



AURICULAR RECONSTRUCTION AFTER A HORSE BITE INJURY

Rekonstrukcja małżowiny usznej
po urazie powstałym w wyniku
ugryzienia przez konia



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Abstract

The paper presents a case of a 71-year-old female patient admitted to the Department due to severe damage to the right ear lobe as a result of a horse bite. The patient was qualified for ear reconstruction using an autologous cartilage graft and an adipocutaneous flap, which resulted in a satisfactory aesthetic and functional outcome. The intervention consisted of two stages of reconstruction, separated by a three-month interval. The described case demonstrates the positive outcomes of this technique and its effectiveness in reconstructing various types of ear injuries.

Streszczenie

W pracy przedstawiono przypadek 71-letniej pacjentki, która została przyjęta na oddział z powodu zaawansowanego uszkodzenia prawej małżowiny usznej w wyniku ugryzienia przez konia. Pacjentkę zakwalifikowano do rekonstrukcji małżowiny z zastosowaniem przeszczepu autologicznej chrząstki oraz płata skórno-tłuszczowego, co pozwoliło na uzyskanie zadowalającego wyniku estetycznego i funkcjonalnego. Zabieg obejmował dwa etapy rekonstrukcji, oddzielone trzymiesięczną przerwą. Przedstawiony przypadek potwierdza korzystne efekty zastosowanej techniki i utwierdza w przekonaniu, że tego typu metody mogą być skuteczne w rekonstrukcji różnego rodzaju urazów małżowiny usznej.

Keywords: ear reconstruction; plastic surgery; autologous ear cartilage graft; bite wounds; ear wounds

Słowa kluczowe: rekonstrukcja małżowiny usznej; chirurgia plastyczna; przeszczep autologicznej chrząstki ucha; rany kątowe; rany małżowiny usznej

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Introduction

Injuries inflicted by animals are a serious public health problem worldwide, but auricular bites by a horse are rarely reported. The annual incidence of horse and donkey bites is estimated at 7.8/100,000 [1]. Approximately half of Americans will experience bites in their lifetime, with the annual cost of treatment estimated to exceed \$100 million. Potential complications include disfigurement, amputation, and infection. Effective treatment

requires prompt medical evaluation and may involve surgical intervention as well as prophylactic antibiotic therapy [2].

The auricle, composed of skin and cartilage, plays an important role in facial aesthetics. As the external part of the ear, the auricle is particularly vulnerable to trauma and deformities due to its prominent and exposed position. Auricular deformity poses a significant challenge to the surgeon.

Selecting a surgical strategy for traumatic ear defects is challenging due to significant variability in defect size, shape, and the condition of the surrounding skin. The choice of reconstructive technique depends on the patient's individual characteristics, the extent of soft tissue loss, and the location of the auricular defect [3].

This paper presents a case of a 71-year-old female patient who sustained right auricle injury following a horse bite.

Many auricular reconstruction techniques are employed in plastic surgery. The choice of method should be individualized based on the defect's size and location, the condition of surrounding skin tissues, patient expectations, and the surgeon's experience.

Case report

A 71-year-old patient presented to the Hospital's Emergency Department (ED) and was subsequently referred to the Department of Plastic Surgery, Reconstructive Surgery, and Burn Treatment due to a horse bite injury. She was urgently qualified for the first stage of auricular reconstruction. Examination revealed a defect involving the auricular skin and cartilaginous structures, including the helix, antihelix, and antitragus (Fig. 1).

The first step involved reconstruction of the skin defect using an adipocutaneous flap mobilized from the postauricular area to cover the exposed cartilage and ensure vascularization in the reconstructed area.



Figure 1. The ear defect on admission

The procedure was performed under general anaesthesia. The surgery proceeded as follows: a fragment of the auricle and the top part of the cartilage were infiltrated with lignocaine. An incision line was made on the skin behind the ear to lift and move the adipocutaneous flap forward. The tissues were then dissected along the designated lines. The damaged part of the auricle, including the exposed cartilage, was positioned onto the surface of the skull behind the ear and temporarily fixed with an absorbable suture. The tissue defect was covered using the elevated flap, which was trimmed to match the shape of the defect. Full coverage of the defect was achieved. During the procedure, the ear flap showed no signs of ischaemia. Both the flap and the surrounding skin were secured with sutures, and haemostasis was satisfactorily maintained (Fig. 2, Fig. 3).

The second stage of reconstruction was performed three months after the initial procedure. Its goal was to repair the auricular cartilage defect and reposition the auricle away from the head to achieve symmetry with the opposite ear. A cartilage graft was harvested from the other auricle, along with a free split-thickness skin graft (FTSG) taken from the thigh. The procedure was performed under general anaesthesia and began with an incision along the planned flap line, intended for the reconstruction of the posterior surface of the right auricle. The tissues were dissected to the edge of the ear helix, haemostasis was achieved, and the cartilage defect was identified and measured. A cartilage fragment measuring approximately 4 cm in length and 7 mm in thickness was harvested from the left ear (Fig. 4).



Figure 2. The outcomes after the first stage of ear reconstruction, two days post-surgery



Figure 3. The outcomes after the first stage of ear reconstruction, three weeks post-surgery

The wound was closed using a continuous suture. The harvested cartilage graft was carefully prepared, adjusted, and sutured into the auricular defect (Fig. 5).

The tissues were covered with the previously created adipocutaneous flap and sutured. A free split-thickness skin graft, harvested from the right thigh, was placed over the skin defect behind the right ear (Fig. 6). Haemostasis was adequate, and a dressing was applied.

