HAND REPLANTATION IN 83 YEAR OLD MAN – CASE REPORT

LESZEK KACZMARZYK, JERZY JABŁECKI, JANUSZ KACZMARZYK

Subdepartment of Replantation of Limbs, General Surgery Department, St Hedwig of Silesia Hospital in Trzebnica
Kierownik: dr hab. med. J. Jablecki

Indications for hand replantation need to take into account the patient's general condition and the severity of the trauma. The advanced age of the patient is generally considered as a limiting factor of the replantation but does not absolutely disqualify a patient.

The case of a right - handed man, 83 years of age is presented, who had a circular-saw wrist level amputation of his dominant hand. As the general condition of the patient was satisfactory, the wound was clean, and the ischemia time was only 3 hrs the replantation of the hand was decided. The procedure was performed in a standardized way, the revascularization took place 7 hrs after injury. In the early post-operative period within the replanted part skin and soft tissue necrosis developed. It was treated with hyperbaric oxygen therapy, pedicled skin flap, and after its failure omental flap. The early functional result was poor (Chen's IV°). Patient died 27 weeks after replantation due to complications of coronaroplasty. The problems involved in replantation of hands of senile patients are discussed.

**Key words:** hand replantation, aged patients, operative risk

One of the replantation's prognostic factors is the age of the patient (1). The elderly, that is those over 65 years of age, form a small fraction of the patients with traumatic amputation of the upper limb. In our material it was less than 3% of all such cases (2). However, his number is expected to grow due to the aging of society. These patients are often early disqualified as potential candidates to replantation because of their comorbidity. But does an advanced age indeed advocate the disqualification? The answer to this question is difficult because the available databases lack a metaanalysis of the results of limb replantation in this age group and the available reports are case illustrations (3-6). So is this paper which we hope will help to set guidelines for such cases.

**CASE REPORT**

A man P.Z., aged 83, was admitted to the hospital because of a subtotal amputation at the level of wrist done with a circular saw (Fig. 1a). The amputated part remained connected to the stump with a 2.5 cm-wide avascular skin flap on the ulnar side. The wound seemed to be clean (and was later proved by microbial culture to be uninfected) and the tissue necrosis was limited to operational wound. The amputated part was properly secured and cooled. Three hours elapsed between the injury and the admission. The patient was admitted in good general condition: BP 140/90 millimeters of Mercury, HR 80/minute, with no signs of anemia, which was subsequently proved by lab tests: Hb 11.2 g/dl, Ht 35%, MCV 91.2 fl, WBC 5300/cmm. Other basic lab test results were also within the norm.

The patient denied any comorbidities (and had not been hospitalized prior to the amputation), was not treated pharmacologically, and had been working on his family farm. Because of the lack of contraindications and the strong motivation of the patient, who was thoroughly...
243

Hand replantation in 83 year old man – case report

informed on the risk of the operation and the subsequent procedures and the need of intensive rehabilitation, the decision was made to attempt to replant the limb.

The operation was carried out in the standard way (2). After identification of the corresponding anatomical structures of the stump and the amputated part, with special consideration on good condition of the vessels and nerves, the limb was shortened by removal of the proximal carpal bones damaged by the injury. The osteosynthesis at the radiocarpal joint was performed with sutures (PDS 1) connecting ligaments of the wrist. The primal junction was strengthened with 2 Kirschner pins (1.6 mm wide) introduced through the distal carpal bones into the radius (fig. 1B). Tendons of the following muscles were reconstructed: flexor digitorum II-V profundus, extensor communis digitorum II-V, extensor pollicis longus, abductor et flexor pollicis longus, extensor radialis et ulnaris carpi. The median and ulnar nerves were sutured using the perineural sutures (6/0); three end-to-end vascular anastomoses were performed that is on the ulnar artery and two large veins of the dorsal part of the hand (suture 7/0).

The postoperative period was complicated due to formation of deep necrosis followed by suppuration within the wound on the hand’s palmar side (Escherichia coli was cultured). The treatment included antibiotics according to the antibiogram results as well as hyperbaric oxygen therapy (10 sessions, oxygen pressure: 3 atmospheres). On postoperative day 8 an extensive necrectomy was performed which allowed to control the suppuration (fig. 2).

Over the following 5 days only regional treatment was implemented (octanisept dressings changed twice daily). Once a satisfactory state of the wound was achieved (as proved by a negative microbial culture) we decided to fill the loss of the soft tissues with a pediculated groin flap. Independently of all the operations, the patient was undergoing an intensive rehabilitation. On day 10 after the second procedure (that is, day 23rd of the hospitalization), because of his persistent pleading and assuring of appropriate conditions for regional treatment and physiotherapy at the dwelling and after consultation with the care-takers we decided to discharge the patient.

