
Keynote Forum | DAY 1

December 05, 2022

ICWDO 2022



6th International Conference on
WOUND CARE, DERMATOLOGY AND ORTHOPEDICS
December 05-06, 2022 | Dubai, UAE

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Eliaz Babaev

Arobella Medical, LLC. USA

Future of general ultrasound in tissue regeneration, wound and skin care: Technologies, systems, devices, science and clinical outcomes

Purpose: Last 30 years use of general ultrasound in wound and skin treatment has been shown grate results in hospitals, clinics; wound care centers and doctors' offices.

In this presentation I'll share of my 50+ years worldwide scientific/academic, industry and clinical experience on research (*in vivo* and *in vitro*, laboratory, bench, etc.), review and evaluate the results, safety, validity and efficacy of treatment of all types of acute and chronic wounds including diabetic foot ulcers and share the results with the existing and future users by enhancing their understanding of potential positive outcomes from using the variety of ultrasound devices.

Methods: For tissue regeneration and wound treatment purposes, the different ultrasound devices (low and high frequency) have been used, which are been marketed worldwide. The ultrasonic parameters and design of instruments are very influential and critical for different aspects of tissue regeneration and wound treatment, such as ultrasonic energy delivery methods and concepts of ultrasound waves and energy to target, tissue fractionation/ fragmentation/ debridement, liquefaction/ histotripsy, erosion, homogenization, liquation and wound therapy. Ultrasound treatment applies effective ways to prevent damage to surrounding healthy tissue and to succeed in therapeutic wound treatment. Treatment was both contact and non-contact modes, depending on the manufacturers, devices and wound conditions such as acute, infected, chronic, trauma, burn, gun shut, hard-to-heal, etc.

Results: All wounds have reacted well to all ultrasound treatment; some of the wounds have exceeded expectations compared to standard-of-care treatment vectors. Even painful wounds have been aggressively

debrided with some devices without local anesthetics and without patient complaints.

Discussion/Conclusion: Ultrasound systems and devices including methods recommended for use in treatment of all types of wounds, depending on size, body parts, tissue type, depth, infection and other conditions, treatment time will vary. It cleans the wound from necrotic (dead) tissue very precisely, stops the bleeding, kills the pain if there are any, activates tissues growth factors, destroys the bacteria cells without hurting healthy tissue cells, increases blood flow in wound bed and peri wound. Use of the numerous aspects or methods of ultrasound wave and energy delivery and distribution of ultrasound energy to wound bed, different energy level, parameters, signal shapes, wave delivery concepts, e.g., contact and non-contact, creation of macro and micro-streaming are critical.

Recent publications

1. E Babaev, Ultrasonic method and device for wound treatment. Acoustical Society of America Journal, 2004

Biography

Eliaz Babaev, Co-Founded Arobella Medical, LLC in 2006 and serves as its chief executive officer and president. Dr. Babaev Co-founded Celeration Inc. and served as its chief technical officer until July 2009 and chief executive officer. Babaev worked as an ultrasound system design engineer and research scientist for DiaSorin, Inc., SpectRx and AeroPag-USA, Inc. He served as the head of biomedical engineering laboratory and a professor for State Technical University, Baku, USSR for 25 years. Dr. Babaev has more than 40+ years expertise in non-imaging medical ultrasound and particularly in ultrasound wound management, live tissue repair and in all the areas of advances in skin, wound care, nursing, tissue science, drug delivery systems, wound treatment technologies, tissue engineering and body architectonics research and cancer research including apoptosis. 50+ US and 100+ worldwide patents are issued, numerous are pending, 50+ scientific articles, abstracts are published.

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Meital Zilberman

Tel-Aviv University, Israel

Dual composite bioadhesives for wound closure applications: An *In vitro* and *In vivo* study

Conventional sutures have been the most common practice for wound closure applications for years. The alternative method, to use surgical adhesives, is more convenient and less time consuming. However, the application of commercial adhesives such as Histoacryl® Blue is limited, due to cytotoxicity. Hence, developing surgical adhesives with strong adhesion to soft tissue in wet environment, controlled physical and mechanical properties and excellent biocompatibility has been a significant challenge. In the current study we developed a new bioadhesive concept, which is based on the highly biocompatible natural polymers gelatin and alginate. In order to enhance the mechanical- physical properties and functionality, two types of fillers were added: hemostatic agents (kaolin or montmorillonite) and cellulose fibers. Our results show that addition of the functional fillers enabled to increase the tensile strength and modulus of the bulk material, leading to both, higher sealing ability and higher bonding strength. The gelation time and swelling degree of significantly decreased and the viscosity increased with the functional fillers incorporation, which all together enables better functioning. The *in-vivo* study focused on the bioadhesives function in a porcine skin incisions model, compared to conventional sutures and the commercial adhesive Histoacryl® Blue. The histological analysis demonstrated a superior efficacy of these new bioadhesives compared to the control Histoacryl group. I.e., they resulted in rapid healing, less inflammation and higher degree of wound closure. In conclusion, our dual-

composite bioadhesives demonstrated promising potential for use in wound closure applications and may serve as a suitable alternative for conventional sutures.