The patient was discharged on day 3 postoperatively in good general condition, with appropriate postoperative recommendations.

Two weeks after the surgery, the patient attended a follow-up visit, during which the skin sutures were removed (Fig. 7).

Discussion

Our patient underwent auricular reconstruction using autologous cartilage transplantation, which is reported in the literature as an effective approach. In cases of traumatic auricular damage, reconstructive techniques vary depending on the extent of the defect, the location of the injury, and the availability of tissue resources.

In 2018, Habiba et al. described treatment options for partial auricular reconstruction, highlighting their benefits for patients' quality of life. The prospective study involved individuals with traumatic partial auricular de-



Figure 4. Cartilage graft harvested from the left ear

fects. Reconstructions were done using various techniques, including simple local skin flaps, tubular flaps, and cartilage scaffolds from auricular or rib cartilage, covered with a local skin flap.

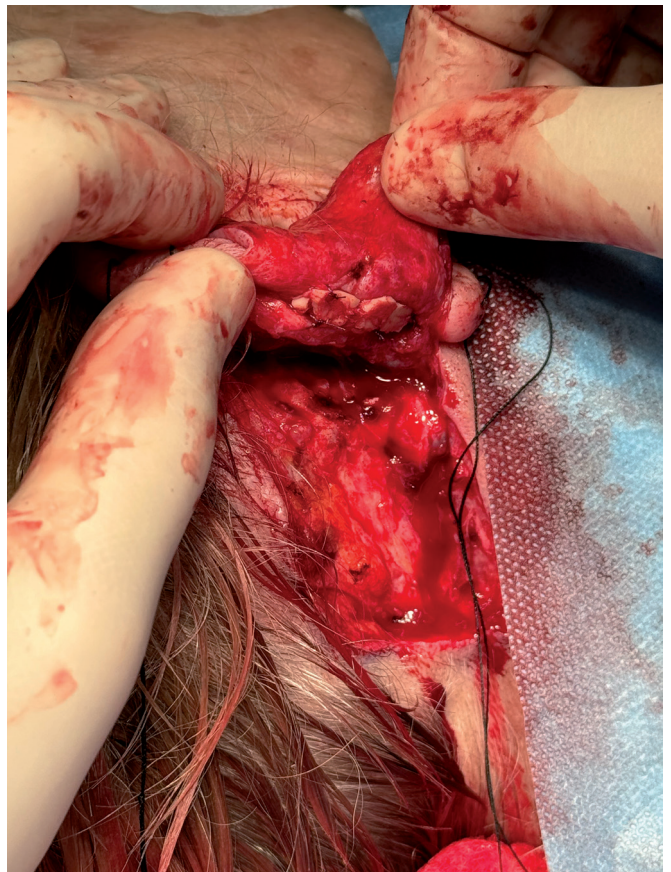


Figure 5. Grafted cartilage placed in the right ear defect



Figure 6. Final outcome after the second stage of ear reconstruction

The study demonstrated that retroauricular and mastoid skin flaps, with or without a cartilage scaffold, produced favourable aesthetic and functional outcomes. These ear reconstruction techniques resulted in fully satisfactory functional outcomes and contributed to enhanced patient confidence [4].

In 2023, Hajebian et al. reported a case of complete auricular avulsion in a child as a result of a dog bite. The ear was reconstructed using prelaminated native auricular cartilage. Based on their study, the authors concluded that in cases of traumatic auricular avulsion with preserved native cartilage, successful reconstruction can be achieved using a two-stage technique involving prelaminated native ear cartilage. This modality involves creating a posterior ear pocket and placing a skin graft over the cartilage [5].

Autologous auricular cartilage transplantation for traumatic defects allows for a satisfactory outcome, restoring an acceptable appearance of the reconstructed auricle.

In their study in 2024, Singh et al. utilised rib cartilage grafts to reconstruct larger auricular defects. They demonstrated that this approach offers structural stability and satisfactory aesthetic outcomes, though it requires additional surgical steps [6].

In 2006, Sclafani et al. described various reconstructive techniques, including retroauricular skin flaps. The study compared the aesthetic and functional outcomes of various modalities, highlighting the effectiveness of combining cartilage grafts with local flap coverage [5].

A 2022 study evaluated the effectiveness of complex microscopic techniques for auricular reconstruction



Figure 7. Final outcome three weeks after the second stage of ear reconstruction

following trauma. Tissue transfer and reconstruction techniques using microsurgery enabled precise restoration of the ear's anatomical structures. The study demonstrated high patient satisfaction and effective graft integration with surrounding tissues. This approach is particularly recommended for more complex defects [4].

In 2021, a study was conducted using modern biopolymer scaffolds for auricular reconstruction. The scaffolds were shaped to match the anatomical structure of the damaged cartilage and covered with skin grafts. Positive outcomes were particularly observed in cases with limited availability of autologous tissue. Biopolymer scaffolds demonstrated both satisfactory aesthetic and functional outcomes, with good biocompatibility and integration into surrounding tissues [7].

Conclusions

Reconstruction of the auricle following injuries such as a horse bite is a complex process requiring an individualized approach. In the described case, the use of autologous cartilage transplantation combined with an adipocutaneous flap achieved satisfactory aesthetic and functional outcomes. Literature data confirm the effectiveness of these techniques in reconstructing various types of auricular injuries, with the choice of method depending on the size and location of the defect, as well as the condition of the surrounding tissues.

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