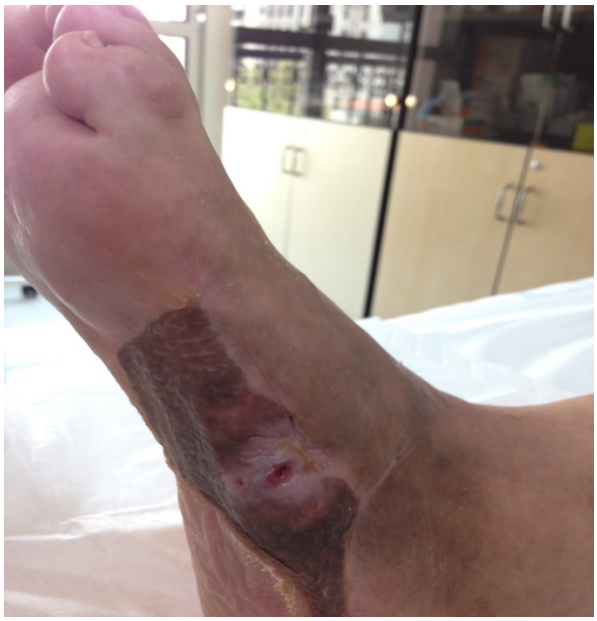


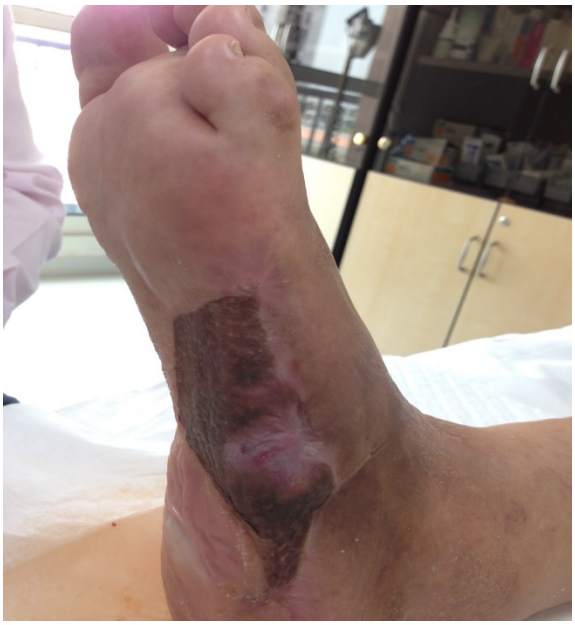
2 – Applying of Nanoskin membrane. Note folding membrane and put inside cavity to insure seamless contact with wound bed.



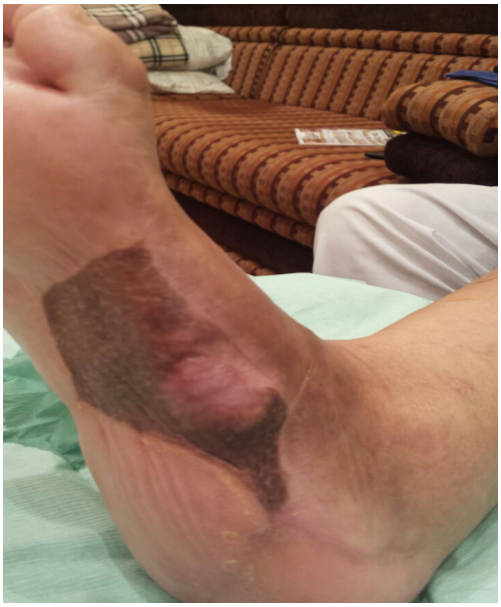


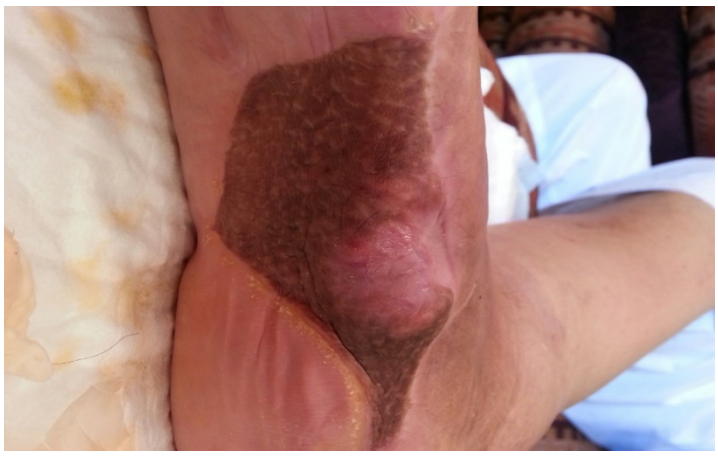
3 – Healthy granulation tissue filling up the cavity, and wound diameter is decreasing



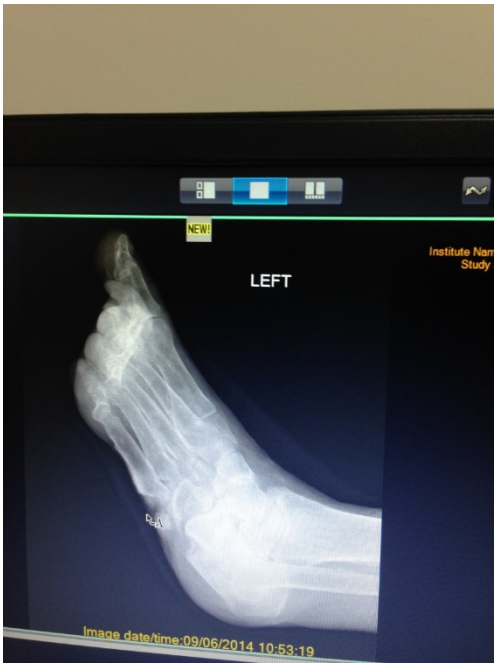


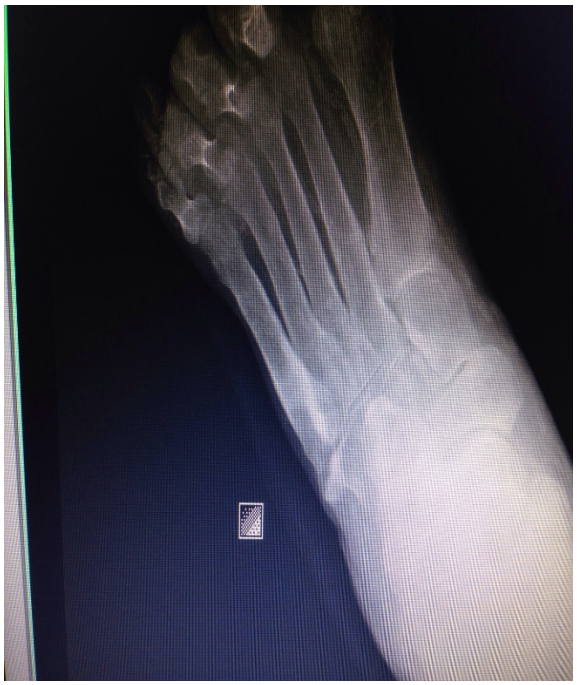
4 – Wound nearly closed but Doctor had to do another debridement operation on bone tissue to insure full closure





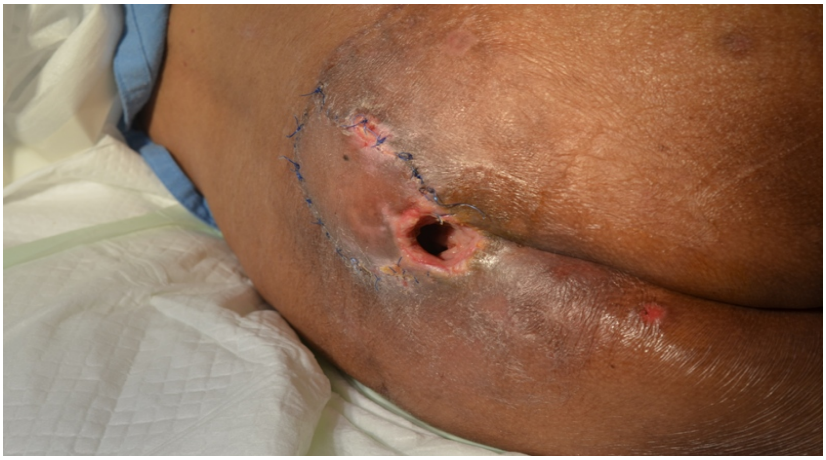
5 – Wound site completely healed with healthy granulation filling the wound bed and minimized scars.

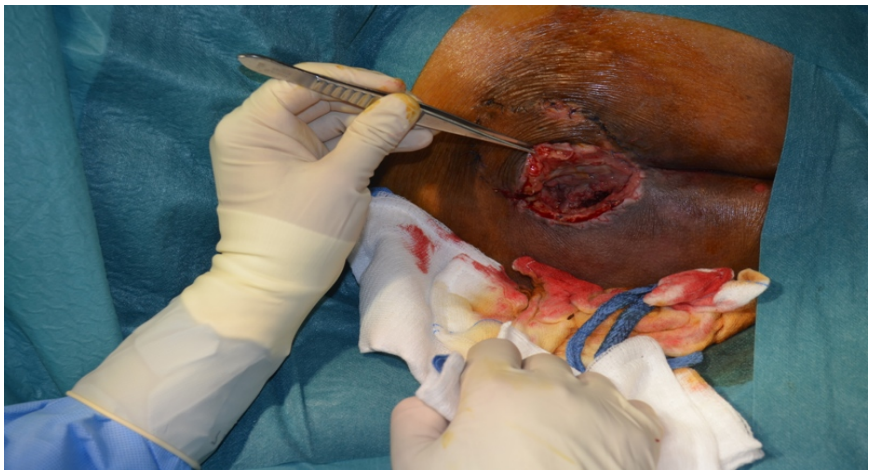




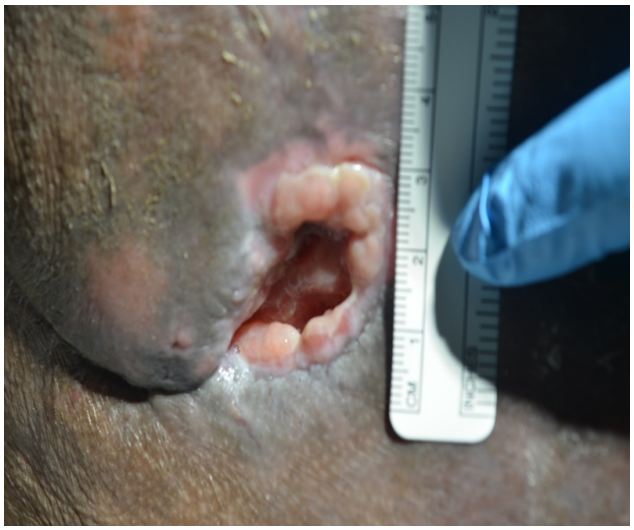
6 – X-Ray scans show healing of bone tissue after debridement done of boney prominence with use of Nanoskin membrane.

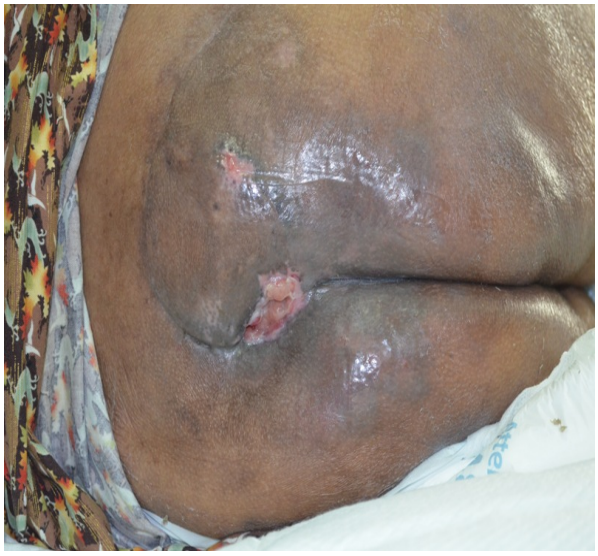
- **Pressure ulcer Case**
  - 82 years old female patient
  - Pressure sore developed post flap surgery
  - Wound dimensions were 3 cm in width and 5 cm in depth
  - Treatment over 6 weeks
  - Treated in Welcare Hospital – Dubai



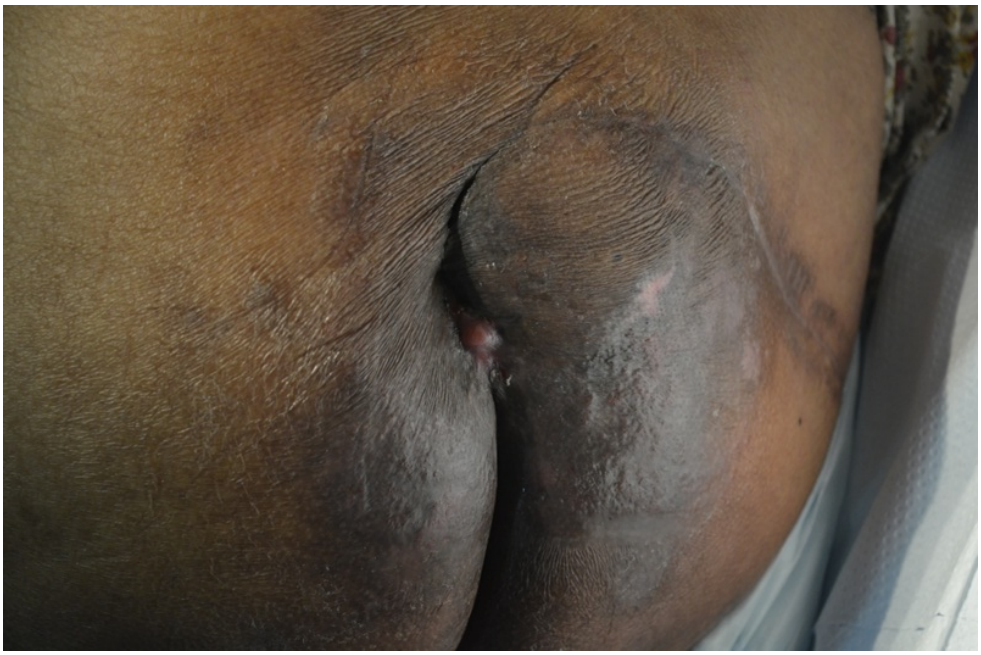


1 – Debridement operation done on wound in preparation to apply Nanoskin membrane





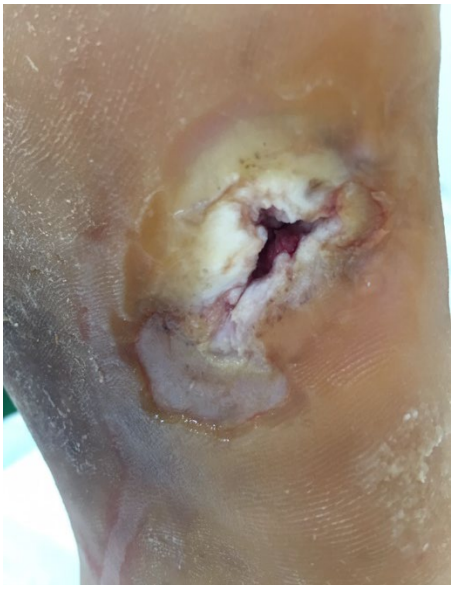
2 – Healing progress throughout treatment. Note the granulation tissue filling up the cavity with pink edges indicating epithelization phase



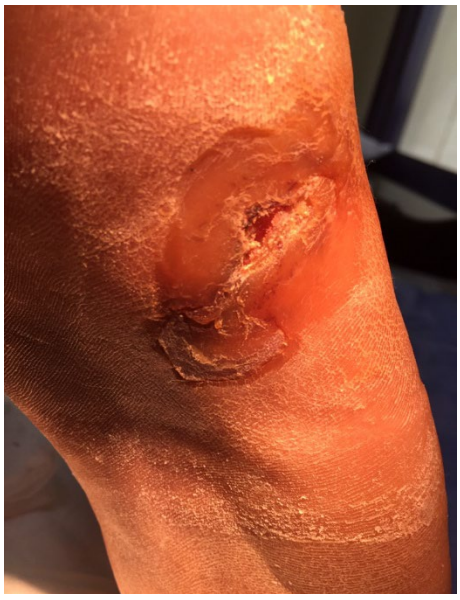
3 – Complete healing after 42 days with full healthy tissue and minimized scarring

---

- **Diabetic Foot Ulcer**
  - Patient came in with an open wound with excess skin formed and non-healing
  - Treated in of Dr. Abdulsalam Khamis – Al Baraha Hospital
  - Treatment with Nanoskin membrane

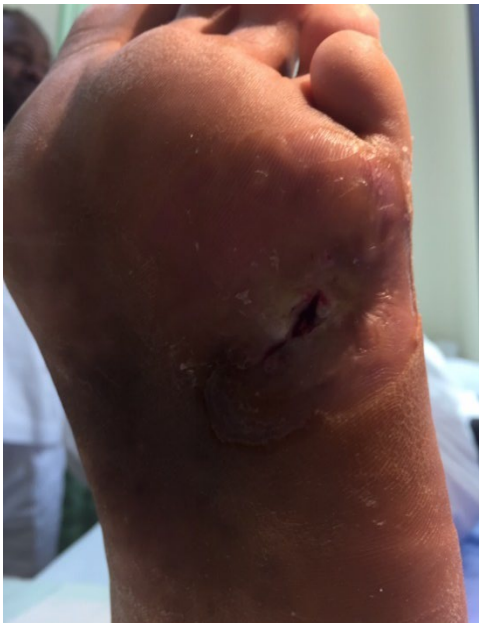


20/12/2015



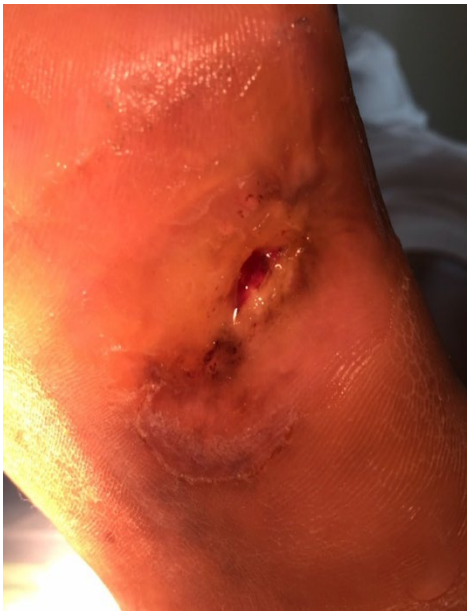
10/01/2016

1 – 20 days of slow progress using basic dressings. Note dryness of skin that hinders healing process



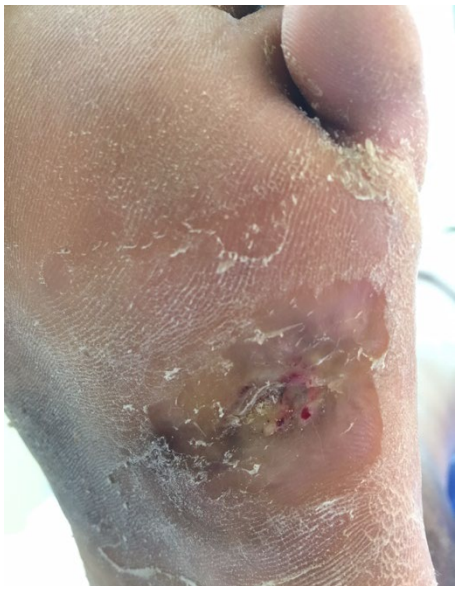
2 – 10/01/2016

Doctor had to do a debridement operation to remove dry skin and any unhealthy tissue formed. And begin applying Nanoskin membrane after 1 week



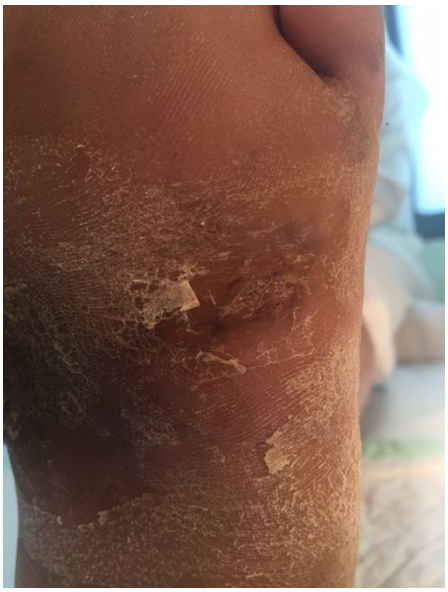
3 – 24/01/2016

Treatment progress after 1 week of applying Nanoskin membrane. Note proper attachment of granulation tissue and surrounding area.



4 – 14/02/2016

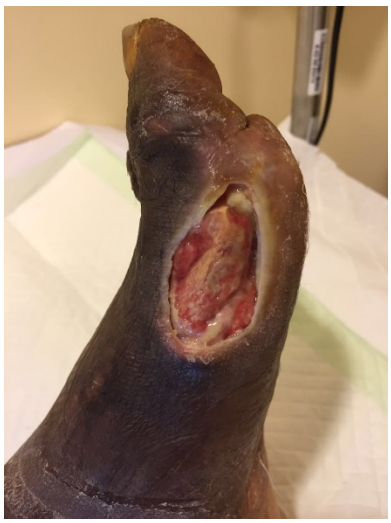
Healing progress with Nanoskin membrane. Note filling of cavity



5 – 28/02/2016

Complete healing with Nanoskin membrane.