Recent publications

1. Daniella Goder, Lior Matsliah, Shir Giladi, Liron Reshef-Steinberger, Idan Zin, Alon Shaul, Meital Zilberman, Mechanical physical and biological characterization of soy protein films loaded with bupivacaine for wound healing applications. *International Journal of Polymeric Materials and Polymeric Biomaterials*, 70(5), 345-355 (2021).
2. Lior Matsliah, Daniella Goder, Shir Giladi, Meital Zilberman, *In Vitro* characterization of novel multidrug-eluting soy protein wound dressings. *Journal of Biomaterials Applications*, 35(8), 978-993 (2021).
3. Inbar Eshkol-Yogev, Efrat Gilboa, Shir Giladi, Meital Zilberman, Formulation - properties effects of novel dual composite hydrogels for use as medical sealants. *European Polymer Journal*, 152 (2021).

Biography

Meital Zilberman holds an appointment of full professor at the department of biomedical engineering and the department of materials science and engineering of Tel Aviv University. Her research interests are polymeric biomaterials, active implants and scaffolds for tissue engineering and drug- delivery systems. During 2015-2020 she served as the president of Israel Society for Medical and Biological Engineering (ISMBE). She published more than 100 articles in the top biomaterials, biomedical engineering and polymers journals, invented over 30 patents and delivered about 250 presentations (including invited talks keynote and plenary lectures). Among her prizes and awards is the prestigious Journal of Wound Care (JWC) world first place innovation award.

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Jasmina Begic

Bosnia and Herzegovina Association for Wound Management, Bosnia and Herzegovina

Light medicine: Holistic effects of Biopton light system (480-3400nm) on wound healing at patients with chronic wounds

Introduction: The sun is a powerful source of energy. Light is part of the electromagnetic spectrum. Light medicine is the science about effects of light therapy in the treatment diseases. Phototherapy is not new concept. In the ancient time Egyptians, Greeks were using sunlight like “Heliotherapy”. Hippocrates “Father of Medicine” prescribed heliotherapy for physical and psychological problems. Dr Niels Ryberg Finsen was awarded with nobel price for therapy skin diseases with light beams. We consume light through food and photosynthetic processes, our DNA produces light: each of our cells in the body emits more than 100,000 photon pulses per second. Impulses are called biophotons and are responsible for maintaining good health. The team of Hungary scientist made a light source using the combination of visible and infrared lights, which is the cause for the Biopton system light therapy. Project of Clinical research: “Appliance Biopton polarized light (480 -3400nm) in the therapy of dermatosis: Acne vulgaris and ulcer cruris”, was my first step in the world of light medicine. Project Approved by: members of Scientifically Research Institute of Clinical Center of University in Sarajevo and members of ethics committee of Clinical Center University in Sarajevo Number 03.05.-5768. date: 08.03.04). The physical parameters of this light source are as follows: wavelength 480-3400 nm power density 40mW/cm² at the distance of 10cm. At each treatment session, a patient received an average flounce of 19,2 J/cm² with bio stimulation effects. Water is an essential ingredient of all living organisms. In some organisms it makes up 99% of their mass, in humans about 70%. Water is a medium. When exposed to sunlight, water in a colored container absorbs the vibrational energy of that particular color. It absorbs and conducts information, messages, emotions, vibrations.

Aims: 1. Establish the influence of the Biopton light therapy on the skin disesses: Acnae vulgaris, chronic wounds different etiology, rosacea, anti-aging, vitiligo, pyoderma chronica. 2. How does it work – Photon, on the phasis of wound healing 3rd.

The aim of this research is to examine whether Biopton hyper light affects the properties of drinking water. Whether and what effects *Hyper Water*[®] has on the body.

Material and methods: Wound healing is a complex process that consists of different stages, which are traditionally divided into 3 overlapping phases. Patient with chronic wounds treated on the base GCP. CEAP (clinical, etiology, anatomy, patophysiology) clinical descriptive classification (American Venous Forum, 1994) corresponds to the clinical picture of ulcus cruris All patients made: basic laboratory findings, immunoassay (IL-1, IL-6, MMP-1, MMP-3), microbiological analysis, color doppler, biopsy of the edge and PHD to exclude or confirm an ulcerated tumor of the skin (basiliom, spinaloma). TIME principle (for local care). Six patients, aged 30-82 years, were included in the pilot study. Both sexes are represented: three females aged 30, 60 and 82 years. Three males, aged 30, 60 and 76 years. We monitored the general condition, mental and physical, blood findings, skin findings as well as specific findings for each patient. Light source was Biopton Pro with Fullerene C60 filter on standard operating procedure physico-chemical analyzes of ordinary water and treated water were performed (Euro-Inspekt d.o.o. date: 23.04.2021. Address: H. Kreševljakovića 16-18, Sarajevo, Bosnia and Herzegovina.

