

## Three cases of successful microvascular ear replantation after bite avulsion injury

Fabrizio Schonauer, James Blair, Dominique Moloney, T. C. Teo & Mark Pickford

**To cite this article:** Fabrizio Schonauer, James Blair, Dominique Moloney, T. C. Teo & Mark Pickford (2004) Three cases of successful microvascular ear replantation after bite avulsion injury, *Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery*, 38:3, 177-182, DOI: [10.1080/02844310310016269](https://doi.org/10.1080/02844310310016269)

**To link to this article:** <http://dx.doi.org/10.1080/02844310310016269>



Published online: 08 Jul 2009.



Submit your article to this journal [↗](#)



Article views: 16



View related articles [↗](#)

THREE CASES OF SUCCESSFUL MICROVASCULAR EAR REPLANTATION AFTER  
BITE AVULSION INJURY

Fabrizio Schonauer, James W. Blair, Dominique M. Moloney, T. C. Teo and Mark A. Pickford

From the Department of Plastic Surgery, Queen Victoria Hospital, East Grinstead, UK

Scand J Plast Reconstr Surg Hand Surg 2004; 38: 177–182

**Abstract.** We present three cases of sub-total amputation of the external ear caused by bite avulsion injury. The ears were all successfully replanted despite us being unable to perform a venous anastomosis in one case. These outcomes support attempted microsurgical replantation for total or sub-total amputations of the ear, as successful replantation is the most effective surgical option.

**Key words:** ear replantation, microsurgery.

**Correspondence to:** M. A. Pickford, MS FRCS(Plast), Queen Victoria Hospital NHS Trust, Holtye Road, East Grinstead, West Sussex RH19 3DZ, UK. (Tel: 01342 410210. Fax: 01342-315512. E-mail: pickford@picky.demon.co.uk)

Accepted 3 January 2003

Various non-microsurgical techniques have been described to deal with amputated ears, including simple composite grafting (6, 7) and the Baudet modification using fenestration of the cartilage (1, 2). However, partial or total necrosis is common and late deformity has been reported (2, 7). A staged approach has also been advocated, in which the ear is dermabraded, reattached, and buried in a postauricular skin pocket before later exteriorisation (8). 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, and require multiple operations, as do osseo-integrated prostheses.

Microsurgical replantation of the ear is technically challenging, because of the small calibre of the vessels and the difficulty in gaining surgical access to the recipient vessels, and relatively few successful cases have been reported. As a result it is often assumed to be a waste of time. However, replantation requires only a single, albeit prolonged, procedure, and gives the optimum aesthetic outcome.

We present three cases of successful microvascular replantation of an ear. Two replantations were carried out in heavy smokers, and all were performed for bite avulsion injuries, which are considered far from ideal for such surgery. The successful outcome in these

unpromising cases may encourage others to consider replantation for amputation of an ear.