- **Diabetic Foot Ulcer Case**
    - Treated in Al Zahra Hospital – Sharjah



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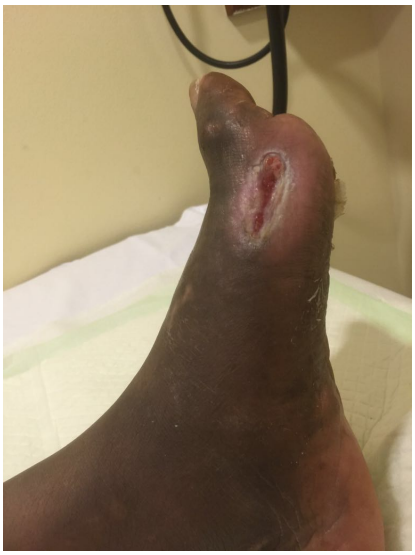

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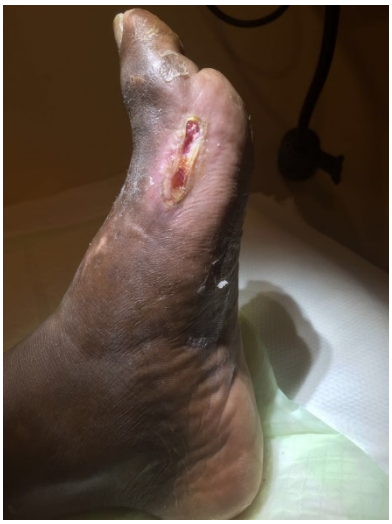

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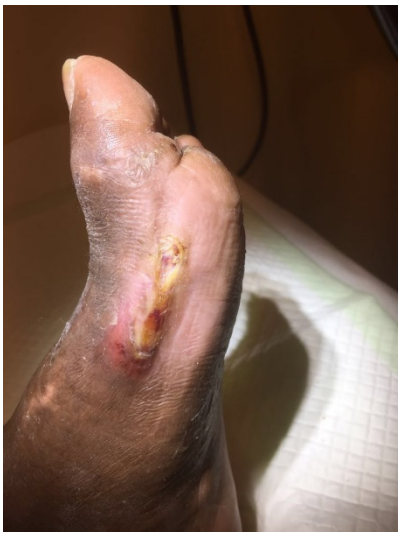
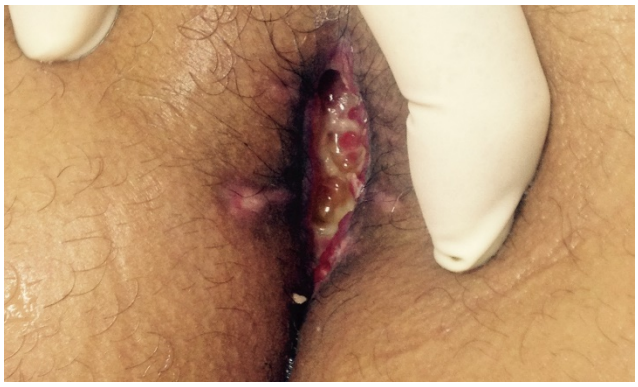


(4)

- **Pilonidal Sinus Case**
    - Treated in Neurospinal Hospital



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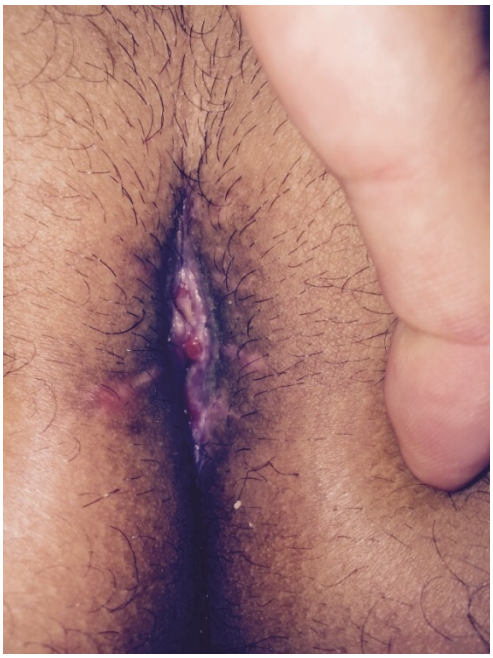
(2)



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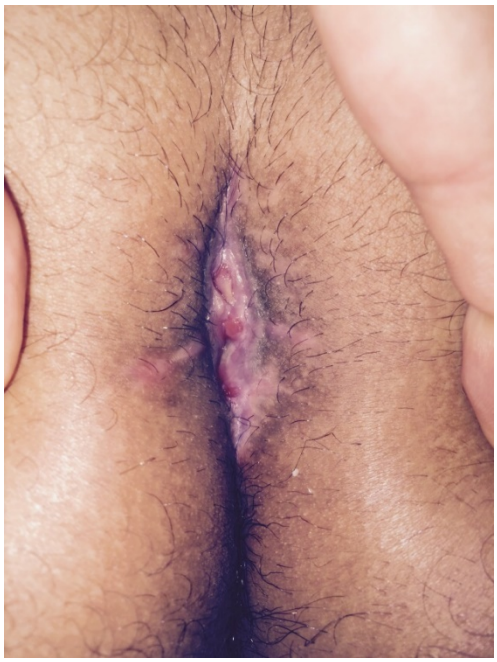
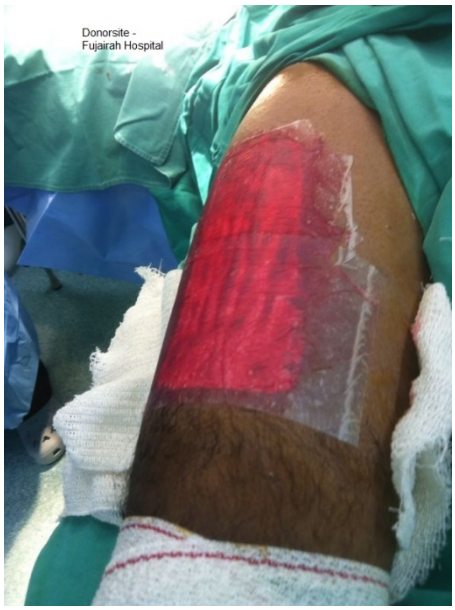
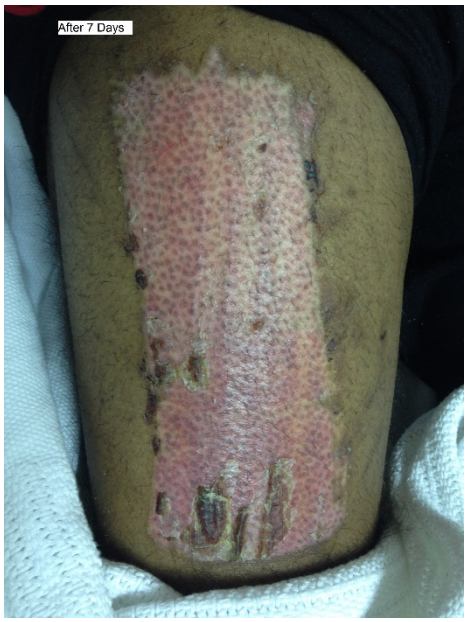


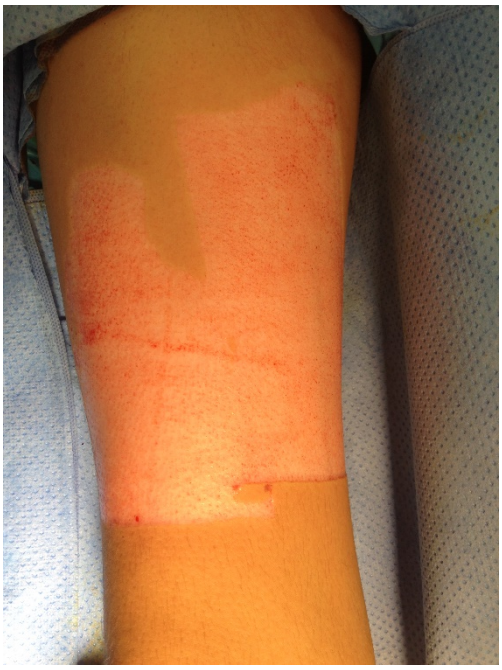
(4)

- **Donor Site Case**
  - Treated in Al Fujairah Hospital
  - Wound healed within 7 days and patient noted painless healing



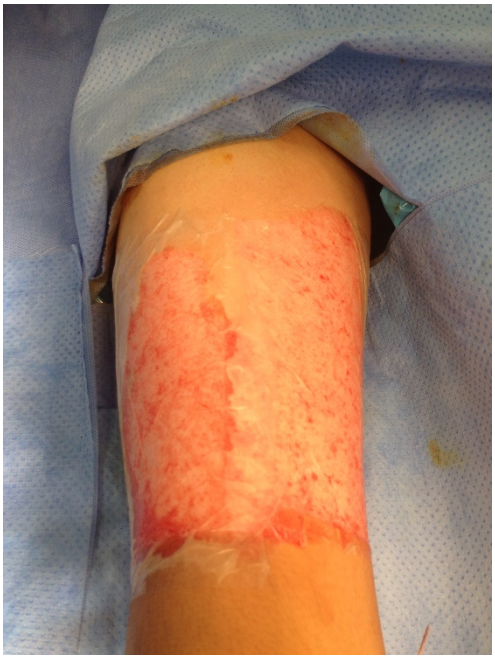


- **Donor Site Case**
  - Treated in Al Qassimi Hospital
  - Wound healed within 9 days and patient noted painless healing



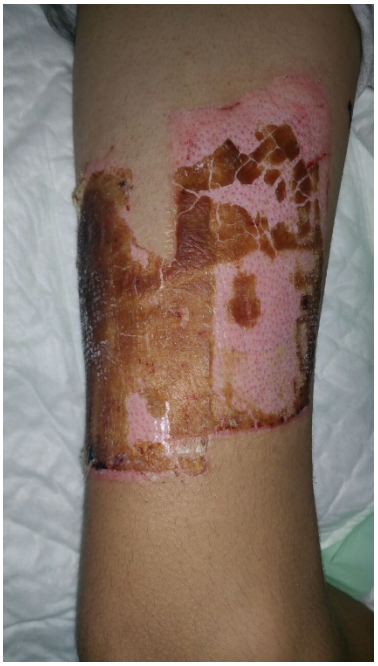
1 – 14/03/2016

Donor site during operation



2 – 14/03/2016

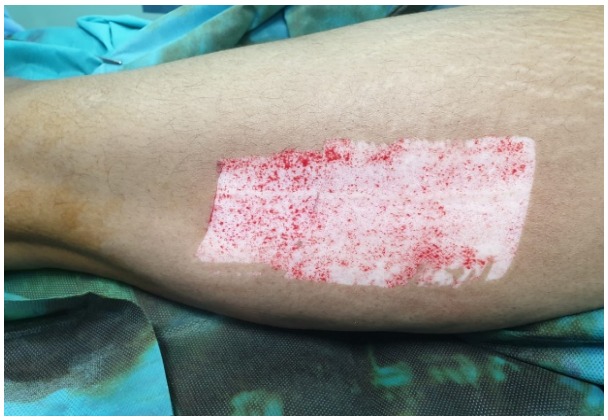
Donor site after applying Nanoskin membrane



3 – 23/03/2016

Donor site after healing. Note dryness of Nanoskin membrane, will keep until it falls on its own

- **Skin Graft donor site Cases**
    - Treated in – NMC Hospital AD
    - All Cases Healed within 10 days or less
    - on top of protecting the wound from infection, the doctors and patients were impressed with the painlessness throughout the healing process.



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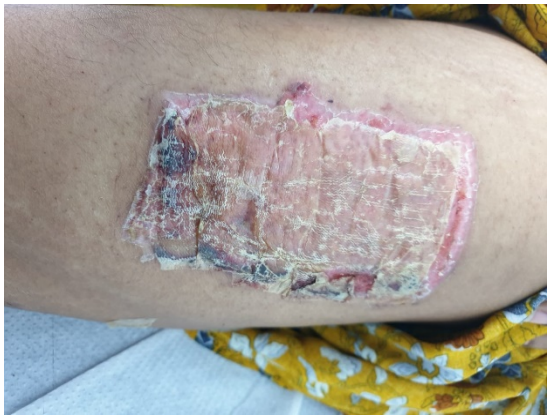

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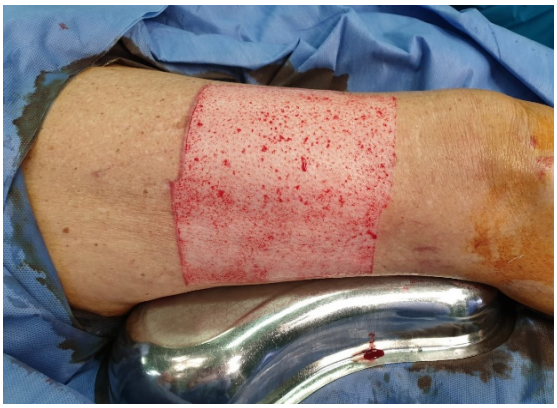

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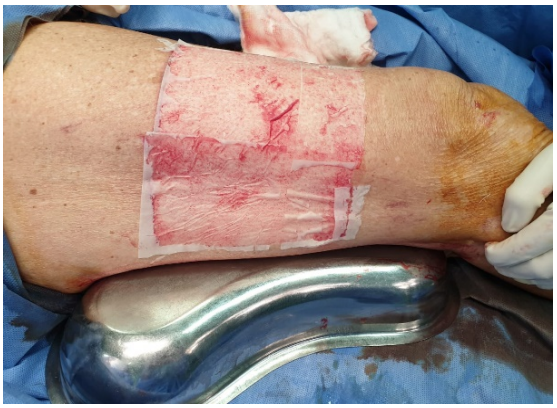

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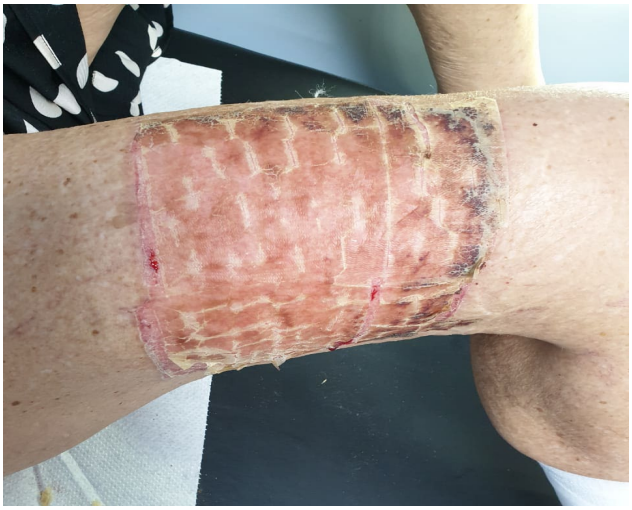
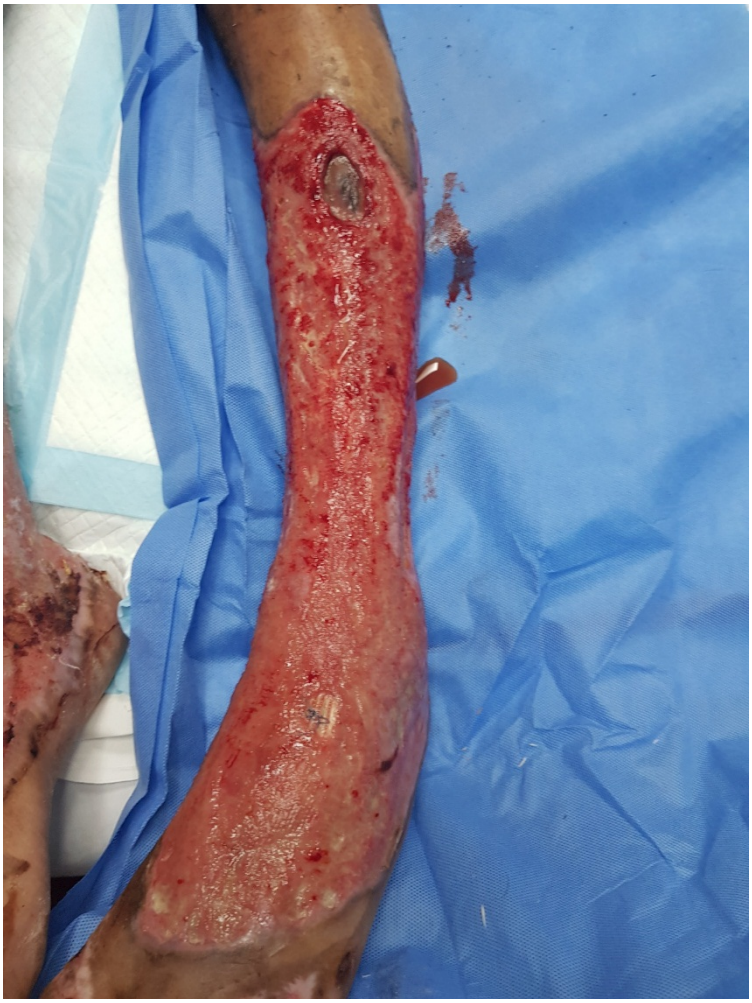


(3)

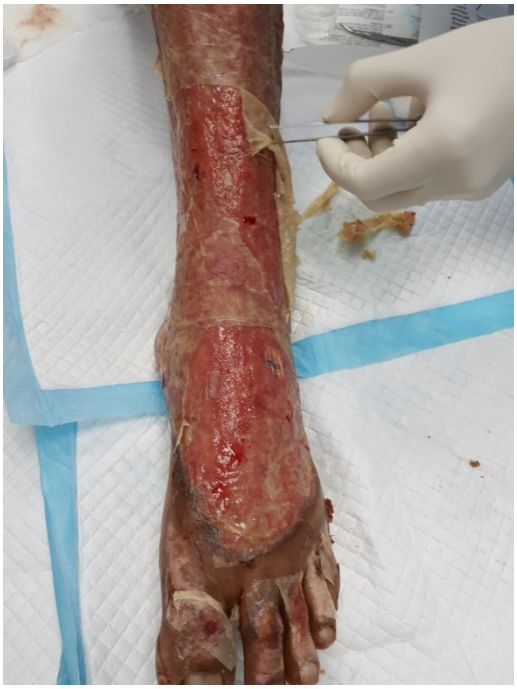
Nanoskin ACT Clinical Cases

- **2nd and 3rd Degree Burn Case**
  - Male, 36 years old
  - A gas explosion caused burns on 85% of his body
  - Admitted in the ICU for more than 2 months, and his wounds and burns became chronic
  - Regular dressings used but with no progress in that time period
  - Nanoskin ACT was used on his left leg to provide clinical effectiveness comparison against other products



1 – 23/04/2018

First application of Nanoskin ACT membrane. Due to severity of the burn, it was determined necessary for a dressing change every day.

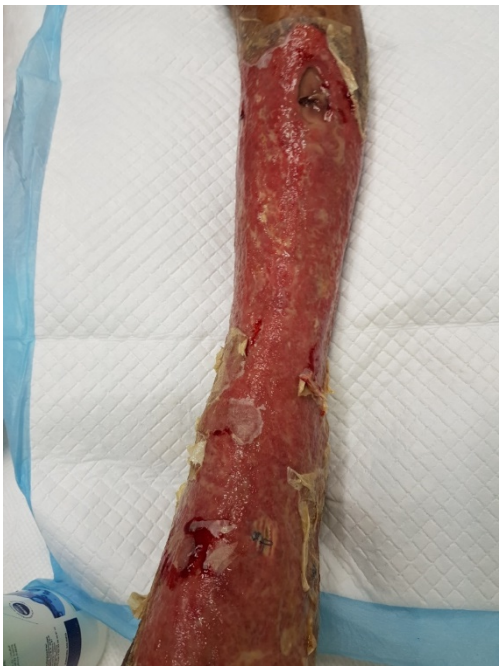


2 – 24/04/2018

Change of Nanoskin ACT membrane and apply a new one.

3 – 25/04/2018

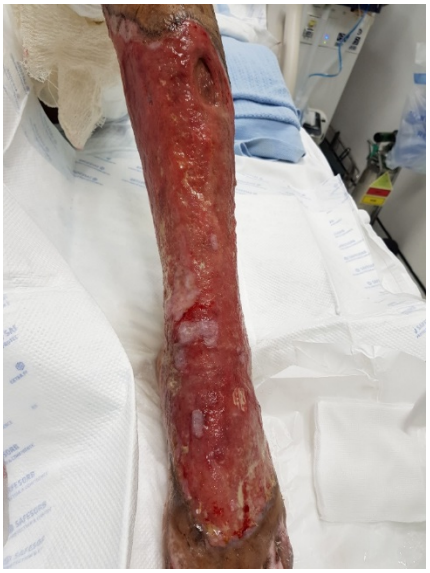
Change of Nanoskin ACT membrane and apply a new one.

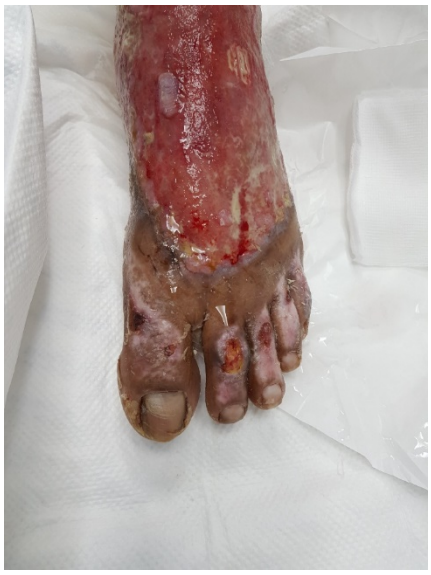


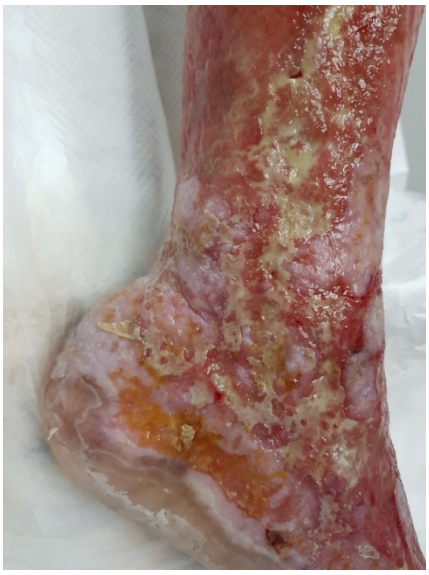
4 – 26/04/2018

5 – 26/04/2018

Comparison of progress with right leg that uses a different product

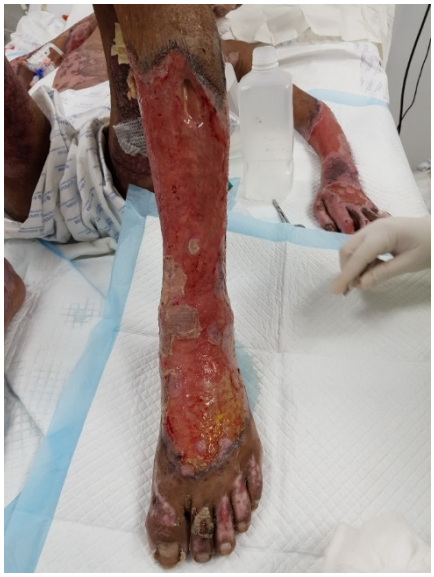


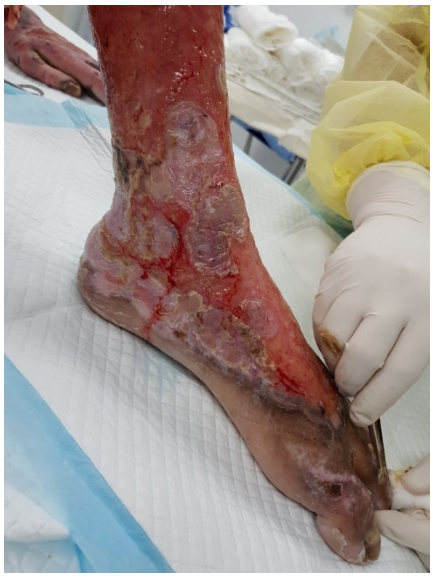


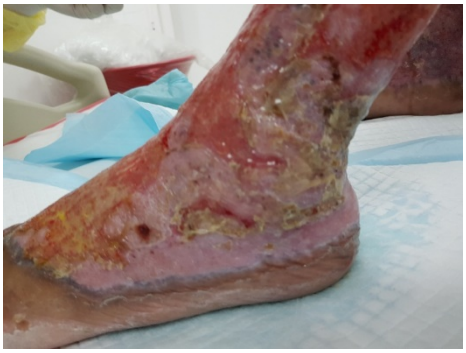


6 – 29/04/2018

State of burn area is getting better, more granulation and epithelization islands appear

