CASE REPORT

Reattachment of a partially amputated ear without microsurgery

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Abstract

Traumatic ear amputations are relatively rare. Whenever possible, ear re-implantation should be attempted; however the choice of the surgical procedure must be judicious. In the current report, a case of complete non-microsurgical salvage of a partially amputated ear treated by the pocket technique described by Mladick was presented. The surgical technique is described in detail by serial photographs, along with the postoperative management and outcome of the patients. The revascularisation of the severed part was successful. Morphological result was very good when the ear was freed from the pocket. We recommend the Mladick's procedure for reimplantation of fragments less than 1/2 of the auricle with favourable tissue condition.

Keywords: Ear replantation, Amputation, Microsurgery, Mladick's technique.

Introduction

Amputation of any body part is undoubtedly a traumatic experience, especially when the part or parts involved are visible and constitute an essential component of the entire face. The traumatic loss of an ear constitutes a great aesthetic deformity and reconstitution of the amputated ear remains a major challenge for the surgeon. The difficulty of reconstitution is mainly related to the unique anatomical structure of the auricle, with fine skin covering, a thin and elastic cartilage, and small size vessels responsible for its perfusion.

Reattachment as a composite graft of the total or subtotal amputated ear is unreliable. Replantation of an amputated ear, with microsurgical techniques offers the best reconstructive results; however, technical complexity and numerous limitations do not allow for wide practice.[1,2] Therefore, numerous techniques that increase the chance of survival of the replanted ear segment have evolved in the past. Ear salvage using the modified pocket technique, coverage with temporoparietal fascia flap and skin graft, or recreation of the cartilaginous framework using autologous tissues are some of the described surgical techniques.[3-6]

To enhance survival of a reattached ear segment, Mladick et al. advocated use of the retroauricular pocket principle.[3,7] This technique involves desepithelialization of the amputated part, followed by anatomic reattachment to the amputation stump and then burial in a retroauricular pocket. This simple technique increases the surface area of the avulsed segment in contact with surrounding nutrients, maximizing the probability of "take." The relationship between the dermis and cartilage is preserved, thus minimizing the deformity from cartilage warping. The undisturbed dermis on the involved segment can re-epithelialize spontaneously, negating the need for a skin graft.

Here we present a case of a 35-year-old male with partially amputated ear treated successfully by the non-microsurgical pocket technique described by Mladick. The surgical technique is described in detail by serial photographs, along with the postoperative management and outcome of the patients.

Case Report

A 35-year-old man presented to us at the Yuzuncu Yil University Hospital in April 2014 with complaint of partially right ear detachment during an industrial accident. On physical examination, his vital signs were stable and no other injuries were noted. Evaluation of the right ear revealed a partial posterior amputation leaving the helical root, the concha and the lobule intact. The amputated portion of the auricle was placed in a plastic bag with saline, surrounded by ice, and brought to the emergency room with the individual. The patient was immediately started on intravenous antibiotics (ampicillin/sulbactam 3 g qid plus metronidazole 500 mg qid), and was led to the operating room approximately four hours following the accident.

In the operating room, the wound was thoroughly irrigated and debrided under general anaesthesia. As no vessels could be identified, microsurgical repair was not attempted (Figure-1a). The severed part was cleaned; the edges of both severed part and auricular stump were

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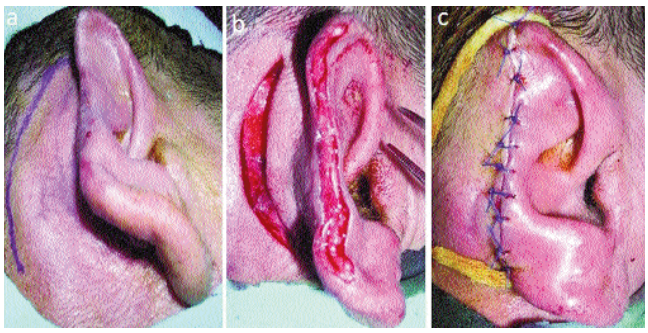

Figure-1: (a) Right ear stump, cut edge is clearly seen. (b) Development of a subcutaneous pocket over the mastoid. (c) Replantation of the ear into the pocket: suture of the cartilage onto the cartilage stump, suture of the skin onto the anterior skin of the stump.