## CASE REPORTS

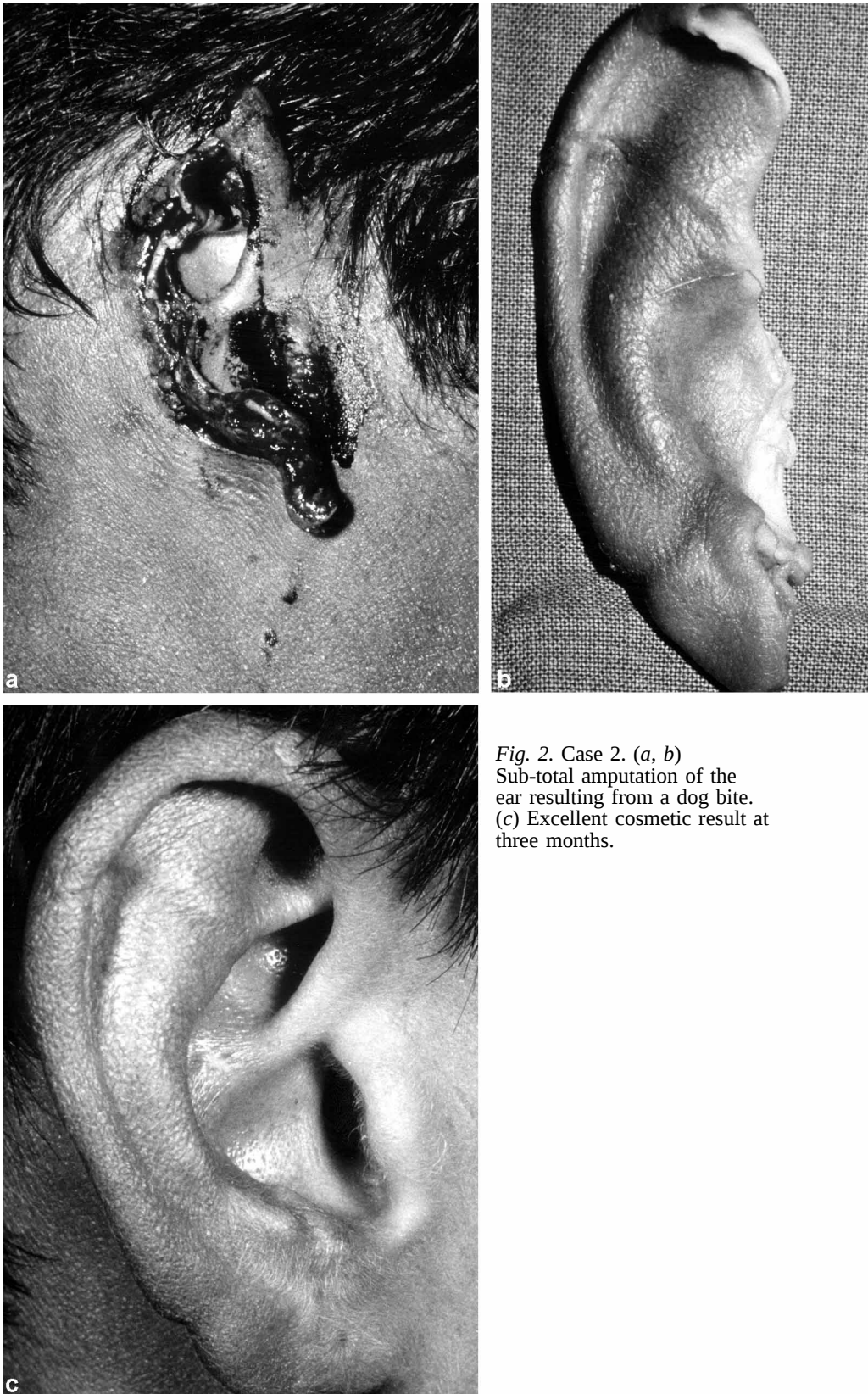
*Case 1*

A 41-year-old man was referred to our unit after amputation of his right ear by a human bite during an altercation (Fig. 1a, b). The entire pinna was lost, except for a small part of the lobule, and teeth marks could be seen across the upper pole of the amputated part. The patient, who was a heavy smoker, had consumed amphetamines, ecstasy, and a large quantity of alcohol. He requested that all reasonable efforts be made to reattach the ear, which had been appropriately preserved in a saline-soaked gauze and immersed, within a plastic bag, in ice slush.

Side-table dissection of the amputated part revealed an artery of reasonable diameter in the subcutaneous tissue on the posterior surface of the upper pole, and a vein was identified on the posterior surface close to the lobe. The patient was given a general anaesthetic and, after debridement of the stump, the ear was loosely reattached with sutures at the upper and lower poles and folded forward to allow access to the posterior surface/postauricular sulcus (Fig. 1c). The artery was anastomosed end-to-end, using 10/0 nylon, to a branch



*Fig. 1.* Case 1. (a, b) Sub-total amputation of the ear resulting from a human bite. (c) The ear is loosely reattached and folded forward for ease of access during microsurgery. (d) Good cosmetic result at six months.