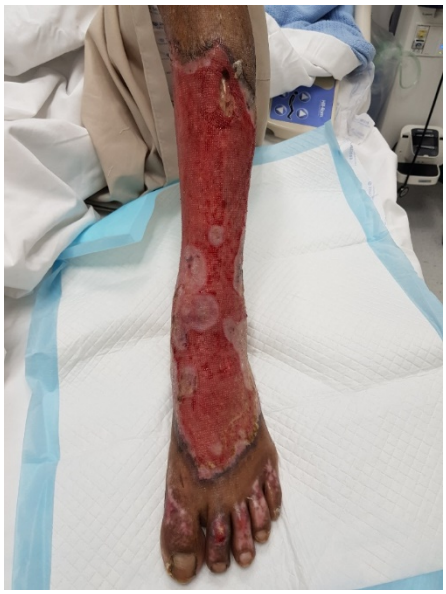


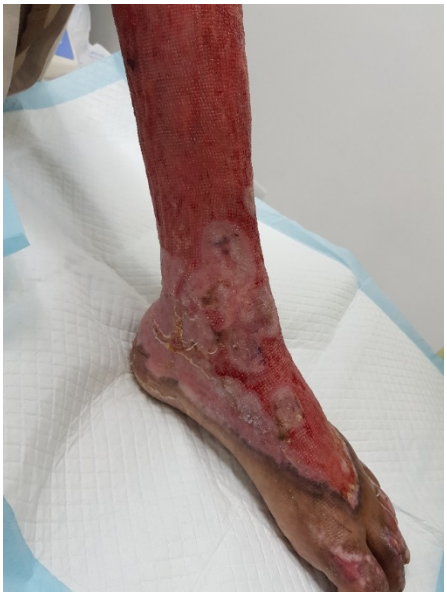




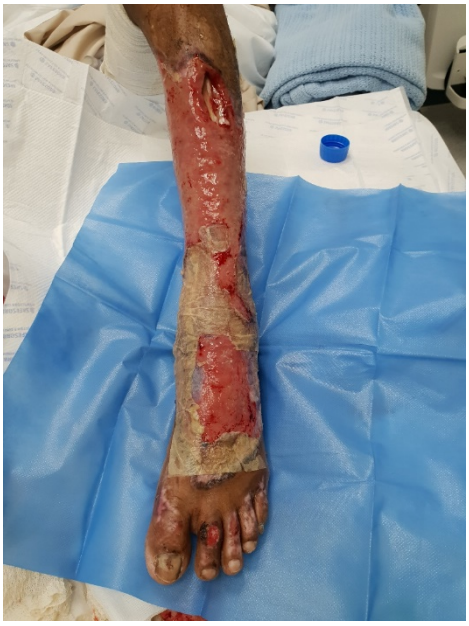
7 – 09/05/2018

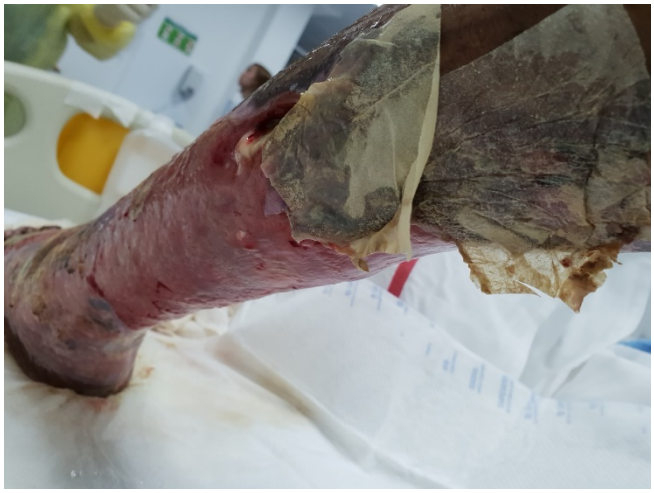
Epithelization islands take over the burn area,
specifically towards lower of the leg





8 – 13/05/2018





9 – 28/05/2018

Burn area is now prepared for a skin graft operation in which Nanoskin ACT created a healthy wound bed to ensure a successful operation

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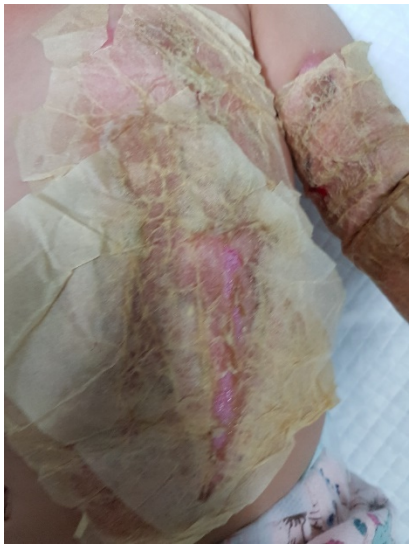
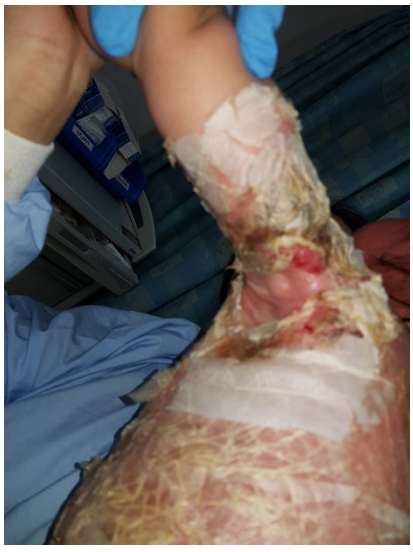
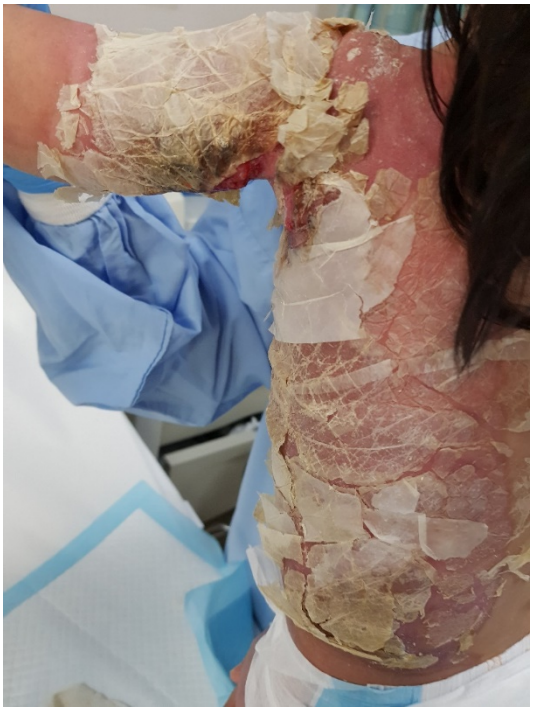
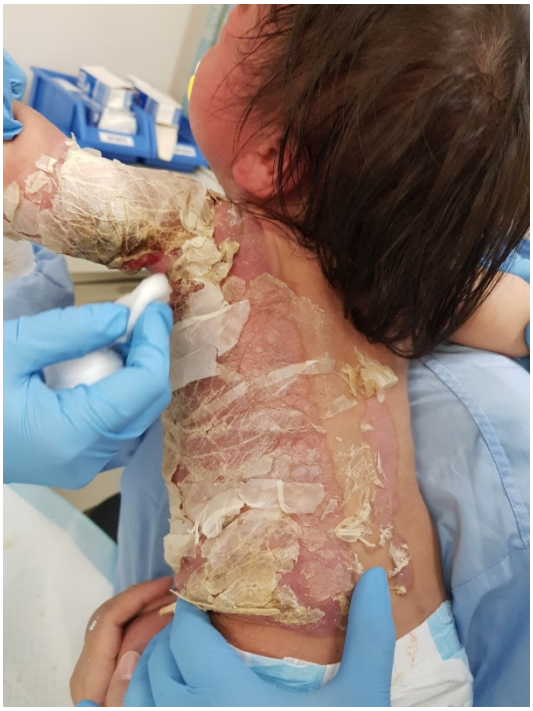
- **2nd and 3rd degree Burn Case**
  - Patient is a 2 years old child
  - Child sustained burns from boiling water over his abdomen, left arm and shoulder, and his back
  - Regular dressings used but showed no progress in the critical time frame post injury
  - Started treatment with Normal Nanoskin on superficial areas, and deeper infected areas were treated with Nanoskin ACT
  - Treated in Latifa Hospital





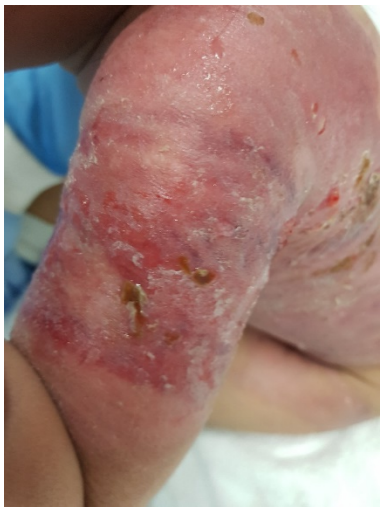
1 – 15/03/2018

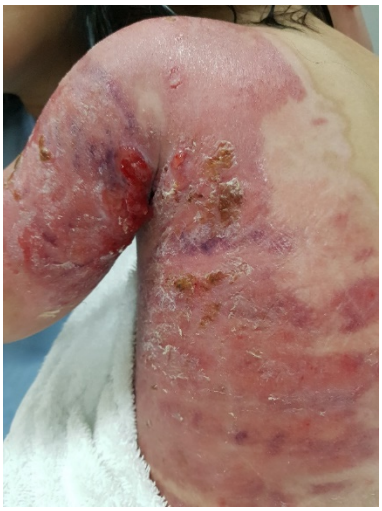


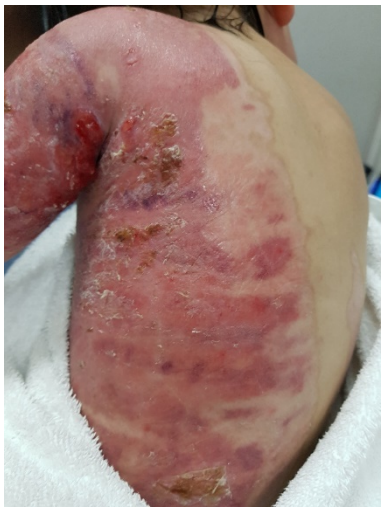


2 – 22/04/2018

More than 80% of burn healed

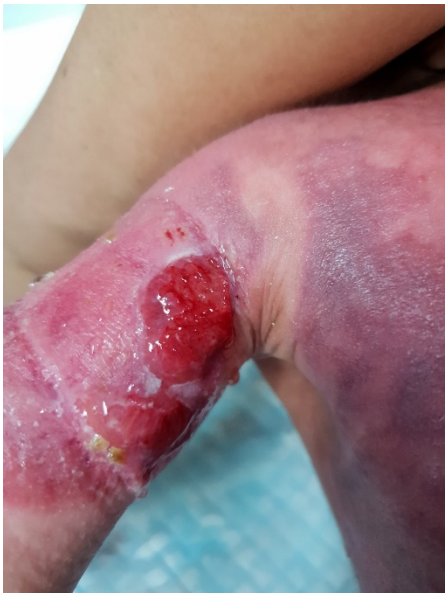


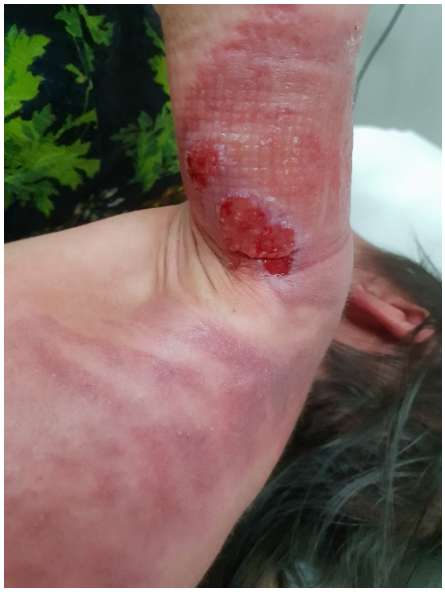




3 – 03/05/2018

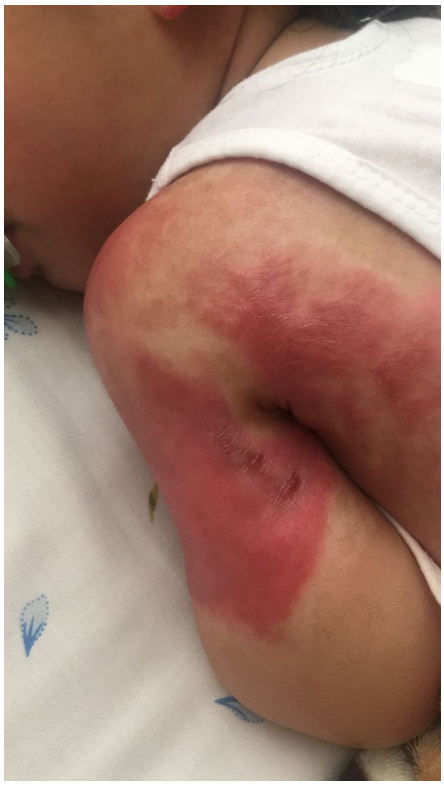
Burn area almost healed, continue treatment on deeper areas with Nanoskin ACT membrane

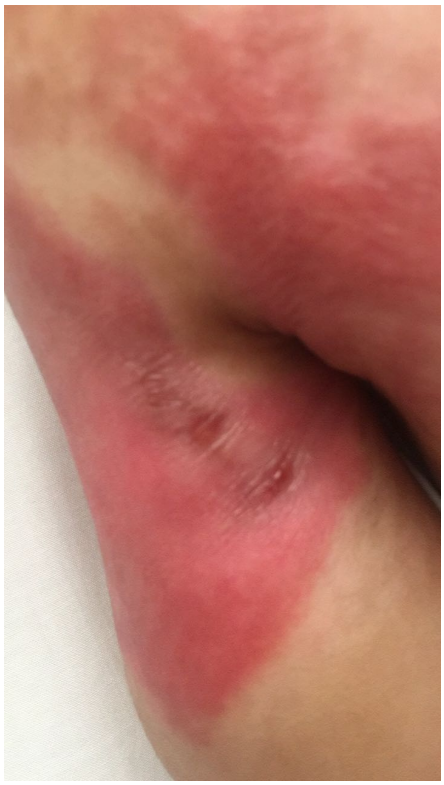




4 – 19/06/2018

Continue treatment on deep area in armpit with Nanoskin ACT membrane

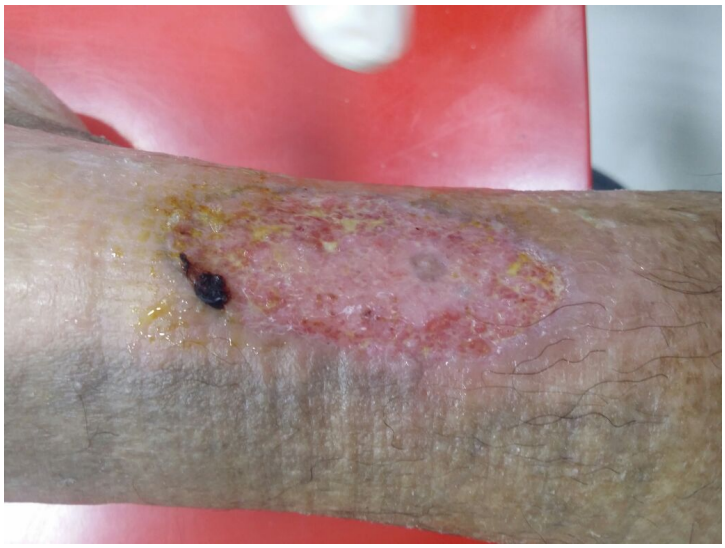




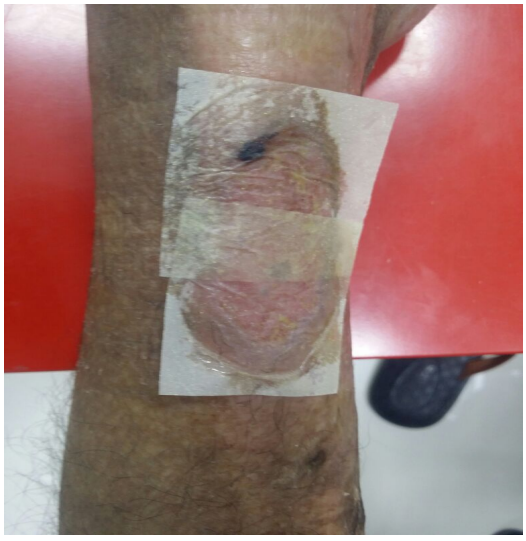
5 – 28/07/2018

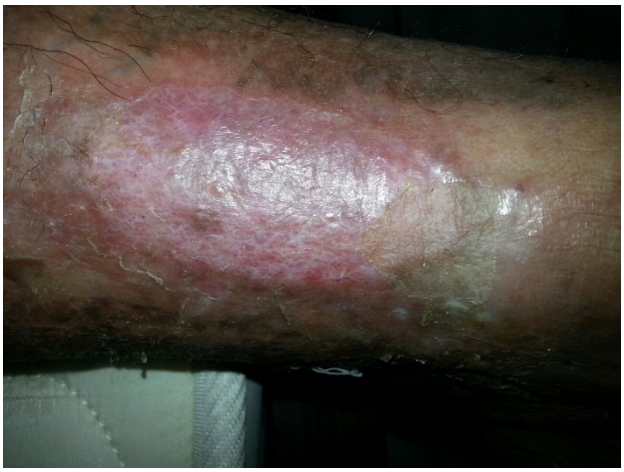
Follow up appointment after complete healing

- **Chronic nonhealing 2nd degree burn case**
  - Regular dressings used but no progress for a few months
  - Treated with one membrane of Nanoskin ACT in 7 days
  - Treated in Kuwait Hospital



1 – 17/03/2016

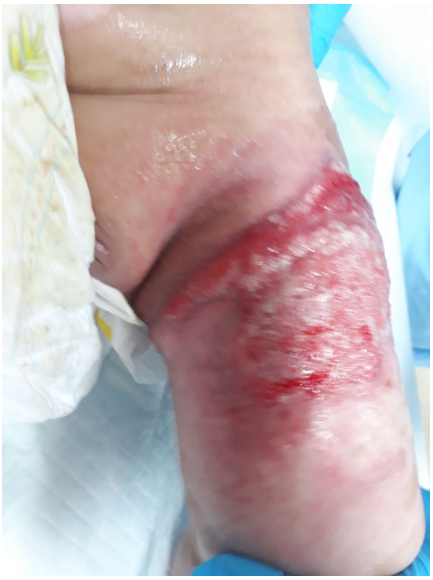




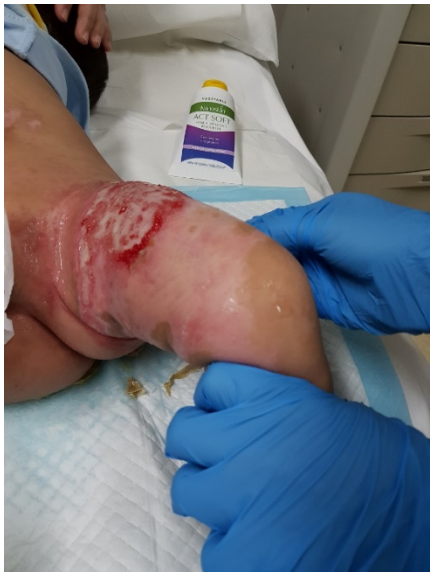
2 – 22/03/2016

Complete healing in under 7 days

- **2nd and 3rd degree burn on child**
  - Child is 20 months old, sustained deep burns from boiling water, some areas were infected
  - Regular dressings were used but to no progress
  - Treated with Nanoskin ACT and Nanoskin ACT soft
  - Treated in Latifa Hospital

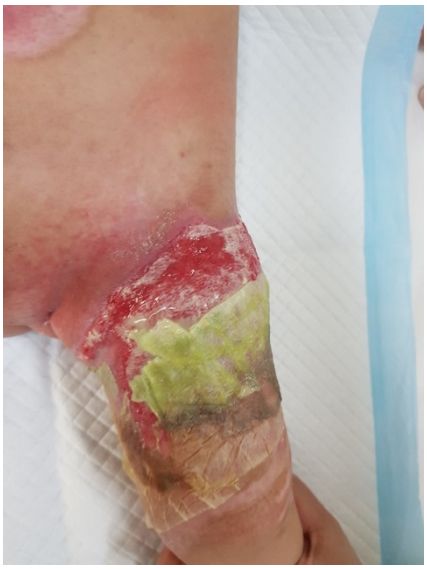


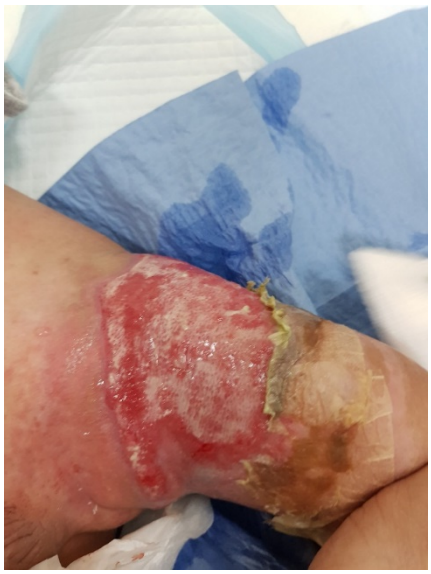
1 – before treatment with Nanoskin ACT and Nanoskin ACT Soft



2 – 15/03/2018

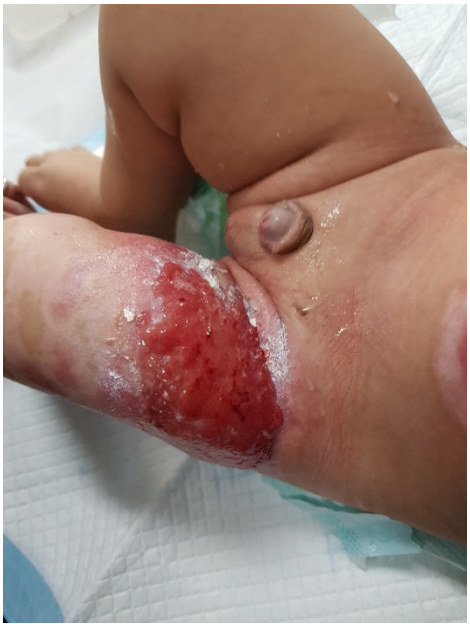
Begin treatment with Nanoskin ACT Soft for one week

