

Hemiface Rhytidectomy

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Abstract In the current study, skin flaps raised in the subcutaneous plane were applied for 22 patients who underwent reconstruction for unilateral upper facial skin defects after skin tumor surgery. The defect was reconstructed with flaps designed via procedures similar to classic rhytidectomy techniques using periauricular and temporal skin incisions. Objective assessment of the aesthetic result was possible by comparison with the healthy contralateral side of the face. Immediate postoperative evaluation confirmed facial asymmetry due to unilateral skin tension. High patient acceptance of the procedure, uneventful flap healing, and good aesthetic results were achieved, with almost complete restoration of facial symmetry 1 year postoperatively. In conclusion, unilateral rhytidectomy without plication or resection of the subcutaneous musculoaponeurotic system (SMAS) is an ideal application of aesthetic surgical techniques for the reconstruction of unilateral skin defects.

Keywords Facelift · Facial symmetry · Skin tumor · Subcutaneous plane

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Previously, reconstructive surgical techniques were modified to solve aesthetic problems. Currently, aesthetic surgery procedures are implemented in the practice of reconstructive surgeons to obtain outstanding results [1]. To accomplish this aim in the reconstruction of facial defects after tumor resections, many innovative techniques and procedures have been described, which are being continuously refined [2].

Rhytidectomy, a common aesthetic surgical procedure, aims to achieve a rejuvenation effect by repositioning of facial structures and reduction of facial wrinkles [3]. Many different operative techniques have been described and compared in terms of aesthetic result and duration of the rejuvenation effect [4–12]. However, objective analysis of outcomes remains difficult and commonly is limited to questionnaires assessing patient satisfaction or to subjective evaluation of pre- and postoperative photographs.

Ideally, objective evaluation of the applied technique is by comparison with a control group of patients or by using the treated patient as his or her own control. The related ethical issues and the fact that a unilateral facelift is not applicable for cosmetically motivated patients make this an unsolvable task. This is, however, different for reconstructive patients, who may benefit from aesthetic surgery techniques to achieve excellent cosmetic results for skin defect closure. Such patients would profit from hidden incision lines and from a more natural symmetrization process due to incision lines that will allow normal skin sagging of the face in the vertical vector line.

This study aimed to evaluate the applicability of a cosmetic rhytidectomy technique for unilateral defect closure after eradication of skin tumors in the upper and middle face.

Materials and Methods

This study enrolled 22 consecutive patients presenting with a skin tumor in the temporoparietal or infraorbital region between July 2003 and October 2005. The inclusion criteria specified patients with a minimal skin defect 6 cm² in size after histologic confirmation of complete tumor eradication in the permanent section analysis, a minimum skin mobilization area of 64 cm² for defect closure, and a minimum follow-up period of 1 year. Informed consent and clearing for photographic publication were obtained from all the patients. The study followed the ethical guidelines of the Swiss Academy of Medical Sciences.

Surgical Procedure

The patients were treated using a two-stage procedure in which facial integrity was restored after histologic confirmation of complete tumor removal. The defect was reconstructed with flaps designed via procedures similar to classic rhytidectomy techniques using periauricular and temporal skin incisions. Flap elevation was applied in the subcutaneous plane corresponding to the dissection plane used for subcutaneous face-lift procedures. Incisions were made from the defect to the hairline, then caudally into the preauricular zone and, if necessary, prolonged to the retroauricular area (Fig. 1). The entire cheek and the upper half of the neck were undermined to the nasolabial fold and the mariotte line to allow defect closure without tension. No resection, suspension, or plication of the subcutaneous musculoaponeurotic system (SMAS) was performed. Surgery was performed using local anesthesia and sedation (Xylocain 1% and propofol 1%), except in one case, which was managed with the patient under general anesthesia at the patient's request.