*Fig. 2. Case 2. (a, b)*  
Sub-total amputation of the  
ear resulting from a dog bite.  
(c) Excellent cosmetic result at  
three months.

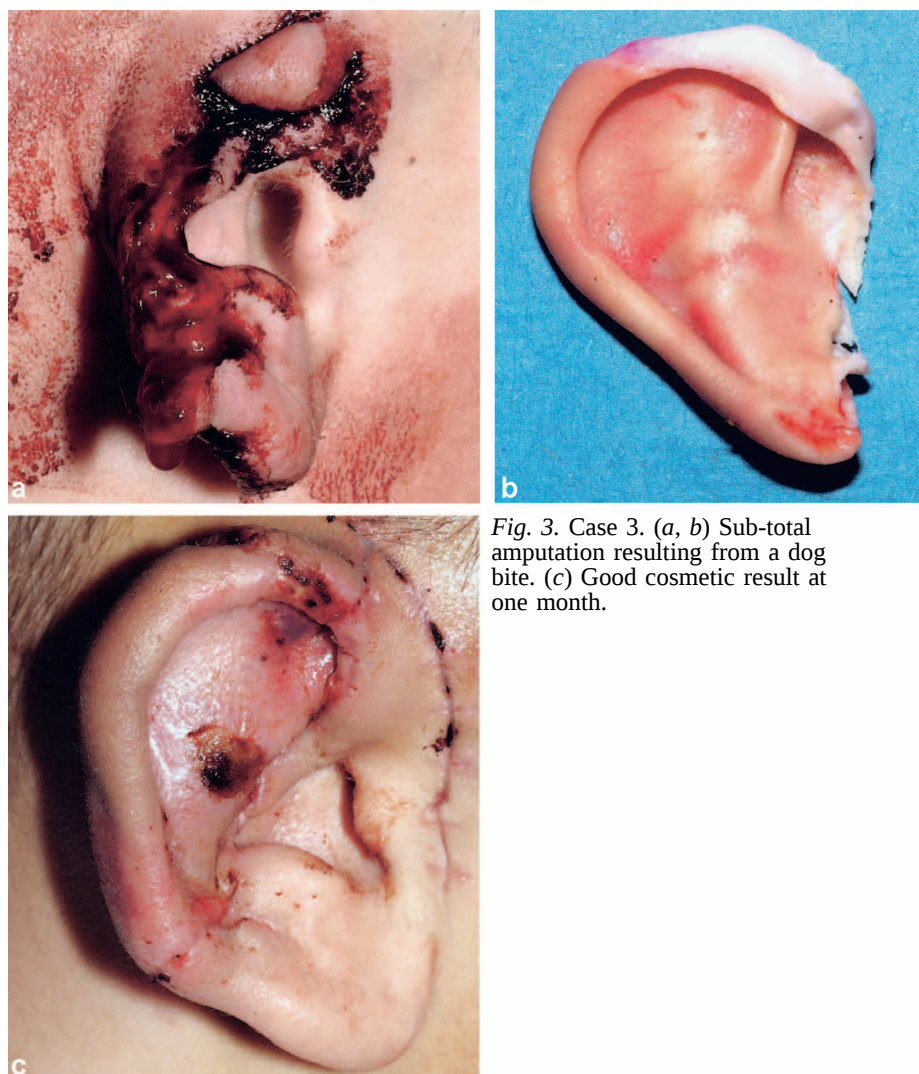


Fig. 3. Case 3. (a, b) Sub-total amputation resulting from a dog bite. (c) Good cosmetic result at one month.

of the superficial temporal artery that had been mobilised sufficiently to reach the posterior ear. The vein was anastomosed end-to-end to a postauricular vein using 11/0 nylon. The cartilage was sutured with polyglactin 910 (Vicryl) and the skin closed with 6/0 nylon. The operation lasted approximately 3.5 hours.

