



## A Chronic Wound is a Wound that Does Not Heal in the Expected Time

Siniša Franjić

\* Independent Researcher, Osijek, Croatia.

\***Corresponding Author:** Siniša Franjić, Independent Researcher, Osijek, Croatia.

**Received: January 11, 2023 | Accepted: January 30, 2023 | Published: February 4, 2023**

**Citation:** Siniša Franjić, Independent Researcher, Osijek. A Chronic Wound is a Wound that Does Not Heal in the Expected Time, Journal of Clinical and Medical Case Reports and Reviews. 1(1).

**Copyright:** © 2023 Siniša Franjić, This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

A chronic wound is a term that refers to a wound that does not heal in the expected time, i. e. when there is no progress in healing for a period of four to six weeks despite a properly performed treatment procedure. In a chronic wound, the healing process stops in the initial part of the third healing phase which is the proliferation phase. The healing process is long and very demanding, which can be further complicated by complications, such as infection. Chronic wounds affect all aspects of the patient's life - emotional, psychological and social. In addition to prolonging the healing time, they also increase the number of visits to the doctor as well as the number of days spent in hospital treatment.

**Keywords:** Wound; tissue damage; injuries; ulcers; health

### Introduction

Chronic wounds affect millions of human beings and are a selected trouble of the aged who're maximum probably to have comorbidities assumed to impair recuperation [1]. Few research have recognized unique comorbidities that may be attributed to effecting recuperation and nonhealing. Two retrospective opinions confirmed that sufferers with comorbid situations of cerebral vascular accident (CVA), neuropathy, and dementia had been statistically by no means probably to heal ( $p < .0001$ ). Other essential comorbidities recognized related to the by no means recuperation included malnutrition, infection, diabetes mellitus (DM), depression, dementia, and degenerative arthritis. Other statistically widespread elements recognized here as predictive of nonhealing had been a excessive variety of continual ulcers and decrease hemoglobin counts. Hypertension, cardiovascular/respiration illnesses, senile dementia, and neurologic disorder are situations recognized as related to improvement of strain ulcers. The consequences of continual and comorbid infection on predicting wound recuperation need to be taken into consideration as a part of the holistic affected person evaluation. From what we know, it is affordable to mention that early identity of things that expect wound recuperation reaction will assist you triage cases, lessen variability in price and care, and enhance the prognosis and final results for planned interventions.

### Etiology

Wounds may be broadly of types, acute and chronic [2]. Acute wounds end result following trauma or excisional surgical procedure. Chronic wounds are the ones which do now no longer heal inside 6 weeks. The reason of continual wounds varies relying upon the genesis of wounds, its depth, the involvement of underlying structures, primary wound care and tissue handling. Whatever can be the reason, the simple motive is insufficient circulation.

Common etiologies are trauma, overseas bodies, infection, postoperative dehiscence, thermal, chemical and electric burn, diabetic ulcers, strain sores, secondary to varicose vein, trophic adjustments following spinal

harm or peripheral nerve involvement. Often the trauma victims, with bony and gentle tissue injuries, are looking for preliminary control in orthopaedics. The gentle tissue stays beneathneath assessed and both sutured beneathneath anxiety or left open. Sometimes overseas our

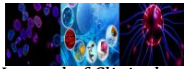
bodies aren't adequately cleaned. Later they're stated reconstructive surgeon. This ends in widespread useful, sociopsychological and most cost-efficient burden to the affected person. Such state of affairs may be prevented if a blended group method is followed at some stage in the number one control. The evaluation of a wound is finished via way of means of what tissue parts are misplaced and what tissues are exposed. This has maximum widespread significance in attitude of resurfacing and approach of reconstruction. This is the significance of dimension in reconstructive surgical procedure of any wound. It has direct bearing with the selection of the form of tissue for use for resurfacing. In many conditions there can be a slow cessation of blood float, because of steady strain as in decubitus ulcer, trophic ulcer, main to necrosis. Circulation can be additionally hampered in acute infections as in excessive cellulites, necrotizing fascitis, etc. Hence it's miles important to exactly become aware of those elements and take important well timed measures to save you and treatment the wounds. All the above conditions reason structural and useful adjustments withinside the parts of tissue, main to a wound. Thus a clean know-how of the natural human tissue and their functioning is crucial for a treating expert who encounters a wound and plans to treatment it.

