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Management of finger deep burns: The interest of local flaps

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ABSTRACT

Introduction: The management of finger deep burns is still problematic for the surgeon. Due to the fineness and the thickness of the subcutaneous tissue, after excision there is an important risk of exposure of the underlying tissue like bone, nerve or tendons.
Local flaps (random pattern flap and pedicle flap) allowed ensuring a good quality covering with a tissue with many advantages (good thickness, sensitivity). On the contrary of all other techniques, flaps can be used independently from the vascular quality of the wound bed. Despite those advantages, the literature is poor to report the experience of flap in the management of finger deep burn.
Material and methods: We report our experience in the use of such technique with a series of 49 flaps. The cohort consisted of 34 patients (22 men and 12 women) who were treated in our unit between 2003 and 2012.
Results: Of the 49 flaps made, 71,4% were homodactyl flaps. 22,5% were heterodactyl flaps and 6,1% were intermetacarpian (second space) flaps. The rate of success was 87,8%. We reviewed 16 patients out of 34 patients operated, 20 of the 49 flaps performed (40,8%). The patients were reviewed by an independent surgeon. The average follow-up at this consultation was 4,25 ±2,46 years. The monofilament test was positive for 17 flaps (85% of cases). For the Weber's test, we found a normal perception threshold for 11 flaps (55%), with an average test at 2,8 mm (2–4 mm). Normal motricity was found at the donor site in 14 of the 16 patients evaluated for 18 of the 20 revised flaps (90% of cases). In terms of cosmetic result, the average overall score obtained at the patient's own evaluation was 0.85. That obtained by the evaluator was equal to 0.55, with no significant difference (scale range from 0 best results to 5 worse results).
Discussion: Hand and finger burns are frequent and benefit from rapid, high-quality coverage, enabling early mobilization to combat secondary stiffness problems. The high success rate of our series, as well as the quality of the functional and cosmetic results obtained, demonstrate the reliability and the interest of the digital flaps.

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1. Introduction

Deep burns on the fingers are a real therapeutic issue for the surgeon and functional issue for the patient. With the fineness of the skin, it generates a problem of exposure of anatomic elements (neurovascular pedicle, tendon, joint structure), benefiting from quality coverage and recommending against the coverage by a simple skin graft. In this context, the use of a local flap can find its place and its interest. It brings a living tissue, of full thickness, allowing a quality cover and thus authorizing a mobilization and early reeducation. Yet, the realization of these flaps, in the context of burns, is not very often described in the literature. We report here our experience of the coverage of 51 skin defects following hand burning by local pedicle or random flap.

2. Material and methods

We conducted a monocentric retrospective study, between January 2003 and June 2012, including patient with skin defect of one or more fingers after a burn, covered by a flap. We excluded patients with others types of surgery (skin graft, artificial dermis, regional or free flap, additional tendon/nerve/vessel repair).

In 2016, medical records were reviewed by the same senior surgeon, who did not participate in the initial management.

We chose a primary study endpoint: the absence of complicated surgical recovery, early and remote.

For the secondary study endpoint, we reviewed the patients in consultation, in order to fill an evaluation score of the results, at the level of the flap and the donor site. On the treated area, we evaluated the results of the function, by studying the articular mobility of the operated finger (distance volar region of hand – pad finger), the discriminative sensitivity by an instrumental monofilament test and the sensitivity to pressure by a Weber's test. Finally, we evaluated the cosmetic aspect on two criteria: the colorimetric aspect (0 point: color similar, 1 point: light dyschromia, 2 points: intermediate dyschromia, 3 points: severe dyschromia) and the flap's thickness (0 point: total integration, 1 point: small thickness, 2 points: very thick). The final score varied from 0 to 5 points, with 0 being attributed to the most satisfactory reconstruction possible. This evaluation was carried out by the patient himself and an independent surgeon.

On the donor site, we evaluated joint mobility (if the sample concerned another finger), as well as discriminative sensitivity and sensitivity to pressure (instrumental monofilament test and Weber's test). Donor sites closed by direct suture or managed wound healing were not evaluated sensitively because of the small size of the area to be tested. We have also investigated whether or not there is adherence to the underlying plan. On the cosmetic side, we evaluated these sites by the same scale of 0–5 used at the treated area.

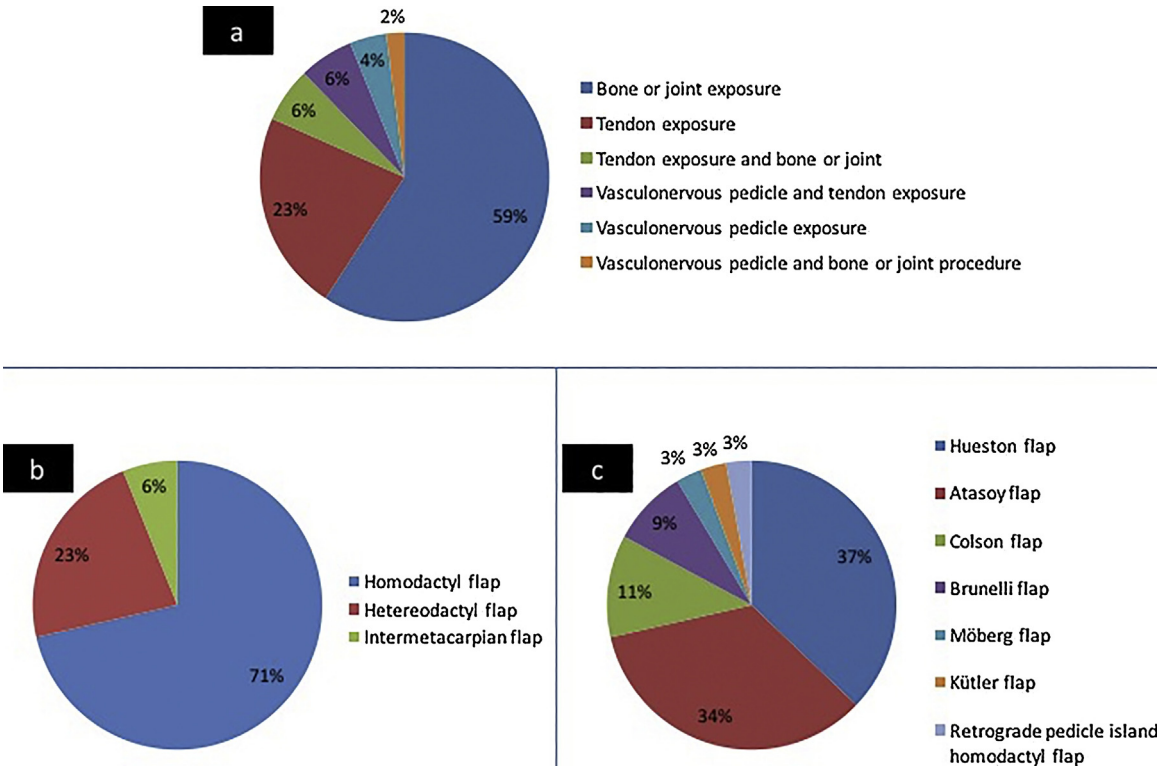

Fig. 1 – Summary of the distribution of the digital flaps of the study.
(a) Repartition of exposure tissue. (b) Repartition between heterodactyl, homodactyl and intermetacarpian flap. (c) Repartition of each type of homodactyl flap.

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