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ORIGINAL ARTICLE

Our 35 years' experience on postburn heterotopic ossification: A three-step treatment

Nos 35 ans d'expérience à propos des ostéomes après brûlure : un trépied de traitement

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Summary Our retrospective study of burn patients presents a three-step treatment of heterotopic ossification: excision surgery, early rehabilitation, and analgesia. We included patients admitted to the department for treatment of postburn heterotopic ossification between January 1, 1979, and September 30, 2015. The mean age at the time of the burn was 43.3 years. Men accounted for the majority of burn patients who developed an osteoma (70.8%). The mean total skin area burned was 38.4%. No osteoma justifying surgery was found for any patient with a total burned skin area less than 19%. The burned zones were related to the osteoma development in 94.3% of cases. On average, the surgery took place 10.8 months after the burn. The osteotomy was accompanied by surgical treatment of a contracture in 37.1% of patients. Most of the osteomata were found at the elbows (30), followed by the shoulders (3), and finally the knees (2). Rehabilitation began on D0 after the surgery, except if a flap or a thin-skin graft was used. Regarding analgesia, opiates were prescribed systematically during the immediate postoperative period. Elbow range of motion on flexion improved by a mean of 84.1°. During the postoperative period, we found 2 recurrences of osteoma and 1 elbow hematoma in two separate patients. There were no postoperative infections or neurological sequelae. Our retrospective French study confirmed results found in the international literature. The three-step treatment – excision

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surgery, early rehabilitation, and analgia – seems to be the best means of treating osteoma with satisfactory results. Surgery is indicated only in the case of functional impairment and not simply based on imaging.

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Résumé Notre étude rétrospective à propos de patients brûlés présente un trépied de traitement pour les ostéomes : excision chirurgicale, rééducation précoce et analgésie. Les patients inclus étaient admis pour ostéomes après brûlure entre le 1^{er} janvier 1979 et le 30 septembre 2015. L'âge moyen au moment de la brûlure était de 43,3 ans. On retrouvait une grande majorité d'hommes (70,8 %) parmi les patients brûlés ayant développés un ostéome. La surface cutanée totale brûlée moyenne était de 38,4 %. Les ostéomes étaient en zones brûlées pour 94,3 % des patients. Les ostéomes ont été opérés en moyenne 10,8 mois après la brûlure. Une bride cutanée a été traitée chirurgicalement en plus de la cure de l'ostéome chez 37,1 % des patients. La très grande majorité des ostéomes a été retrouvée au niveau des coudes (30), suivi des épaules (3) et enfin des genoux (2). La rééducation était débutée à j0 en postopératoire, sauf dans les cas où un lambeau ou une greffe de peau avaient été utilisés. En ce qui concerne l'analgésie, des opiacés avaient été utilisés systématiquement en postopératoire. Les amplitudes articulaires au niveau du coude ont été améliorées en flexion-extension de 84,1° en moyenne. Nous n'avons pas déploré d'infection ou de séquelle neurologique postopératoire. Cependant, notre étude retrouvait 3,3 % (1 cas) d'hématome et 6,7 % (2 cas) de récurrence ayant nécessité une ré-intervention. Les résultats retrouvés dans notre étude sont comparables aux grandes études parues dans la littérature. Le trépied de traitement (excision chirurgicale, rééducation précoce et analgésie) semble être efficace dans le traitement des ostéomes. La chirurgie ne doit être indiquée qu'en cas de déficit fonctionnel et non devant une imagerie.

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Introduction

Heterotopic ossifications (HO) are defined as abnormal proliferation of lamellar bones in the soft tissue of periarticular regions. They may affect any part of the body and have been described in a variety of conditions ranging from trauma to diseases of the central nervous system [1–3].

Clinically, they cause joint stiffness and may be associated with both various painful phenomena and neurological effects. Several areas of the body can be affected simultaneously and range of joint motion (ROM) can be reduced [4].

There are 300,000 burns every year in France, including 3000 severe burns that require hospitalization [5]. Among these patients, the incidence of heterotopic ossification appears to be approximately 2% [6]. For burn patients, these HO are most often found in the elbow, but they can affect every joint in the body [7].

The onset of heterotopic ossification can lead to complete loss of capacity for the activities of daily living (self-care, dressing, eating, etc.) as well as for walking or functional mobility.

Anticipating heterotopic ossification, preventing stiffness in nonfunctional positions, supporting patients through surgery if necessary and helping them to develop a life plan are all essential to the quality of multidisciplinary management of severely burned patients.

Current research data about the pathophysiology of heterotopic ossification, especially in burn patients, are sparse.

The objective of our retrospective study of burn patients with heterotopic ossification was to examine their demographic characteristics, the diagnostic and treatment

methods used, and their range of movement before and after surgery.

Currently, few studies have collected more than 30 patients with HO [6–8].

Materials and methods

We conducted a retrospective study that included patients admitted to the department of reconstructive and esthetic plastic surgery and burn treatment at the hospital Saint-Louis in Paris for treatment of a postburn heterotopic ossification between January 1, 1979, and September 30, 2015.

Treatment was considered indicated for patients with functional impairment in their daily life. An heterotopic ossification visualized on imaging but without any functional impairment was not routinely treated.

Demographic and clinical data were collected: age, sex, date of burn, type of burn, total skin area burned, area burned related to heterotopic ossification, acute surgery for burn excision and split thickness skin grafts (STSG), area of heterotopic ossification, the skin contracture associated with the heterotopic ossification, and the heterotopic ossification's neurological repercussions.

The preoperative ROM was measured the week before surgical excision of the heterotopic ossification, and postoperative ROM 3 months after surgery.

The preoperative work-up included standard radiography (Fig. 1) as well as scintigraphy to verify the heterotopic ossification. More recently (since July 2003), computed tomography (CT) without injection has been used instead of scintigraphy, which we no longer perform.

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