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ORIGINAL ARTICLE

Is there any place for spontaneous healing in deep palmar burn of the child?



Place de la cicatrisation dirigée dans les brûlures palmaires de l'enfant

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Received 4 September 2016; accepted 18 September 2016

KEYWORDS

Palmar burn;
Pediatric plastic surgery;
Spontaneous healing

Summary Child palm burns arise by contact and are often deep. The singular difficulty of such a disease comes from the necessity of the child growth and from the potential occurrence of constricted scars. In order to avoid sequelae, the actual gold standard is to practice an early excision of the burn, followed by a skin graft. The aim of this study is to evaluate the results of spontaneous healing combined with rehabilitation versus early skin grafting and rehabilitation concerning the apparition of sequelae. We performed a retrospective study in two burn centers and one rehabilitation hospital between 1995 and 2010. Eighty-seven hands have been included in two groups: one group for spontaneous healing and the other group for excision and skin grafting. Every child benefited from a specific rehabilitation protocol. The two main evaluation criteria were the duration of permanent splint wearing and the number of reconstructive surgery for each child. The median follow-up duration is about four years. The two groups were comparable. For the early skin grafting group, the splint wearing duration was 1/3 longer than for the spontaneous healing group. Concerning the reconstructive surgery, half of the grafted hands needed at least one procedure versus 1/5 of spontaneous healing hands. Our results show the interest of spontaneous healing in palmar burn in child, this observation requires a specific and intense rehabilitation protocol.

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MOTS CLÉS

Brûlures palmaires ;
Plastique pédiatrique ;
Cicatrisation dirigée

Résumé Les brûlures palmaires de l'enfant surviennent par contact et sont souvent profondes. La difficulté singulière d'une telle atteinte est liée à la contrainte de la croissance et au développement de séquelles rétractiles. Afin de limiter ces dernières, le dogme actuel est de pratiquer une excision-greffe précoce. Le but de cette étude est d'évaluer les résultats de l'abstention chirurgicale (cicatrisation dirigée) versus greffe de peau mince, sous couvert de rééducation précoce, dans la limitation de ces séquelles. Une étude rétrospective sur les 2 centres lyonnais de brûlé aigus et le centre lyonnais de rééducation des brûlés pédiatriques à été menée de 1995 à 2009. Cent mains ont été incluses, réparties en 1 groupe abstention chirurgicale (cicatrisation dirigée) et 1 groupe greffe de peau mince. Tous les patients ont bénéficié d'un protocole de rééducation précoce spécifique. Le délai nécessaire à la stabilisation cicatricielle (évalué par l'arrêt du port d'attelle permanente) et le nombre de chirurgies réparatrices ont été étudiés. Le recul minimum est de 3 ans. Les 2 groupes présentent des lésions de gravité égale. Pour le groupe mains greffées, la durée de port d'attelle permanente était 1/3 plus longue que pour le groupe cicatrisation dirigée. Concernant la chirurgie réparatrice, 1/2 des mains greffées ont du y avoir recours versus 1/5 pour le groupe cicatrisation dirigée. Les résultats de cette étude montrent l'intérêt de l'abstention chirurgicale associée à une rééducation spécifique immédiate dans les brûlures de paume de main de l'enfant.

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Introduction

Burns epidemiology in industrialized countries highlights the significant incidence of children less than 24 months suffering from burns. In France, children under four years old amount for 28% of the burned population and more than 30% of the total number of hospitalizations [1]. This population category is particularly exposed to palmar burns as children develop their sense of touch during this period [2–4]. Moreover, the growing period to come ensures a palmar skin of good quality that helps avoid the occurrence of disabling functional sequelae [5]. Providing care for deep and intermediary burns of children palms may involve either a spontaneous healing or a surgical excision followed by a skin autograft. This study aims to compare both techniques regarding the occurrence of functional limitation.

Material and methods

We headed a retrospective study in two centers dedicated to patients with acute burns and in a rehabilitation center for burned children in Lyon. The cases of children with palmar burns of these centers have been reviewed from 1995 to 2010. Palms isolated burns have been included but not the hand dorsum injuries and those representing less than 50% of the palmar surface. The fourth degree burns with no spontaneous healing potential have been excluded from this study. Burns healing in less than 15 days have also been excluded since they are first degree and superficial second-degree burns that do not imply an excision-graft procedure because of their excellent spontaneous healing potential. Two groups of children with deep second-degree and third-degree burns of the palms have been created: a group treated by excision following by a split-thickness skin graft and another using a spontaneous healing technique. A protocol for early rehabilitation (Day 2–3) has been established and was frequently readjusted. Therefore, every patient benefited from the same rehabilitation protocol that was supervised by physicians from the center of physical

medicine and rehabilitation and by the team of physiotherapists. Our principal aim is to demonstrate that both groups show equal results. The spontaneous healing group (group A) benefited from dressings that were applied every day with a silver sulfadiazine-like topic and a tulle gras under adapted analgesia. All the blisters have previously been excised. If a hyperbudding emerged, a corticosteroid ointment was applied every two dressings on the affected area. The excision and split-thickness skin graft group (group B) benefited from a tangential excision performed under general anesthesia after parental authorization. The excision was performed with a manual dermatome until obtaining a bleeding area able to receive a split-thickness skin graft. This area was judged satisfying as there were homogenous petechial hemorrhages all over its surface. No full-thickness skin graft have been applied. Donor site is represented by the scalp every time it was possible with a electric dermatome, at a deepness of 0.015 inch. If it was impossible or if the parents refused, the grafts were extracted from the internal surface of an arm or thigh. Grafts were stabilized with mechanical staples or 4/0-like quickly absorbable sutures (Ethicon, Johnson Johnson, Somerville, New-Jersey). Then, a tulle gras-like dressing was applied and an extension splint placed to ensure maximal cutaneous function. The engraftment assessment took place five days after the operation. During this post-operative period, all the patients remained hospitalized in a unit for parents and children to ensure an optimal pain monitoring and to initiate the therapeutic education of the parents and even of the child, depending on its age. Both populations were monitored in a specialized rehabilitation ward in the pediatric rehabilitation center of Romans-Ferrari. Rehabilitation was initially done during the patient hospitalization. It was later performed during day ward consultation so as to have time to restore the devices. The standardized rehabilitation protocol combined the use of extension splints (for maximal cutaneous function), siliconized pressure therapy applied on the scar tension lines (device for divergent gradual massage DMDG[®]), divergent, gradual manual massages and high pressure showers. The splints were frequently renewed depending on their state. If

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