

ONCOLOGY

Parotid surgery in patients over seventy-five years old

La chirurgia parotidea nei pazienti ultrasettantacinquenni

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SUMMARY

Malignant parotid tumours are generally rare but become more common in the last decades of life; this increased incidence concerns mainly secondary parotid space involvement from metastasis or direct invasion. During the past five years, we observed and operated upon 84 patients for parotid diseases, performing 86 parotidectomies (2 bilateral operations). The patients included 30 (35.7%) over 75 years old (2 subjects over 90), mean age 80.5 years, object of the present study. In these 30 patients 2 chronic infections were observed, 6 benign tumours and 22 malignant tumours with only 6 primary neoplastic lesions. Overall, 14 extended radical parotidectomies were performed, 13 conservative total parotidectomies, 2 superficial parotidectomies and 1 radical parotidectomy, a few associated with neck dissection and/or radiotherapy. Three patients died in the post-operative period from heart attack. Five patients died from disease (3 from melanomas – 2 after 3 years and 1 after 2 years – and 2 from primary carcinomas – 1 after 2 years and 1 after 1 year). Six patients died without disease from various causes (2 after 4 years, the others after 3, 2, 1 year and 8 months). Nine patients are alive, 8 NED and 1 with disease in the ethmoid after 2 years, the latter well under control with radiotherapy. This experience implies that surgical treatment of these secondary tumours, which are performed more frequently in old age, exposes the patient to the risk of serious complications (3 patients died in the immediate post-operative period) and stresses the importance of careful evaluation of general conditions. However, surgery seems to have been the treatment indicated also in the patients who subsequently died from the disease, but in whom at least two-year survival was achieved in almost all cases. Unfortunately, because of the advanced age of the patients, the final results are penalized by deaths from natural causes. It is, nevertheless, encouraging that over one third of the patients operated upon are free of disease.

KEY WORDS: Parotid gland • Malignant tumours • Elderly • Surgical treatment • Extended parotidectomy

RIASSUNTO

I tumori maligni della parotide sono neoplasie rare, la cui incidenza aumenta nelle ultime decadi della vita, soprattutto per coinvolgimento secondario della ghiandola da parte di metastasi giunte per via linfatica, o più raramente ematica, o per infiltrazione diretta. Nel corso degli ultimi cinque anni sono giunti all'osservazione per patologie parotidiche di interesse chirurgico 84 pazienti, su cui abbiamo effettuato 86 parotidectomie (bilaterali in due casi). Abbiamo focalizzato la nostra attenzione su 30 di questi pazienti (35,7%), ultrasettantacinquenni, con età media di 80,5 anni (2 soggetti ultranovantenni), affetti da 2 infezioni croniche, 6 tumori benigni, 22 tumori maligni, dei quali solo 6 primitivi. Abbiamo effettuato 14 parotidectomie radicali estese, 13 conservative, 2 superficiali e una radicale associate, in alcuni casi, a svuotamento del collo e/o radioterapia. Tre pazienti sono morti nell'immediato post-operatorio per problemi cardio-vascolari. Cinque pazienti sono deceduti per persistenza di malattia (3 per melanoma: 2 dopo 3 anni e uno dopo 2 anni; 2 per tumore maligno primitivo della parotide: uno dopo 2 anni e uno dopo un anno). Sei pazienti sono deceduti in assenza di malattia per cause diverse (2 dopo 4 anni, gli altri dopo 3, 2, un anno e 8 mesi, rispettivamente). Nove pazienti sono vivi, di cui 8 NED e 1 con patologia residua etmoidale a distanza di 2 anni dal trattamento, ben controllata con radioterapia. La nostra esperienza ci porta a concludere che il trattamento di queste neoplasie secondarie, più frequenti negli anziani, espone il paziente al rischio di gravi complicanze (tre malati deceduti nel post-operatorio) e ciò implica un'attenta valutazione delle condizioni generali. L'intervento chirurgico appare però giustificato anche nei casi deceduti per persistenza di malattia, in cui abbiamo ottenuto quasi sempre almeno un biennio di sopravvivenza. Purtroppo, vista l'età media avanzata, i risultati finali sono comunque penalizzati dai decessi per cause naturali ma è confortante che oltre un terzo dei pazienti operati sia libero da malattia.

