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Research Article

Standardization and protocol for performing dressings in chronic wounds and dehiscence with platelet- and leukocyte-rich fibrin (L-PRF)

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Abstract

Over the years, we have been able to observe the important role that nursing plays in many areas, not only in the care of the patient, but also in decision-making when it comes to making diagnoses and treatments independently.

Our competencies are extensive, varied and have evolved as the science itself, we increasingly specialize in promoting and improving the needs of our patients, which leads to more individualized and personalized plans, actions, diagnoses and treatments available to patients.

In the following article it is proposed to validate, standardize and the protocol to be followed, for the treatment in wounds, chronic wounds and dehiscence with fibrin rich in platelets and leukocytes (L-PRF), as another additional treatment and improvement, to all those already existing by nursing.

Key words: membrane; autologous; centrifugation; dehiscence; wound; healing; regeneration; plasma

Abbreviations: L-PRF, PRF, UPP.

Objectives

Establish a protocol and standardization for performing cures using this method.

Normalize the use of this technique, as part of the extensive tools already existing for carrying out cures.

Introduction

Science has evolved by great strides and as a result, new challenges have been presented. In fact, who would tell us that we were going to live through a pandemic like the one we are currently experiencing and that science continues and will continue to demonstrate the constant/continuous process of evolution.

In the same way, it has happened with the wounds, which have had a constant evolution for the health personnel in general.

Thanks to this evolution, we could be debating all day about how to heal wounds, many ink jets and great literatures were created and created, to improve the realization of the cures, their classification, their etiology and their morphophysiology.

The skin as the highest organ of the body and for being our first barrier of defense against any external and internal agent, we must take care of it and a lot. Sometimes, this protective barrier is not strong enough and yields, to these external or internal agents and injuries occur.

At first, these skin lesions should heal in a simple way and / or alone or with minimal care, but sometimes depending on the type of injury, causal agent, previous pathologies that the patient presents, this healing time is affected and prolonged, making these lesions can be infected, chronic and even can increase in size, which leads to a more difficult and complicated recovery.

Over the years and in this constant research, to improve and shorten times in the healing of wounds, different types of healing were developed and with a good variety of materials.

Within these types there are simple cures, dry cures, wet cures and cures of ulcers and dehiscences, with an infinity of materials that we can apply depending on the assessment that is made. Within these materials we can find antiseptics, dressings of different compositions and endless techniques.

In this constant advance of healing the wounds in an adequate, clean and safe way, he made many scientists such as the French doctor Joseph Choukroun specialized in General Surgery and Anesthesiology, after much research, discover in 2001 Fibrin rich in platelets with its acronym in English (PRF) and in 2008 the Fibrin rich platelets and leukocytes with its acronym in English (L-PRF).

L-PRF is a concentrate of autologous platelet factors, which is obtained by extracting blood from the patient without any added additives, resulting in a strong three-dimensional clot for subsequent application in the form of a membrane in the bed to be treated.

Given its composition and bioavailability, it helps the regeneration of various tissues significantly shortening the healing time and consequently lowering costs, in addition to having antibacterial properties.

Next, we will develop the technique, its use in the realization of wound healings of any kind, but we will focus it especially on chronic wounds, dehiscences and on creating a standardization and protocolization for the realization of the same, in addition to proposing the standardization of its use by nursing.

To perform this technique, the procedure and the steps to be followed to obtain the clots and subsequently the L-PRF membranes will be listed below:

Perform Venopunción and subsequent blood collection, 2 to 8 tubes will be extracted, depending on the extent of the lesion and the assessment made. (See Image Nº 1)