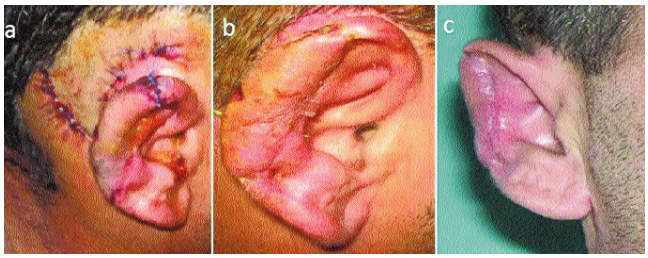

Figure-2: (a) Coverage of the reattached cartilage with local skin flaps. (b) Assessment on postoperative day 21 revealed a completely viable auricle. (c) No complications but reasonable shape and color mismatch have been noted after 3 months of follow-up.

debrided. Both skin surfaces of the severed part were then dermabraded removing the epidermis and keeping the dermis intact. A subcutaneous postauricular pocket was developed, the amputated ear was inserted in its correct anatomical position, its cartilage was attached to the stump cartilage, and the skin of the pocket sutured to the anterior skin of the stump (Figure-1b,c). A light pressure dressing was applied for 14 days. The postoperative treatment protocol included vitamin E (400 IU daily administered orally), aspirin (325 mg daily), and antibiotics.

The patient was hospitalized for seven postoperative days. After two weeks, the reattached ear was freed from the subcutaneous pocket by opening the pocket at the stump and exposing the buried auricle. After exteriorizing the ear, the skin was returned to its old retroauricular bed (Figure- 2a). The dermabraded auricular parts of the anterior and posterior surfaces, which were initially nourished by the enveloping pocket and the mastoid bed, began to re-epithelialize. Assessment on postoperative day 21 revealed a completely viable auricle (Figure-2b). No complications have been noted after 3 months of follow-up (Figure-2c).

Discussion

Although traumatic amputation of the ear is a rare occurrence, many treatment modalities have been used up to date.[1-6] However, none of them appear to have solved the problem in a definite manner.

Microsurgical ear replantation was first reported in 1980 and has since proved to be a reliable method for the management of traumatic ear amputation.[7] However, appropriately sized veins are often not identified and venous drainage must be accomplished with leech therapy or mechanical drainage and synchronous heparin administration.[1] This may result in multiple blood transfusions, with all the associated risks, and prolonged hospitalization.[2] Furthermore, microsurgical ear replantation may require a lengthy operative time and has a significant failure rate.[1,2] Finally, the technical complexity of microsurgical operations requires specialized medical personnel, thus not permitting their use in many centers around the world. The simple reattachment of the ear as a compound graft usually leads to necrosis and total loss of the organ.[4,9] Therefore, many techniques have been advocated in order to maintain the survival of a replanted ear.[4,9] Park et al., described a technique for amputated auricular cartilage burial, by removing all skin from the graft except over the helix area. The denuded cartilage is then sandwiched between a retroauricular flap anteriorly and a facial flap posteriorly. However, the unburied helical skin can undergo necrosis, while three stages are required to achieve a satisfactory result.[4] A similar technique has been proposed by Destro and Speranzini, in which all the skin is removed from the graft except over the concha. Multiple small perforations are made in the cartilage which is then covered with a postauricular flap. A second operation is required for elevation of the ear.[10]

We believe that the technique of Mladick et al., whose principles we followed in our cases, is quite simple and very reliable.[3] This method involved deepithilization of the amputated part, followed by anatomic reattachment to the amputated stump and then burial in a retroauricular pocket. In this way, a larger area of inset and greater surface of contact with the vascular bed was provided for the graft, thus increasing its odds of survival.[3,7] Complications of this technique include lack of spontaneous re-epithelialization, hypertrophic scarring in the region of the auricle and mastoid, and lack of contouring. Shrinkage of the auricle, as well as resorption, have also been reported. In our case we did not experience such complications.

The graft is always in risk of infection, therefore antibiotic treatment with good coverage of aerobes and anaerobes

of the oral flora is necessary, while the importance of meticulous pro and postoperative care of the amputated auricle and the wound must not be underestimated. On the other hand, long hospital stay can be avoided with the use of the Mladick's technique, and, after the first few postoperative days, the individual can be followed on an outpatient basis. However, a second operation will eventually be required for elevation of the ear. The optimal time between the two procedures is unknown. We chose to wait for two weeks in order to enhance the chance of the graft to survive. Mladick's technique is inferior to primary ear repair with regard to shape and colour mismatch. However, the outcome of primary ear salvage is limited by reestablishment and/or preservation of the existing perfusion to the severed tissue, which may be complicated by partial or complete tissue loss.

Conclusion

The Mladick's technique has been used successfully in a case of traumatic ear amputation due to an industrial accident. It is a simple technique, without the need for microsurgery, and produces reasonable aesthetic results. The fact that no surgical revisions were needed encourages us to suggest that this technique may be useful when no microvascular techniques are possible or available.

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