

A RADIAL ISLAND FOREARM FLAP - OPPORTUNITIES FOR COVERING OF SKIN DEFECTS IN THE REGION OF HAND AND ELBOW JOINT

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ABSTRACT

The radial island forearm flap based on the radial artery has proved to be extraordinarily universal. It can be applied with traumatic lesions of the hand - with a distal vascularization and retrograde blood flow as well as with defects in the elbow joint region - with proximal blood supply and anterograde blood flow. In this paper some of these applications in a series of 39 patients are described and discussed.

Key words: radial forearm flap, skin osseous flap, skin-tendon flap, hand defects

INTRODUCTION

Fascio-cutaneous flaps represent a relatively new concept in restorative surgery (1,2,3,6,7). The fascio-cutaneous flaps of the lower limb was first suggested in 1981. The radial forearm flap was described in the American literature by Song *et al.* in 1982 (4). The capacity of the axial flaps to be used as reverse flaps was accomplished by Stock *et al.* (5) who reported a distally based pedicled forearm flap. It found a wide application in hand defects for tendon and bone reconstructions.

The purpose of the present paper is to summarize our experience and to assess the properties of the radial island forearm flap with a distal pedicle in hand lesions and with a proximal pedicle in defects in the elbow joint region.

MATERIAL AND METHODS

We used the radial island forearm flap in 39 patients. Of them, in 32 a distal pedicle (for hand defects) and in 7 a proximal pedicle (for elbow joint lesions) was used. The age of the operated patients varied between 15 and 59 years. A complex skin-bone radian antebrachial flap was performed in 23 patients with amputated thumbs. A complex skin-tendon flap was done in 9 patients with dorsal hand defects with damaged extensor tendons.

CASE REPORT ONE

After a work accident a male patient aged 28 years developed a decompensated amputation of the thumb of the right

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hand. A radial island forearm flap on a distal pedicle was formed. The graft and the vascular limb were prepared taking care of the vessels supplying the radius proximally from processus styloidei. A 7-cm long bone lamella was created in the lower end of the radius. The complex graft was lifted and rotated as the bone was engraved in the bed of the first metacarpal bone and fixed by a Kirschner's needle. The skin graft enveloped circularly the bone but the donor area was covered by a dissected graft. The control examination after 6 months demonstrated a good esthetic appearance of the thumb.

CASE REPORT TWO

After a car accident a male patient aged 18 years was wounded on the dorsal hand surface and wrist and developed a defect of the extensor muscles of the II, II, and IV finger. A fascio-cutaneous flap from the forearm was lifted on a distal vascular limb incorporating the tendon grafts from *m. palmaris longus*, *m. flexor carpi radialis* as well as a tendon band from *m. brachioradialis*. The separated proximal and distal ends of the extensor muscles of the II, II, and IV finger were refreshed. The rotation of the flap was followed by a tendon and skin suture to cover the defect. After three months the flap has grown-in well, the fingers perform a full extension, the flexion is not hampered and the fist grip is good.

CASE REPORT THREE

After compression by a hot plate a male patient aged 45 years presented with a defect on the antero-lateral surface of the right elbow joint. A radial island flap with a proximal pedicle was created. The graft was rotated into a proximal direction at 180° and thus covered the defect. The function

of the elbow joint was restored by means of active rehabilitation after 3 months.

RESULTS AND DISCUSSION

All the flaps were successful. They performed a timely reconstruction and coverage of the defects that enabled the initiation of an early and effective rehabilitation. The patients were satisfied by the quality of the grafts.

The recent achievements of microsurgery enabled the transfer of various autogenous tissues. The vascularized bone and tendon grafts involved in the complex island forearm flap possess a series of advantages:

1. The reconstruction is done at one stage only.
2. There is an excellent vascularization.
3. The structure and elasticity of the forearm skin transplant is similar to that of the hand skin.

The radial island forearm flap capable of lifting on a proximal and distal pedicle represents an effective and reliable method. It ensures optimal conditions for a rapid restoration of the hand and elbow joint and thus it is the method of choice in such lesions.

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