Outcome Evaluation

Follow-up examinations were performed 1 month and 1 year after surgery. Parameters assessed included patient morbidities, American Society of Anesthesiologists (ASA) physical score, tumor size, flap mobilization area, operation time, skin tension (mild/moderate/strong), flap survival, wound morbidities, scar contracture, facial nerve lesions, and hematoma and seroma formation. Cosmetic satisfaction and sensate restoration of the face were assessed by a questionnaire using a visual analog scale (VAS) that patients completed at home and sent in anonymously. Tissue relaxation and facial symmetry were evaluated by photographic documentation, with the contralateral hemiface serving as a control.

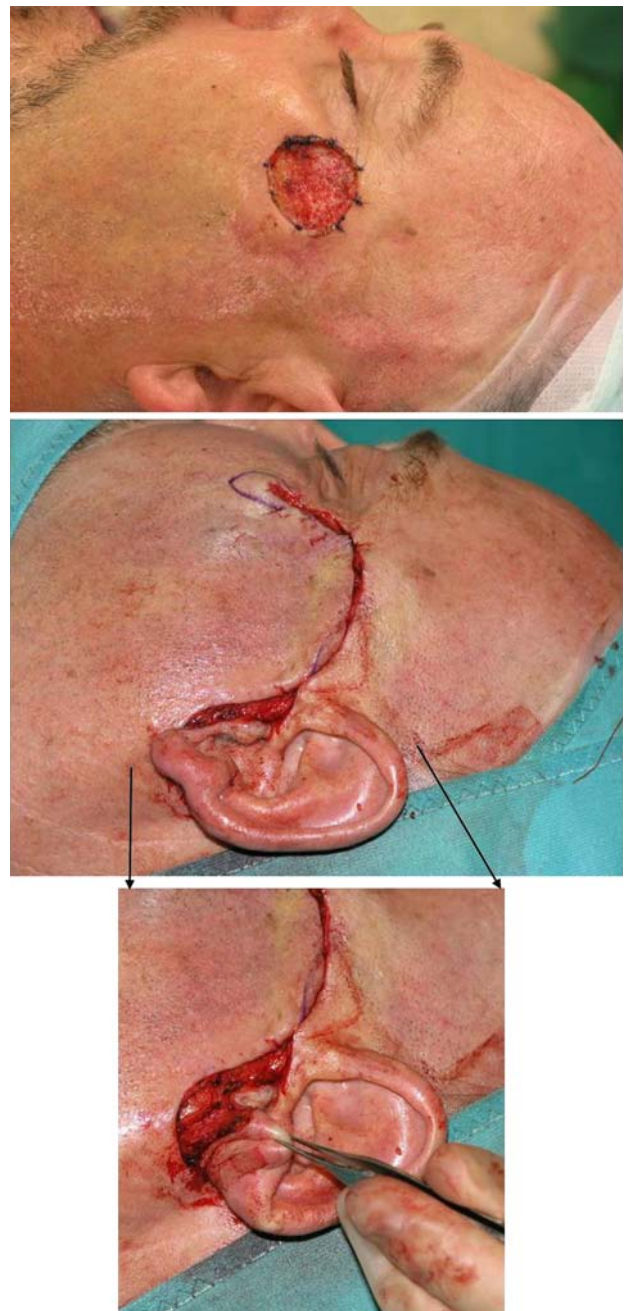
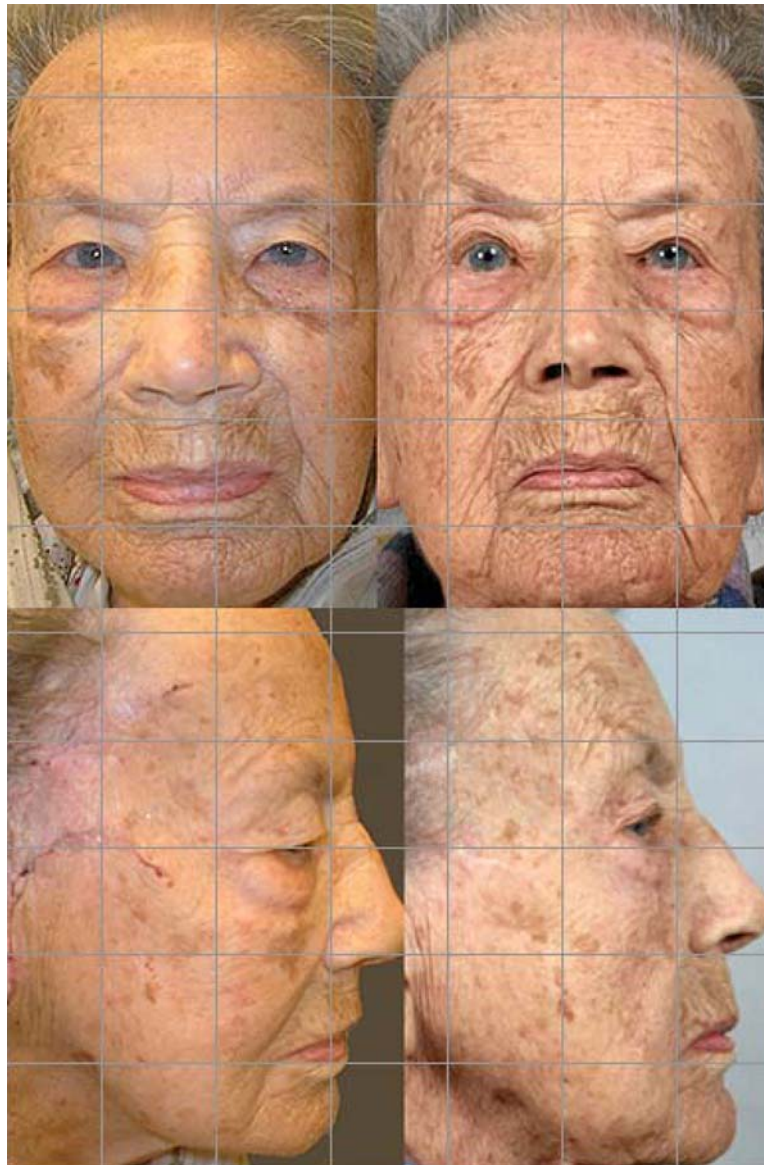