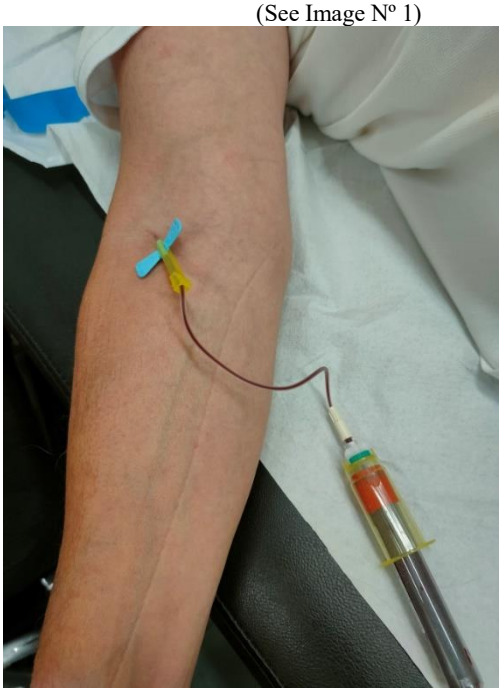

Figure 1: Nº 1 blood extraction.

The tubes are inserted two by two into the centrifuge, while we perform the extraction of the following tubes (the tubes must be between a minute and a half to two minutes to introduce the next ones). (See Image Nº 2)

Figure 2: Introduction of tubes and centrifuge model.

The centrifuge to be used, has to be one that can manipulate the parameters and time (digital), must oscillate between 2700 rpm and 3000 rpm with a time of between 5 to 10 min to count from the last two tubes introduced and stopping the centrifuge between minute and a half to two min about three or four times. (See Image Nº 2)

It is important that if the patient is being treated with anticoagulants or antiplatelet agents, the centrifugation time should be increased between 10 to 12 min, to ensure that the clot forms.

Once the centrifugation process is finished, the separation of the L-PRF clot from the blood form part begins. (See Image Nº 3)

Figure 3: clot separation.

Once all the clots have been separated, we proceed with obtaining the membranes as follows:

Clots are placed in the minor surgery tray. (See Image Nº 4)

Figure 4: clots.

Once the clots are introduced into the tray, gauze is applied above and the surgical plaque is placed, so that it is, help to dehydrate the clots, the plaque is left for 3 to 6 minutes. (See Image Nº 5)

Figure 5: dehydration of clots.

After this time, the plate is removed; the gauze and the membranes would be ready for later use. (See Image Nº 6)

Figure 6: ready to use clots.

All this is done with sterile technique.

The supernadating fluid from the dehydration of clots, can be used to infiltrate the lesion or also to apply it at the edges, since this liquid contains the same properties as membranes.

The standardization for this type of treatment is:

1. Observe and assess the injury well.
2. Perform a thorough anamnesis.
3. Sampling for cultivation.
4. Request complete analysis and including coagulation study, glycosylated hemoglobin in cases of diabetic patients and proteinogram.
5. Request X-ray from the affected area if applicable, to rule out possible bone disease.
6. Signature of the informed consent of the technique to be performed.
7. Signature of the informed consent of the realization of photographic images.

The protocol to follow is:

1. Washing of the affected area with saline and with prontosan.
2. Taking photographs with measurement, for the comparison of evolution.
3. Peripheral trium for the collection of samples, with closed technique.
4. Centrifugation of the blood, with the parameters indicated above.
5. Dehydration of clots.
6. Application of membranes in the lesion.

After everything done, we will start closing the injury as follows:

1. We will moisturize the periphery of the affected area with cream, oil to prevent the rest of the tissue from drying out or rubbing with the bandage. (See Image Nº 7)

Figure 7: peripheral hydration.

2. We will place a hydrocolloid dressing above the membranes. (See Image Nº 8)

Figure 8: Hydrocolloid patch coverage.

3. After the dressing hydrocolloid gauze. (See Image Nº 9)

Figure 9: Covering the hydrocolloid patch with gauze.

4. Then the bandage will be made. (See Image nº 10)

Figure 10: Closure with bandage.

