Nonmicroscopic reconstruction of subtotally amputated/torn auricles: Report of 3 cases

Shuaib K. Aremu, FWACS

Abstract

Otolaryngologists are increasingly expected to perform a variety of minor surgical procedures in both elective and emergency situations. Surgical repair of the subtotally amputated/torn auricle, hitherto the realm of plastic surgeons, is a procedure that can be performed both at the clinic and in the emergency room, thereby sparing patients the inconvenience and cost of referral to another subspecialist. Presented in this article are 3 cases of traumatic tearing/amputation of the external ear: 1 caused by a motorbike accident, 1 caused by a human bite, and 1 by a machete. All three ears were successfully reconstructed nonmicrovascularly.

Introduction

Traumatic auricular amputation is not a common event. Nonetheless, it constitutes a difficult challenge for the reconstructive surgeon. Microsurgery can be performed in some cases, but most microsurgical techniques are complex, and their use can only be advocated in specialized centers. Replantation of a severed ear without microsurgery can be a safe alternative as long as a proper technique is selected.[1]

Various nonmicrosurgical techniques have been described to deal with amputated ears, including simple composite grafting[2,3] and the Baudet modification, using fenestration of the cartilage.[4,5] However, partial or total necrosis is common, and late deformity has been reported.[3,5]

A staged approach has also been advocated, in which the ear is debrided, reattached, and buried in a postauricular skin pocket before later exteriorization.[6] Others have banked the auricular cartilage at more distant sites or used autogenous cartilage grafts. However, these reconstructive options seldom accurately reproduce the delicate chondrocutaneous architecture of the normal pinna. The difficulty of this reconstitution is mainly related to the unique anatomic structure of the auricle, with fine skin covering, a thin and elastic cartilage, and small vessels responsible for its perfusion.[1,7]

In this article, we describe our experience with 3 cases and review the international literature.

Case reports

Patient 1. A 12-year-old boy who was a passenger on a motorbike that had a head-on collision with a car had sustained a subtotal amputation of his right pinna. Only a strip of skin about 2 cm wide, with 2 vessels, connected the helical rim to the parietal region (figure). The patient was immediately started on intravenous antibiotics (ampicillin/sulbactam plus metronidazole) and was taken to the operating room approximately 2 hours after the accident.

It was decided to reattach the ear since there were still identifiable vascular supplies. Under general anesthesia, both the temporal stump and the amputated stump of the ear were meticulously cleaned with rigorous use of normal saline and povidone iodine 10%. No injection of topical vasoconstricting agents was used.

The anterior skin of the temporal stump was sutured in layers to the amputated stump of the ear with Vicryl 3-0 sutures. The same thing was done on the skin of the posterior aspects of the stump. The external auditory canal was stented to maintain its patency. A firm dressing was applied to prevent edema of the auricle. The ear completely healed, and sensation returned completely after about 2 weeks.

Patient 2. A 31-year-old man presented to our department after partial amputation of his right ear by a human bite during a misunderstanding with his spouse. The superior one-third of the helix was detached from

From the Department of Otorhinolaryngology, University of Ilorin Teaching Hospital, Ilorin, Kwara State, Nigeria.
Correspondence: Dr. Shuaib K. Aremu, Department of ORL, University of Ilorin Teaching Hospital, PO Box 685, Ilorin, Nigeria. Email: shuaib.aremu@gmail.com

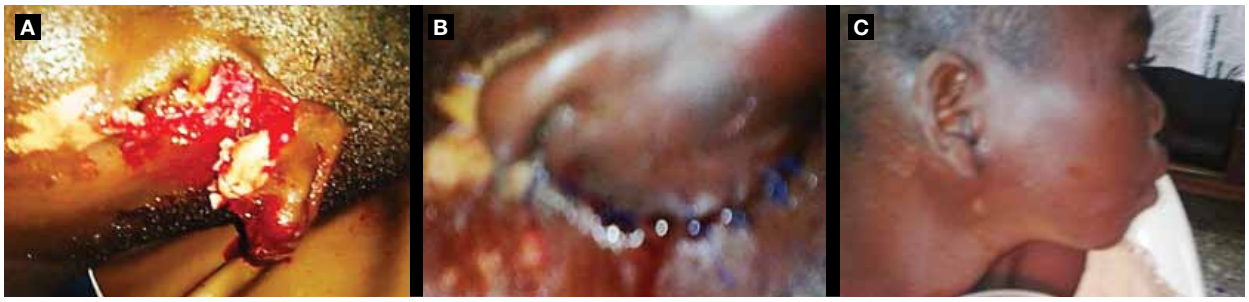

Figure. Patient 1. ***A:*** *Preoperative anterior view shows that only a strip of skin about 2 cm wide, with 2 vessels, connects the helical rim to the parietal region.* ***B:*** *After debridement of the wound margins, the wound is sutured primarily.* ***C:*** *Postoperative anterior view shows that the auricle has healed well without a vascular anastomosis.*

its root. Teeth marks could be seen across the upper pole of the amputated part. The remaining portion was still attached to the other auricular parts.