### Assessment

Performing a complete affected person evaluation is the crucial first step in the direction of recuperation the continual pores and skin situation or wound [3]. Once the clinician has assessed the affected person, recognized any underlying situations affecting recuperation, completed a whole evaluation of the affected person's dietary repute, completed the right assessments to offer an correct prognosis of the underlying trouble, assessed the affected person's information of the disorder, and documented all elements that have an effect on the mastering wishes of the affected person, a whole pores and skin and wound evaluation may be completed.

The evaluation is set in movement with a one-on-one dialogue among the affected person or caregiver and clinicians who've cared for the affected

person's pores and skin and wound. Understanding the affected person's beyond and modern family, social, and scientific records might also additionally offer essential perception into why the wound isn't recuperation.



Clinical interventions will range in keeping with the evaluation.

#### Age

Inflammation, cellular migration, proliferation, and maturation responses sluggish with ageing [1]. A principal pores and skin extrude that takes place with ageing is thinning of the dermis, which will increase the chance of harm from shearing and friction, ensuing in pores and skin tears and ulceration. The pores and skin additionally loses its impenetrability to materials in the surroundings, so irritants and positive tablets are extra effortlessly absorbed. The reproductive feature of epidermal and fibroblast cells diminishes with age, and substitute is slowed. Elastin fibers are misplaced, and the pores and skin turns into much less elastic. There is faded vascularity of the dermis, and the dermis atrophies, which slows wound contraction and will increase the chance of wound dehiscence. Wound dehiscence is to a few instances better in sufferers over age 60, yet, the causative elements can be contamination, insufficient protein intake, and different scientific complications—now no longer totally age.

Ageing and continual disorder states frequently pass together, and each postpone restore techniques; that is due to not on time cell reaction to the harm stimulus, not on time collagen deposition, and decreased tensile strength withinside the made over tissue. The regeneration manner may be faded due to impaired circulatory feature. Because continual disorder is extra not unusualplace in older adults, age is at least a marker for situations that predispose to continual wounds, and it's miles normally recognized as a cofactor in impaired recuperation. Despite those elements, ageing on my own isn't always a prime thing in continual wound recuperation. Research now demonstrates that recuperation is handiest barely retarded in wholesome aged people with out continual disorder states, in comparison with that of a young populace. Patient age does now no longer substantially have an effect on the recuperation time for leg ulcers related to venous insufficiency or for neuropathic foot ulcers the usage of general touch casting. However, age seems to have an effect on the chance for pores and skin breakdown in those who are older than 85 years; this organization validated a 30% chance of growing strain ulcers.

#### Tissue Damage

Bacterial infections are the maximum not unusualplace reason of human infectious illnesses and antibiotics, used to deal with those infections, have stored tens of thousands and thousands of lives withinside the closing century [4]. Most antibiotics are powerful towards dividing micro organism, and their systemic utility ends in a discount withinside the bacterial burden, permitting for decision of the contamination. One of the maximum not unusualplace warning signs for applying antimicrobial remedy in advanced nations just like the United States are pores and skin and gentle tissue infections. In a few cases, localized tissue harm can cause continual, non-recuperation wounds that fail to heal inside 4–6 weeks and can persist for months or years, in spite of non-stop remedy. Chronic wound sufferers frequently be afflicted by different situations which includes diabetes or obesity, and this kind of wound represents a developing situation in healthcare settings during the world. These continual wounds consist of diabetic foot ulcers, strain ulcers, and venous leg ulcers, all of that are painful and debilitating situations that negatively effect the pleasant of lifestyles of affected sufferers. It is it expected that as much as 2% of the populace will be afflicted by decrease limb ulcerations, and direct clinic fees to deal with pores and skin ulcers and continual wounds have been expected to be as excessive as £5.3 billion withinside the United Kingdom and \$25 billion withinside the United States. As the worldwide fees of obesity and diabetes upward push coupled with an growing aged populace who frequently have comorbidities that predispose them to the improvement of continual wounds, there exists an pressing want to broaden new remedy techniques to address this developing health issue.