Fig. 1 Operative technique of hemiface rhytidectomy used for a patient with a small defect. Different defects ranging from 6 to 64 cm² in size have been reconstructed with a subcutaneously raised flap using the typical face-lift incisions

Symmetry of the nasolabial fold, the cheek prominence, and the temporal area were assessed clinically by three independent plastic surgeon consultants not involved in the procedure using the VAS method. The results were classified as symmetric for values in the range of 0 to 3, as mild asymmetry in the range of 3 to 5, as moderate asymmetry for values from 6 to 8 or as severe asymmetry for values from 9 to 10.

Fig. 2 An 83-year-old woman with reconstruction of a low temporal defect after basal cell carcinoma resection. Reconstruction using the hemiface rhytidectomy technique shows initially a tense cheek on the right side with elevation of the nasolabial fold (*left row*) and an almost complete relaxation and symmetrization after 1 year (*right row*). The photographs show restored symmetry of the nasolabial fold after 1 year on the right surgically managed side



Results

Demographic Data

Between July 2003 and October 2005, 22 patients (9 men and 13 women) with a mean age of 71 years (range, 42–96 years) underwent unilateral rhytidectomy for restoration of facial integrity after skin cancer surgery. Of these 22 patients, 17 presented with basal cell carcinoma and 5 presented with squamous cell carcinoma of the face. The average follow-up period was 26 months (range, 12–38 months) after surgery for the questionnaire and 12 months for the symmetry analysis. Two patients died of unrelated causes during the follow-up period.

With regard to patient morbidities, the median ASA score was 2 (range, 1–3). Eleven patients had moderate

hypertension, and five had diabetes mellitus type 2. Six patients were smokers. Two patients took immunosuppressive medications because of kidney transplantation, and one patient took steroid medications.