PAROLE CHIAVE: Parotide • Tumori maligni • Età avanzata • Terapia chirurgica • Parotidectomia allargata

Introduction

Swellings of the parotid gland can be due to congenital diseases, traumatic lesions, acute and chronic infections, sialoadenosis and benign or malignant neoplasms. The parotid is the most frequently affected of the salivary glands and many types of diseases of this organ require surgical treatment, in particular neoplastic lesions. Of parotid tumours, 80% are benign and the pleomorphic adenoma is the most common type (80% of cases), followed by Warthin's cystoadenolymphoma (10%) and other monomorphic adenomas (10%). Malignant tumours are comparatively rare (20% of cases) and among these the most common primary neoplasms are mucoepidermoid carcinomas, consisting of 30% of the neoplasms, followed by adenoid-cystic carcinomas, 25% of cases, carcinomas on pleomorphic adenomas, 15% of cases, and acinic-cell carcinomas, 5-10% of cases, but secondary tumours are also relatively frequent in the parotid space, especially in old age¹⁻⁴.

It is well known that in the head and neck regions, as in other human organs, malignant tumours become more frequent in old age and those occurring in the parotid space increase, likewise, in the last decades of life; this rise in incidence is due, above all, to secondary parotid space neoplastic involvement from metastasis or direct invasion^{5,6}.

The parotid gland with its lymph nodes represents a very important station in the lymphatic system of the head and neck and metastatic involvement is possible from malignant tumours arising in the ipsilateral part of the scalp and face, in the external ear, the orbit and its appendages, nose and paranasal sinuses. The parotid gland can also be involved by direct invasion from malignant external ear neoplasms and from neighbouring cutaneous tumours⁷⁻¹⁰.

This epidemiological phenomenon can be attributed to the increase in the average lifetime, the greater incidence of malignant cutaneous tumours in the elderly and underestimation of these cutaneous lesions, which are often mistaken for benign tumours and thus treated with inadequate procedures (limited exeresis, cryosurgery, laser surgery, etc), sometimes even as an outpatient operation without histological examination.

In this report, the Authors present personal experience in the past 5 years, concerning patients over 75 years of age who underwent parotid surgery for benign or malignant tumours (except 2 cases treated for chronic infections and sialoadenosis), in particular lymphatic metastases or direct invasion from neighbouring primary neoplasms.

Patients and methods

During the last 5 years, 84 patients have been observed and operated upon for parotid diseases, performing 86 parotidectomies (2 of which bilateral); 21 were superficial parotidectomies (SP) in cases with benign lesions of the superficial lobe, 37 conservative total parotidectomies (CTP) for large benign neoplasms or malignant neoplasms with no infiltration of the facial nerve, 8 radical parotidectomies (RP) with sacrifice of the facial nerve when presenting neoplastic involvement and 20 extended radical parotidectomies (ERP) in cases of malignant infiltration of the facial nerve, temporal bone, mandibular bone, temporo-mandibular joint, overlying skin or external ear (Table I).

Table I. Surgical treatment in all 84 patients.

Surgical treatment	Patients
Superficial parotidectomy	21
Conservative total parotidectomy	37
Radical parotidectomy	8
Extended radical parotidectomy	20
Total	86 (2 bil.)

The patients, 54 males, 30 females, mean age 60 years (range 4-94), included 30 (35.7%) over 75 years old (2 over 90), 21 males, 9 females, mean age 80.5 years, who are the subject of the present study. In these 30 patients, we observed 2 chronic infections, 6 benign tumours and 22 malignant neoplasms, with only 6 primary neoplastic lesions (4 squamous cell carcinomas, 1 mucoepidermoid carcinoma, 1 undifferentiated carcinoma) (Table II).