It has been proposed that the pathogenesis of continual wounds is a end result of the interaction of a couple of elements: ageing, broken or decreased blood float to the wound site, and wound colonization via way of means of micro organism coupled with an inflammatory reaction. There is growing proof that the micro organism in continual wounds arise inside an prepared network called a biofilm. Biofilms are normally taken into consideration to be the natural phenotype of micro organism, and they're intrinsically resistant to antibiotics and to the host immune reaction while discovered in a continual wound. Debridement may be

used to dispose of bacterial biofilms from the wound mattress; however, biofilms in vivo may be exceptionally small and hard to become aware of which similarly complicates their remedy, and biofilms often regrow after debridement. Additionally, many biofilms inside wounds are frequently polymicrobial which makes it hard to isolate and correctly deal with the pathogen(s) answerable for the continual wound state.

Unfortunately, there are presently no pharmaceutical sellers that especially goal the bacterial biofilms that make a contribution to continual

wounds. The European Society of Clinical Microbiology and Infectious Diseases launched a tenet for the prognosis and remedy of biofilm infections in 2014, wherein they mentioned the various demanding situations related to figuring out and treating biofilm-related infections. In this document, the pressing want for brand spanking new anti-biofilm-unique antibiotic healing procedures is highlighted as is using anti-inflammatory procedures to lessen nearby tissue harm because of the host inflammatory reaction.

#### Injuries

In general, wounds can both be defined as superficial (i.e., smash of the epithelium), partial thickness (concerning the epidermis and dermis), or full-thickness (deep cuts that attain subcutaneous fats and once in a while bone) lesions [4]. Injuries bobbing up from cuts, scrapes, publicity to chemicals, intense temperatures in addition to surgical procedure, and/or disorder consequences are all viable reasons for wounding. The wound recuperation manner is a complicated and dynamic manner this is crucial for every day survival of knocks and cuts and it's miles without a doubt required for absolutely everyone present process surgical intervention. The first step after preliminary wounding initiates coagulation to shape a blood clot withinside the wound mattress (additionally called hemostasis). The subsequent recuperation manner may be divided into 3 overlapping phases: inflammation, proliferation, and maturation. Since the recuperation manner does now no longer comply with a linear order, wounds can development each ahead and backward via the exceptional phases. During the infection section, blood vessels dilate to allow the access of a number of cells into the wound area. These consist of essential cells of the immune system, consisting of white blood cells which includes macrophages and neutrophils, which produce a number of enzymes, cytokines, and boom elements which might be crucial for the wound recuperation manner. At this level, the first medical signs of recuperation end up seen which includes heat, erythema, edema, and pain. During the proliferation section, the wound is rebuilt with the formation of recent granulation tissue, the extracellular matrix reforms with collagen secreted via way of means of fibroblasts, and new blood vessels emerge (angiogenesis). Subsequently, reepithelialization takes place via the migration of keratinocytes on the floor of the wound to finish this section. After whole wound closure, the very last maturation section remodels collagen and reduces blood vessels withinside the scar tissue.

Chronic wounds are lesions that don't heal inside a predictable quantity of time and are frequently not on time in one (or more) of the aforementioned wound recuperation phases. The vast majority of continual wounds may be classified into 3 principal classes: (1) leg ulcers, often associated with venous or arterial deficiencies, vasculitis, and pores and skin malignancies; (2) pressure ulcers, that are localized pores and skin and tissue harm due to steady strain frequently visible in sedentary sufferers in hospitals and home care homes; and (three) diabetic foot ulcers, that are a principal hardship of diabetes mellitus and are answerable for neuropathy and arterial harm. The everyday wound recuperation techniques is likewise frequently impeded via way of means of ischemia, a situation characterised via way of means of terrible blood deliver ensuing in low oxygen degrees in tissues.

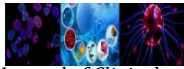
#### Ulcers

Chronically unhealed wounds, mainly at the decrease extremity, are not unusualplace withinside the putting of vascular, immunologic, and neurologic disorder [5]. Venous ulcers, in large part of the decrease leg, mirror terrible perfusion and perivascular leakage of plasma into tissue. The extravasation of plasma proteins into the gentle tissue stimulates continual infection. This is the end result of venous high blood pressure produced via way of means of incompetent venous valves. Most venous ulcers will heal if the venous congestion and edema are relieved via way of means of leg elevation, compression stockings, or surgical tactics that remove or restore incompetent veins or their valves.