The patient was admitted 12 days after discharge with the flap partially disconnected from the inflamed wrist’s recipient site. Due to unfavorable prognosis, we decided to remove the flap and reconstructed the groin’s donor site. After 7 days of treatment with dressings we covered the tissue loss with a pediculated omental flap (fig. 3) (7). On postoperative day 5 the omental flap proved to be healing into the site, a fact which allowed us to cover it with a cutaneous autologous graft of average height. The skin graft healed completely in. The pedicle of the flap was cut off on postoperative day 24 after a typical process of preparation. Simultaneously, the 2 Kirschner pins, that stabilized the wrist position, were removed. Further wound healing process was uneventful.

Fig. 1. X-ray photo of a hand amputation in a wrist of a man 83 year of age: A – preoperative view, B – view after stabilization of a wrist

Fig. 2. View of the lesion after removal of necrotic tissue, 3 weeks after replantation
The result of rehabilitation achieved at week 10 was poor (grade IV in Chen’s scheme). The patient was able to slightly flex the radiocarpal joint and fingers but he claimed to be glad with the outcomes of the operation! The patient did not show up at the next follow-up because of hospitalization at a cardiologic ward where he continued the treatment of ischemic heart disease. After 9 weeks he was admitted to the cardiologic ward again and underwent a percutaneous coronary angioplasty (PCA). On week 27 after the replantation he died because of PCA complications.

DISCUSSION

The presented case should be viewed in the context of indications to replantation in patients over 65-years-old.

Following reasons determine a medium severity of limb replantation at the wrist level:

– it is performed urgently which makes it difficult to assess the perioperative risk objectively
– it consumes a considerable time (from 4 to 8 hours including 2 to 5 hours of patient’s transport)
– until postoperative day 2 it is associated with an important blood loss that requires a transfusion of at least 2 units of packed red blood cells (2, 8).

Hence, the operation does not put at risk the patient’s health so there seem to be no contraindications to it even in patients over 65-years-old. However, on a long stand the operation itself together with the subsequent repairing procedures and the need for multiple hospitalizations may contribute to deterioration of the patient general condition, just as was the case of the above described patient.

The range of recovered limb function constitute a separate problem. The recovery, as expected by us and described by other authors, is significantly lower than in younger patients injured in the same way. There are several reasons for that:

Aging is a physiological process involving a significant restriction of functional efficiency of each system and the organism as a whole. Of special importance seems to be the decrease in the endocrine activity especially low secretion of both the growth hormone (which stimulates protein synthesis and mitosis) and adrenal hormones (which control the process of adaptation). The wound healing is thus impaired. Tissues of the elder exhibit lower resistance to hypoxia, a fact that produces necrosis more extensive than should be expected from the type of mechanism and its duration (9). Wound healing complications were the basic problem in the first episode of the patient’s therapy.

The atrophy of the nervous system leads to impairment of the tactile sense and nervous functions in general (9).

On the other hand, while qualifying an aged patient for a limb replantation one should take into account that the patient’s expectations as for function recovery are low. The patient we operated stressed many times that he was pleased with the mere fact of having the limb. The quality of life after distant forearm replantation (with even only satisfactory results) is much higher than in those who lost their limbs (in DASH form 110 and 90 points respectively) (10).

It should be pointed out, however, that this study involved only middle-aged patients.

On the other hand, while qualifying an aged patient for a limb replantation one should take into account that the patient’s expectations as for function recovery are low. The patient we operated stressed many times that he was pleased with the mere fact of having the limb. The quality of life after distant forearm replantation (with even only satisfactory results) is much higher than in those who lost their limbs (in DASH form 110 and 90 points respectively) (10).

It should be pointed out, however, that this study involved only middle-aged patients.

The calendar age usually does not correspond to the biological age. Unfortunately, these proportions in Poles are unfavorable, and general health of Polish septuagenarians is much worse than that of their Scandinavian, German, French, Italian or Spanish peers (9). This is the reason for which our outcomes of upper limb replantation in aged patients can-
Hand replantation in 83 year old man – case report

not be objectively compared to the ones achieved in Western Europe.

Medical bibliography on limb replantation in the aged is limited to a few case reports with some of them describing finger replants (5). On the one hand, there are authors who claim after R. Villian that “esthetics is function” see no age limits for limb replantation (11). On the other hand some assumed that the age limit is 60 years (12). The function of the hand in two oldest described replant patients (male aged 88 years and female – 83), although initially satisfactory (grade III of Chen’s scheme), deteriorated with time (3, 6).

According to the medical bibliography the man operated on by our team should be considered the third oldest patient who underwent a successful upper limb replantation. Because of the subsequent complications, we were able to perform only an initial function recovery evaluation. Nonetheless, the course of the patient’s treatment indicates that the decision of replanting the limb in such cases is controversial.

REFERENCES


Received: 22.09.2008 r.
Adress correspondence: 55-100 Trzebnica, ul. Prusicka 53