

Application of Polyethylene Cling Film to Underpin Moist Burn Wound Therapy

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ABSTRACT

Background

Dermal burns (partial thickness burns) are the most painful trauma with two types of pain background pain with additional procedural pain, one of the best tolerable mode of treatment that commonly used now adays is treatment with MEBT ointments to maintain the moist and warm wound environment suitable for regeneration of epidermal cells, and to reduces pain. Moist wound dressings retain moisture, heat, body fluids, and biofilm with medication. The assumption is that the polyethylene film will maintain the ointment and its effect more than to be used merely.

Patients and methods

Prospective study to evaluate treatment of patients with partial thickness burns conservatively with MEBT ointment as a control group and MEBT ointment + Cling Film, 63 patients being admitted to the burn center at Azadi teaching hospital during a period of one year starting from June 2018 till June 2019. The inclusion criteria including all patients between 10-95% partial thickness burns of various age, sex and skin types.

Results

Very much decrease in procedural and background pain, better joint movement in physiotherapy decrease in crust formation, increase maceration of eschar, better cost- effectiveness, less days of hospital stay.

Aim; in Iraq circumstances we have to use the most cost effective measures to reach our goals in managing the burn wounds the moist trend which is now being proved it gives better healing with less pain, with best criteria of wound dressing .

Conclusion

Easily applicable, less painful, non-coasty over all, better condition of patient during course of management, reduced length of hospital stay and lower treatment costs, appropriate wound healing with living tissue , less joint stiffness problems.

Keywords ; partial thickness burns, MEBT ointment + Cling film, burn pain, MEBT ointment =Moist Exposed Burn Therapy Ointment.
BSAB = Body surface area burned.

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تعزير تأثير طريقة المرهم المرطب المكشوفة لجروح حرق الادممة بواسطة

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نبذة مختصرة

الخلفية: تعد الحروق الجلدية (حروق السماكة الجزئية) أكثر الصدمات المؤلمة مع وجود نوعين من الآلام ، الآلام الخلفية المتواصلة مع ألم إجرائي إضافي ، أحد أفضل طرق العلاج المسموح به والتي يشيع استخدامها الآن هو العلاج بمرهم MEBT للحفاظ على بيئة الجرح الرطبة والدافئة مناسبة لتجديد خلايا البشرة ، وتقليل الألم. تحتفظ ضمادات الجرح الرطبة بالرطوبة والحرارة وسوائل الجسم والأغشية الحيوية مع الدواء. الافتراض هو أن فلم البولبي إيثيلين سيحافظ على المرهم وتأثيره أكثر من استخدامه بصورة مجردة.

الطرق والمعالجة: دراسة مستقبلية لتقييم علاج المرضى الذين يعانون من حروق سماكة جزئية بالعلاج التحفظي مع طريقة المرهم المرطب المكشوفة لجروح حرق الادممة بواسطة غشاء البولبي اثيلين، 63 مريضاً يتم إدخالهم إلى مركز الحروق بمستشفى آزادي التعليمي وحدة الحروق وخلال فترة عام واحد تبدأ من يونيو 2018 حتى يونيو 2019 تتضمن معايير الاشتمال جميع المرضى الذين تتراوح نسبة مساحة الحروق لديهم من 10 إلى 95% من الحروق الجزئية السمك (حروق الادممة) من مختلف أنواع العمر والجنس والجلد.

النتائج:

انخفاض كبير في الألم الإجرائي والخلفي ، وحركة المفاصل أفضل في العلاج الطبيعي ، هذه الطريقة تنقص في تكوين القشرة ، وتزيد من التئام الجلد المحروق ، وفعالية تكاليفه أفضل ، وأيام أقل من الإقامة في المستشفى.

