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## Case report

# Complex reconstruction of the dorsal hand using the induced membrane technique associated with bone substitute: A case report

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## ABSTRACT

*Introduction:* High-energy trauma of the hand often causes tissue loss involving bone, tendon and skin and is sometimes accompanied by devascularization of digits. Bone stabilization is the first step in the management of such injuries.

*Materials and methods:* A young patient presented composite tissue loss of the dorsum of his right (dominant) hand following an accident with a surface planer. Tissue loss involved the diaphyses of the first 4 metacarpals, tendons and skin with almost complete amputation of the 3rd finger.

Bone stabilization comprised osteosynthesis using pins associated with cement to fill the bone defect. Hunter tendon rods were used for tendon repair and a pedicle groin flap (McGregor) was used to achieve skin coverage.

The cement was replaced with autologous cortico-cancellous bone graft combined with bone paste (Nanostim) 3 months after the cement stabilization.

*Results:* Eleven months after the accident, the patient was able to return to work as a carpenter. Pinch and Grasp strength in the injured hand were half that in the contralateral hand, but there was no loss of sensitivity. Mobility was very satisfactory with a Kapandji score of 9 and a mean TAM of 280°. The patient can write, open a bottle and does not feel limited for everyday activities.

Radiographically, the bone of the 3 reconstructed metacarpals appears consolidated.

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**Conclusion:** The induced membrane technique allowed the reconstruction of small bone deficits in the long bones of the hand in a two-step procedure, the first step taking place in an emergency context of composite tissue trauma.

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## Introduction

Complex multi-tissue lesions of the hand cannot always be repaired in a single step and thus allow early rehabilitation.

In emergency situations involving several bone segments and/or sepsis, it is not always possible to harvest composite micro-vascularized osseous pedicles. The management of these lesions requires rigour in the planning of reconstruction surgery.

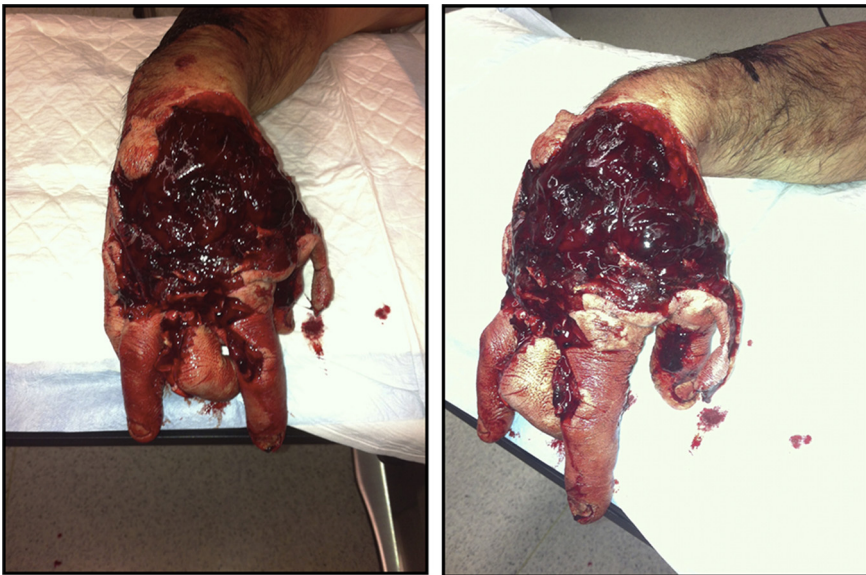
Bone stabilisation, the first step in the reconstruction, is of major importance.

We present here a case of reconstruction using the induced membrane technique in a patient with compound tissue loss of the hand.

## Case

A 26-year-old, right-handed man with no particular medical history was admitted to our unit for compound lesions of the dorsal surface of the right hand, following an accident at work with a straightening planer. There was severe damage to the dorsal surface of right hand measuring 10 cm × 8 cm and extending to the thenar eminence (Figure 1).

The clinical neurological and vascular examination was normal apart from anaesthesia and delayed coloration of the third finger due to almost complete amputation at the base of the first phalange. Further exploration revealed partial section of the radial artery and complete section of the extensor



**Figure 1.** Preoperative view of the back of the right hand showing loss of skin, tendon and bone tissue.

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