Arterial or ischemic ulcers, which generally tend to arise at the lateral ankle or foot, are great dealt with via way of means of revascularization. Hyperbaric oxygen, which affords a brief supply of stronger oxygenation that stimulates angiogenesis, is an powerful though luxurious opportunity while revascularization isn't always viable. Useful records may be received via way of means of transcutaneous oximetry. Tissues with a low Pao<sub>2</sub> will now no longer heal spontaneously. However, if oxygen anxiety may be raised into a quite everyday variety via way of

means of oxygen management even intermittently, the wound might also additionally reply to oxygen remedy.

Sensory loss, mainly of the feet, can cause ulceration. Bony deformities because of continual fractures, just like the Charcot deformity, reason pathologic strain on wounded tissue. Ulcers in sufferers with diabetes mellitus might also additionally have reasons. Patients with neuropathic ulcers typically have exact circulation, and their lesions will heal if included from trauma via way of means of off-loading, unique shoes, or



splints. Recurrences are not unusualplace, however. Diabetics with ischemic disorder, whether or not they have neuropathy or now no longer, are at chance for gangrene, and that they often require amputation while revascularization isn't always viable.

In pyoderma gangrenosum, granulomatous infection, without or with arteritis, reasons pores and skin necrosis, probable via way of means of a mechanism concerning extra cytokine launch. These ulcers are related to inflammatory bowel disorder and positive sorts of arthritis and chondritis. Corticosteroids or different anti inflammatory tablets are helpful. However, anti inflammatory corticosteroids also can make a contribution to terrible recuperation via way of means of inhibiting cytokine launch and collagen synthesis.

#### Biofilms

The presence of biofilms in continual wounds stimulates a continual inflammatory reaction that draws ample numbers of neutrophils and macrophages to the contamination site [4]. These inflammatory cells secrete proteases to assist smash down injured tissue and generate reactive oxygen species (ROS). However, this inflow and retention of innate immune cells coupled with the immoderate secretion of the aforementioned molecules also can harm everyday and recuperation wound tissue. Bacterial protection mechanisms, on the opposite hand, result in the manufacturing of biofilm matrices to shield towards host defenses which includes phagocytic interest, oxidative stress, and proteolytic degradation. The aggregate of those elements contributes to a continual inflammatory kingdom that fails to successfully eliminate the biofilm from the wound tissue. Moreover, excessive densities of bacterial pathogens (and/or commensal bacterial species) withinside the tissue negatively effect wound recuperation because of direct interactions of bacterial cells with keratinocytes and fibroblasts or via oblique modulation of the inflammatory reaction.

Biofilms play a major role in bacterial infections and chronic inflammation. To clinically manipulate a biofilm-related contamination, necrotic and inflamed tissue need to be bodily removed (i.e., via debridement and/or vigorous cleansing). In intense cases, limb amputation is a possibility. In fact, diabetic foot infections are the maximum not unusualplace reason of non-traumatic amputations, and diabetic sufferers who go through a limb amputation have excessive 5-year mortality fees just like the degrees visible for not unusualplace cancers. Unfortunately, biofilms in wound tissue are hard to become aware of and frequently lack substantive medical symptoms and symptoms. The loss of right visualization techniques to as it should be become aware of biofilm inside a wound mattress makes it exceptionally hard to dispose of all the infected tissue. Incomplete elimination of microorganisms from in the wound ends in the capacity for regrowth, formation of recent biofilm mass, or it can probably sell bacterial dispersal and cause a systemic contamination. To manipulate such continual, biofilm-associated infections, a couple of visits to a physician are important to carry out normal wound cleaning. In an try to save you biofilm reconstitution, infections of this kind are frequently dealt with with traditional antibiotics. Unfortunately, antimicrobials handiest save you the boom and proliferation of planktonic micro organism and frequently have a minor effect on organisms nonetheless embedded withinside the biofilm matrix withinside the wound. Another complicating thing is the polymicrobial nature of biofilms that calls for affected person-unique, large-spectrum antibiotics.

#### Patients

For many clinicians and sufferers, the connotations of 'chronic' are frequently bad, missing desire of any description, and explicit a big degree of identical fragility, powerlessness, and finality [6].

The loss of a unique idea and implemented exercise standards of multidisciplinary care method to embody the large variety of non-cancerous sufferers seems to have brought about a fragmented view of what truly constitutes chronic wound mattress control. Wound mattress coaching for chronic wound care seems to have advanced as a end result of this perceived void. Various different non-malignant situations additionally can't be 'cured', and are presently classified inside healthcare as requiring long-term 'chronic' care.