Surgical Procedures

Skin defects had a mean size of 25 cm² (range, 6–64cm²). Defect closure was performed by mobilization of a mean skin area of 95 cm² (range, 64–180cm²). The mean operating time for one-stage tumor excision and defect closure was 89 min (range, 66–176 min).

Of the 22 flaps, 20 healed uneventfully by primary intention. Two flaps showed skin slough in the distal part of the flap requiring ambulatory wound treatments. These two

Fig. 3 A 52-year-old man after reconstruction of a temporal defect due to basal cell carcinoma. Reconstruction using the hemiface rhytidectomy technique shows initially a tense cheek on the right side (*left row*) that has relaxed after 1 year (*right row*). This view also demonstrates the nasolabial fold restoration, but also shows the relaxation in the jaw area after 1 year



flaps healed by secondary intention within 1 month after surgery. Neither hematoma nor seroma were encountered, and no revisional surgeries were needed. In one patient, tumor resection was complicated by partial palsy of the ocular branch of the facial nerve, which recovered within 6 months.

At 1 year after surgery, skin sensation was completely restored for all the patients, and no ocular symptoms or motor dysfunction of the face had occurred. No clinical signs of tumor recurrence were observed during the follow-up period.

Clinical and Photographic Evaluation

Three typical examples of facial symmetry, respectively, asymmetry after 1 month and 1 year, are shown in Figs. 2 to 4. Photographic evaluation 1 month after surgery

showed facial asymmetry with a unilateral rejuvenation effect because of skin tension in all the patients. Asymmetry was classified as mild in six cases (VAS, 3.6 ± 0.8), as moderate in eight cases (VAS, 5.8 ± 0.9), and as severe in six cases (VAS, 9.4 ± 0.2) (Figs. 5 and 6). The effect faded over time and resulted after 1 year in restored facial symmetry with a VAS value of 2.8 ± 0.2 .

Questionnaire

Anonymous questionnaire evaluation using VAS assessment showed high patient satisfaction in terms of facial symmetry (9/10), scar formation (8/10), cosmetic result (9/10), and tactile confidence of the face (9/10) after 1 year (Fig. 7). All the patients were satisfied and would accept the same operative treatment again to restore their facial integrity.

Fig. 4 A 74-year-old woman after reconstruction of a temporal defect due to basal cell carcinoma. Reconstruction using the hemiface rhytidectomy technique shows initially a tense cheek on the right side (*left row*) that has relaxed after 1 year (*right row*). This patient demonstrates that symmetry also is obtained after 1 year in dynamic restoration (e.g., smiling)



Discussion

Our group has studied the controversy over unilateral subcutaneous rhytidectomy using evaluation of six patients with laser scanner technology [13]. Restored facial symmetry was found 1 year after subcutaneous hemiface rhytidectomy without concomitant intervention on the SMAS or deeper layer. The current study confirms the preliminary results found in this smaller group of patients and provides additional clinical evidence that the initial asymmetry caused by a unilateral subcutaneous face-lift disappears within 1 year after surgery and that this procedure is applicable to reconstructive patients characterized by advanced age and increased comorbidities. Surgical risk was minimized by surgery performed with the patient under local anaesthesia. The mean operating time of 89 min was well tolerated by all the patients. The good aesthetic results and low complication rate led to high patient satisfaction, as assessed by the questionnaire.

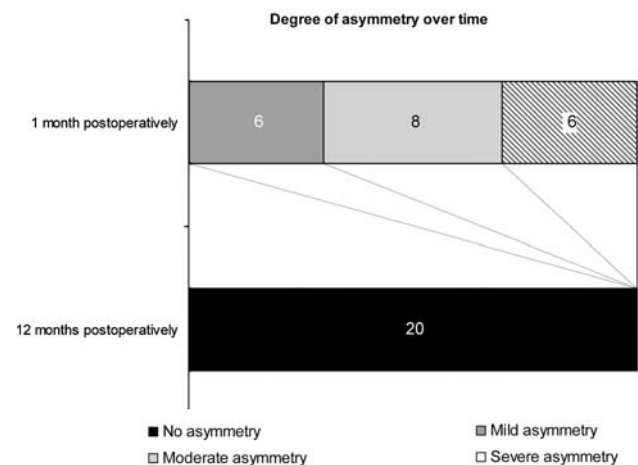


Fig. 5 Results from evaluation of facial symmetry 1 month and 1 year postoperatively, with restoration of symmetry after 1 year. The number of patients is included in the boxes