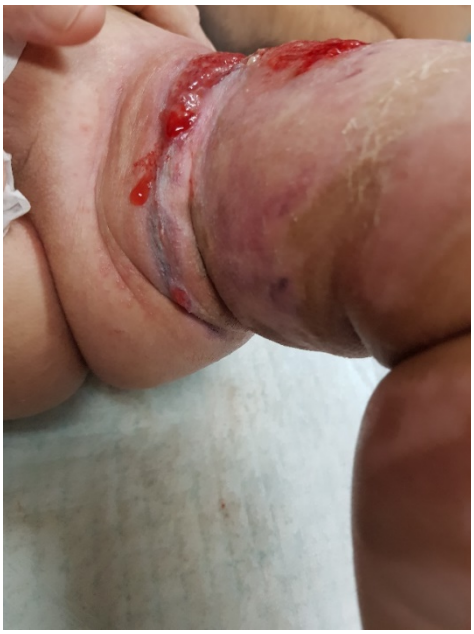




3 – 22/03/2018

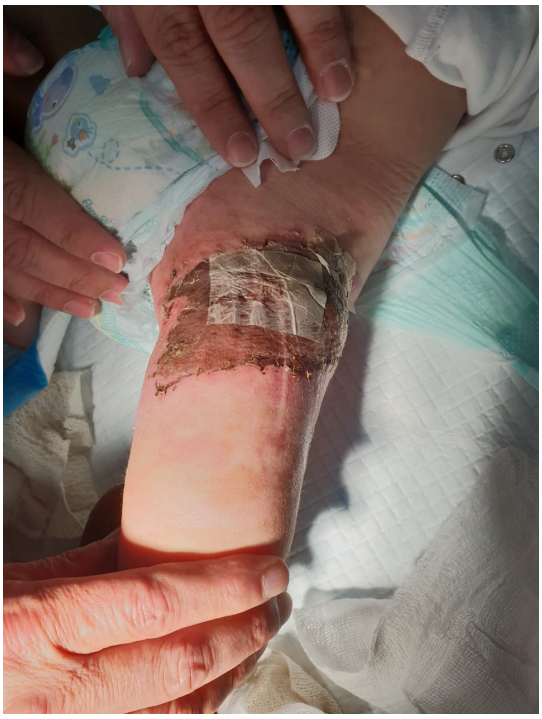
After one week, we shifted to used of Nanoskin ACT after healthy granulation tissue growth





4 – 08/04/2018

More than 40% of burn area healed with rest filled with healthy granulation tissue and now its ready for skin graft operation



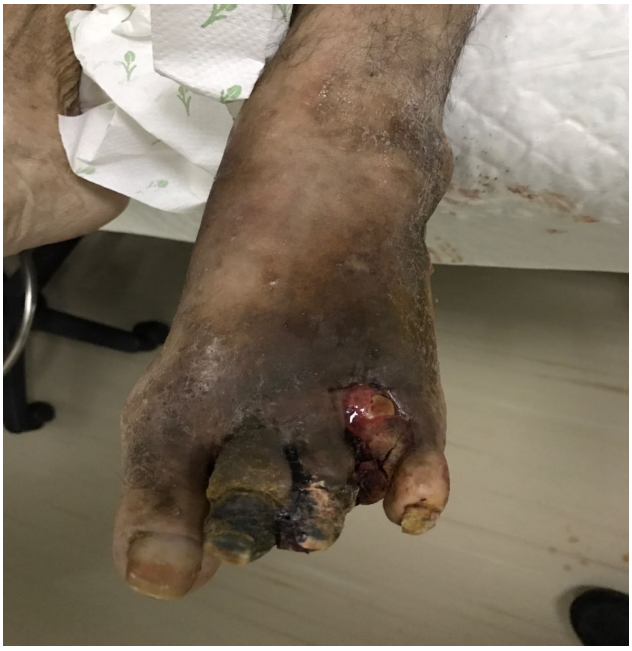
5 – 29/05/2018

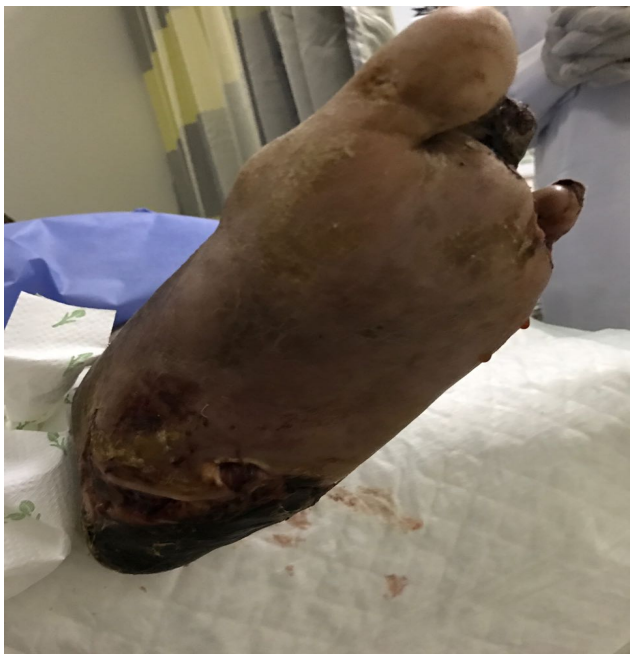
Follow up appointment: Burn completely healed and skin graft operation went successfully

Nanoskin ACT Clinical Cases

- **Wound Cases**

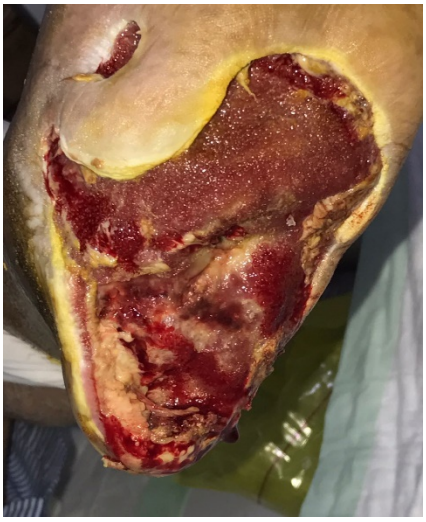
- **Diabetic Foot Ulcer – Partial amputation**
  - A 52 years old male patient
  - Complete necrosis on heels and middle 3 fingers of left leg
  - Debridement and partial amputation done on necrotic tissue
  - Put on negative pressure vac before beginning treatment with Nanoskin ACT
  - Treated in Al Dhaid Hospital

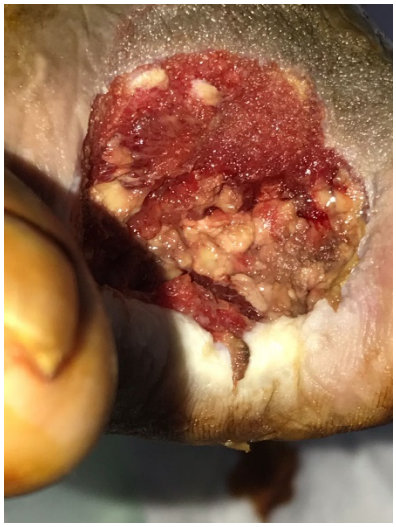




1 – 15/12/2016

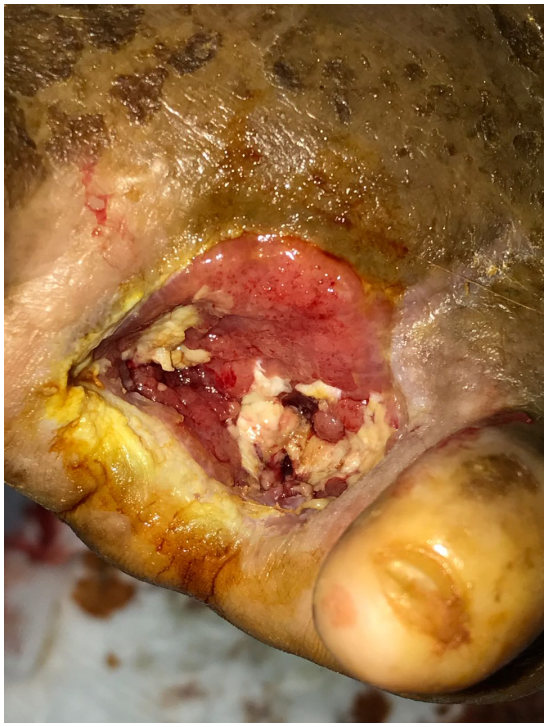
Before partial amputation of necrotic
tissue on both heels and 3 middle fingers

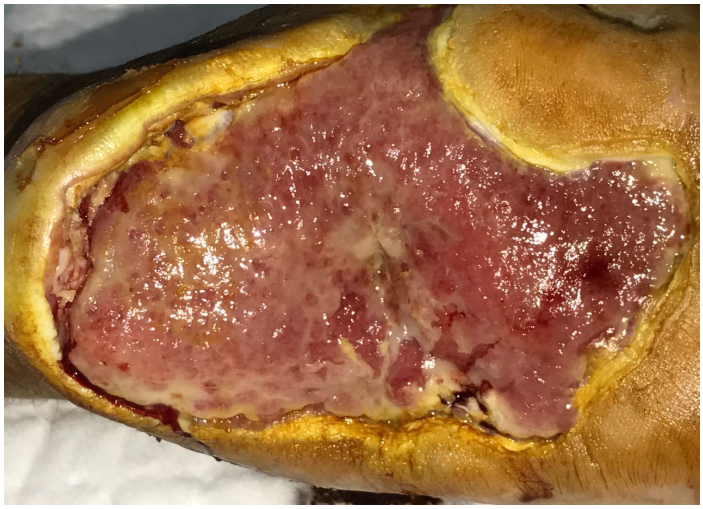




2 – 08/01/2017

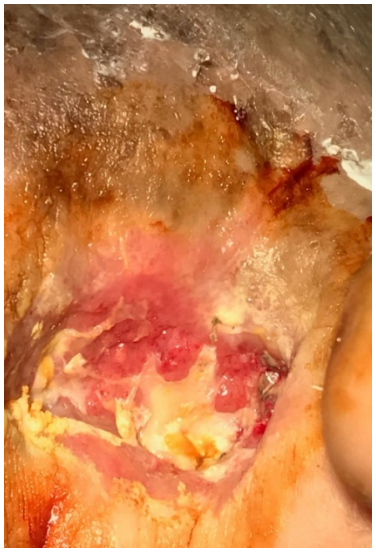
After partial amputation and neg pressure vac treatment. Will begin treatment with Nanoskin ACT

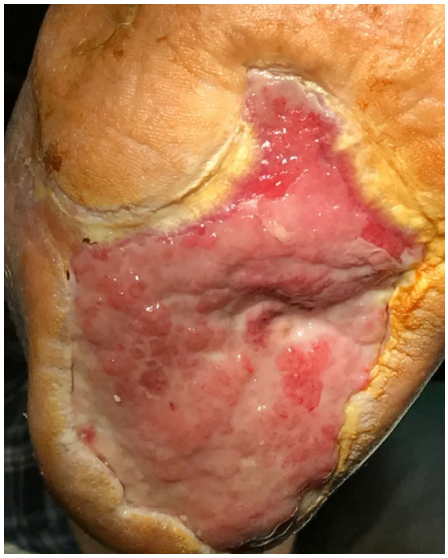




3 – 31/01/2017

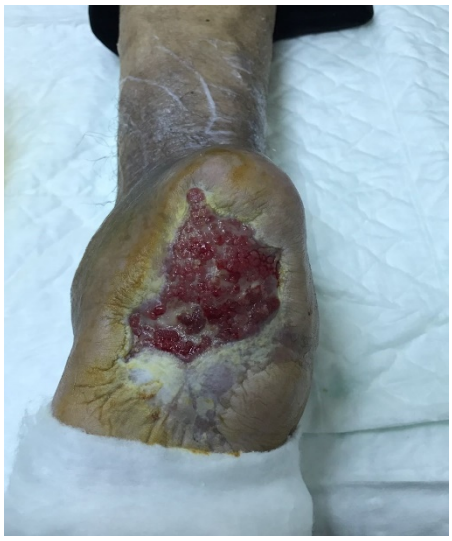
Healing progress with Nanoskin ACT membrane. Note growth of granulation tissue filling the wound bed

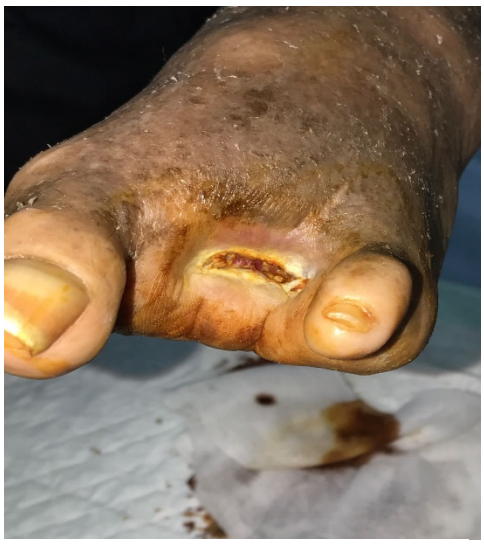




4 – 19/02/2017

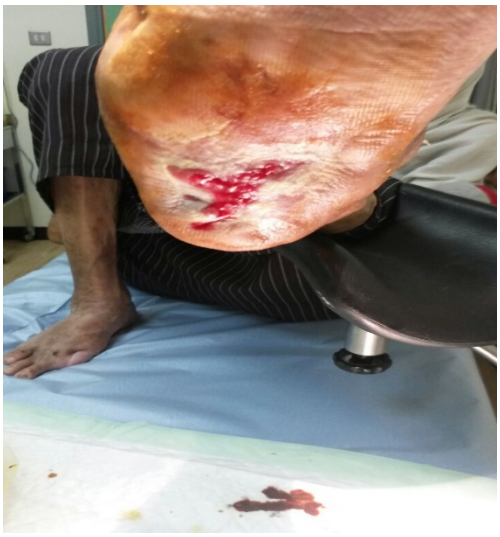
Doctor performed another debridement operation on bone tissue in heels area as it was disrupting the migration of soft tissue. After wound infection was put under control. Treatment shifted to use of Normal Nanoskin membrane

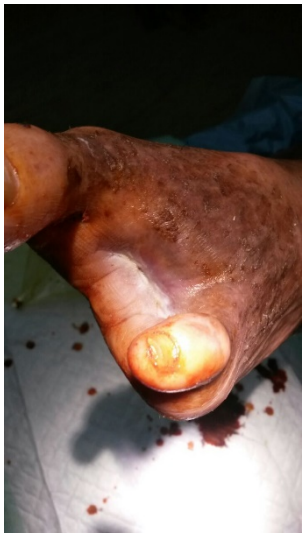




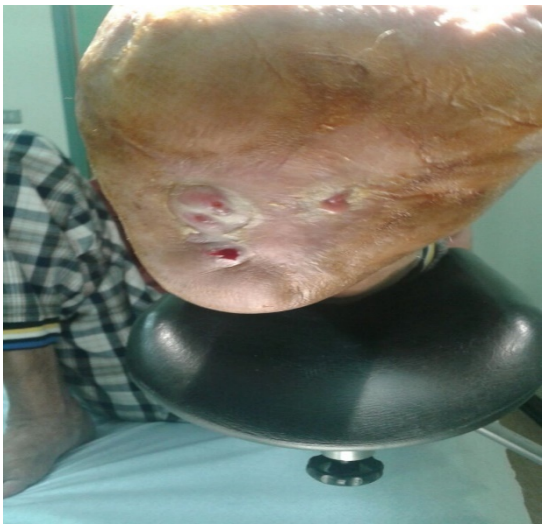
5 – 30/03/2017

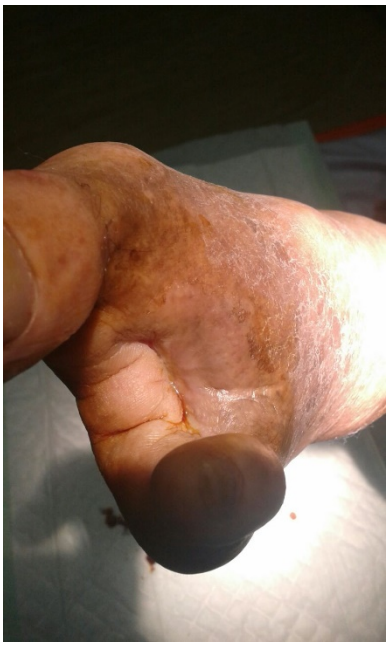
Progress of healing. Note fingers wound almost closed.





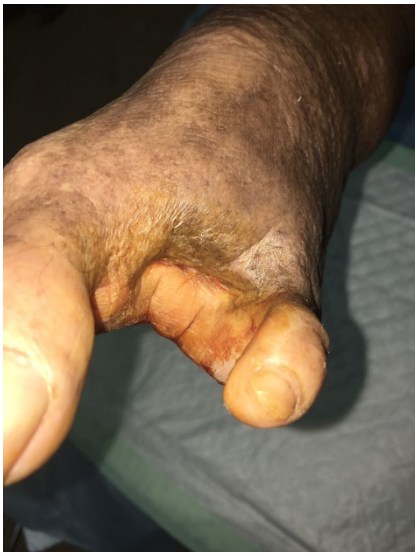
6 – 27/04/2017

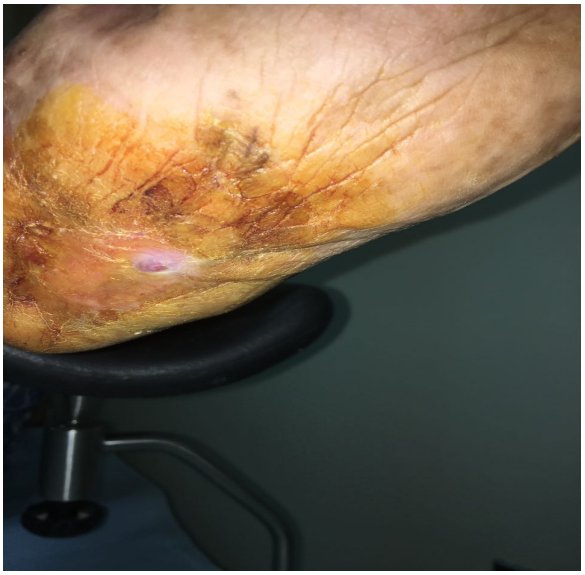




7 – 06/06/2017

Healing progress. Note complete closure of fingers cavity. And only small parts remain to treat in heel area

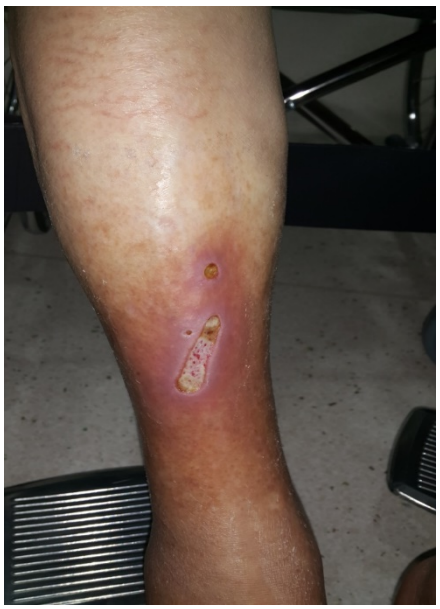


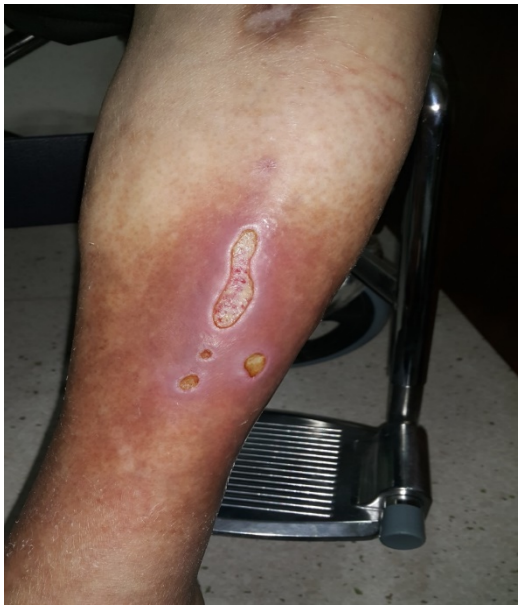


8 – 20/08/2017

Follow up appointment: Complete healing on both wound areas. And leg is saved from further loss.

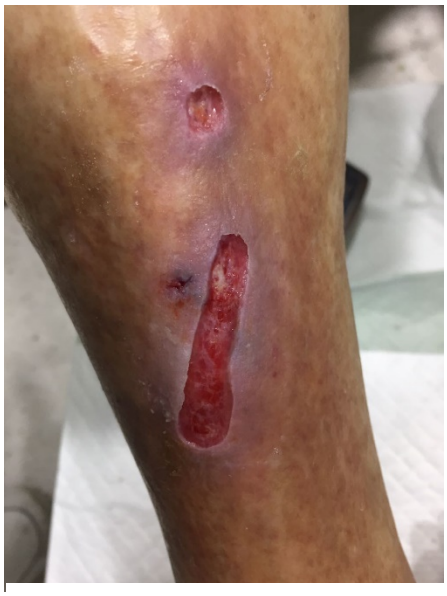
- **Diabetic Foot Ulcer Case**
  - Patient, 59 years old, had a partial burn on both legs
  - Patient used household detergents to remedy the burns which has worsen the case and caused it to become infected and form slough tissue on the wound bed
  - Treated with Nanoskin ACT Treated in Zulaikha Hospital

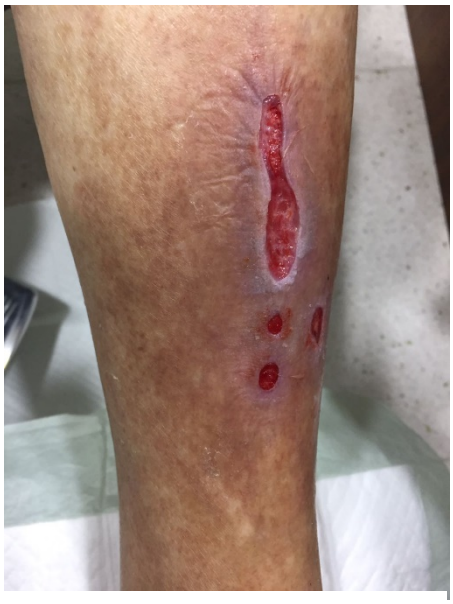




1 – 02/02/2017

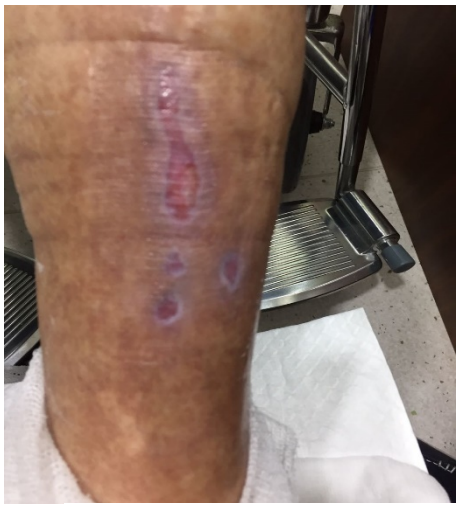
Begin treatment with Nanoskin ACT membrane

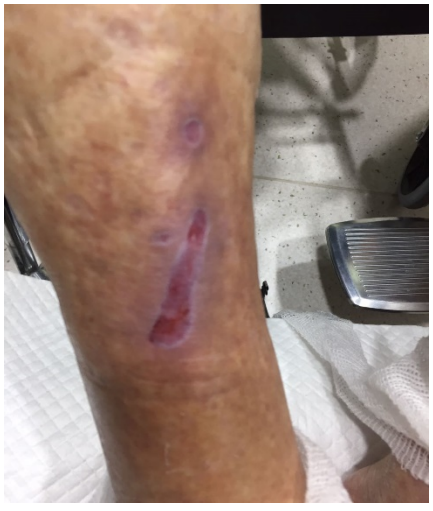




2 – 14/02/2017

Fourth dressing change in 3-day intervals: Wound is completely clean with healthy granulation tissue and rapid skin migration

