

Total Avulsed Ear Management With Radial Forearm Free Flap

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Avulsive injuries to the ear are extremely challenging to treat. The literature documents numerous ways to manage such injuries. This report describes a case of total auricular cartilaginous avulsion that occurred during a motor vehicle accident. The avulsed segment had an ischemia time longer than 8 hours by the time of presentation at the authors' tertiary care facility. The avulsed segment was de-epithelialized and embedded into the volar forearm. After a healing period of 6 months, a radial forearm free flap was harvested and the ear was reconstructed. After ensuring good flap uptake and adequate primary healing, the flap was debulked and reshaped at 4 months after inset.

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Report of Case

A 26-year-old man presented to the emergency room of the KRL General Hospital (Islamabad, Pakistan) after a motor vehicle accident 8 hours previously. The patient, while sitting in the passenger seat, had a head-on collision with a truck, after which the vehicle slid into a shallow pit. His avulsed left ear was located by a passerby, placed in a plastic bag of automobile spare parts, and given to the ambulance staff. The ambulance staff did not take any additional tissue preservation measures, such as placing the ear in a saline-soaked gauze or ice pack. The patient was evacuated from the site of the accident and taken to a primary care facility. After stabilization, he was referred to the authors' maxillofacial tertiary care center for further management.

Apart from the ear injury, detailed examination disclosed multiple nondisplaced rib fractures. After consultation of the on-call maxillofacial consultant with the anesthesiologist, it was decided to take the patient to the operation room to manage his wounds.

Oropharyngeal intubation was performed and positive pressure ventilation was avoided to prevent any sequelae of the nondisplaced rib fractures. The left avulsed ear segment (Fig 1A) was covered in dirt and grass from the site of the accident. The ischemia time was longer than 9 hours at this stage. The ear cartilage with the overlying skin was completely sheared off, with ragged skin margins. The left ear area (Fig 1B) showed a ragged soft tissue avulsive wound with the lobe still attached, albeit hanging by a small attachment.

The aim of treatment was to preserve the ear cartilage and provide skin for future coverage. The volar surface of the nondominant left hand was selected for later use for a radial forearm free flap if the cartilage uptake was uneventful.

The avulsed ear was washed with a copious amount of saline and 7.5% povidone solution and thoroughly examined (Fig 2A). It was completely de-epithelialized and all foreign bodies were removed under magnification (Fig 2B). A suprafascial plane was dissected in

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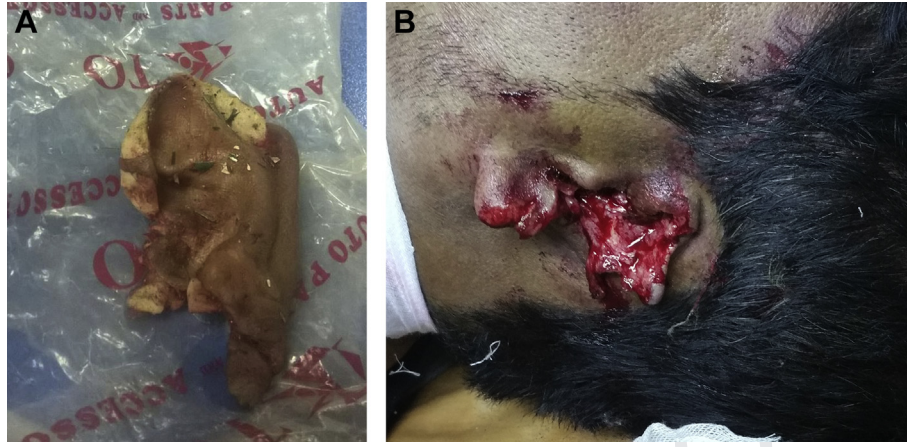


FIGURE 1. A, Avulsed ear transported in a plastic bag of automobile spare parts. B, Avulsed wound of the left ear exhibiting complete auriculo-cartilaginous avulsion.

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the volar surface of the forearm, with the incision line performed to allow subsequent skin incision for the free flap (Fig 2C). The cartilage was placed so that the radial artery free flap would exit from the caudal surface to facilitate anastomosis in the superolateral neck vessels. An active drain was placed to ensure good tissue approximation over the cartilage and prevent hematoma. The ear skin was sutured with 4-0 and 5-0 Prolene while preserving all available vital tissues. A nasal intubation tube stent was placed in the external auditory meatus to keep it patent. Postoperative intravenous analgesics and antibiotics were given. The patient was discharged from the hospital after 5 days with strict instructions to avoid pressure on the left volar surface of the forearm.

Sutures from the ear area and left arm were removed at postoperative day 10. Regular follow-up was performed to watch for any signs of infection at the site of injury and at the embedded ear cartilage.

At 6 months after the injury, healing was found to be sufficient for the next step of radial artery-based free tissue transfer. The cartilage was marked for correct

placement (Fig 3A). The contralateral ear was compared for correct height and position of the flap. A modified Blair incision (Fig 3B) was made in the ipsilateral neck and the facial artery, facial vein, and retromandibular vein were identified for anastomosis. A fasciocutaneous radial forearm free flap was harvested while preserving the peritenoneum, taking approximately 5 × 8 cm of overlying skin (Fig 3C). The harvested flap was examined and showed adequate uptake of the cartilage framework (Fig 4A). The flap was inset and the cartilage was sutured to the retroauricular fascia using 2-0 Prolene sutures. The flap was sutured to the remaining ear skin with 4-0 Prolene (Fig 4B). The radial artery was anastomosed to the facial artery, the vena comitantes was anastomosed to the facial vein, and the cephalic vein was anastomosed to the retromandibular vein. A split-thickness skin graft from the anterior thigh was placed over the forearm wound. The flap was monitored in the postoperative phase using standard clinical markers and showed optimal healing. The patient was discharged on postoperative day 6 and

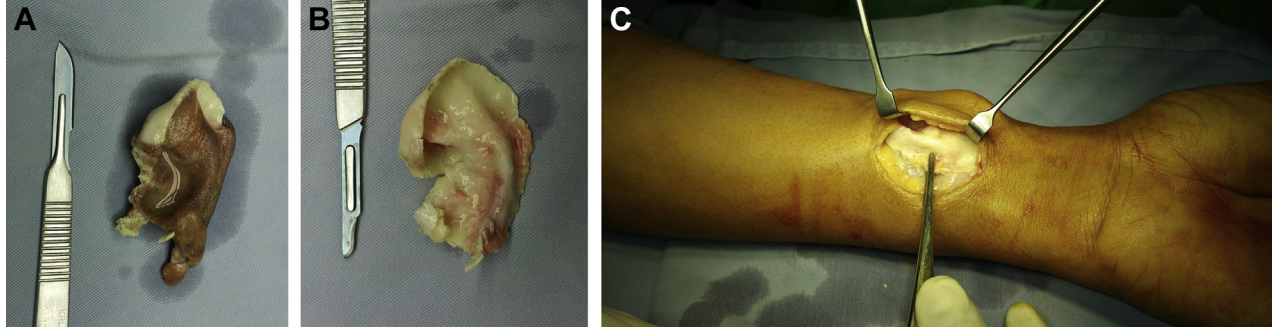


FIGURE 2. A, Avulsed ear after thorough cleaning. B, De-epithelialization to expose cartilage. C, Cartilage burial in the volar surface of the forearm.

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