As with patient 1, the operation started within 2 hours of injury with debridement, but this time after the administration of a local anesthetic by a regional block, using 1% plain lidocaine (1 to 2 ml). The greater auricular nerve was blocked by depositing the solution subcutaneously between the mastoid process and the descending ramus of the mandible, using a 27-gauge needle. The rest of the solution was deposited just posterior and anterior to the ear lobe, to ensure adequate anesthesia.

Again, as in patient 1, the repair was done in layers and firm compression dressing applied. The patient was given antibiotics, but no other drugs such as heparin or prostaglandin preparations. The wound healed completely without complication.

Patient 3. A 45-year-old farmer who was involved in a fight sustained partial amputation of his left pinna by a machete. The lobule and lower one-third of the helix were detached from the root. He presented about 1 hour after the incident and was started on intravenous cefuroxime and metronidazole. Within 3 hours of the incident, he underwent reconstruction under a local anesthetic, as did patient 2.

Auricular edema was present for about 4 days; it later subsided with the use of antibiotics and antiinflammatory drugs. The wound completely healed after about 3 weeks.

Discussion

The first successful replantation of an ear was reported by Pennington et al, using microvascular anastomosis, in 1980.[8] More than 25 other cases have subsequently been reported.[9] Microvascular surgery has since proved to be a reliable method for the management of traumatic ear amputation.

Successful microsurgical revascularization of amputated auricles has been performed using three different techniques: vein grafts, primary vascular repair, and repair by means of pedicled superficial vessels.[7,10] However, appropriately sized veins often are not available, and venous drainage must be accomplished with leech therapy or mechanical drainage and synchronous heparin administration.[7,10] This may result in multiple blood transfusions, with all the associated risks, and prolonged hospitalization.[7,10] Furthermore, microsurgical ear replantation may require lengthy operative time and has a significant failure rate.[10] Finally, the technical complexity of microsurgical operations requires specialized medical personnel, thus not permitting their use in many centers around the world.[11,12]

In our 3 cases the ischemic intervals were short; furthermore, the ischemic tolerance of the ear is probably generous, as there is little muscle in the pinna. These factors, coupled with the fact that some of the vessels were preserved in patient 1, made it possible to achieve results without microvascular surgery.

Although chances of survival are considered to be good for a subtotally amputated auricle, provided that attachment is maintained, an unexpectedly small number of cases have been described.[13-16] Tomono and Hirose reported 2 cases.[16] In their first case, the skin attachment to the lobule measured about 1.5 × 3 cm. After debridement of the wound margin, the auricle was sutured. Komuro and Kawanabe described a patient in whom the lobule remained attached by a strip of skin about 1 cm wide.[14] Clodius described two patients.[13] The first had a skin attachment that was about 3.5 cm wide at the posterior aspect and lower side of the auricle. The other patient had an attachment measuring about 3 cm wide at the posterior aspect and upper side of the auricle. Clodius also used cooling treatment, and both patients recovered completely.

The cases reported in the literature and our own experience indicate that the interval between injury and treatment should be as short as possible if the outcome in a patient with a subtotally amputated auricle is to be good. Debridement is an important step in reconstruction; however, the optimal extent of the debridement remains controversial. We think that the margins of crush wounds should be debrided whenever possible. This is an important factor in maintaining appropriate, rapid blood flow after suturing to ensure normal wound healing. Of course, the region around the remaining skin attachment must be treated conservatively. After debridement, congested sites should be resected in accordance with the vascular networks described by Park et al,[17,18] taking care not to damage the overall shape of the auricle.

In conclusion, microsurgery can be performed in some cases, but most microsurgical techniques are complex and their use can only be advocated in specialized centers. However, replantation/reattachment of a severed ear without microsurgery can be a safe alternative as long as a proper technique is selected, as demonstrated by the 3 cases presented.

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