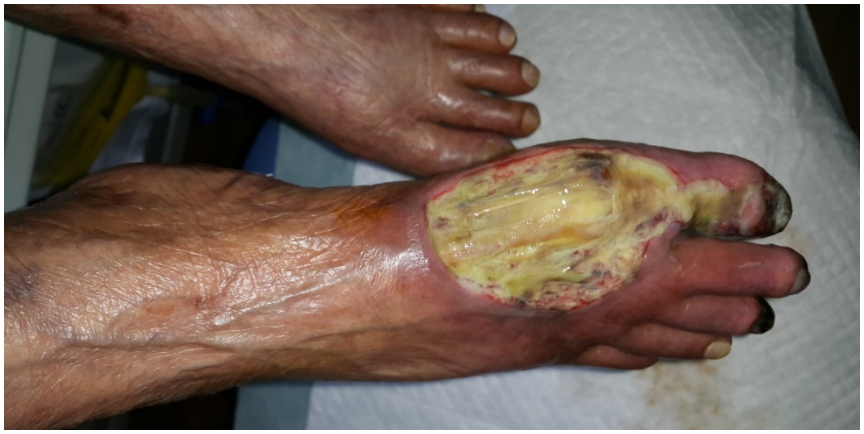




3 – 28/02/2017

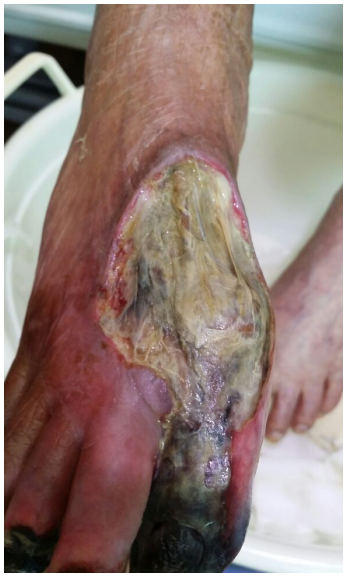
Last dressing change: wound is almost healed with skin covering most of the wound bed. Patient did not come back later which doctor indicated as “no news is good news”

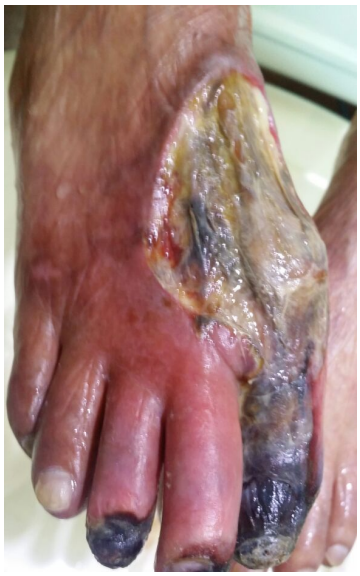
- **Chronic non healing diabetic ulcer**
  - Bedridden female patient in her 80s
  - With Vascular Stenosis that developed an ulcer in right foot leading to necrosis in the tip of her toes.
  - Treatment with Nanoskin ACT Treated in Al Sharq Hospital



1 – 05/11/2016

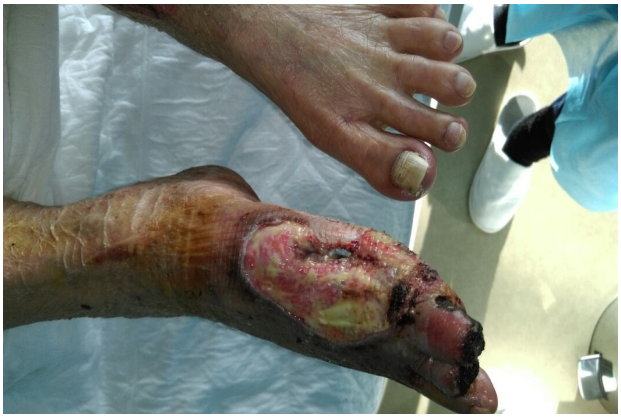
Begin treatment with Nanoskin ACT

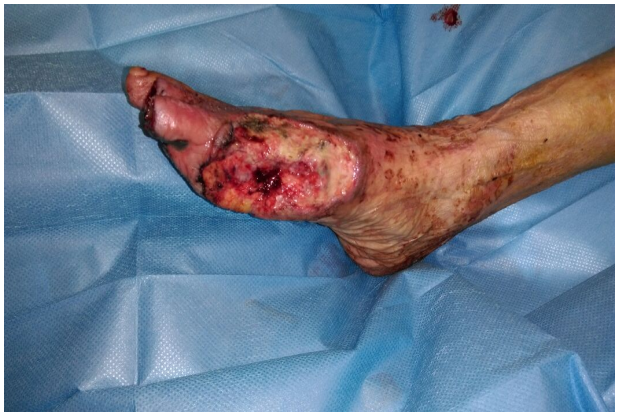




2 – 21/11/2016

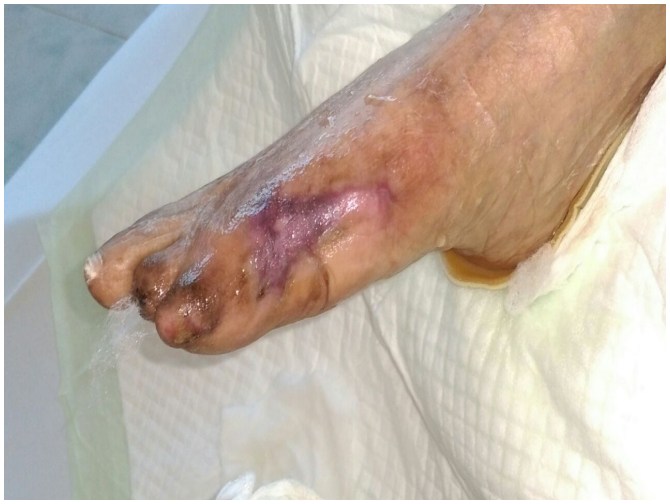
Micro debridement progress of Nanoskin ACT show on wound bed with new blood vessels developing around the wound. Patient decided to perform a surgery in France to correct the Stenosis





3 – 20/01/2017

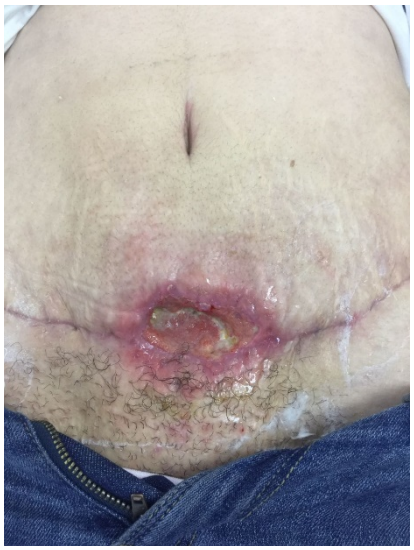
After the surgery in France, surgeons said that “the dressing that has been used preserved the remaining parts of the fingers and the foot as it prevented the progression of the disease”



4 – 15/04/2017

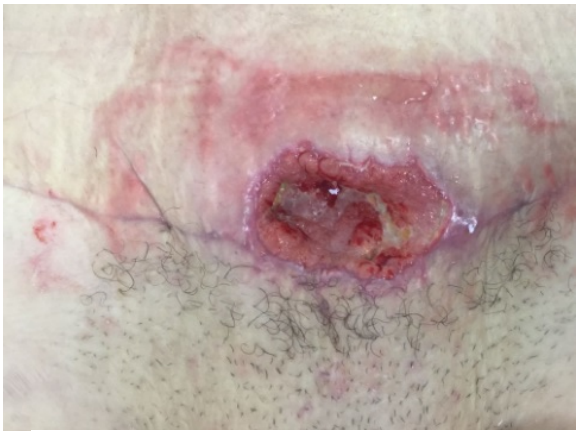
Follow up appointment: wound is completely healed

- **Abdominoplasty site infection**
    - Treated in FirstMed Clinic



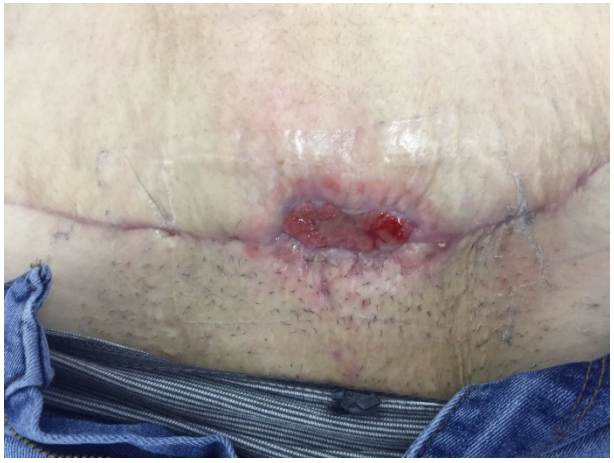
1 – 01/07/2017

First Nanoskin ACT membrane applied



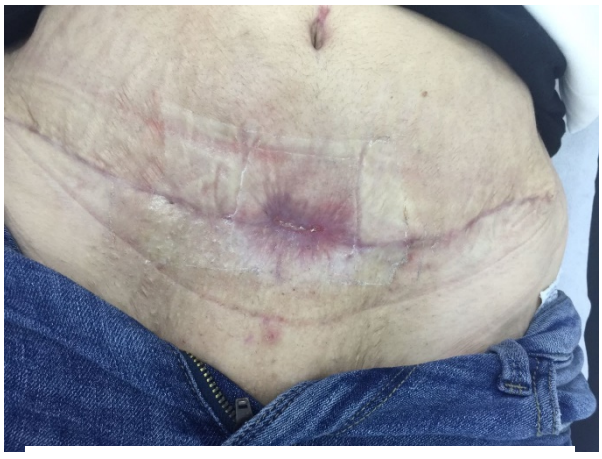
2 – 03/07/2017

Second Nanoskin ACT membrane applied



3 – 09/07/2017

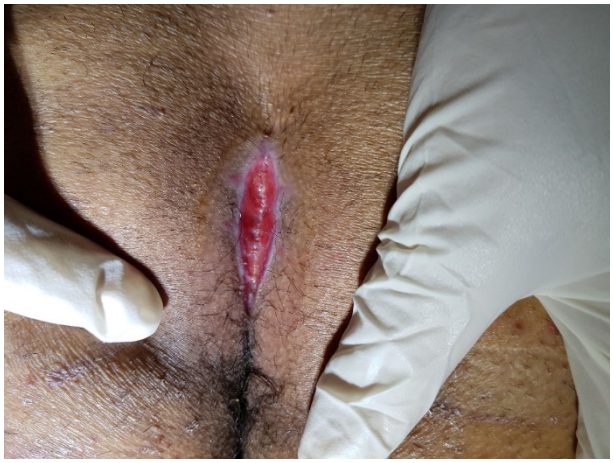
Last Nanoskin ACT membrane applied



4 – 30/08/2017

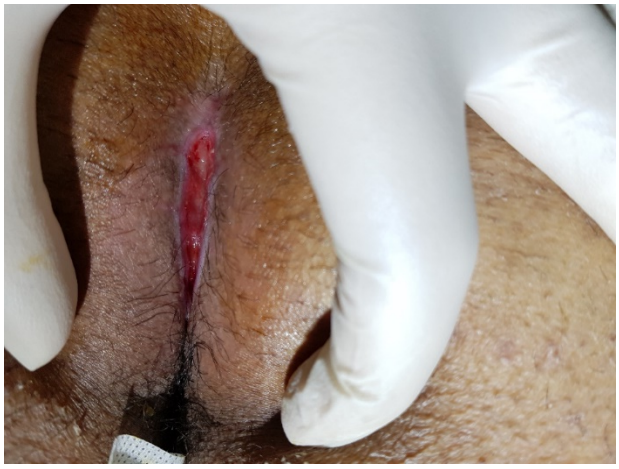
Follow up appointment : Complete wound closure and minimized scar tissue

- **Pilonidal Sinus Ulcer Case**
  - Patient is Male, 33 years old
  - Two months since surgery and the wound is nonhealing
  - Regular dressings were used but to no progress
  - Treated with Nanoskin ACT. Treated in Medeor 24x7 Hospital



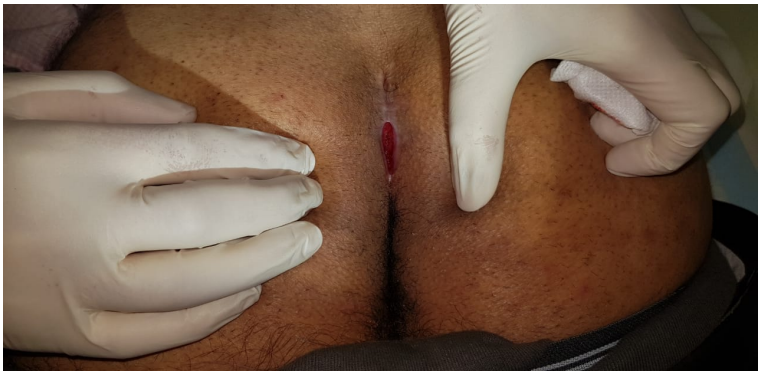
1 – 15/06/2018

First Nanoskin ACT membrane applied



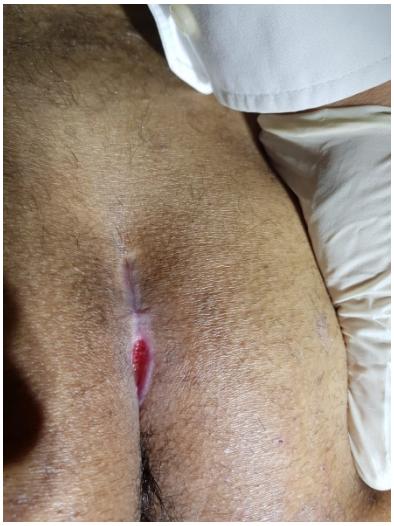
2 – 17/06/2018

Second Nanoskin ACT membrane applied

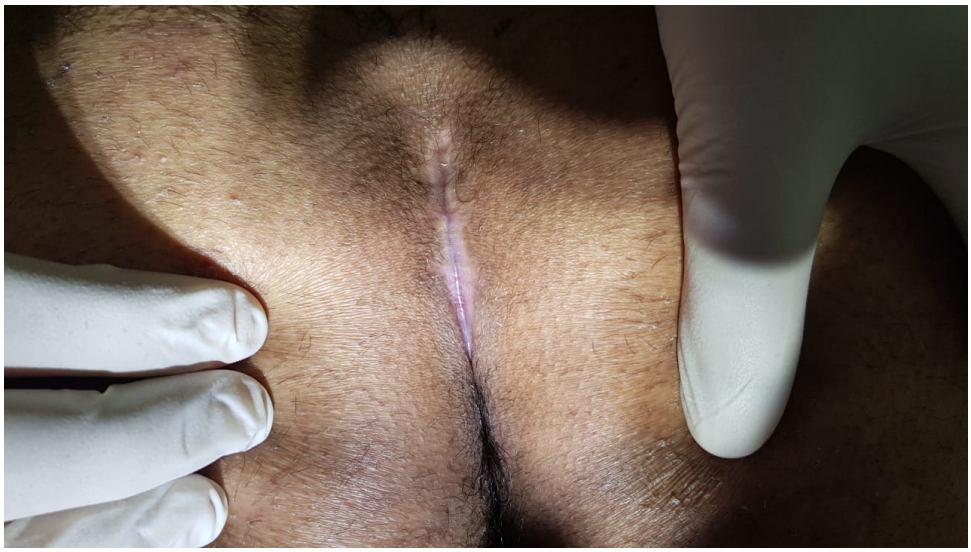


3 – 19/06/2018

Wound is completely clean. We move forward with Normal Nanoskin



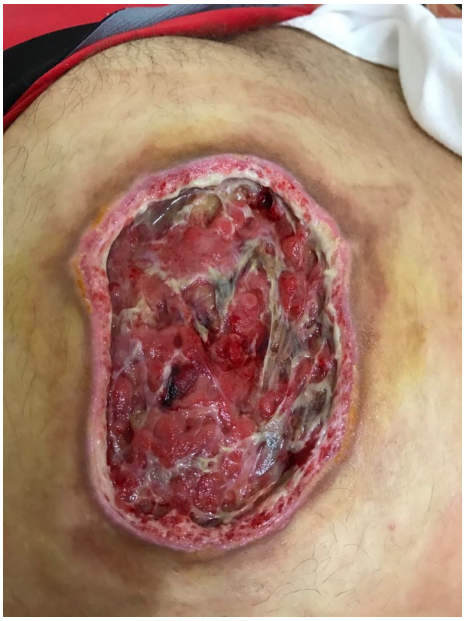
4 – 22/06/2018

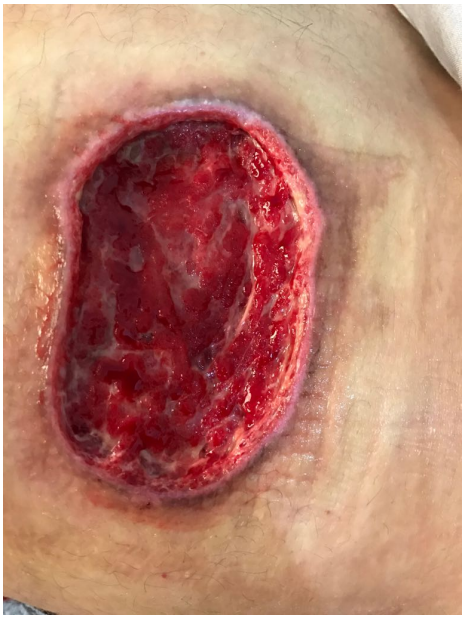


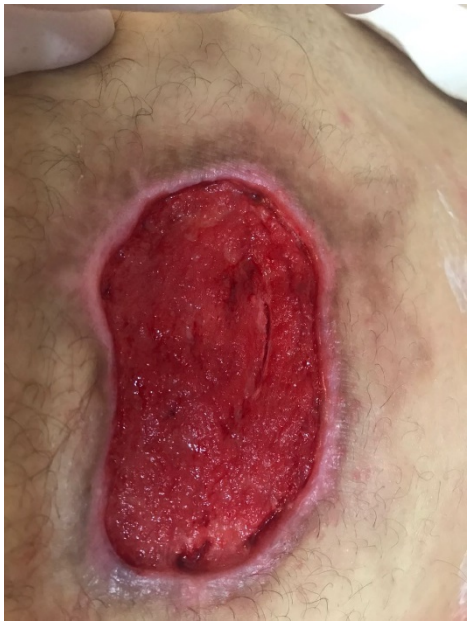
5 – 26/06/2018

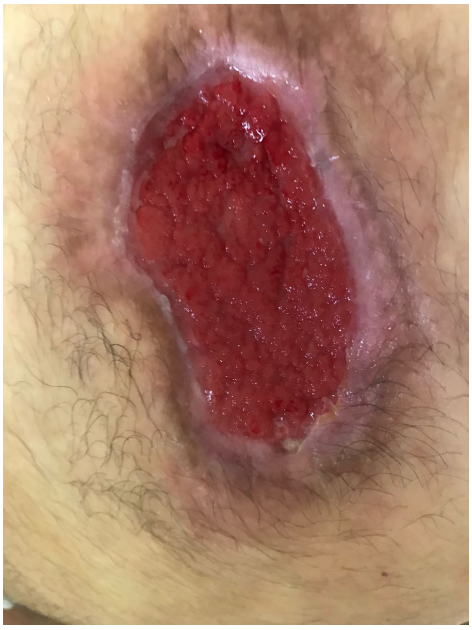
Wound is completely closed and healed

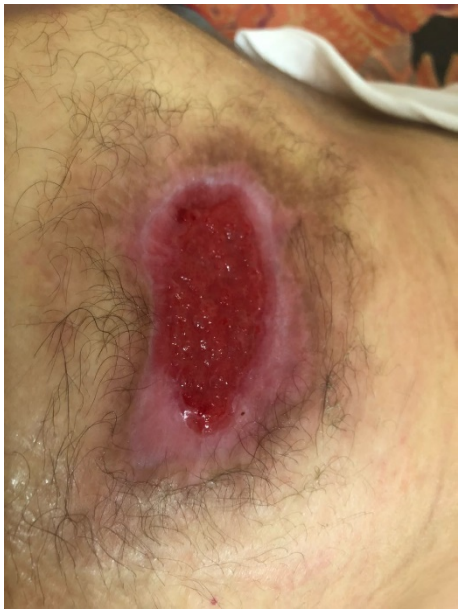
- **Infected ulcer caused by needle usage**
  - Male patient, in his 40s
  - Treatment with needles caused an infection in wound site and to develop an ulcer
  - Started treatment with silver dressings on 20/09/2017 to no satisfying result
  - Begin treatment with Nanoskin ACT on 08/10/17

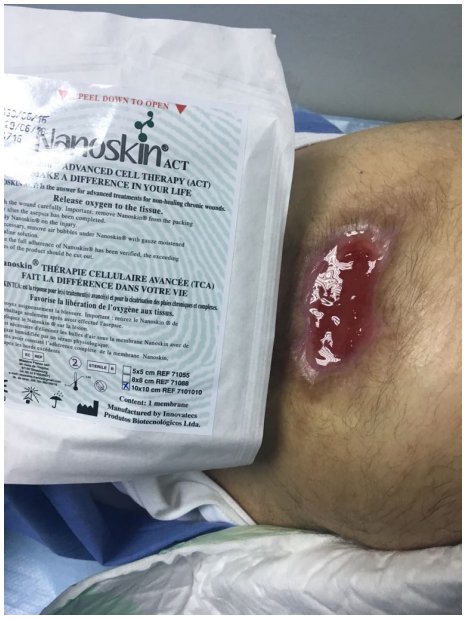


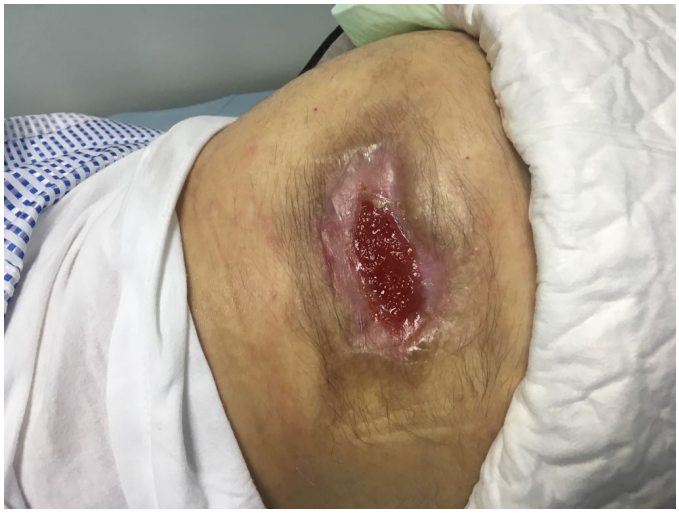


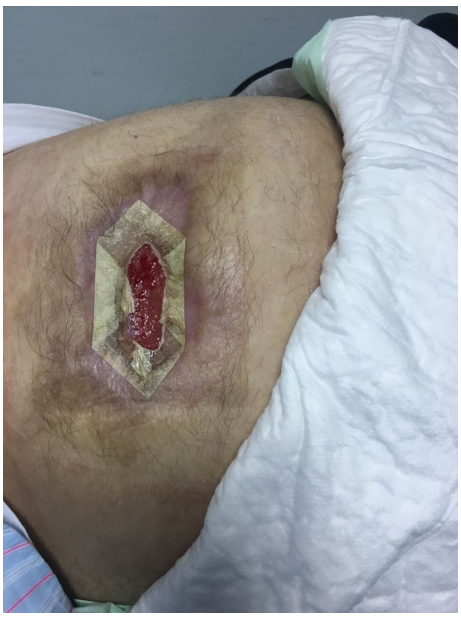


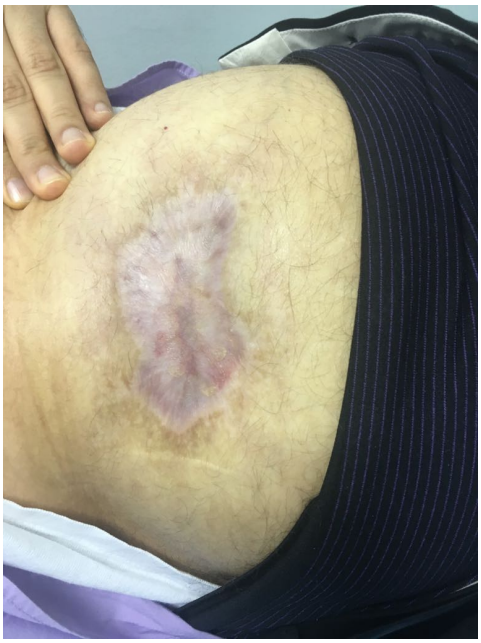


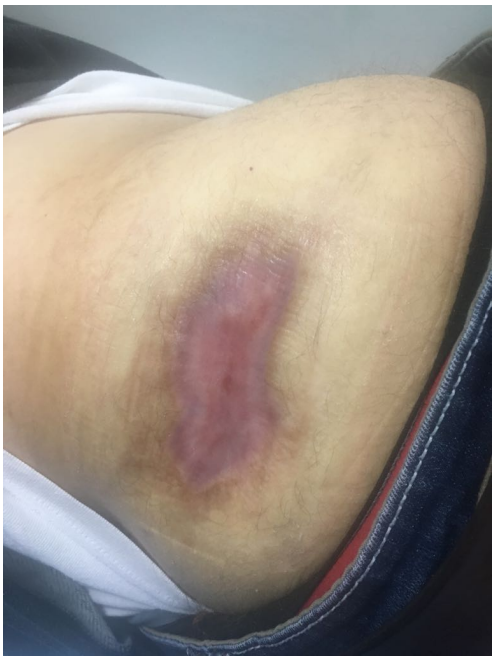



PEEL DOWN TO OPEN
Nanoskin ACT
ADVANCED CELL THERAPY (ACT)
Release oxygen to the tissue.
THÉRAPIE CELLULAIRE AVANCÉE (TCA)
FAIT LA DIFFÉRENCE DANS VOTRE VIE
Favorise la libération de l'oxygène aux tissus.
5x5 cm REF 71005
8x8 cm REF 71008
10x10 cm REF 7101010
Content: 1 membrane
Manufactured by Innovatech
Produtos Biotecnológicos Ltda.

