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Parotidectomy: Assessment of a surgical technique including facelift incision and SMAS advancement

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SUMMARY. Background: **Despite its proven safety and its relevance regarding the cosmetic outcome, the SMAS-lifting technique is not a routine procedure for many surgeons.** Aim: **To compare the classical (subcutaneous flap and neck incision) with the SMAS-lifting techniques for parotidectomies from the patient's perspective.** Patients and methods: **Both procedures are described, tricks are pointed out. In both procedures the posterior branch of the great auricular nerve was not preserved, hence the two procedures were not evaluated regarding sensitivity of the auricle and preauricular area. Forty consecutive patients were asked to classify their concerns before (1–4 months) and 1 year after surgery (10 classical technique and 30 SMAS-lifting technique).** Result: **Before parotidectomy, patients were concerned in a decreasing order with the facial nerve function, the scar, the soft-tissue defect in the dorsal part of the cheek and Frey's syndrome. Following use of the classical technique, patients were concerned in decreasing order with the soft-tissue defect, the scar and Frey's syndrome. Following the SMAS technique, no one was concerned with the scar, Frey's syndrome, or the soft tissue defect although a slight asymmetry could still be noticed.** Conclusion: **The SMAS-lifting technique might possibly appear to offer a new standard procedure for parotidectomy, except for malignant tumours or in obese patients.** © **2005 European Association for Cranio-Maxillofacial Surgery**

Keywords: **SMAS-lifting; parotidectomy; facelift; approach; parotid gland; pleomorphic adenoma**

INTRODUCTION

Benign tumours of the parotid gland are classically removed via an incision extending to the neck without reconstruction of the parotid bed (Fig. 1). Two consequences are usual: a conspicuous scar and a deep hollow dorsal to the mandible. These drawbacks can be prevented or reduced by using a facelift approach (*Appiani* and *Delfino*, 1984; *Ferreira* et al., 1990) with a superficial musculo-aponeurotic system (SMAS) advancement flap (*Bonanno* and *Casson*, 1992). Moreover, the SMAS flap seems to prevent the sweat secretion of the cheek (Frey's syndrome). *Bonanno* et al. (2000), after having carried out 160 parotidectomies with a SMAS flap did not encounter any case of Frey's syndrome (follow-up period of 5–22 years). But, despite its proven safety and its relevance regarding the cosmetic outcome, the SMAS-lifting procedure is not yet a routine procedure for many surgeons.

The purpose of this study was to compare subjectively the classical technique (subcutaneous flap and neck incision) and the SMAS-lifting technique (SMAS advancement flap and lifting incision) from the patient's perspective.

PATIENTS AND METHODS

Forty consecutive patients (30 women and 10 men) underwent a subtotal parotidectomy between March 2002 and September 2003. All tumours were benign; there was no palpable lymph node and MRI had shown no evidence of spread. Moreover, 25% of patients came with the results of a fine needle cytology. The age was 19–70 years (mean 43). The male to female ratio was 0.65. The first ten patients underwent the operation through a bayonet shaped incision without repair of the missing parotid volume. The next thirty patients underwent an operation using a rhytidectomy approach. A SMAS advancement flap was carried out to fill the parotid bed. The facelift incision (Fig. 2) ran behind the tragus, followed the earlobe fold, and ended in the postauricular hair. A subtotal parotidectomy (removing the lateral and deep lobes) was carried out in every case (Fig. 3). The SMAS flap was undermined over the parotid region. The tip of the SMAS flap partly filled the parotid bed (Fig. 4). It was sutured in a very tense way to the anterior edge of the sternocleidomastoid muscle (Fig. 5). The purpose was to use the SMAS flap as a membrane for guided tissue regeneration. The duration of the operation increased by an average of 15 min. In both procedures, the posterior branch of the great auricular was not preserved, as some authors do