For a affected person, hearing the steady use of the terms 'chronic wound, continual affected person, or chronic situation' might also additionally

such is the depression and despair that accumulates, that suicide might also additionally end up an inevitable decision.

When treatment isn't always expected or viable, and a 'chronic' state is inevitable, levels of safety, increased comfort and independence perfect to the affected person may be finished in many circumstances, however require an goal case management model of care.

#### Management

The control of chronic, complicated, and sluggish-recuperation wounds is a widespread undertaking in medicinal drug today [7]. The body's reaction to acute tissue harm is to minimize morbidity and repair feature. Acute harm is observed via way of means of overlapping orchestrated molecular and cell activities main to both whole recuperation or improvement of a continual wound. Healing takes place right now after inciting harm has happened via 3 overlapping phases: inflammatory, proliferative, and maturation section. Paramount to preparation of wound for recuperation is adequate debridement. Once large, open wounds are cleared of nonviable tissues, the recuperation manner can be hastened via way of means of supplying optimal wound surroundings the usage of numerous techniques relying at the wound size, depth, vascularity, and so on. In the late 1970s and 1980s, the idea of wet wound care have become wellknown remedy instead of drying the wound previous to this era. Despite remedy with the great perfect wound care products, it can be hard to heal a few continual wounds. To heal those hard wounds, advance wound care products, which includes bad strain, hyperbaric oxygen remedy, composite, and interactive wound care products, are used earlier than reconstruction the usage of nearby, regional, or remote flaps is taken into consideration. Many variables play in making sure a well timed wound recuperation with minimum complications. Current control of those variables are met with various degrees of proof.

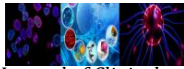
Infection is a not unusualplace reason of not on time wound recuperation. Colonization of micro organism past 105 in step with gram of tissue or presence of beta-hemolytic *Streptococcus* induces persevered infection to clean the wound of contamination and bring about not on time wound recuperation. Once healed, inflamed wounds are liable to immoderate scarring and keloid formation. Wound hypoxemia, resulting from atherosclerosis, wound anxiety, anemia, or cardiac failure, can impair fibroblast interest while tissue oxygen level is under 35 mmHg. Smoking reasons relative hypoxemia via way of means of vasoconstriction and lowering perfusion. Diabetes mellitus thickens capillary basement membranes and reduces wound perfusion microenvironment. It additionally impairs phagocytic feature and prolongs infection, main to not on time recuperation. Ionizing radiation consequences G2 via M section of cell cycle of swiftly dividing cell populations. Albumin levels of dehiscence. Improving nutrients on my own has widespread impact in closure of continual wounds. Old age, mineral deficiency, and positive medications (e.g., doxorubicin) additionally have negative impact on wound recuperation. Aside from burdening sufferers and households with dealing with every day care and inflicting related morbidities, continual open wounds might also additionally cause squamous cellular carcinoma. Cancer withinside the context of continual wound has been defined in style of wounds, consisting of burns, strain soars, osteomyelitis, venous stasis ulcers, and hidradenitis.

Opposite to the nonhealing stop of the wound recuperation spectrum is keloid formation from immoderate fibroblast interest and abnormally excessive collagen deposition. First defined via way of means of ancient Egyptians, it stays a irritating medical trouble. Normally after full-thickness dermal harm, matrix accumulates and scar forms. Initially the wound enters evolutionary section marked via way of means of boom in height, firmness, and redness. This is observed via way of means of balance and subsequently involutional level marked via way of means of flattening, softness, and palar. Keloid does now no longer comply with this everyday sample of wound recuperation and can broaden without delay after the initiating occasion or years from unique trauma. Keloid is exceptional clinically and histologically from hypertrophic scars, which show off similarities to everyday wound recuperation however with extended time path and worse impact on shape and feature.