Results: The effects of Biopton system light therapy on wound healing involve two main pathways: 1. The fibroblastic structural pathway. 2. The immunological

cytokine pathway. 3. Pain is unpleasant sensation that service to limit or reduce injury to the body. 4. Improved local blood flow. 5. Reduce in muscle spasm. 6. Reduction of inflammation. 7. Induction of natural pain-killing. 8. Reduction of pain transmission by direct action on peripheral nerves. All patients with ulcers, had a positive value of the change in healing area size and depth, wound bed condition. Patients did not have pain faster healing of ulcers. Results of physical-chemical analysis of the pilot project "Influence BIOPTRON VLPL with Fullerene C60 filter in the process of "photophoresis water" show that *Hyper Water*[®] has different values of pH (7.37) and mineral concentration (mg/l: NO₃, SO₄, CaCO₃, Ca, Mg (9,7), in relation to ordinary water, which may explain and effects that patients reported as a sweet testing with feeling of fullness, very pleasant to drink. Patients reported feeling well psycho physically.

Conclusion: 1. *Hyper Water*[®] is alkaline water. 2. *Hyper Water*[®] has an ideal pH value of

7.37 (blood pH is 7.35-7.45). 3. Maintains a mild alkalinity of the body. 4. *Hyper Water*[®] has more Mg than ordinary water which is a key component in the range of alkaline enzymes. 5. *Hyper Water*[®] gives the body necessary a number of important minerals to regulate pH values, especially Ca and Mg. 6. *Hyper water*[®] molecules are energy pattern C60-quantum information (HPL Tesla Toroid) harmonizing effect on the water of human being. 7. Water in an optimal hexagonal state of coherence and

thus healing processes of body stimulate healing processes leading to homeostasis. 8. *Hyper water*[®] in a colored container absorbs the vibrational energy of particular color used to balance our physical and emotional state. 9. Color is energy, which is required by all cells in the process of all 3 phases of wound healing process.

Recent publications

1. Ovčina-Kurtović N, Kasumagić-Halilović E, Helppikangas H, Begić J. Prevalence of Candida Species in Patients with Psoriasis, Acta Dermatovenerologica Croatica. 2016; 24 (3): 209-213
2. Begić-Rahić J, Vranic S. The application of Biopton light therapy in Dermatology and Wound Healing. European Dermatology 2011;5(1): 57-60
3. Begić-Rahić J, Experiences and results of the work of the Association for the Wounded in Bosnia and Herzegovina. Symposium with international participation: Diabetic foot. Croatia, Sveti Martin na Muri, October 2010 Acta Med Croatica, 64 (Suppl. 1) (2010) 133-136

Biography

Jasmina Begić is a medical consultant for BIOPTRON, Zepter International for Bosnia and Herzegovina, founder of Association for Wound Management in B&H, founder and author of Euro-Asian Forum, one of founder of BALWMA. She is currently working as a dermatovenerologist in Biopton International team -Wound Healing. She finished her graduation and post-graduation studies at Medical School of University Sarajevo, Sarajevo, Bosnia and Herzegovina and completed her PhD in the field of tissue regeneration and wound healing from Indian Institute of Technology, Kharagpur. She is also active member in UEMS TF WH, EWMA, EADV.

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Keynote Forum | Day 2

December 06, 2022

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Sally NG

Austin Health, Australia

The use of 3D printing in facial prosthetics for head and neck cancer reconstruction

3D printing (3DP) is a rapidly advancing tool that has revolutionized the field of plastic surgery. In the area of head and neck cancer reconstruction, 3DP allows surgeon to produce specific facial prosthesis to reconstruct the nose, eyes and ears. This helps the patient to reduce the stigamata associated with their cancer diagnosis. In the presentation, we will share our 3DP set up at the Austin Health and how to produce various facial prosthesis in our three cases studies.

Recent publications

1. Lim P., Li H., Neoh D., Ng S. Health related quality of life measurement tools for lymphoedema: A review of the literature. PRS open 2022 10:24276

2. Xiao WT, Ng S., Li H., Min P., Feng S., Su W., Zhang Y. An innovative and economical device for ischaemic preconditioning of forehead flap prior to pedicle division: A comparative study. J of Reconstructive Microsurgery 2022 March
3. Xu HL, Zhu Z., Chen J., Ng S., Xiao D., Pan J., Perdanasari T., Largo R., Wang X., Zhang YX. Identify unequal flow carry capabilities of choke vessels: a rat model study (accepted for minor revision)

Biography

Sally Ng graduated from Monash University (with honours) in 2005. She completed her specialist training in plastic and reconstructive surgery in 2016. She is the current head and neck reconstruction and research lead at the department of plastic and reconstructive surgery at Austin Health. Sally Ng has over 24 publications with a H-index of 4.

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