Our experience showed the technique to be suitable and unproblematic for a defect size of up to 25 cm² and for skin

Fig. 6 Evaluation of facial symmetry by three independent plastic surgeon consultants using the visual analog scale (range, 1–10) 1 month postoperatively

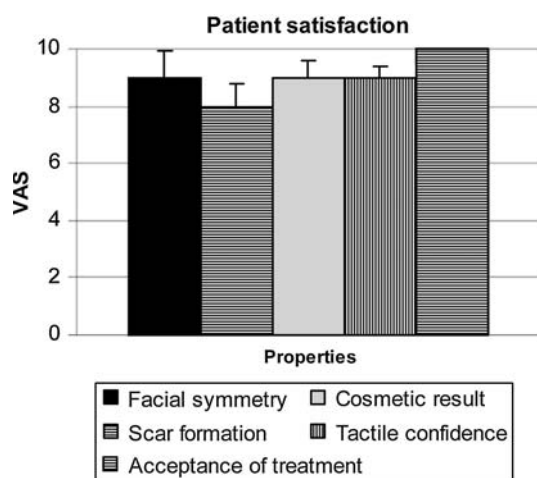
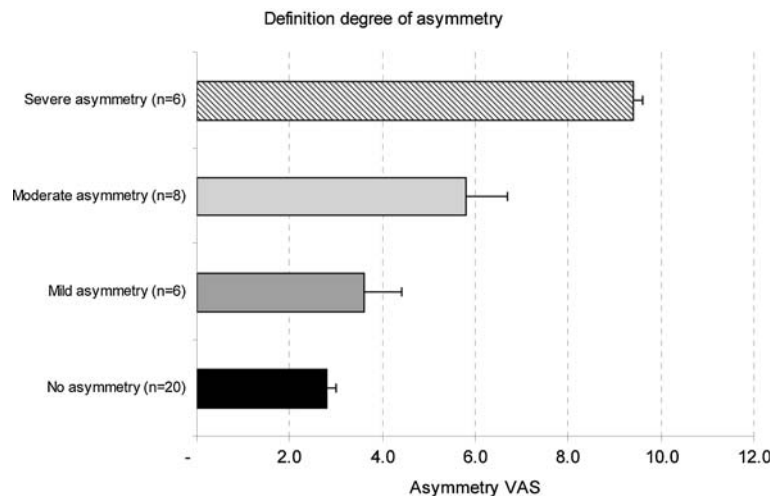


Fig. 7 Result of patient questionnaire using a visual analog scale with a range of 1 to 10. High patient satisfaction is obtained with the hemiface rhytidectomy procedure. All the patients stated that they would undergo the procedure again if necessary

tumors located below the eyebrow line. Treatment of lesions larger than 64 cm² or tumors located cranially to the eyebrow line is possible but results in severe tension and may produce skin slough in the distal flap part requiring ambulatory wound treatments until healing by secondary intention is achieved.

The low morbidity rate for surgery found in our study confirms previous findings that age is not a risk factor for compromised wound healing [14, 15]. Also, the previously described capacity of the skin of elderly patients to expand over a period of 1 year is corroborated [13, 16, 17].

In conclusion, the unilateral subcutaneous face-lift technique without any intervention on the SMAS [18] or deeper layer performed in the current study did not have a lasting rejuvenation effect and is therefore ideal for unilateral defect reconstruction after tumor excision in the

upper face and fulfills aesthetic criteria without affecting facial symmetry.

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