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CASE REPORT

Successful re-plantation of an amputated nasal segment by supermicrosurgery: A case report and review of the literature[☆]

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Summary The nose is a critical aesthetic subunit of the face, but because of the difficulties in anastomosis of the small-sized arteries and veins, several cases of nasal replantation have been reported. Using supermicrosurgical techniques, we successfully replanted a patient's nasal segment which had been amputated by a falling sharp metal pipe. The result was excellent both aesthetically and functionally, and the patient was very satisfied.

The nose is located at the centre of face and is thus important aesthetically. The nose also has functions in olfaction, respiration, humidification, filtration, temperature regulation and phonation. However, the nose protrudes from the face and is readily injured by trauma, and in injured cases, reconstruction of the nose is essential. Recently, with the development of microsurgery, microsurgical replantation of the amputated nose has been reported.^{1–11} We performed successful replantation of the nasal alar and tip that were completely amputated and smaller in size than previous reports, using a supermicrosurgical technique.

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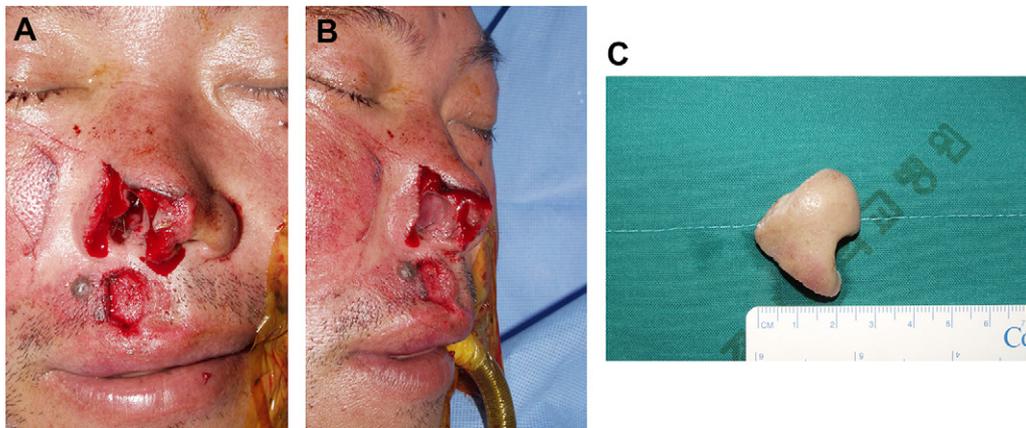


Figure 1 Preoperative views. Anterior (A) and three quarter (B) views of the patient. (C) Anterior surfaces of the amputated nasal segment.

Case report

A 48-year-old man was admitted to our hospital following a complete nasal segment amputation by a falling metal pipe. The amputated segment, 2.5×2.6 cm in size, included the right alar with the right alar cartilage, most of the nasal tip and one-third of the anterior part of the columella (Figure 1).

The amputated nasal segment was assessed while the patient was put under general anaesthesia, which revealed a lateral nasal artery approximately 0.7 mm in diameter in the lateral aspect of the amputated segment. However, the veins could not be identified. After the mucosa of the amputated nasal segment and nasal stump was sutured in position, an end-to-end anastomosis of the two lateral nasal arteries was performed with 11/0 nylon. Immediately after removal of the microvascular clamps, blood perfusion in the amputated nasal segment was observed. In the medial side of the amputated nasal segment, bleeding in a 0.6-mm-sized subcutaneous vein occurred. End-to-end anastomosis of the two subcutaneous veins was performed with 11/0 nylon. Because the diameter of the artery and vein was so small, it was possible to make only six stitches.

After capillary refilling of the nasal tip was confirmed, the severed cartilaginous segments were repaired and the wound margin was sutured (Figure 2). The total operation time was 2 h and 45 min, and the total time from injury to revascularisation was 9 h.

Postoperative perfusion was monitored clinically. From approximately 4 h postoperatively, mild congestion developed in the replanted nasal segment. For the prevention of further congestion, a salvage procedure was performed by placing medical leeches. From day eight postoperatively, the congestion ameliorated, so the salvage procedure was no longer required. During the 8-day period, a total of five medical leeches were used, and a blood transfusion was not performed. The replanted segment survived completely, and on postoperative day 16, the patient was discharged.

The patient is currently 77 days post-injury (Figure 3). In spite of a linear depressed scar on the margin, the colour and texture match were good, and the aesthetic result was excellent. The nostril of the replanted side was not narrowed and the airway was patent, thus the functional result was also excellent. The patient regained static two-point discrimination of 10 mm, although nerve repair was not performed at the time of surgery. No other complication



Figure 2 Revascularized amputated nasal segment after replantation.