5. Let 7 days elapse to perform next cure.

The materials used to perform the technique are:

1. Kit for Venopunción with scalp (is worth any system of extraction of blood in closed technique).
2. Biochemistry tubes of 10 ml without additive or separator (BD hemogard vacutainer 10 ml with silica, reference 367896).
3. Digital centrifuge (in this case DLAB clinical centrifuge, model DM0412) was used.
4. Sterile gloves.
5. Sterile cloth.
6. Box of minor surgery.
7. Straight tweezers without teeth (two).
8. Saline solution and prontosan.
9. Hydrocolloid dressings, it is recommended to only use this type of dressings for its benefits and protection to the membranes (for this case Aquacel hydrocolloid was used).
10. Sterile gauze.
11. Moisturizer or oils such as mepentol, rosehip or ozone.
12. Creppe type bandages, the measure of this will depend on the area to be bandaged.
13. Tape of any kind, to fix the bandage.

Materials and methods

To write this article, I found the difficulty of the little existing information for the treatment of wounds with this technique, since most of the information available is for use and treatment in dentistry and maxillofacial surgery, it should be noted that some All this available scientific information and the little that existed was used to carry out this type of wound treatment.

To search for information, search engines such as Dialnet, Scielo, Pubmed, Google, and Google Scholar were used. In principle, the last 6 years were taken into account, but the search was expanded to include the last 12 years, both in Spanish and English. We also performed searches with Boolean operators (AND, NOT AND OR) to further improve and refine the research.

The patient inclusion criteria for this article are all patients who present any type of wound, whether simple, chronic or dehiscence at any age between 18 and 100 years.

The sample is obtained from all those patients who attend the nursing consultation and after assessment by nursing, the most appropriate treatment for the patient will be selected. You will be asked to sign the informed consent for the technique to be performed, as well as the consent to take images.

Among the exclusion criteria that I selected for this treatment we will have children, psychiatric patients and all those patients who refuse to sign the informed consent.

The materials and costs for the production do not exceed 70 euros, taking into account that these costs only include the tubes, gauze and other materials for the treatment of the injury; they do not include the centrifuge and the rest of the material necessary for the preparation and development of the technique.

Discussion

The prevalence of pressure ulcers (UPP), as well as chronic wounds, dehiscence and ulcers of other etiologies has been increasing in recent decades. This increase is due to the progressive aging of the population, with the consequent fragility associated with age, the increase in chronic pathologies and the treatments received. In developing countries, these factors are compounded by little or no access to health care.

Today, the treatment of chronic wounds is very varied. There are multiple products and new materials on the market with specific indications for each phase of the cures. However, the complexity of managing these types of injuries often requires very close monitoring, long healing times and frequent failures. The consequences for patients are not only physical, but also psychological and social. They are certainly a public health problem and a high cost to health systems.

The use of L-PRF has some advantages over other methods of chronic wound management. It is a safe method, minimally invasive, simple to apply, biocompatible as it is an autologous product, and its cost is low compared to other products available.

The intervals between cures are much longer compared to those of conventional dressing cures. These dressings are applied to the lesion with intervals of between three to seven days at most, which can be even shorter in cases of very exudative wounds. Material consumption can therefore be substantially high in the case of chronic wounds.

The application of L-PRF is performed at intervals of 7 days, regardless of the exudativeness of the wound. The tube boxes contain one hundred units, and in each weekly session eight to ten tubes will be used, so the consumption is one box every two or three months per wound and patient.

The fundamental modification proposed in the article with respect to the protocols for obtaining clots and subsequent L–PRF membranes is to stop the centrifuge at certain intervals of time after completing the total of the tubes. With this new protocol, the clot is obtained faster, its consistency is better and its size is greater when compared to the original technique.

With all the above, what is really desired with the realization and application of this technique, is to have a new tool that can be used in a standardized way, in the same way in which we use the other existing techniques. We believe and we are sure that covering the needs of patients in a more personalized way substantially improves their evolution.

Conclusion

It is concluded that:

Given the benefits and advantages of this treatment, the zero risk of rejection due to being autologous, the safety of its use in patients, the low complexity of implementation, its prompt availability, the reduction of time in the healing process and cost savings. For the health system, the proposed treatment is a new opportunity not only for patients who have been rejected, but also for all patients who present some type of wound that is difficult to heal. For everything described, it is recommended:

Normalize and include this type of nursing treatment in the wide variety of existing treatments due to its usefulness, benefits and great effectiveness.

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