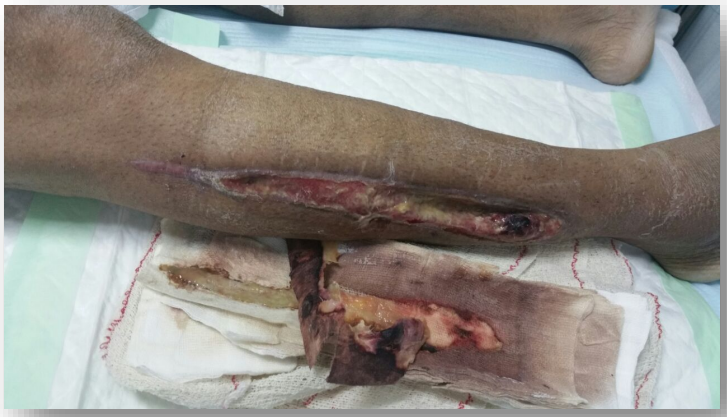




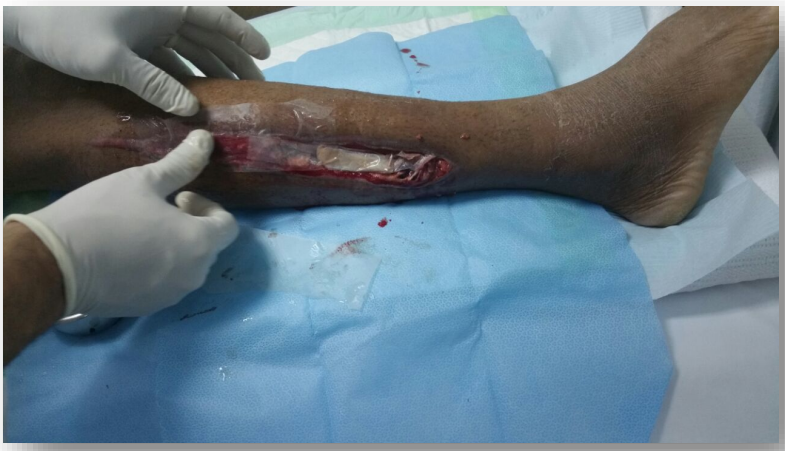




- **Deep Wound Case**
    - Male patient with severe infected wound that led to amputate part of leg muscle and expose bone
    - Treated with Nanoskin ACT
    - Treated in Al Qassimi Hospital

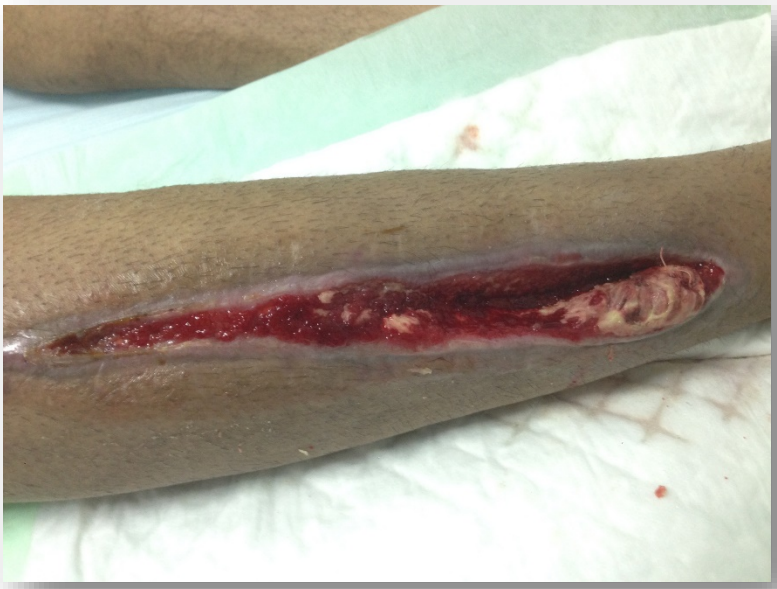


1 – Before Treatment with Nanoskin ACT



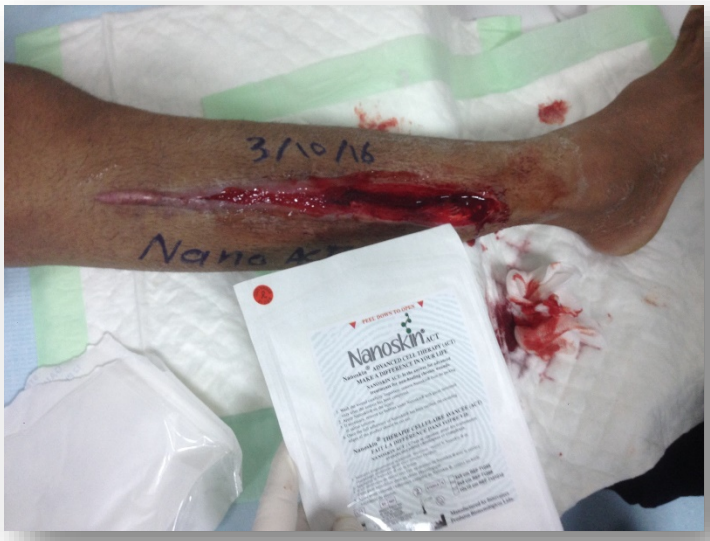
2 – 21/09/2016

Started treatment with Nanoskin ACT



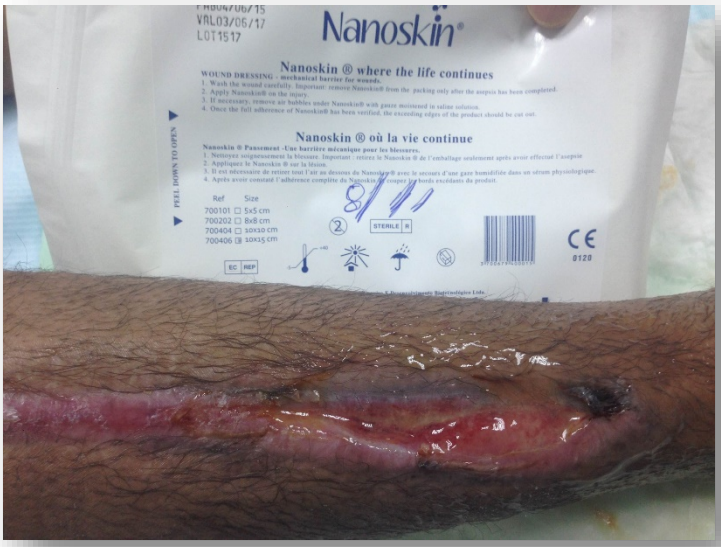
3 – 27/09/2016

Note progress of granulation growth and covering of bone tissue



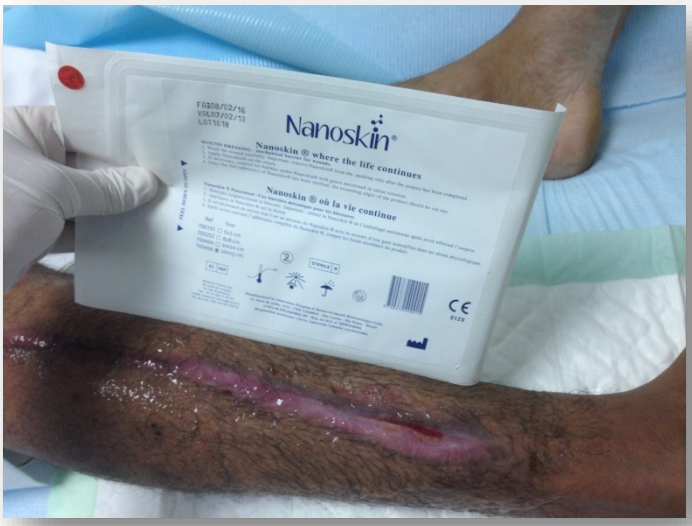
4 – 03/10/2016

Debridement procedure done and apply Nanoskin ACT membrane



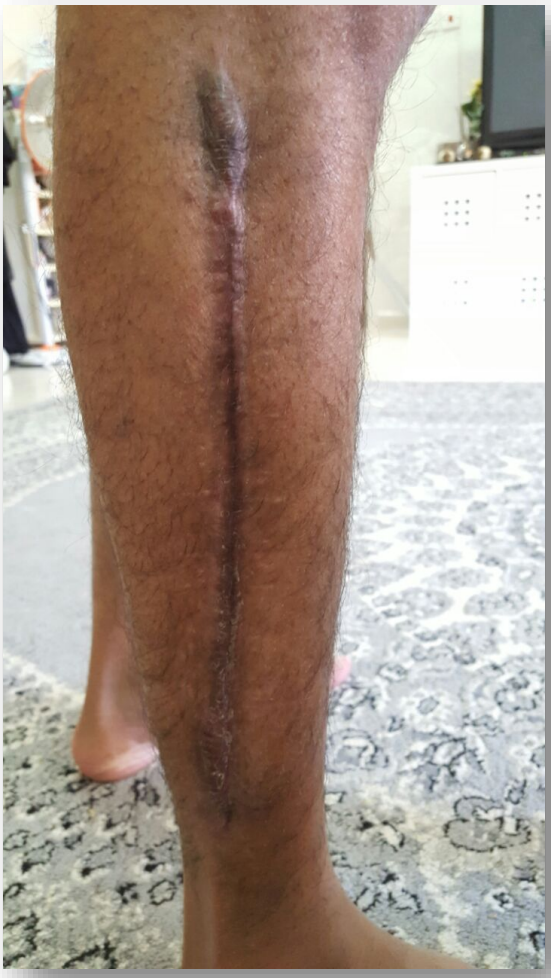
5 – 08/11/2016

Healing Process & Shift to Normal Nanoskin after Granulation



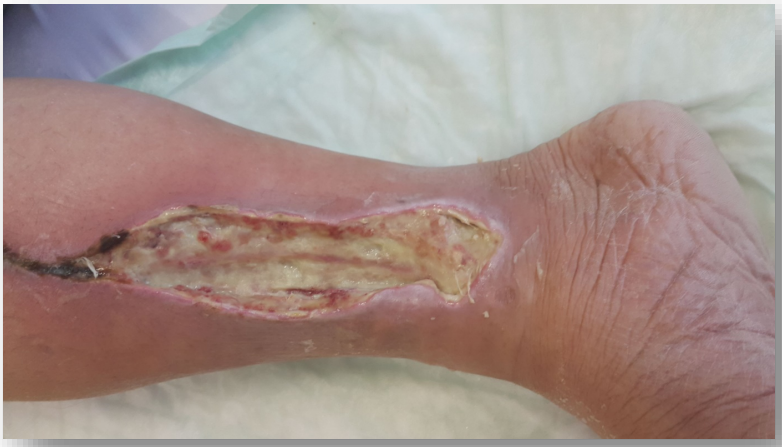
6 – 04/12/2016

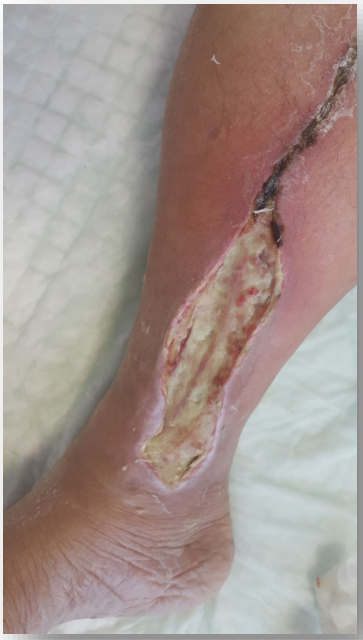
Nanoskin Normal last application



7 – Follow up appointment after treatment

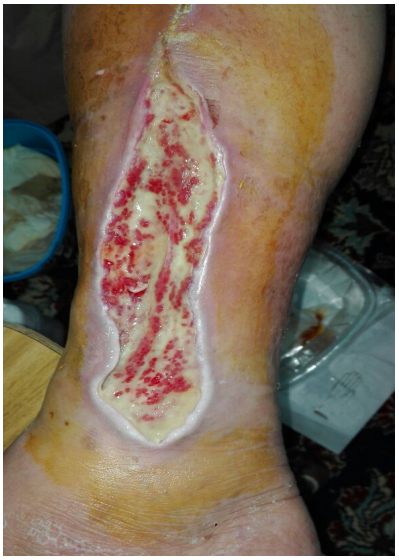
- **Donor Vein Graft Ulcer with Kidney and Other Health Complications**
    - Diabetic geriatric patient of 60 years old.
    - Done a vein graft for heart failure surgery.
    - Wound is infected and slough tissue is accumulated all over the wound.
    - Classic dressing was used (silver dressing) but no progress.
    - Patient is suffering from kidney failure doing kidney dialysis.
    - Treated with Nanoskin ACT
    - Treated in SKMC Ajman





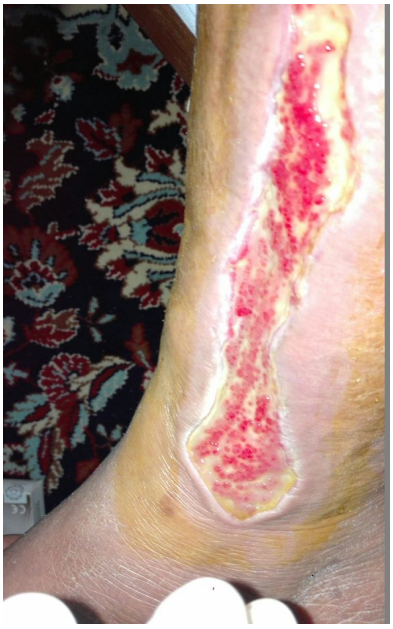
1 – 24/11/2016

Started treatment with Nanoskin ACT



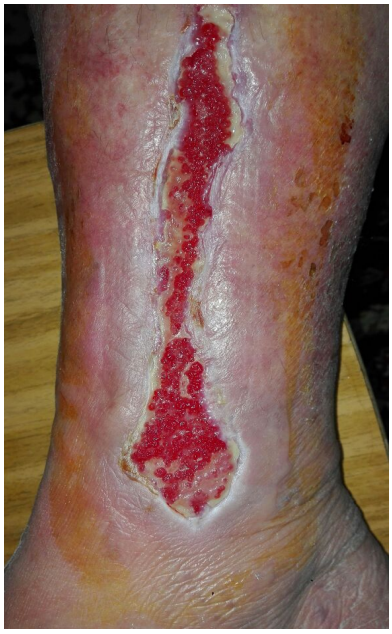
2 – 24/12/2016

Slough tissue is decreasing while wound is showing healthy granulation tissue



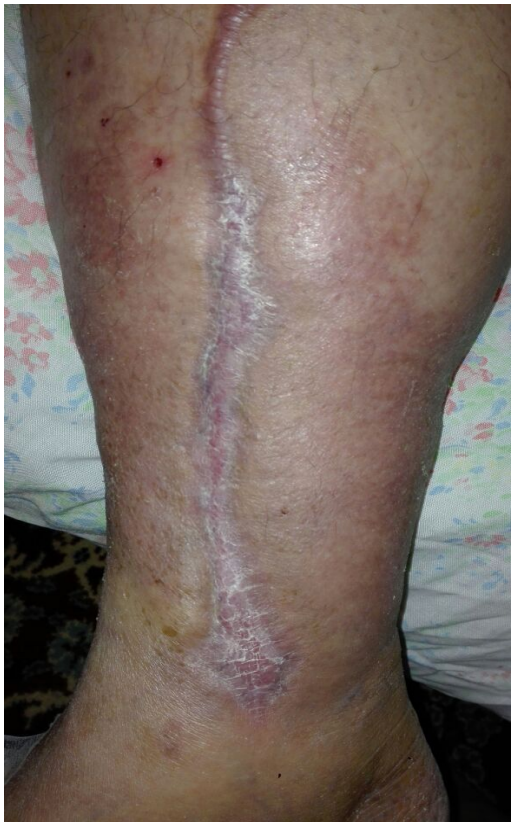
3 – 15/01/2017

Almost all slough tissue is removed with Nanoskin ACT only. Granulation and building up of healthy tissue is coming up.



4 – 31/01/2017

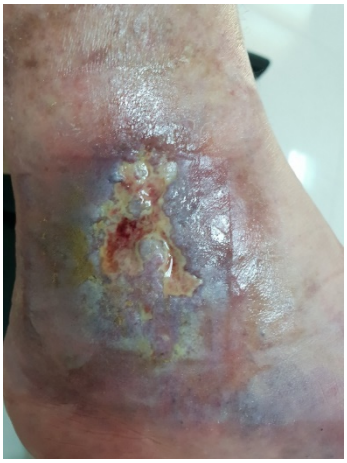
Skin is migrating and the progress with Nanoskin ACT is shown



5 – 25/03/2017

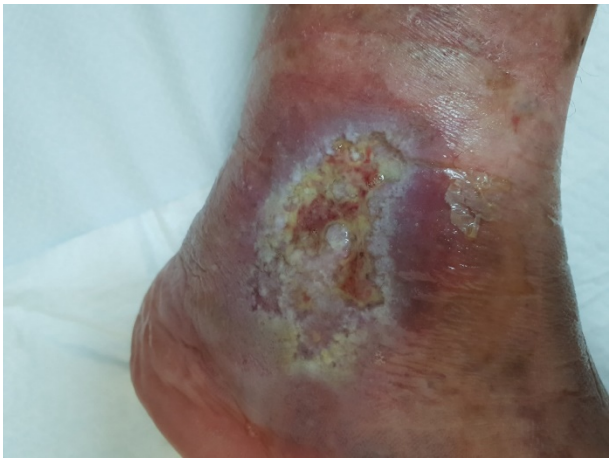
Follow up appointment – Wound is completely healed

- **Chronic Venous ulcer**
  - Male patient, 43 years old
  - The wound was nonhealing for more than 6 months and it got infected
  - Treated in Sobeh Clinic



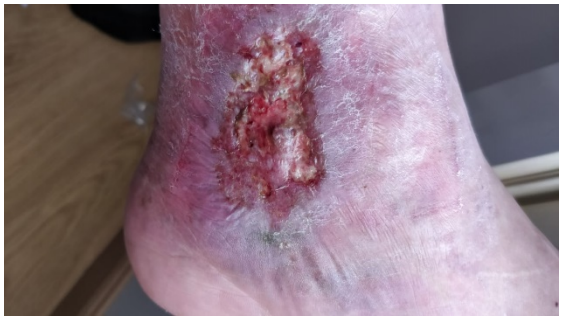
1 – 10/06/2018

First application of Nanoskin ACT and Nanoskin ACT Soft



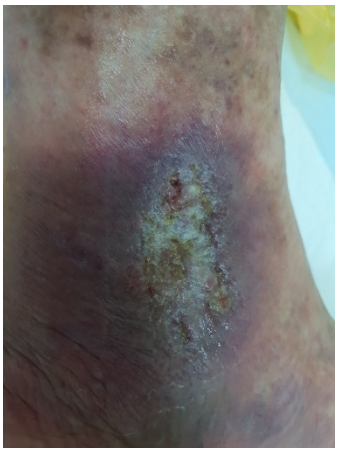
2 – 12/06/2018

Second application of Nanoskin ACT and Nanoskin ACT Soft



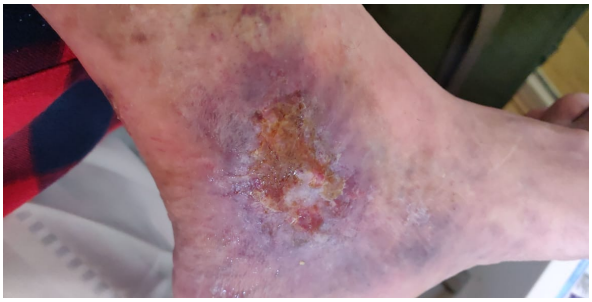
3 – 21/06/2018

Patient left the country for a few days but he did the dressing change on his own every 3rd day. After he's back we apply Nanoskin ACT and soft again



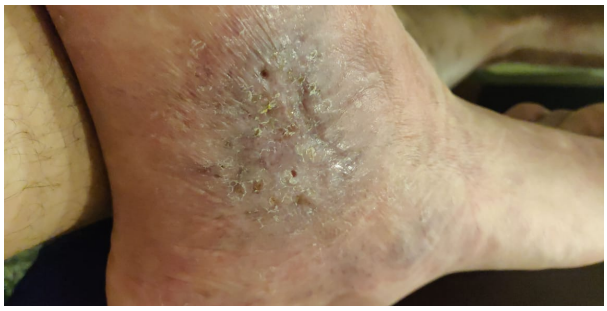
4 – 16/07/2018

We resumed treatment with Nanoskin ACT after he was back again. Wound is showing progress