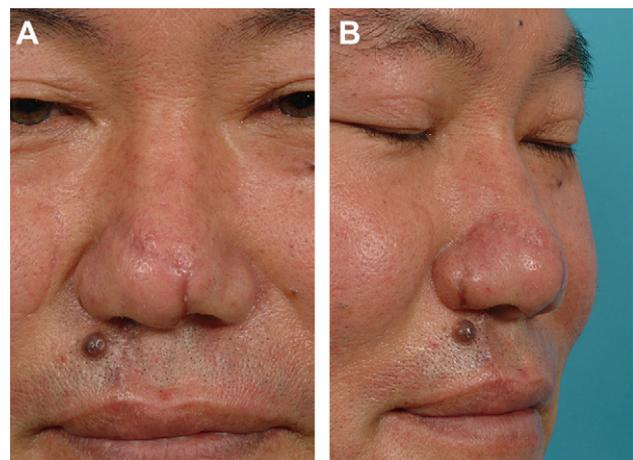


Figure 3 The appearance of the nose 77 days after surgery. The shape and color of the nose are almost normal. (A) Anterior view. (B) Three quarter view.

Table 1 Authenticated English Reports of Microsurgical Replantation of Amputated Nasal Segments.

No.	First Author (year)	Size (cm)	Anastomosis of A/V (D, mm)	Ischemic time (hours)	Results (2 PD)	Salvage procedures
1	James (1976)	5 x 3	1 (1)/1 (0.3)	3.5	Partial necrosis	
2	Tajima (1989)	2/3 of lower half nose	1 (0.7)/0	4	Partial necrosis	A-V anastomosis, pin-prick, heparin sponge
3	Niazi (1990)	2/3 of nose	1 (?)/0	4.5	Total survival	Leech
4	Jeng (1991)	3.5 x 3.5	1 (0.4-0.5)/0	8	Total survival	A-V anastomosis, pin-prick
5	Sanchez-olaso (1993)	2.8 x 3.2	1 (0.5)/0	8	Total survival	Open venous drainage
6	Jeng (1994)	3 x 3	1 (?)/0	7	Partial necrosis	Intrareplant heparin injection
7	Yao (1998)	4 x 4	1 (0.4)/1 (0.3)	4	Total survival (8 mm)	
8	Hammond (2000)	From nasion to columella	2 (0.3)/1 (?)	?	Total survival (normal sensation)	Nasal tip abrasion, heparin sponge
9	Kayikcioglu (2001)	4 x 5	1 (?)/0	4	Total survival	Leech, pin-prick, stab incision, heparin sponge
10	Akyürek (2004)	2.5 x 1 (incomplete)	1 (0.5)/0	8	Total survival (8 mm)	Stab incision, heparin sponge
11	Flores (2007)	Heminasal amputation	1 (?)/0	0.5	Total survival (12 mm)	Leech

No., number; A, artery; V, vein; D, diameter; 2 PD, 2 point discrimination; A-V, artery-to-vein; incomplete, incomplete amputation.

was reported and no secondary nasal surgery was performed after replantation.

Discussion

Since James² performed successful microvascular replantation of the upper lip and nose of a 3-year-old girl bitten by a dog in 1976, an additional 10 English papers involving the replantation of amputated noses have been reported (Table 1).¹⁻¹¹

According to Table 1, neither the ischaemic time nor the size of the amputated segment is important factor in relation to total survival of the replanted tissue.

However, six replants survived totally among the eight cases in which no veins were suitable for anastomosis and only salvage procedures were performed, such as open venous drainage,⁶ nasal tip abrasion,¹ pin-pricking,^{3,5,9} stab incisions,^{9,10} medical leeches,^{4,9,11} artery-to-vein fistulas,^{3,5} intra-replant subcutaneous heparin injections⁷ and heparin sponges.^{1,3,9,10} Based on this, direct venous anastomosis may not be a prerequisite for the total survival of replantation. However, if the salvage procedure is performed, systemic anticoagulation may be required, and this can lead to significant blood loss requiring multiple transfusions.¹ So, we believe that direct venous anastomosis should be attempted before salvage procedure is performed. We also tried venous anastomosis in our case, although that was not sufficient (probably not successful), therefore we performed the salvage procedure.

In the previous reports, the smallest size of the amputated nasal segment was 2.5 × 1 cm, as reported by Akyürek,¹⁰ and involved an incomplete amputation with a narrow skin bridge and anastomosis performed with only

one artery. Compared with previous reports, we performed replantation of an amputated nasal segment of the next smallest size, 2.5 × 2.6 cm. The diameters of the artery and vein were 0.7 and 0.6 mm, respectively, so a very precise anastomosis technique was required. According to Kosima, anastomosis of blood vessels 0.5–0.8 mm in diameter is defined as supermicrosurgery,¹² hence our case was the smallest size of successful replantation of the completely amputated nasal segment using supermicrosurgical techniques.

In cases with a small amputated nasal segment, as in the case herein, it may be argued re-attachment is preferable, such as a composite graft. However, the survival of composite grafts is influenced by a number of factors, such as tissue size, extent of injury, ischaemic time and realignment of the replant, and the results are not predictable.^{5,10} Even if a composite graft is successful, it may alter the colour, appearance and underlying cartilaginous framework, which necessitates further procedures.⁵ Therefore, the experience obtained in our case report indicates that for specialised structures, such as the nose, replantation of the amputated segment leads to excellent aesthetic and functional outcomes and should be attempted.

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Conflict of interest

None.

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