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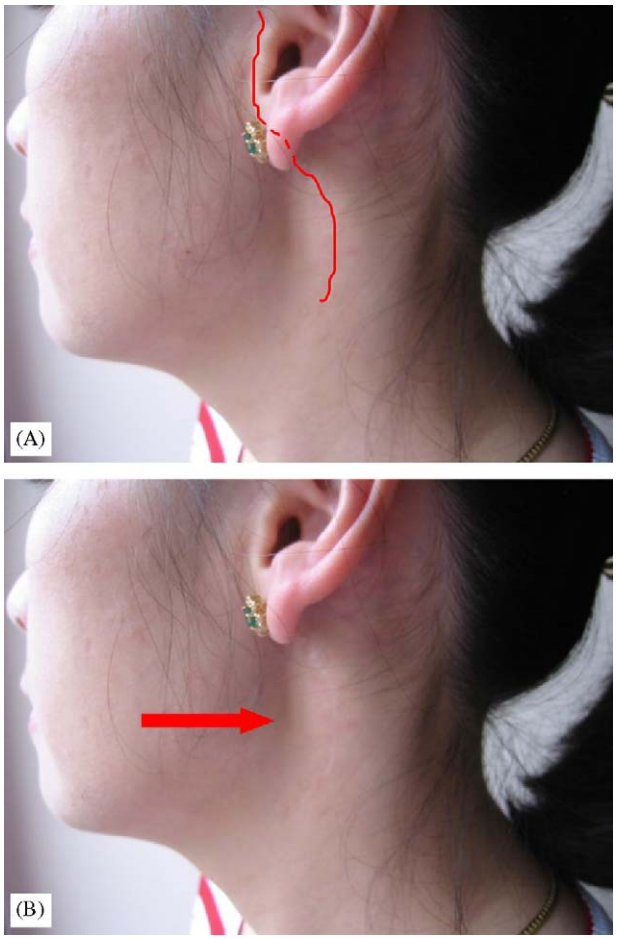

Fig. 1 – (A) Basic technique: The classical incision in front of the tragus and ending in front of the anterior edge of the sternocleidomastoid muscle. (B) Same without outline. There was no filling up of the parotid bed; a hollow is conspicuous (arrow).

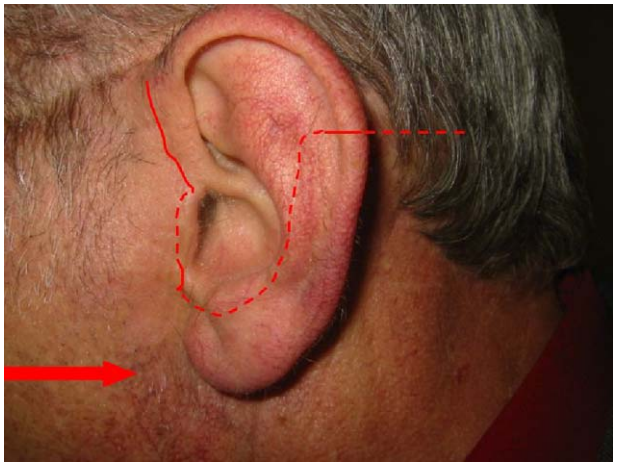

Fig. 2 – Facelift incision behind the tragus following the earlobe fold, and ending in the hair. The hollow is inconspicuous (arrow).

(*Brown* and *Ord*, 1989). So this was not evaluated in the follow-up.

Patients were asked to prioritize their concerns before (1–4 months) and 1 year after surgery.

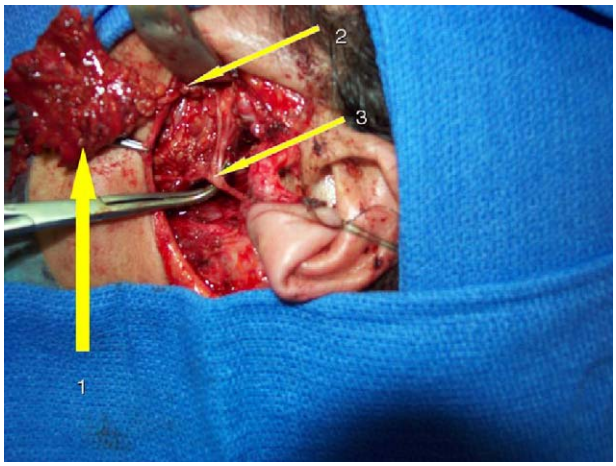

Fig. 3 – Despite the facelift approach, the exposure of the facial nerve is excellent: Parotid lobe (1) attached by Stenson's duct (2), trunk (3) and branches of the facial nerve.

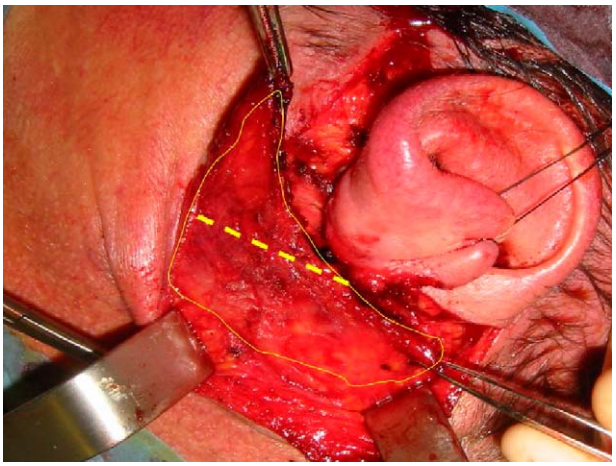

Fig. 4 – Area of the undermined right SMAS flap. The hinge is indicated by a dotted line.