5 – 13/08/2018

Last application of Nanoskin ACT. Wound is clean and can move forward with Normal Nanoskin



6 – 27/08/2018

Venous ulcer is healed completely. Doctor Sobeh was impressed with the result, especially since the patient was travelling during the treatment

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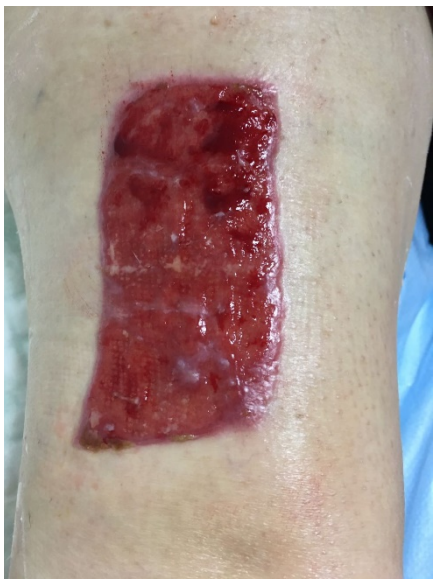
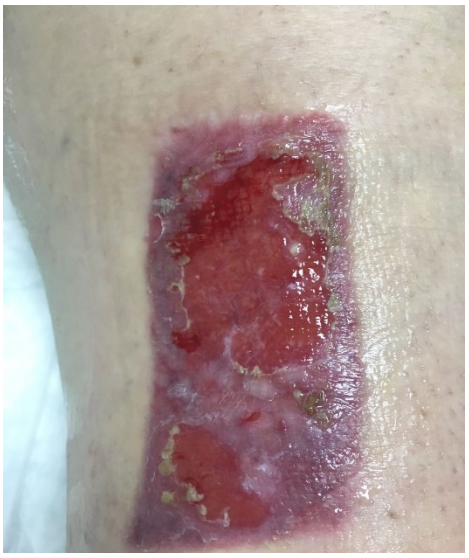
- **Skin graft donor site infection**
  - Patient had donor site infected for more than 3 months without healing and sever pain on touch and heavy exudate and over granulation
  - Treated with Nanoskin ACT in Al Qassimi Hospital



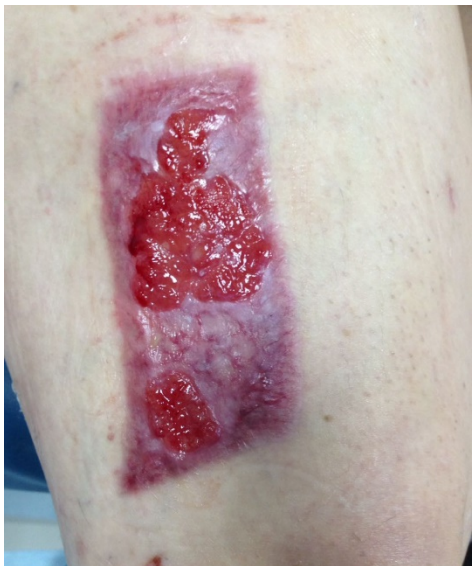
1 – 23/05/2017

Before first application of Nanoskin ACT membrane



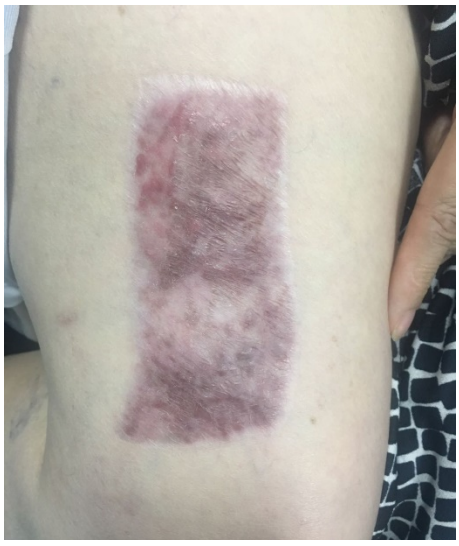
2 – 01/06/2017

4th visit: No more hyper granulation and very minimal exudate. Epithelization also started from the edges toward the center



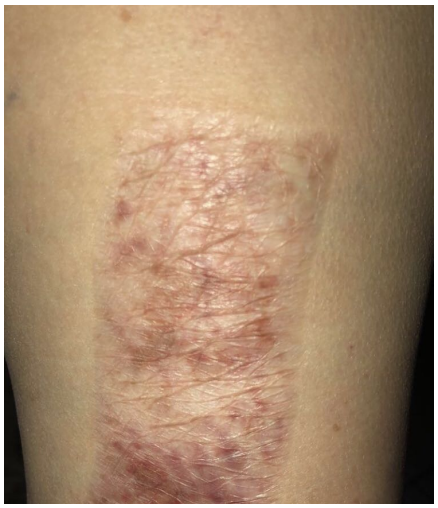
3 – 11/06/2017

6th visit: No more exudate and the wound bed looks healthier



4 – 28/06/2017

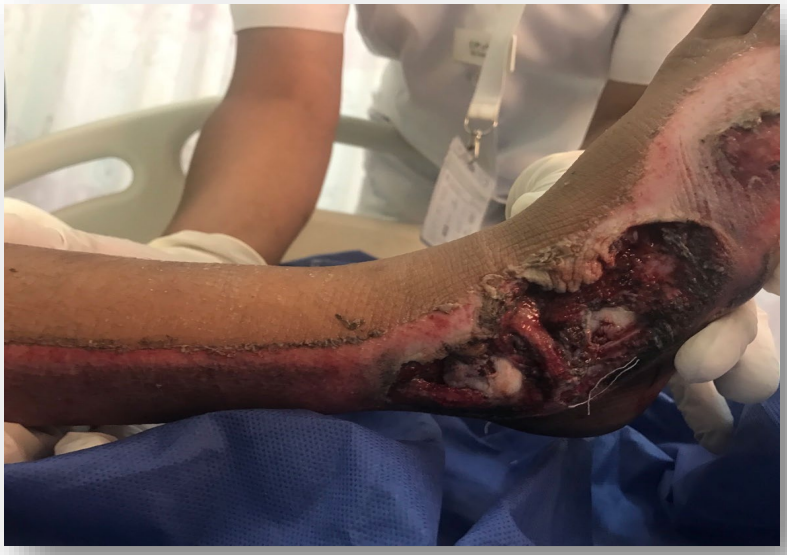
Last visit: wound healed completely with minimal scarring



5 – 16/04/2018

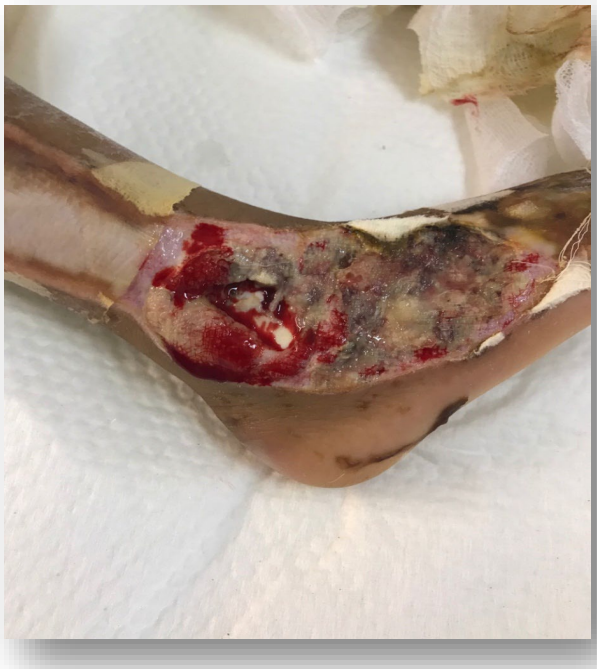
Follow up: Scar tissue is even better

- **Deep Trauma Wound Treatment**
    - Patient is a 6 years old boy, sustained injuries in a car hit
    - presented with deep laceration of the Lateral aspect of the right leg and Foot with Loss of skin and soft tissue over the Right Lateral Malleolus
    - Patient was admitted on 07/04/2017
    - Treated with Nanoskin ACT and Normal Nanoskin
    - Treated in Al Kuwaiti Hospital



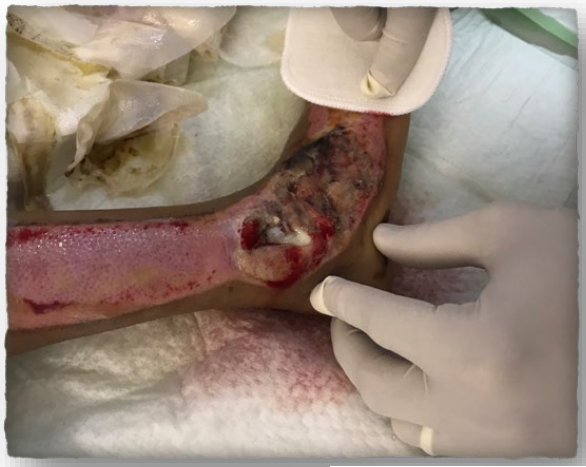
1 – 07/04/2017

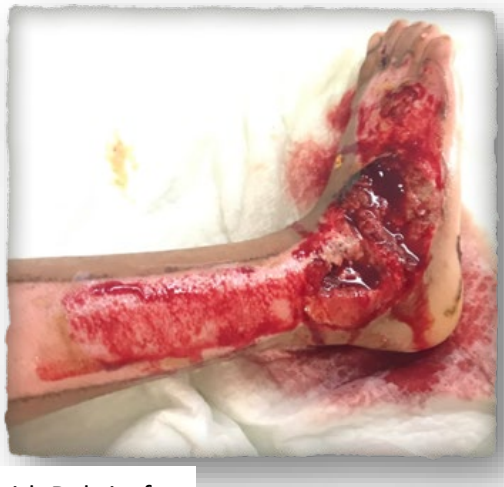
Patient was admitted after car accident



2 – 15/04/2017

After treatment with silver dressing but with no satisfactory progress

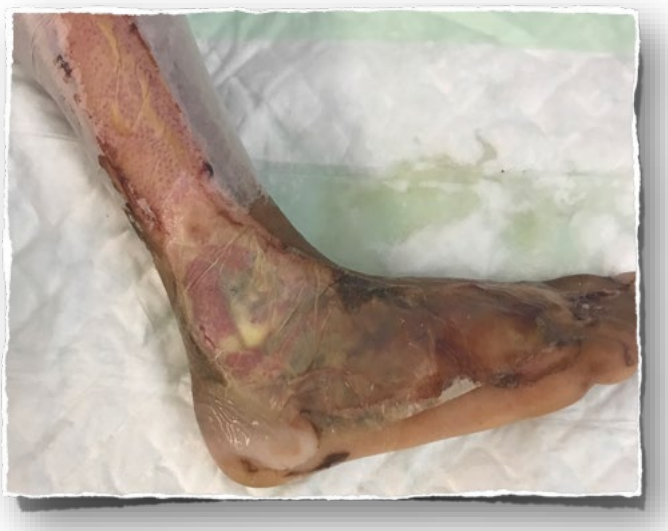


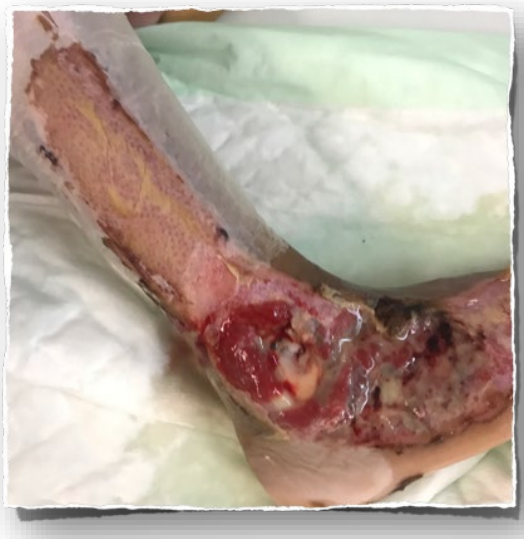


3 – Minimal debridement with Debrisoft

4 – 15/04/2017

Started treatment with Nanoskin ACT on deep wounds on ankle. And Normal Nanoskin on abrasion area

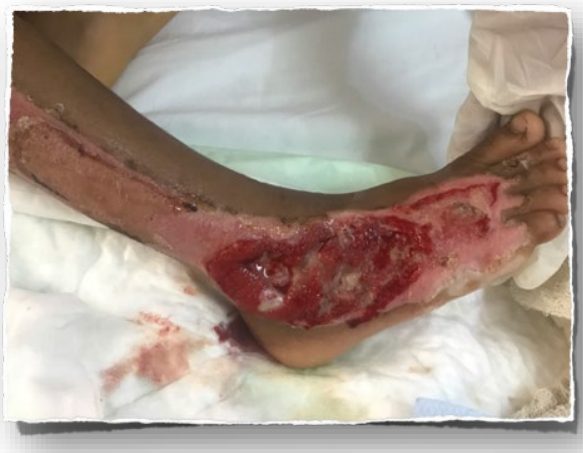


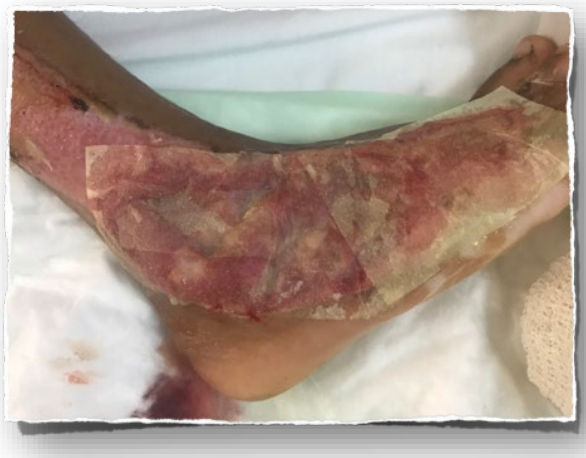


5– 18/04/2017

Normal Nanoskin was kept on leg abrasion area for 1 week.

Ankle and foot deep wound had alternate day dressing change with Nanoskin ACT

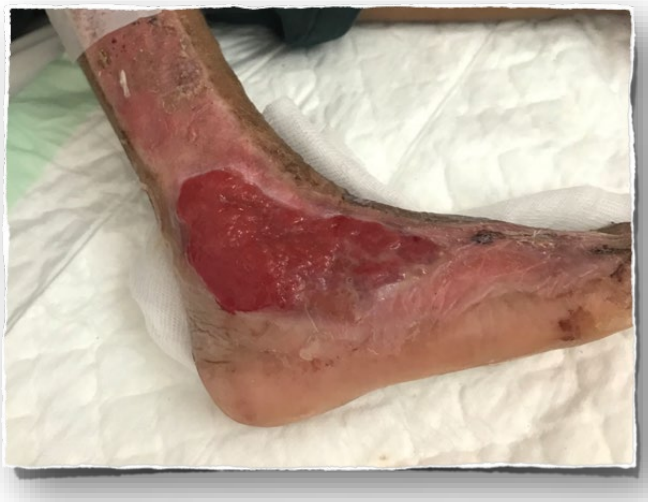




6– 20/04/2017

Leg abrasion area almost healed

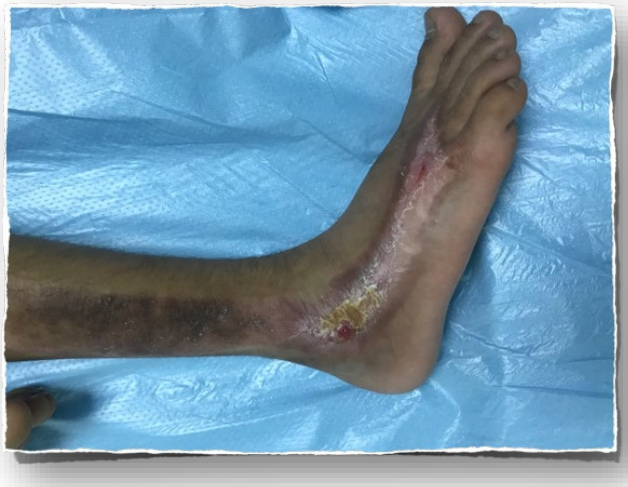
Ankle and foot deep wound is covering with healthy granulation which started to cover exposed bone



7– 16/05/2017

Child was discharged from hospital

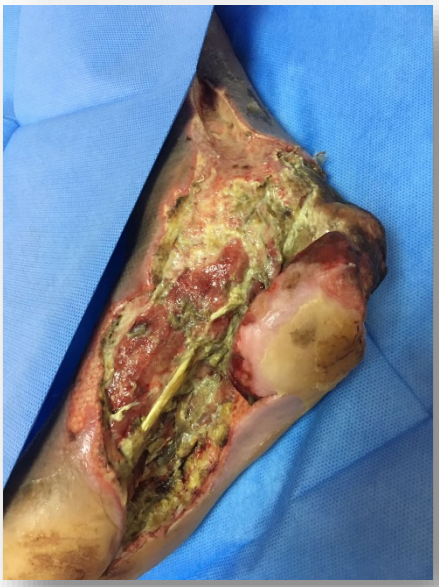
Deep wound is clean now with granulation tissue completely filling the wound bed. Shifted to Normal Nanoskin for weekly change



8– 02/07/2017

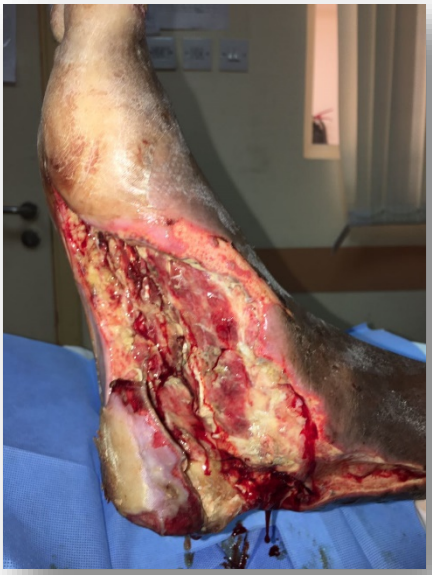
Follow up appointment : Wound completely healed

- **Chronic non-healing Diabetic Foot ulcer (Heavy Infection)**
    - Infection spread throughout his right leg and it was diagnosed for amputation and was kept in isolation
    - Treatment with Nanoskin ACT started on 02/04/2018

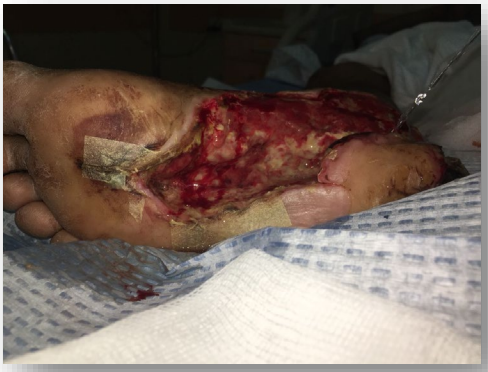


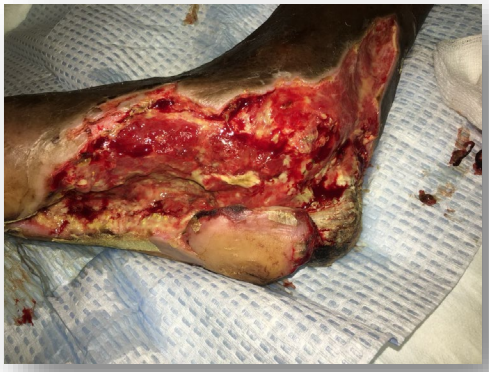
1 – 02/04/2018

Started treatment with Nanoskin ACT



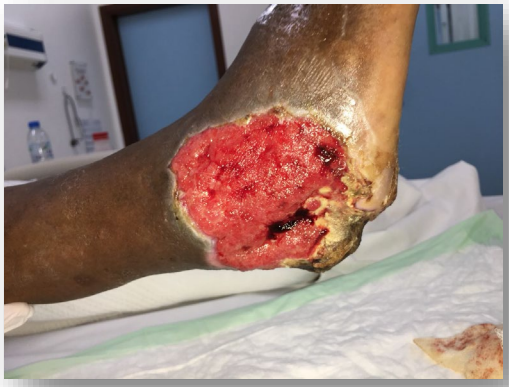
2 – After debridement still no sense of feeling with poor circulation. Recommended daily membrane change for one week

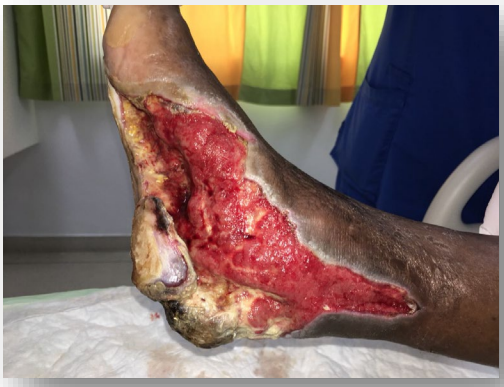




3 – 08/04/2018

Healing process

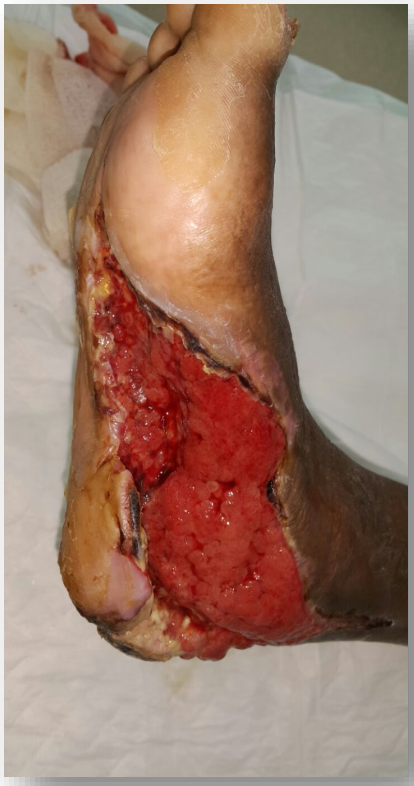


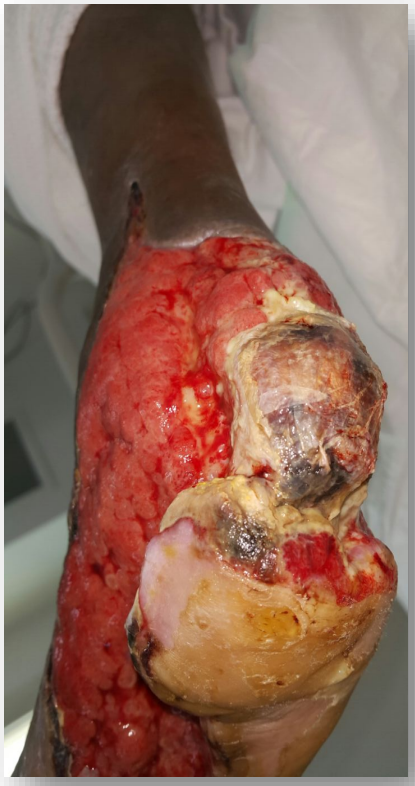


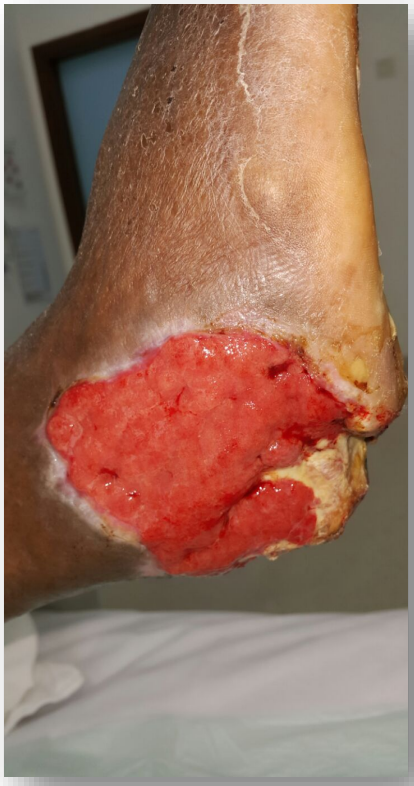
4 – 18/04/2018

Healing process:

Wound is almost clean with control of infection and growth of granulation tissue.



