

A case of autologous microfat grafting in lip reconstruction of a whistle deformity following cancer treatment

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A whistle deformity is defined as a deficiency in the vertical length of the lip so that the free margins of the upper and lower lips do not meet normally, giving the appearance of whistling. This is a common secondary deformity of the vermilion in patients with cleft lip. A case involving a 61-year-old man who developed a whistle deformity as a result of two wedge resections and postoperative radiotherapy for treatment of squamous cell carcinoma of the lower lip is presented. Hyaluronic acid-based tissue filler and autologous microfat transplantation to the lower lip were used for definitive management of the patient's whistle deformity. After one year of follow-up, the patient was pleased with the overall result and noted marked improvement of his oral competence and overall appearance of the lip. The present case demonstrates that microfat transplantation is a viable option for correcting a whistle deformity, not only after surgery, but also following adjuvant radiotherapy – both of which potentially reduce graft viability secondary to decreased vascularity of the recipient site.

Key Words: *Autologous fat grafting; Postoperative radiotherapy; Whistle deformity*

CASE PRESENTATION

A 61-year-old man developed a squamous cell carcinoma on his left lower lip, which was initially excised with positive margins. He subsequently developed lymphadenopathy within the left neck and was referred to the Division of Otolaryngology – Head and Neck Surgery at the Queen Elizabeth II Health Sciences Centre (Halifax, Nova Scotia). He underwent a second wedge resection of the left lower lip with an ipsilateral functional neck dissection. The patient received postoperative radiotherapy to the lip and neck at a total dose of 66 Gy. As a result of his combined modality treatment, he developed a whistle deformity, marked by lip incontinence and an asymmetric smile, and was referred to another member of the head and neck team who was an expert in facial plastic surgery for potential fat augmentation and reconstruction of his lower lip (Figure 1).

It was decided that the patient would receive hyaluronic acid-based injectable tissue filler for temporary augmentation, followed by treatment with autologous microfat transplantation to the lip for definitive augmentation. Following the tissue filler injection, it was noted that the patient had closure of the lateral lip margin, improvement in lip competence and a pleasing aesthetic result. However, on reassessment three months later, the patient reported having issues of lip incompetence, once again, due to the relatively premature

Un cas de microgreffe de graisse autologue dans la reconstruction d'une déformation du vermillon de la lèvre après un traitement oncologique

La déformation du vermillon se définit comme une anomalie de la partie verticale de la lèvre, de sorte que les bords libres des lèvres supérieure et inférieure ne se touchent pas normalement et donnent l'impression que la personne siffle. C'est une déformation secondaire courante du vermillon chez les patients ayant une fente palatine. Est présenté le cas d'un homme de 61 ans qui a acquis une déformation du vermillon après deux résections cunéiformes et une radiothérapie postopératoire en traitement d'un carcinome squameux de la lèvre inférieure. Un produit de remplissage tissulaire à base d'acide hyaluronique et une microgreffe de graisse autologue sur la lèvre inférieure ont permis de prendre en charge la déformation du vermillon du patient. Après un an de suivi, le patient était satisfait du résultat global et avait remarqué une amélioration importante de sa compétence orale et de l'apparence globale de la lèvre. Le présent cas démontre que la microgreffe de graisse est une option viable pour corriger une déformation du vermillon, non seulement après l'opération, mais également après une radiothérapie adjuvante, qui peuvent tous deux réduire la viabilité de la greffe en raison de la vascularité réduite au foyer de réception.



Figure 1) The whistle deformity (arrow) before tissue filler and microfat injections

degradation of the tissue filler and subsequent reformation of his whistle deformity.

A decision was then made to proceed with autologous microfat transplantation to the lip. The donor site chosen by the senior author was the abdomen, and a series of three injections was

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Figure 2) One-year postoperative appearance of the lip following reconstruction (arrow). Note the improved contour and competence of the lower lip

planned at six-month intervals. For the first microfat injection, approximately 4.5 mL of abdominal fat was obtained using a Coleman harvesting cannula and injected into the lip area using a Coleman type III cannula. Six months later, the patient presented for his second microfat injection to the lip. A total of 5 mL of fat was infiltrated using the microfat transplantation technique. A final procedure using 3 mL of fat was performed six months later using the technique described above. All three procedures were very well tolerated, with no complications. At one-year follow-up, the patient was pleased with the overall result, noting marked improvement of his oral competence and overall appearance of the lip (Figure 2).

DISCUSSION

The use of autologous fat grafting has been successfully used in facial, lip and hand rejuvenation, and also for body contour improvement (1). Autologous fat is a favourable filler; however, fat absorption at the grafted site may equal 70% of the filler volume (1). The cell survival theory proposed by Peer (2) offers

a plausible explanation for fat absorption. The theory suggests that “the number of viable adipocytes at the time of transplantation may correlate with the ultimate fat graft survival volume” (2).

To obtain long-term viability of transplanted autologous fatty tissue, clinicians have devised techniques to aspirate the adipose tissue to minimize trauma to the adipocytes (1). Some of the current methods include the Coleman technique, fat cylinder grafting and the LipiVage fat harvest system (Genesis Biosystems, USA) (3,4). Currently, the choice of method resides with the surgeon who is performing the procedure.

A whistle deformity is a common secondary deformity of the vermilion in patients with cleft lip (5). It is defined as a deficiency in the vertical length of the lip so that the free margins of the upper and lower lips do not meet normally, giving the appearance of whistling (6). For significant secondary deformities of the vermilion, rotation advancement reoperation is usually necessary for management (6). For the repair of lesser secondary deformities of the vermilion, there are several options available including local flaps, Z-plasties and fat grafts (6). We believe that our case is the first to be reported in the English literature, in which autologous microfat grafting was used to treat a whistle deformity of the lip in a patient with two previous lip surgeries and postoperative radiotherapy. By comparison, a recent study by Patel and Hall (5) described the use of free dermis-fat grafting to correct the whistle deformity in patients with cleft lip. However, our case differs significantly given the fact that our patient underwent two previous lip operations and also received postoperative radiotherapy – both of which potentially reduce graft viability secondary to decreased vascularity of the recipient site.

SUMMARY

Autologous fat grafting has been successfully used in facial cosmetic surgery; however, little supportive evidence exists for its use in reconstructive facial surgery following radiotherapy. The present case demonstrates that microfat transplantation is a viable option for correcting a whistle deformity, not only after surgery, but also following adjuvant radiotherapy.

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