Other not unusualplace techniques of remedy for keloid consist of silicone gel and strain remedy. Silicone gel, a cross-related polymer of ethylsiloxane, has been show to be efficacious in remedy of hypertrophic

infer an prolonged period, or a lifetime, dwelling with a degraded bodily and social repute compounded via way of means of durations of pessimism, hopelessness, powerlessness, blame, guilt, despair and social isolation. This might also additionally make the affected person reluctant to have interaction in remedy modalities that may offer nice levels of safety, consolation and increased levels of independence. For a few, nice efforts afforded for survival end up a fascinating manner, and for others,

scars. Silicone gel is positioned as a protecting layer over wounds for 12–24 hours a day. Results are appreciated after 4 to 6 months of utility. One have a look at indicates superiority of silicone gel over triamcinolone injection in remedy of hypertrophic scars. However, this has now no longer been hooked up in keloid remedy. Pressure remedy is a easy and price-powerful approach of lowering keloid recurrence to much less than 20%. Other unconventional and much less powerful techniques of keloid control consist of laser, intralesional



injection of 5-fluorouracil, intralesional injection of interferon, topical and intralesional injection of nutrition A and its retinoid derivatives, and plenty of extra.

#### Conclusion

Unlike acute wounds, most chronic wounds are not caused by external mechanical events but by existing diseases, therefore they most often represent the final stage of tissue damage in the case of vascular, metabolic and neuropathic diseases. Chronic wounds, as well as circulatory problems, are the main causes of illness in the elderly population. Finding an effective therapy has been a significant challenge for many years. The main and desired goal of treatment is to heal wounds and prevent their recurrence. Chronic wounds cause significant emotional and psychological problems for the patient, so it is important to seek professional medical help. Most chronic wounds can be classified into three categories: venous ulcer, diabetic foot and pressure ulcer. If the chronic wound, as well as the underlying diseases, are not treated properly, there is a possibility of developing complications. In most cases, it is necessary to primarily treat the disease that is the basis for the development of a chronic wound. Thus, in the case of diabetes, it is necessary to regulate the level of glucose in the blood, while in the case of arterial ulcers there is a possibility of revascularization. Venous ulcers can be repaired with compression therapy. Effective antiseptic cleaning is the basis of local wound treatment, which in combination with debridement effectively removes bacteria and secretions from the wound, as well as tissue remnants and dressing material. Such an approach provides a favorable environment for healing.

#### References

- www.alcrut.com
- Copyright: © 2022 Siniša Franjić
1. [Sussman, C. \(2012.\): „Assessment of the Patient, Skin, and Wound” in Sussman, C.; Bates-Jensen, B. M. \(eds\): „Wound Care - A Collaborative Practice Manual for Health Professionals, Fourth Edition”, Lippincott Williams & Wilkins, Wolters Kluwer; Baltimore, USA, pp. 53. - 54.](#)
  2. [Bhattacharya, V.; Agarwal, N. K.; Bhattacharya, S. \(2012.\): „Measurement of Wound Healing and Tissue Repair” in Mani, R.; Romanelli, M.; Shukla, V. \(eds\): „Measurements in Wound Healing - Science and Practice”, Springer-Verlag, London, UK, pp. 73. - 74.](#)
  3. [Hess, C. T. \(2013.\): „Clinical Guide to Skin and Wound Care, Seventh Edition”, Wolters Kluwer, Lippincott Williams & Wilkins, Ambler, USA, pp. 15.](#)
  4. [Haney, E. F.; Pletzer, D.; Hancock, R. E. W. \(2018.\): „Impact of Host Defense Peptides on Chronic Wounds and Infections” in Shiffman, M. A.; Low, M. \(eds\): „Chronic Wounds, Wound Dressings and Wound Healing”, Springer Nature Switzerland AG, Cham, Switzerland, pp. 3. - 6.](#)
  5. [Franz, M. G. \(2015.\): „Wound Healing” in Doherty, G. M. \(ed\): „Current Diagnosis and Treatment - Surgery, 14th Edition”, McGraw-Hill Education, New York, USA, pp. 68.](#)
  6. [Storch, J. E.; Rice, J. \(2005.\): „Reconstructive Plastic Surgical Nursing - Clinical Management and Wound Care”, Blackwell Publishing Ltd, Oxford, UK, pp. 184. - 185.](#)
  7. [Sahar, D.; Wang, H. \(2009.\): „Evidence-Based Wound Care Management” in Cohn, S. M. \(ed\): „Acute Care Surgery and Trauma - Evidence-Based Practice”, Informa UK Ltd, London, UK, pp. 233. - 237.](#)

#### Ready to submit your research? Choose Alcrut and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Alcrut, research is always in progress.

Learn more: <https://alcrut.com/en/journals/journal-of-clinical-and-medical-case-reports-and-reviews>



This work is licensed under creative commons attribution 4.0

To submit your article Click Here: [Submit Manuscript](#)