الهدف من الدراسة:

في ظروف العراق ، علينا أن نستخدم أكثر التدابير فعالية من حيث التكلفة للوصول إلى أهدافنا في إدارة معالجة جروح الحروق ، وهو الاتجاه نحو طرق المعالجة الضمادات الرطبة التي ثبت الآن أنها تعطي الشفاء بشكل أفضل مع ألم أقل ، مع أفضل معايير الضماد المطلوبة.

الاستنتاج:

قابلة للتطبيق بسهولة ، وأقل ألمًا ، وغير مكلفة على الإطلاق ، وحالة أفضل للمريض أثناء التداوي ، وخفض مدة الإقامة في المستشفى ، وتضميد الجروح بالشكل المناسب مع الأنسجة الحية ، وتقليل مشاكل تصلب المفاصل.

الكلمات الدالة: حروق سمك جزئي ، مرهم MEBT + فلم التشبث (البولبي اثيلين)، آلام الحرق .

1-Introduction

A prospective randomized clinical study using of Beta sitosterol¹ containing ointment which is a sesame-oil-based ointment for burns produced in China². As a local conservative treatment remedy in acute partial thickness burns, Moist Exposed Burn Ointment (MEBO) was more expensive but without any wound crust (pseudo-eschar layer) formation³, healing being faster, and functional hand movement was better, with less post-burn complications⁴⁻⁶. Dr. Ioannovich J.⁷⁻⁸ finding that;

1. MEBO contributes to a better-quality scar after epithelial repair than other local agents.
2. Local substances applied to burn wounds may provoke a debriding effect. In a moisturized environment where eschars are easy to remove in small pieces MEBO showed an efficient debriding effect compared with the other remedies .
3. MEBO significantly accelerates the wound healing process in partial-thickness burns
4. Measurement of moisture in the wound may give additional information regarding the wound healing process. MEBO manifests a moisturizing environment for a longer period than other substances.

Clinical and experimental investigations by Rongxiang⁹ ChuanjiU¹⁰, and Yunying¹¹, have indicated that MEBO has the following therapeutic effects:

1. Analgesia: it improves pain threshold in partial-thickness burns;
2. Anti-shock: MEBO decreasing water loss from the burn wound surface and improves microcirculation.
3. Anti-bacterial: MEBO changes bacteria milieu, inducing a decrease in bacterial virulence and invasive capacity, as well as change sensitivity to antibiotics; it also improves wound's local and systemic immunity;
4. MEBO enhances regeneration.
5. MEBO improves quality of newly healed skin and reduce formation of hypertrophic scars.

Wound planimetry was analyzed in Department of Plastic Surgery, Hadassah Hospital, Nahariya, Israel (The trends of wound-healing histological patterns were better for MEBO subgroups on days 14 and 21 than with bacitracin¹². Moist exposed burn ointment (MEBO) is a good option for management of partial thickness burns owing to the soothing effect, joints movement, easier handling, and better healing properties¹³.

The laboratory test also found no side effect of MEBO ointment to routine test of blood and urine, liver function or renal function¹⁴. The ointment can promote the liquefaction and discharging of the damaged tissues of skin to enforces continuous drainage of the wounds, so the wounds can be kept in a moist wound milieu suitable for regeneration to ensure healing in the shorter time¹⁵. However, most chemical substances retard wound healing. Several natural remedies such as honey are believed to protect wounds from infection and promote healing but it need more frequent dressing changes episodes per one day make it inconvenient for patient¹⁶. Moist ointment beta sitosterol promotes the healing, reducing pain and controlling infection. It is also a cost-effective therapy as it accelerates healing and reduces hospital stay¹⁷.

2-Patient and method

Between JUNE 2018 - JUNE 2019; sixty three patients of variable age twenty five female & thirty eight male are treated by this trend with burn injuries sizes from 10% BSAB – 95% BSAB and with various causes electrical flash , thermal flame or scald burns all are selected according to clinical assessment of burn depth we plan to use conservative management MEBO treatment and wrapping wounds with a cling films (falcon-cling-film[®]) and changing the dressings three times daily (eight hourly) using new dressings we used for hands polyethylene gloves (Fig.1-5).



