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20 Years of the Use of Coumarin Bandage for Venous Leg Ulcer Treatment

Fernando Vega R^{1,2*}, Lourdes A Vega R^{1,3}, Fernando Contreras¹, Fernando Torres¹, Carlos Arreola¹, Eugenio Ramírez¹, Felipe Rendón¹, Víctor Carmona², Gloria Reyes² and Italia Robles²

¹Instituto Mexicano de Flebología

²Clínica de Várices de México

³Escuela Nacional de Ciencias Biológicas IPN

*Corresponding Author: Fernando Vega Rasgado, Instituto Mexicano de Flebología, Clínica de Várices de México.

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The treatment of venous ulcer is still a pending issue; it is the main sequel of Chronic Venous Insufficiency (CVI), although there are significant advances on the origin of this disease. It is well known that valvular insufficiency allows blood reflux from the upper veins down, the ankle being the most distal point, since the strong tendons that limit it prevent the transmission of increased venous pressure (hypertension venous) towards the foot, although sometimes superficial veins can do so. Sustained venous hypertension has been considered the main cause of venous ulcer [1]. Antireflux treatments in the saphena magna or short saphena are very effective in controlling this hypertension; however, it has been detected in various studies that the only correction of the sources of reflux is not sufficient to prevent recurrence2. In this context, the use of various compression systems have been more effective for the treatment of ulcers, different dressings and systems are used. However, the Gold standard of venous Ulcer treatment remains the Boot proposed by Unna in 1917 (Unna's boot), which consists of a cotton band (inextensible) impregnated with an inert paste based on zinc oxide usually covered in an elastomeric bandage [3,4]. In 1999 Brizzio proposed to use a similar system but added coumarin to paste [5], later in México we modified a little the zinc oxide paste formulation by adding essential oils and 10% coumarin and impregnating it in a cotton gauze bandage, with which we apply this variant of the Boot of Unna (we call it Coumarin Bandage), which can be kept eight days in the patient's leg and allows some mobility within an inextensible tri-layer system. This system has the advantages of being easy to place, it allows to absorb the secretion of the ulcer, provides constant inextensible compression, does not adhere to the wound and coumarin prevents micro thrombosis of the surface od scare and stimulate the action of macrophages, as well as the lymphatic function, all of which is relatively inexpensive.

The system is placed on the ulcer that has previously been cleaned or debrided, the skin has been covered with a special dermo protective cream (In our case DIABEM®). Then the bandage is placed from the toes gently rolling upwards, giving a greater number of turns on the wound without exerting pressure and finishing a few centimeters before the knee flexion fold, if it exceeds the remaining is rolled down. Subsequently, a low extensibility bandage is placed from the origin of the toes on which we have previously placed the Coumadin bandage applying a compression around 30mm Hg, winding the foot and ankle with this compression upwards, at the same height as the coumarin bandage, If necessary we return the bandage without compression. Finally, a third bandage of the same characteristics is placed without exerting pressure just winding it over the previous bandage. This system remains for 8 days and the patient is asked to perform their normal activities, is also instructed to avoid wetting the bandage during the bath by covering it with a plastic bag and to walk regularly in the usual way.



Figure 1: Application of Coumarin Bandage. A). Starting the bandage. B). Tri-layer full bandage.

According to international guidelines previous to the placement of the bandage, the ankle-arm index should be measured, if the index less than 0.6 do not apply it, always verify adequate arterial perfusion and supervise the distal circulation continuously, for it the patient is instructed about the color or sensitivity changes in the foot that should be reported immediately. If necessary, the bandage can be easily removed [6].

A week later the bandage is removed (in the first two changes it sometimes has an unpleasant smell due to the absorption of exudate), the wound and the skin are cleaned then re-impregnated with the dermo protective cream and the system is replaced. Each change we observe that ulcer is self-limited, the wound acquires a pink coloration by the granulation and evidently, the progress of healing, as well as the decrease in the volume of the leg (decreases edema). Usually the closure of the ulcers occurs in 8 weeks on average. If surgery is performed simultaneously (conventional surgery, laser, radiofrequency, etc.), intravenous chemical ablation with foam (with syringe, catheter, MOCA, ETC.) the closure is even faster [7]. When the ulcer size is y approximately 1 cm, we only place a dressing from this bandage impregnated with coumarin (approx. 10 cm² about 6 folds) and the system of the other two low compression bandages (extensibility) is maintained.



Figure 2: Ulcer healing process.



Figure 3: Before and after the use of Coumarin bandage.



Figure 4: Before and after the use of Coumarin bandage.

After 20 years of starting its use and publishing the first results [8,9], the system is now used not only throughout the Mexican territory, but in countries such as Guatemala, Honduras, El Salvador, Nicaragua, Bolivia, Peru, Paraguay and Argentina. In all of them it has shown its benefits with excellent results and a quick closure of virtually any ulcer size. It has become a system of current use in our country that offers multiple advantages. Unfortunately in Latin America only have a few communications in conferences, receptionist theses in Phlebology Diploma courses or journals. This does not take away the importance and significance of this method that has proven its effectiveness even in patients who do not wish to have surgery. Since once the closure is achieved, the use of high compression elastic socks and skin care is continued, as well as phenological rehabilitation exercises so that recurrence is significantly reduced. As with any other topical system, some patients develop allergy, either by paste or by bandage material, so the application of the system in these cases should be ruled out.

Soon we will present results of a multicentric study with this system (modification of the Unna boot auditioned with coumarine) that shows the goodness and effectiveness, as well as the low cost for the management of this condition which still remains a cause of work disability to which many thousands of dollars a year are invested.

Finally, we conclude that the tri-layer compression system of the Zinc Oxide Bandage with Cumarin (Coumarin bandage) is an excellent resource, easy to place and control for the management of patients with venous ulcer, regardless of any other method of abolishing venous reflux.

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