Venous congestion developed in the ear within a few hours of surgery, but responded to intermittent leeching over the next few days. An infusion of dextran 40 (30 ml/hour) was given for five days. It was necessary to transfuse several units of packed cells during his admission. As can be seen, the ear survived completely, with an excellent cosmetic result at six months (Fig. 1d).

#### Case 2

A 29-year-old man presented with total amputation of the left pinna caused by dog bite (Fig. 2a, b), again with appropriate preservation of the ear.

As with case 1, the operation started with side-table debridement, which revealed bite marks and signs of avulsion. Microsurgical dissection showed two arteries that were suitable for microvascular anastomosis, one on the posterior surface of the inferior ear, and one anteriorly at the conchal fossa.

Under general anaesthetic the ear was loosely reattached and folded forward as above. The vessel that had been located posteriorly was anastomosed end-to-end using 10/0 nylon to an arterial branch lying in the postauricular sulcus. However, the inflow was not considered adequate and the vessel that had been located anteriorly in the conchal fossa was anastomosed to a branch of the superficial temporal artery. On completion of the second arterial anastomosis the perfusion of the ear improved immediately. However, even after arterial inflow was established, no suitable veins could be found for anastomosis, so the posterior skin of the replanted ear was partially shaved to

encourage bleeding and a decision was made to apply leeches to the ear post-operatively. The skin wounds were closed with fine nylon after approximately five hours of operating.

The first leeches were applied in the recovery room and more were applied intermittently for six days. An infusion of dextran 40 was given as for the first patient. The present patient had a total of nine units of packed cells transfused during his admission. The ear survived completely and looked satisfactory on follow up at three months (Fig. 2c).

### Case 3

A 15-year-old boy who was a heavy smoker had the upper two-thirds of his right pinna bitten off by a police dog, with appropriate preservation of the amputated portion (Fig. 3a, b). As with the first two cases, debridement and micro-dissection demonstrated an appropriate artery and vein on the superior posterior surface. Under general anaesthetic, the parietal branches of the superficial temporal artery and vein were mobilised as recipient vessels and brought inferiorly into the posterior sulcus. End-to-end anastomoses were performed using 11/0 nylon and resulted in immediate satisfactory perfusion. The operation lasted six hours.

A postoperative infusion of dextran 40 was given over five days, together with a daily dose of aspirin 75 mg. No blood transfusion was required. On day 5, venous congestion developed, which resolved after 24 hours of treating with leeches. The ear survived completely, with a satisfactory early cosmetic appearance. (Fig. 3c).

## DISCUSSION

The first successful replantation of an ear was reported by Pennington et al. in 1980 (11). More than 25 other cases have subsequently been reported (5). Besides illustrating the immediate success of replantation, these cases have shown (like ours) that the natural appearance of the pinna remains intact. This contrasts with the late deformity observed after composite grafting (2, 7), although there are exceptions (16).

In our cases the ischaemic intervals were short, the amputated parts were appropriately preserved, and the patients were enthusiastic for replantation to be attempted. Although the injuries were bite avulsions, preliminary side-table assessment and micro-dissection of the amputated part facilitated a decision as to whether the part was replantable. The ischaemic tolerance of the ear is probably generous, as there is little muscle in the pinna, but the presence of a second surgeon to explore the recipient bed would potentially reduce the ischaemic interval.

In each case we found vessels easier to locate on the posterior surface of the pinna. We did not encounter difficulties with mismatch in the calibre of the vessels during anastomosis, but standard microsurgical manoeuvres may be used to overcome this problem if it arises (4, 15). Other authors have also reported success after managing an arterial anastomosis alone, using medicinal leeches in the postoperative period (3, 12–14) or a wick (10). This is not ideal because it lengthens the hospital stay, is tiring for the patient, and increases the risk of infection, but it is a reasonable fallback when suitable veins cannot be found. We were able to mobilise local vessels or longer pedicles based on the superficial temporal axis and avoid the use of bridging vein grafts, but others have found the latter useful.