(Fig.1) 95 % BSAB Young man Gas Flame burn injury

Over 15 days treated by conservative way MEBO + Nylon wrapping a part from systemic antibiotics and pulmonary and fluid resuscitation patient discharged well after 15 days only.





(Fig.2) About 32 % BSAB in a twenty seven years woman with Deep partial thickness take 21 days to re-epithelialize reaching the final picture (notice the budding)



(Fig.3) MEBO WRAPPING with cling food nylon OVER 9 DAYS



(Fig.4) 8 % BSAB Moderately deep partial thickness Electrical flash burn treated by MEBO & Nylon for twenty-one days

(Fig.5) Patient treated conservatively MEBO & Wrapping cling nylon after 9 days discharged healthy with lesser amount for analgesia needed during hospitality



In comparison with the control group who are with same patients' criteria 29 patients 18 males 11 females our selection are depending on burn depth all were with partial thickness burns treated by MEBO four to six times daily after once daily bathing each day.

To make a informative measurable data we grouped the patients according to age, with comparable surface area involved but still we need more studies to evaluate this simplified trend of management.

Directions for use: Apply directly onto wound immediately at a thickness of not more than 1mm. Re-apply every 4 to 6 hours if wound is exposed, and 10 to 12 hours if wound is covered ¹⁸.

3-RESULT

1. Analgesia with MEBO and Cling film nylon wrapping reduces pain in partial-thickness burn wounds. (figure 6)¹⁹.

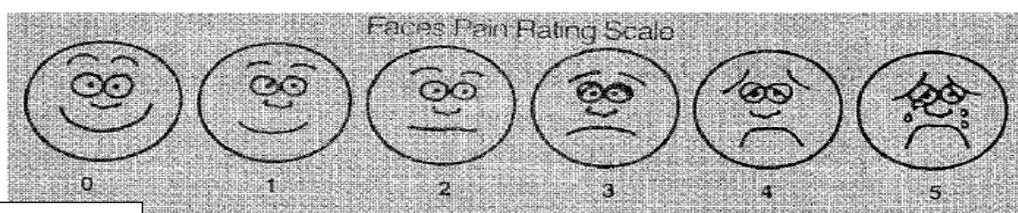


Figure 6

Faces pain rating scale. Patients point at the face that best describes the pain they are suffering. A laughing face means no pain at all; a sad, crying face describes intensive, non-bearable pain.

Dressing assessment score	Group MEBO +Cling Film 34 Patients	Mean value at 5 th day since burn	Group MEBO 29 Patients	Mean value at 5 th day since burn
<i>Pain score</i> ¹¹ 0-5	Procedural pain	2 (no pain)	Procedural pain	4 (sad 4-6 times daily)
	Background pain	1 (no pain at all)	Background pain	2 (no pain)
<i>Wound texture at dressing change time</i>	Always wet, moist , Eschar macerated		Simi wet, less moist, Eschar crustated	
<i>Joints movements disability score</i> 0-3	Active by patient	1	Active by patient	2
	Passive by nurse	0 =No restriction	Passive by nurse	1
<i>Patient discomfort score</i>	The bad odor	Less	The bad odor	intolerable
	Skin covered with ointment and nylon	Tolerable	Skin covered with ointment	intolerable
	Linen of bed	Less frequent changes	Linen of bed	frequent changes

(Table 1); MEBO and Cling film being more accepted by patient and care giver.

Age	0-1	1-2	2-5	6-15	16-55
NO.	4	8	3	6	13
Mean % BSAB	13.75	19.25 %	22.3 %	18.12 %	31.53
Mean LOH. stay in days	6.25 days	13.4 day	8.33 day	9 days	14.1 day

(Table 2); Age groups of MEBO + Cling film (34 pt.)

