

Papain Associated with Urea in the Debridement of Necrotic Wounds

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Abstract

Papain allows the effective removal of necrotic tissue in wounds by a type of enzymatic debridement. The objective of this work was to emphasize the effectiveness of the association of papain with urea in necrotic lesions. The case of a 56-year-old patient is reported with an ulcerated lesion in the internal malleolar region of the left lower limb. The necrotic tissue was made enzymatic debridement using papain and urea and vitamin E supplement twice daily. By the fourth day the debridement was complete and was changed to a bandage with carboxymethylcellulose associated with pectin once daily. The association of papain with urea at 10% concentration proved to be efficient in the enzymatic debridement of a wound of the lower limb. This is another option of removing necrotic tissue when a selective process is desired.

Keywords: Papain; urea; debridement; ulcer.

Introduction

Debridement of the necrotic tissue of a wound is essential for granulation and re-epithelization. This is particularly important for large wounds and in the presence of cellulite and sepsis⁽¹⁾. Debridement involves the removal of devitalized contaminated tissue and foreign bodies⁽²⁾ and thus this procedure can reduce contamination of the wound⁽²⁾. Although the organism presents with physiological debridement mechanisms, studies have shown that this process can be accelerated by utilizing additional procedures⁽¹⁻³⁾.

Debridement can be achieved by surgical, mechanical, autolytic and enzymatic procedures^(1,2). Enzymatic debridement is utilized in patients that would not tolerate a surgery and for smaller lesions. Several debriding agents are used including collagenase, fibrinolysin, desoxyribonuclease and papain. Papain is derived from the papaya fruit, collagenase from bacteria and the fibrinolysins and desoxyribonuclease from bovine extracts⁽²⁾. Papain destroys collagen when sulfhydryl groups are present, a condition that can be achieved by adding urea in its preparation^(2,3). It should be remembered that all these substances may cause sensitization when in contact with the skin and so the

patient may evolve with erythema and vesiculation on the skin surface⁽⁴⁾.

Each wound should be assessed in order to define the best method; occasionally an association of methods is recommended. Surgical debridement is the fastest and most effective method to remove necrotic tissue and enzymatic debridement is the most selective.

Papain has been utilized in different ways. In the USA, it is associated with urea and in Brazil it is employed using a natural approach, by placing the papaya fruit itself on the wound, in saline solutions and in the form of paste or gel^(5,6).

The aim of the current study was to demonstrate the use of a mixture of papain and urea for debridement in necrotic lesions.

Case report

The case of a 56-year-old patient is reported. The patient had a history of left leg ulcers over a two-year period, with the dressings being changed on a daily basis. Even so the wound suddenly deteriorated causing much pain and the formation of necrotic tissue and pus (Figure 1). As the region was adversely affected and as

the patient did not present with symptoms of joint involvement, enzymatic debridement was chosen using a combination of 10% papain, 10% urea and vitamin E. Debridement was complete by the fourth day when the attending physician decided to change the treatment to a dressing using carboxymethylcellulose and pectin. The patient reported that the papain had caused a tolerable burning sensation and after the change of dressing this discomfort was eliminated.

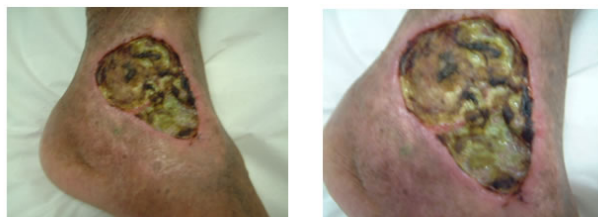


Figure 1 The necrotic aspect of the wound



Figure 2 The aspect of the wound after the 4th day of treatment using a combination of papain and urea

Discussion

Wounds are the cause of severe discomfort and thus can interfere in the quality of life of patients (7). Scarring of these wounds is the main objective of treatment. After the evaluation and diagnosis of lesions, the form of treatment employed depends on each specific wound.

When necrotic material is involved, it is advisable to debride the wound. Of the available options, enzymatic debridement is commonly utilized. Papain is one substance which has been used in different manners for enzymatic debridement, including naturally, using the papaya fruit itself, as extracts dissolved in saline solution, or in gels or in paste.

In Brazil, the first studies on debridement using papain were published by Monetta who greatly contributed to this practice. Initially, different amounts of concentrated extracts, generally around 2.5%, were dissolved in saline solution. Currently the concentrations still vary but are normally around 1% to 3% depending on the experience of each professional.

In the USA, the use of an association of papain and urea has been reported in several studies⁽⁸⁾. Among the benefits of urea are its strong osmotic power which

facilitates hydration of the wound, in particular the fibrous layer and its ability to supply sulfhydryl groups which facilitate the breakdown of collagen⁽⁸⁾. Limited evidence suggests that a papain-urea-based ointment removes necrotic material from pressure ulcers more rapidly than collagenase ointment, but progress toward wound healing appears to be equivocal.

In the current study the utilization of 10% papain associated with 10% urea and vitamin E proved to be efficient in the debridement of the wound. This is another option for the enzymatic debridement of wounds with necrotic material.

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