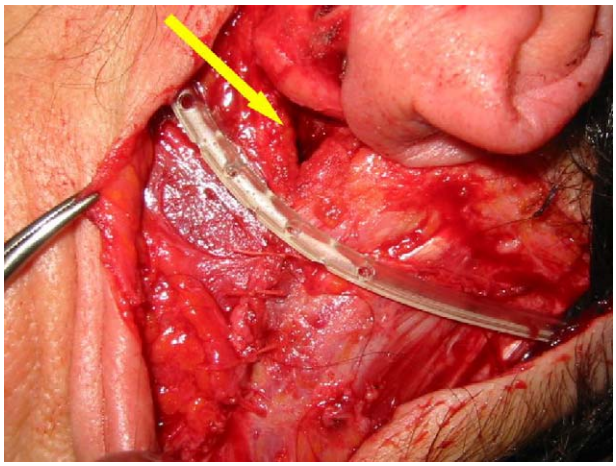

Fig. 5 – The hinge is sutured to the anterior edge of the left sternocleidomastoid muscle. A small hole (arrow) is left to evacuate the haematoma.

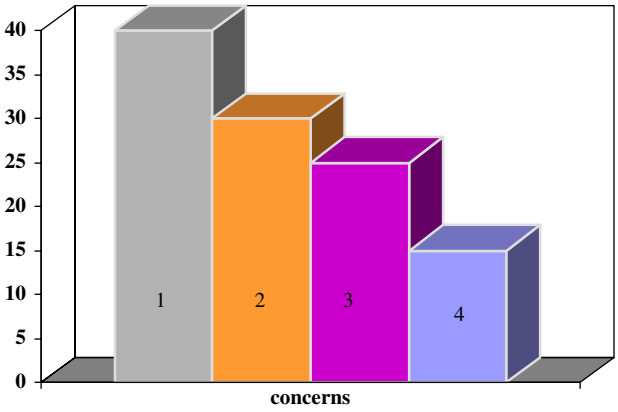

Fig. 6 – Concerns prior to subtotal parotidectomy in 40 patients: 1. facial nerve function, 2. scar, 3. soft-tissue defect dorsal to the mandible, 4. Frey's syndrome.

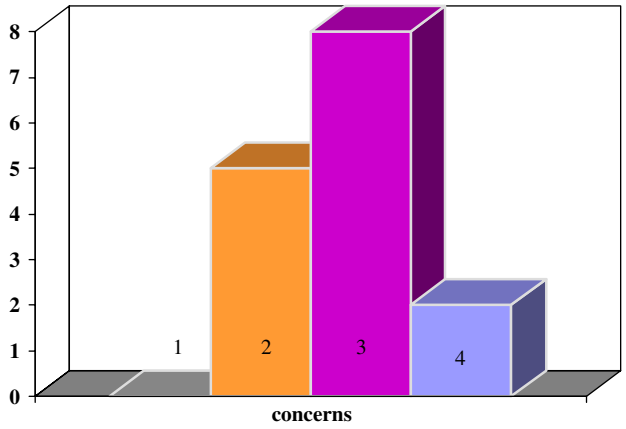

Fig. 7 – Concerns after the 'classical' approach for parotidectomy in 10 patients: 1. facial nerve function, 2. scar, 3. soft-tissue defect dorsal to the mandible, 4. Frey's syndrome.

RESULT

Before parotidectomy, patients were concerned in a decreasing order with the facial nerve function, the scar, the soft-tissue defect dorsal to the mandible and Frey's syndrome (Fig. 6). Following the 'classical' technique, patients were concerned in a decreasing order with the soft-tissue defect, the scar and Frey's syndrome (Fig. 7). Following the 'aesthetic' technique, none was concerned with the scar, function of the facial nerve or Frey's syndrome. No one was concerned with the soft tissue defect although a slight asymmetry could be noticed.

DISCUSSION

The scar is a clear concern among patients who have to undergo a parotidectomy. It can remain a concern after surgery and not only for young women. The facelift approach prevents this concern although this approach is often pointed out as being less secure for the facial nerve. But, if the incision is correctly prolonged dorsally behind the ear in the hair, the skin can be reflected for an excellent exposure of the entire gland: the risk of damaging the nerve is not enhanced (Fig. 4). With this kind of incision, the use of a cold light retractor is not necessary. Nevertheless, the bayonet shaped incision can be still useful for patients with voluminous ptotic parotids or when a cervical lymph node dissection is necessary in case of malignancy.

