

Post Cancer Treatment: Whistle Deformity Lip Reconstruction

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ABSTRACT

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, and gives the appearance of whistling. This is a common secondary deformity of the vermillion in patients with cleft lip.

We present a case of a 61-year-old male patient who developed a whistle deformity as a result of to two wedge resections and postoperative radiotherapy for treatment of squamous cell carcinoma of the lower lip. Hyaluronic acid-based tissue filler and autologous microfat transplantation to the lower lip were used as definitive management of this patient's whistle deformity.

After one year of follow-up, the patient was pleased with the overall result and he noted marked improvement of his oral competence and overall appearance of the lip.

This 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.

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Case Presentation

A 61-year-old male patient, developed a squamous cell carcinoma on his left lower lip, which was initially excised with positive margins and he subsequently developed lymphadenopathy within the left neck. He was then referred to the Otolaryngology-Head and Neck Surgery service at the Queen Elizabeth II Health Sciences Center in Halifax, Nova Scotia, Canada and underwent a second wedge resection of the left lower lip with an ipsilateral functional neck dissection. He received postoperative radiotherapy to the lip and neck at a total dose of 66Gy. 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 with expertise 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 esthetic result. However, upon reassessment three months later, the patient reported having issues of lip incompetence once again, due to the relatively premature degradation of the tissue filler injection 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 were planned at six month intervals. For the first microfat injection, approximately 4.5 cc's of abdominal fat was obtained using the Coleman harvesting cannulae 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 cc's of fat were infiltrated using the microfat transplantation technique. A final procedure using 3 cc's of fat was performed six months later using the technique described above. All three procedures were tolerated very well and there were no complications. At the one-year follow up appointment, the patient was pleased with the overall result and he noted marked improvement of his oral competence and overall appearance of the lip (**Figure 2**).

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RESULTS



Figure 1. The whistle deformity before tissue filler and microfat injections.



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

DISCUSSION

The use of autologous fat grafting has been successfully employed in facial, lip and hand rejuvenation, and also for body contour improvement (1). Autologous fat is a favorable filler; however, fat absorption at the grafted site may equal 70% of the filler volume (1). The Peer's cell survival theory offers a plausible explanation for the fat absorption. The theory claims that "the number of viable adipocytes at the time of transplantation may correlate with the ultimate fat graft survival volume (2)."

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

A Whistle deformity is a common secondary deformity of the vermillion 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, and gives the appearance of whistling (6). For significant secondary deformities of the vermillion, rotation advancement reoperation is usually necessary for management (6). For the repair of lesser secondary deformities of the vermillion, there are numerous options available, including local flaps, Z-plasties, and fat grafts (6).

We believe that our case is the first reported case 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 described the use of free dermis-fat grafting to correct the whistle deformity in patients with cleft lip (5). However, our case differs significantly given the fact that our patient had two previous lip operations and also received postoperative radiotherapy, both of which potentially reduce graft viability secondary to decreased vascularity of the recipient site.

Conclusion

In summary, the use of autologous fat grafting has been successfully employed previously in facial cosmetic surgery, but little evidence exists for its use in reconstructive facial surgery following radiotherapy. This case demonstrates that microfat transplantation is a viable option for correcting a whistle deformity, not only after surgery, but also following adjuvant radiotherapy.