Age GROUP	(0-1)Years old	(1-2)	(2-5)	(6-15)	(16-55)
NO.	0	2	5	3	19
Mean % BSAB	0	23.5%	19.8	31%	27.6%
Mean LOH. stay in days	0	17.5 day	16.6 day	12.3 days	20.6 day

(Table 3); Age groups of MEBO only (29 pt.)

From these tables 2 &3 MEBO and Cling film being with a lesser duration of hospital stay with a comparable larger BSAB.

2-Cost –effectiveness;

Comparable Age GROUP	(16-55) year		Mean Length Of stay in Hospital stay in days
groups MEBO only	5.31 tubes/day		20.6 day
Mean % BSAB	19 pt.	27.6 %	
MEBO + Cling film	3.61 tubes/day		14.1 day
Mean % BSAB	13 pt.	31.53 %	

(Table 4); MEBO and Cling film being less cost and more effectiveness.

4-Discussion

Despite the plethora of technologic advances for the preparations for management of partial thickness dermal burns (**ANTIBIOTCS** as Bastracin oint. , Silver Sulfa Diazin, Fucidic acid oint)., or the use of **BIOLOGICAL coverings** Amniotic membrane, Alloderm sheets , Integra, or even Allograft , or using **SYNTHETIC materials** like Mepitel & Biobrane , Acticoat ,Opsite or Tegaderm, a polyurethane occlusive film. Trans Cyte Temporary Skin Substitute. The most common and practically used now in developing country and some large countries (like China , India) is MEBO but the restriction was in the cost , availability , and frequency of application needed to reach our goal of effective covering may need doubling the amount we needed for managing our patients with this trend we need less amount of ointment to be applied and with more effective results we get.

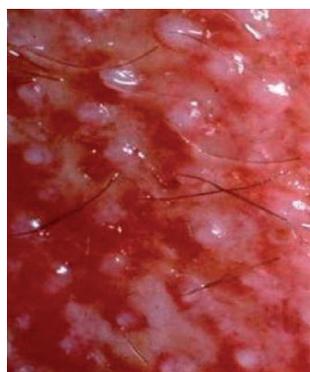
The analgesia with MEBO and Cling film nylon wrapping reduces pain in partial-thickness burn wounds to a degree some patients not need analgesia at all after the third day while the needs for

analgesia usually three times on less extant twice with changing dressing and bathing were it was painful leads to bouts of fears make the patient uncooperative and with psychological insult , another problem hence this trauma may lead to increase in adrenalin release leads to increase in catabolic state and more worsening to his condition.

The patient was less prone to electrolytes imbalance; the bouts of cold sensation which usually burn patients are complaining of it are less, ileus which is usually seen due to potassium reduction are less, urine output were easily controllable in them.

The joints of this group of burned patient are easily moved during physiotherapy which is a usual challenge in the burn patient.

Epidermal budding in a healing deep second-degree burn. Each bud of epidermis is arising from a single hair follicle (skin appendage). The source of the new keratinocytes is arising from a collection of stem cells, known as 'the bulge'.



This shows epidermal budding in a relatively deep second degree burn. Each bud of epidermis is arising from a single hair follicle.

The source of the new keratinocytes is thought to be a collection of stem cells, known as 'the bulge'⁹

Total Burn Care, David N. Herndon
2006

It also reduces healing time in partial-thickness burn less needs for bathing needs. No pseudo-eschar had seen like that seen in SSD.

MEBO improves scar formation and contributes to the formation of a smooth, thin, and aesthetically acceptable healing.

5-Conclusion

Easily applicable, non-coasty over all, less pain, better condition of patient course of management, reduced length of hospital stay and lower treatment costs, appropriate wound healing with living tissue, less joint stiffness problems, these are main advantages of this procedure in comparison with other techniques.

6-Recommendations

We recommend application of this trend in our country and in all developing countries that are missing the ability of application of coasty products like integra which still the best to be applied because not need to be changed, but it s not easily available because it is very expensive.

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