Although we feel a serious attempt at microvascular replantation may be appropriate in some cases of traumatic amputation of an ear, it is important that the preliminary surgical efforts should not prejudice the opportunities for secondary reconstruction should this be required; the postauricular skin and temporoparietal fascia should be preserved if at all possible. End-to-end anastomosis to the main superficial temporal vessels should be avoided if possible to preserve the vascularity of the superficial temporal fascia (9).

In conclusion, despite the technical difficulties, we believe it is worthwhile to attempt microvascular replantation of an amputated ear even when this has been caused by bite injury with avulsion, and even when the compliance of the candidate is not guaranteed. If successful, a replant is superior to any other means of reconstruction.

## ACKNOWLEDGEMENTS

We thank John Davison, registrar in plastic surgery, and the Medical Illustration Department of the Queen Victoria Hospital NHS Trust for their help in preparing the photographs for this paper.

## REFERENCES

1. Baudet J. Successful replantation of a large severed ear fragment. *Plast Reconstr Surg* 1973; 51: 82.
2. Baudet J, Tramond P, Goumain A. A propos d'un procede original de reimplantation d'un pavillon de l'oreille totalment separe. (An original procedure for replantation of a completely amputated portion of an ear). *Ann Chir Plast* 1972; 17: 67–72.
3. Chalain T de, Jones G. Replantation of the avulsed pinna: 100% survival with a single arterial anastomosis and substitution of leeches for a venous anastomosis. *Plast Reconstr Surg* 1995; 95: 1275–1279.
4. Juri J, Irigaray A, Juri C, Grilli D, Mira Blanco C, Vasquez GD. Ear replantation. *Plast Reconstr Surg* 1987; 80: 431–434.

5. Kind GM. Microvascular ear replantation. *Clin Plast Surg* 2002; 29: 233–248.
6. Lewis E, Fowler JR. Two replantations of severed ear parts. *Plast Reconstr Surg* 1979; 64: 703–705.
7. McDowell F. Successful replantation of a severed half ear. *Plast Reconstr Surg* 1971; 48: 281–283.
8. Mladick RA, Horton CE, Adamson JE, Cohen BI. The pocket principle: a new technique for the reattachment of a severed ear part. *Plast Reconstr Surg* 1971; 48: 219–223.
9. Mutimer KL, Banis JC, Upton J. Microsurgical reattachment of totally amputated ears. *Plast Reconstr Surg* 1987; 79: 535–541.
10. Nath RK, Kramer BA, Azizzadeh A. Complete ear replantation without venous anastomosis. *Microsurgery* 1998; 18: 282–285.
11. Pennington DG, Lai MF, Pelly AD. Successful replantation of a completely avulsed ear by microvascular anastomosis. *Plast Reconstr Surg* 1980; 65: 820–823.
12. Sadove R. Successful replantation of a totally amputated ear. *Ann Plast Surg* 1990; 24: 366–370.
13. Safak T, Ozcan G, Kecik A, Gursu G. Microvascular ear replantation with no vein anastomosis. *Plast Reconstr Surg* 1993; 92: 945–948.
14. Talbi M, Stussi JD, Meley M. Microsurgical replantation of a totally amputated ear without venous repair. *J Reconstr Microsurg* 2001; 17: 417–420.
15. Turpin I. Microsurgical replantation of the external ear. *Clin Plast Surg* 1990; 17: 397–404.
16. Yotsuyanagi T, Yamashita K, Watanabe Y, Urushidate S, Yokoi K, Yukimasa S. Reconstruction of a subtotally amputated auricle: a case report. *Scand J Plast Reconstr Surg Hand Surg* 2001; 35: 425–428.