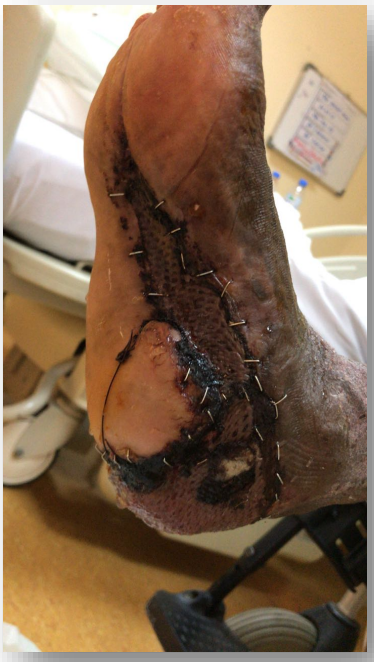




5 – 01/05/2018

Healing process:

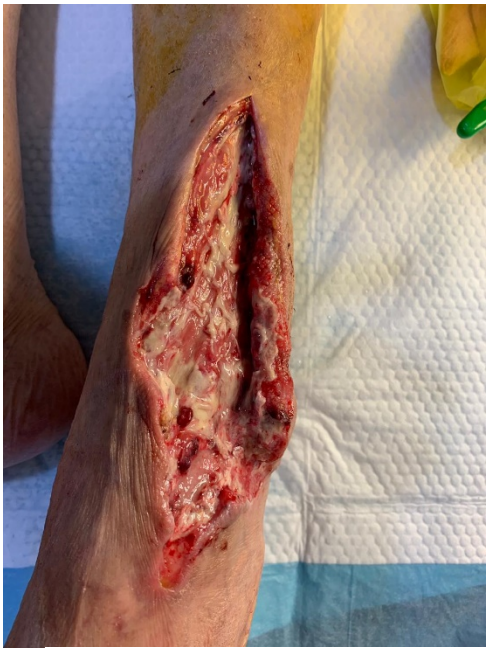
Healthy granulation tissue filling the wound bed

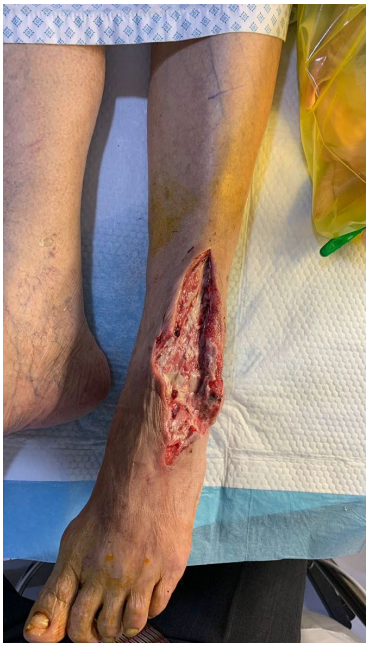


6 – 10/05/2018

After skin graft operation that went successfully and leg is saved from amputation

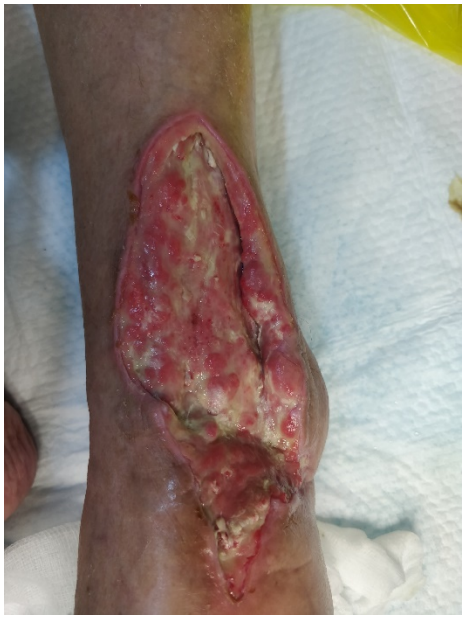
- **NECROTIZING FASCIITIS CASE (flesh-eating disease)**
    - A Diabetic Geriatric patient of 80 years old complained of severe pain and swelling in leg area. The disease progressed and puss started coming out via 3 little holes.
    - Patient has history of multiple systemic complications as well
    - A Surgery was performed to clean and debride the lost tissue.
    - Treatment with Nanoskin ACT and Nanoskin ACT Soft
    - Treated in Burjeel Hospital Abu Dhabi





1 – 12/03/2019

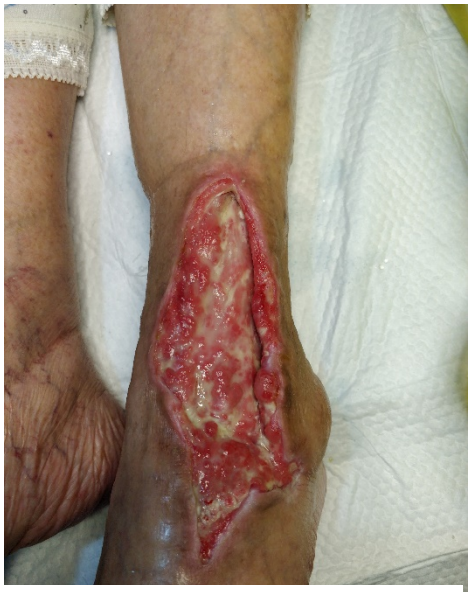
Before Treatment With Nanoskin ACT & Nanoskin ACT Soft. First Application



2 – 26/03/2019

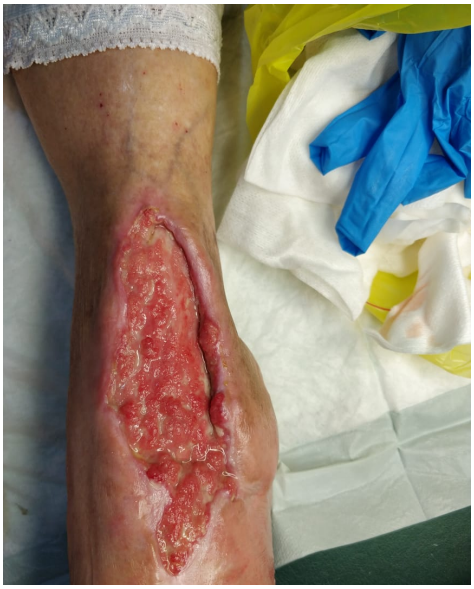
During Treatment With Nanoskin ACT & Nanoskin ACT Soft (alternate day dressing change.)

In this stage, the doctor applies a layer of Nanoskin ACT Soft (to make sure the whole wound bed area is covered), followed by Nanoskin ACT Membrane.



3 – 03/04/2019

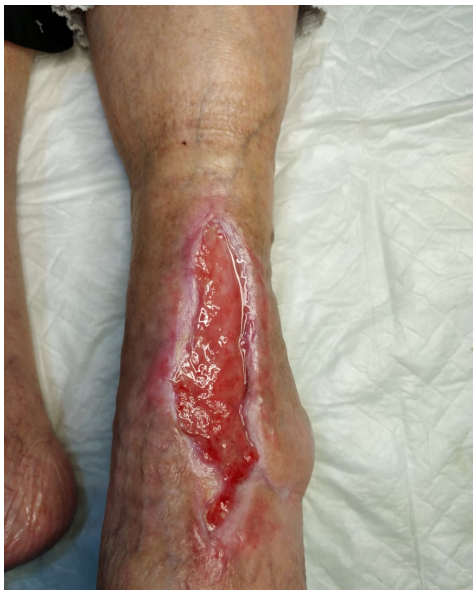
During Treatment With Nanoskin ACT & Nanoskin ACT Soft.



4 – 29/05/2019

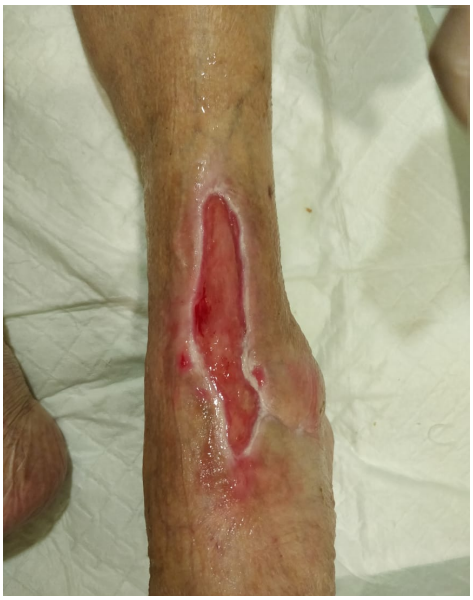
During Treatment With Nanoskin ACT & Nanoskin ACT Soft.

The doctor makes small debridement where necessary



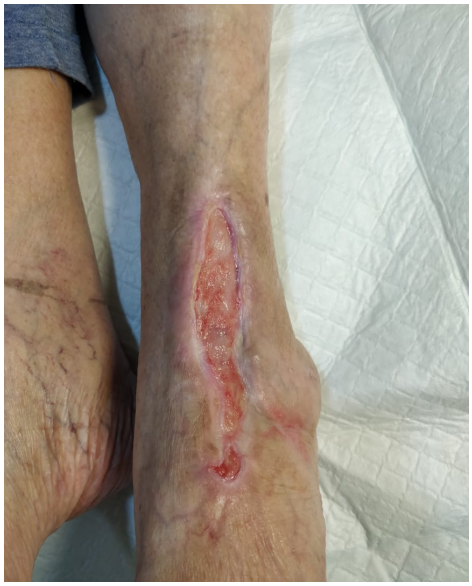
5 – 08/07/2019

Wound bed shrunk significantly in size, with healthy granulation tissue filling up the site. At this stage, we use Nanoskin ACT Membrane only, 2 times a week



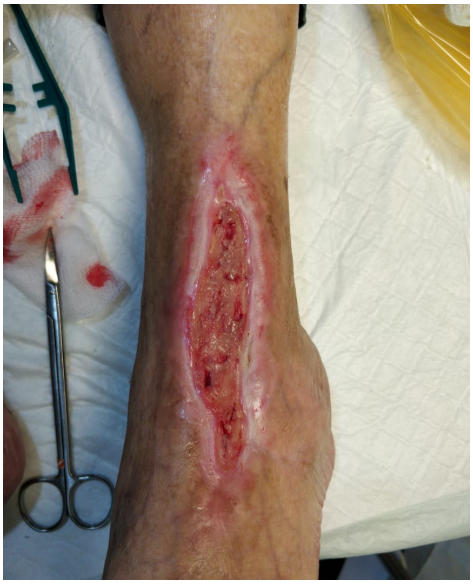
6 – 29/08/2019

During Treatment with Nanoskin ACT. Doctor opted for changing the dressing once a week.



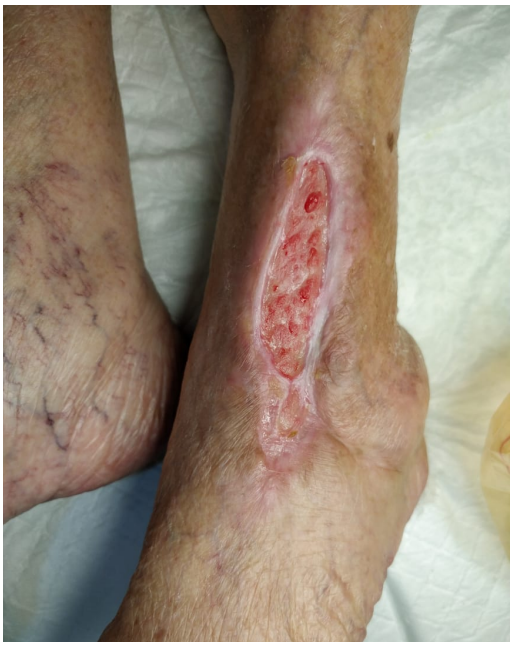
7 – 22/09/2019

During Treatment with Nanoskin ACT. Wound almost healed, and the need for skin graft was avoided entirely.



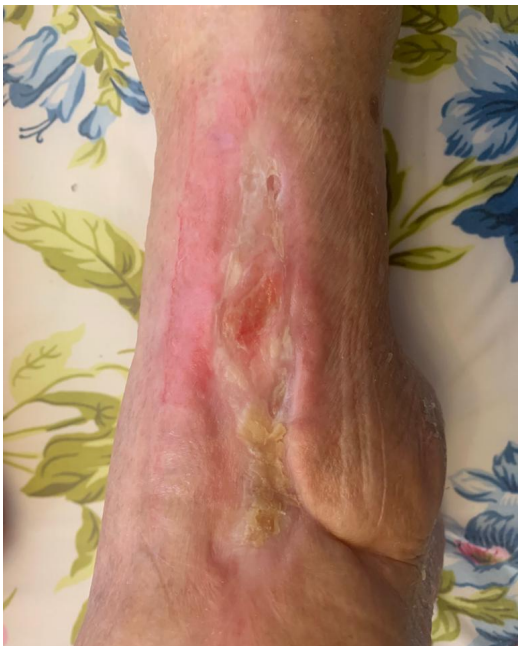
8 – 20/10/2019

During Treatment with Nanoskin ACT. Doctor opted for local debridement of the wound bed as a stimulant for the process



9 – 18/11/2019

Visible decrease in wound size, Doctor attributes slow epithelization to patient's age and diabetic condition



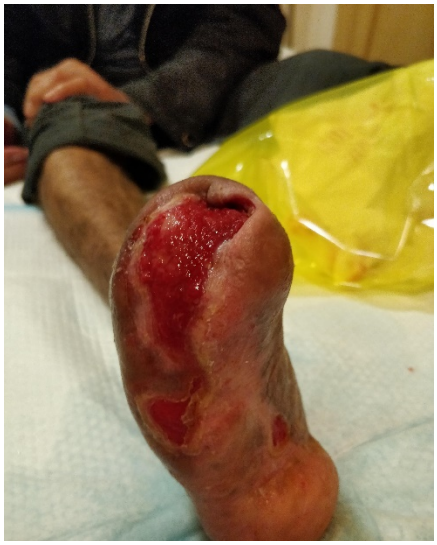
10 – Follow up appointment

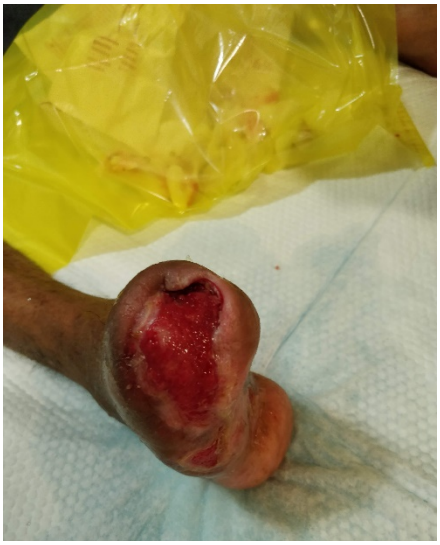
Wound completely healed without having to let 80 years old patient undergo a skin graft operation

- **Infected Diabetic Foot (Partial Amputation)**
    - A Diabetic Geriatric patient of 75 years old came to the first hospital with a complain of a spreading infection across the foot and necrotic toes. It was advised to amputate the leg. So he came to Burjeel Hospital for additional consolation. Doctors decided to save as much as possible and close the wound using Nanoskin ACT.
    - Treatment with Nanoskin ACT and Nanoskin ACT Soft
    - Treated in Burjeel Hospital Abu Dhabi

1 – 18/12/2018

Before Treatment With Nanoskin ACT & Nanoskin ACT Soft.

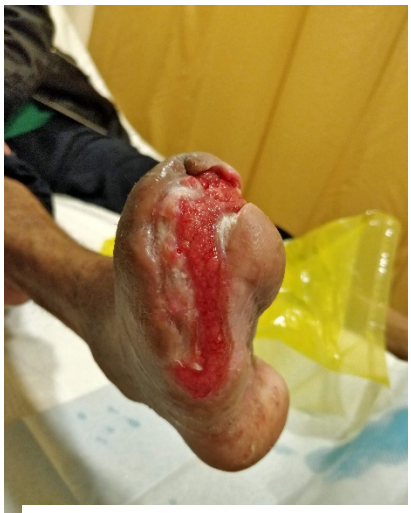


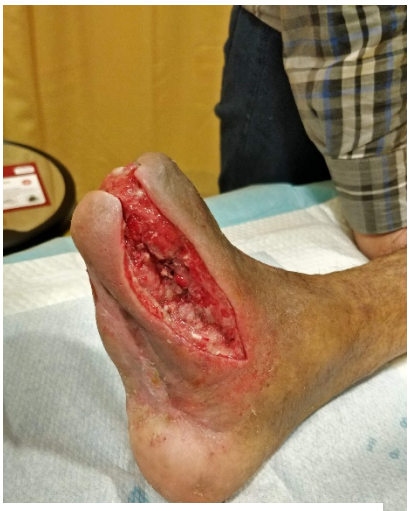


2 – 16/02/2019

During Treatment With Nanoskin ACT & Nanoskin ACT Soft (twice a week).

In this stage, the doctor applies a layer of Nanoskin ACT Soft (to make sure the whole wound bed area is covered), followed by Nanoskin ACT Membrane.

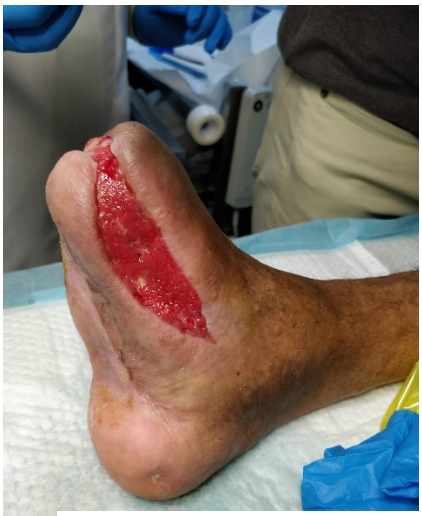


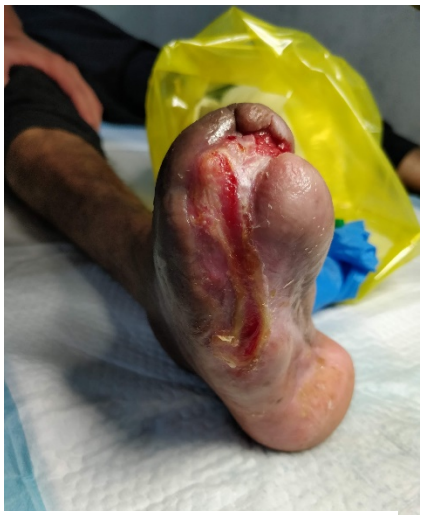


3 – 06/03/2019

During Treatment With Nanoskin ACT & Nanoskin ACT Soft (twice a week).

Doctor opted for further debridement of the mesial part of the leg. To completely remove infected tissue and allow regrowth of healthy tissue.

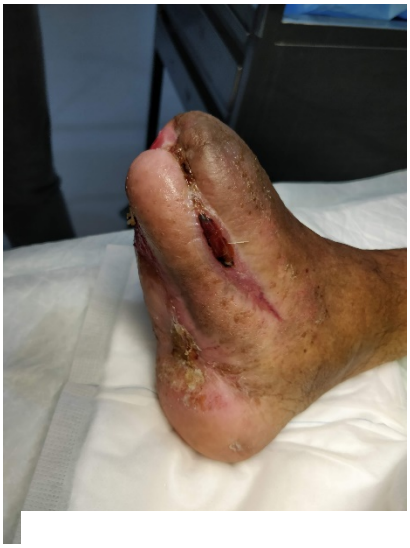


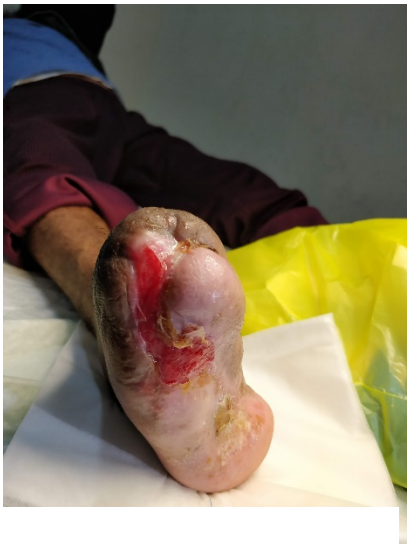


4 – 26/03/2019

During Treatment With Nanoskin ACT & Nanoskin ACT Soft (twice a week).

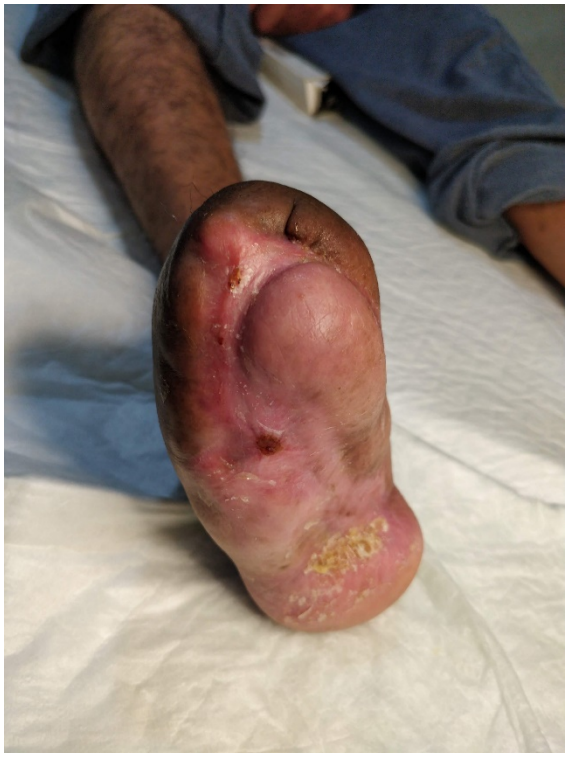
Note fast growth of healthy granulation tissue





5 – 25/05/2019

Wound bed shrunk significantly in size, with healthy granulation tissue filling up the site & the mesial part completely healing



6 – 18/06/2019

Complete healing and successfully saving the leg from amputation in a conservative approach with Nanoskin ACT

I would like to thank the Nanoskin team for their availability, and dedication to help others, congratulations to those involved the list is too long to name all the names. God bless you, Gratitude.

"NANOSKIN WHERE LIFE GOES ON"

To do everything, the jobs, the homework, the tasks from the heart in the best way as if it were done for God.

P.B

September 2021. Edição 1

Nanoskin®