The SMAS flap is undoubtedly the user-friendliest flap to fill the soft-tissue defect in the dorsal part of the cheek (other flaps are discussed later). The dissection is easy and rapid, provided it is done in the parotid region. It is even easier after a hydrodissection and using spatulated scissors. Undermining has to be carried out at the level of the parotid aponeurosis. The greyish colour of the parotid gland contrasts with the yellow one of the SMAS. The trick is to use the SMAS flap as a membrane for guided tissue regeneration. The tip of the SMAS flap alone is too small to fill the entire defect. Actually, it is essential that the haematoma below the SMAS becomes organized by scar tissue thus filling the parotid bed.

Sometimes the tumour is too close to the SMAS layer and a hole has to be made in order to remove the tumour with a free margin of tissue around. This holds true also for pleomorphic adenomas as pseudocapsule-free regions, satellite nodules, and pseudopodia are frequent (*Stennert* et al., 2004). Simple enucleation enhances the risk of recurrence (45% in some series; *Paris* et al, 2004). Nevertheless, we have to recognize with *Donovan* and *Conley* (1984) that close dissection (at least in part) is often the reality at the time of the operation, e.g. in very anterior tumours. When a hole through the SMAS layer has to be made, repairing it with a few sutures is sufficient.

But the SMAS flap also has positive functional consequences. *Cesteleyn* et al. (2002) have shown that it decreases the incidence of Frey's syndrome from 33% to 4%. *Allison* and *Rappaport* (1993) found only two cases of Frey's syndrome in 112 patients operated with a SMAS flap procedure. Frey's syndrome is thought to be due to aberrant reinnervation of sympathetic fibres supplying sweat glands by postganglionic parasympathetic fibres normally supplying the parotid gland. These sympathetic fibres have the peculiarity of being cholinergic, which is an exception in the physiology of the sympathetic system. So two different kinds of fibres use the same neuromediator allowing misdirected parasympathetic regeneration (*Laskawi* et al., 1999). Moreover, the SMAS flap seems to accelerate the nerve recovery, from 3 months to 6 weeks according to *Cesteleyn* et al. (2002). The mechanism seems to be the provision of a supplementary blood flow inducing the formation of a capillary network around the ischaemic nerve.

The SMAS flap competes for repair with others, especially with the sternocleidomastoid rotational flap. But *Gooden* et al. (2001) have shown that the

sternocleidomastoid flap reconstruction following parotidectomy does not modify the incidence of Frey's syndrome and does not significantly improve facial contour and aesthetics. A prospective randomized trial confirmed these results (*Kerawala* et al., 2002). *Jost* et al. (1999) propose a procedure that combines displacement of the posterior belly of the digastric muscle, a flap with an upper pedicle taken from the sternocleidomastoid muscle and a double layer free graft, taken from the superficial and deep temporal fascias. This procedure seems complicated and time-consuming compared with the SMAS advancement flap. The temporoparietal fascia rotational flap is another interpositional barrier often proposed to prevent Frey's syndrome and to act as a soft tissue filler (*Zaoli*, 1989). *Ahmed* and *Kolhe* (1999) found a significantly lower incidence of gustatory sweating and a far less noticeable post-parotidectomy volume deficit. But this procedure considerably enlarges the incision. To avoid the donor-site morbidity some authors have proposed synthetic or cadaveric membranes, which may increase the cost (*Sinha* et al., 2003). But the SMAS advancement flap seems to have the same advantage without any added difficulties.

In this department, the posterior branch of the great auricular nerve is not preserved, although preservation is not more difficult when applying the facelift approach. However, it is recognized that this postoperative sensory disturbance of the pinna is a real cause of distress for some patients. It is agreed that this nerve should be preserved whenever the tumour clearance is not compromised. According to *Hui* et al. (2003) this is achievable in 69% of cases. Nevertheless, the accuracy of the preservation is still controversial, because, even if this nerve is sacrificed, the area of sensory loss decreases in an exponential way, most of the improvement occurring within 6 months (*Porter* and *Wood*, 1997).

When the patient is obese or when the tumour is malignant, a bayonet-shaped incision seems more suitable. Regardless of whether the diagnosis of malignancy is realized during the operation by frozen section or postoperatively due to the final histological examination, it seems appropriate to complete the operation by removing the SMAS and extending the incision for cervical lymph node dissection.

CONCLUSION

The SMAS-lifting technique might possibly appear to offer a new standard procedure for parotidectomy except in obese patients and in cases of malignant salivary gland tumours. The exposure of the gland is sufficient and the dissection easy to perform. There is no donor-site morbidity, minimum additional operating time, and no extra cost. It seems to decrease the incidence of Frey's syndrome. The speed of the recovery of the facial nerve has been highlighted in the literature. And the main result of this article is that it is more satisfactory from the patient's point of view.

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