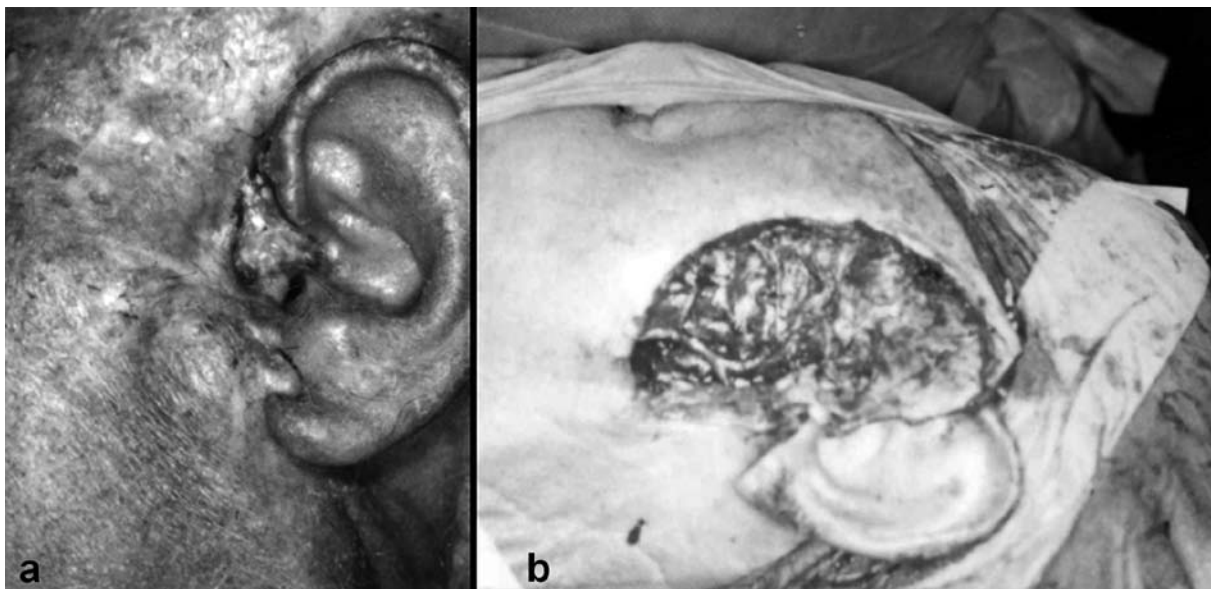


Fig. 1. Male, 84 years old, with basal cell carcinoma of left external ear infiltrating parotid gland: a) pre-operative view; b) intra-operative

Table II. Characteristics of study population: 30 patients over 75 years old.

Infection & sialadenosis (2)	Benign tumours (6)				Malignant tumours (22)								
	Adenoma		Enameloblastoma		Melanoma		Carcinoma		Merkel's Tumour				
	Pleomorphic	Monomorphic	Direct infiltration	Direct infiltration	N	Direct infiltration	Primary	Secondary					
♂ 75 y. SP	♂ 84 y. CTP	Warthin's Tumour	Others	♂ 82 y. ERP (MI-S-MM-MAX) + FTSG PST: Maxillary bone	♂ 89 y. CTP + ND + CH PST: Overlying skin	♂ 89 y. CTP + ND + CH PST: Overlying skin	s.c.c. ♀ 79 y. RP + MP + RT	♂ 78 y. ERP (EE-MB) + FTSG + RT PST: External ear	Direct infiltration	N			
		♀ 78 y. CTP	♂ 76 y. CTP + ND + CH PST: Upper eyelid				m.c. ♂ 80 y. CTP + ND				♂ 86 y. ERP (VI-EE) + PMf PST: External ear	Squamous cell carcinoma	
		♀ 75 y. CTP					s.c.c. ♀ 87 y. ERP (S-MB) + ND + RT				♂ 77 y. CTP + RT PST: Lacrimal tract	♂ 76 y.	ERP (VI-S-EE) + ND + LDF PST: External ear
		♂ 76 y. SP	♀ 76 y. ERP (EE-S) + ND + FTSG + CH PST: External ear				s.c.c. ♂ 88 y. ERP (VI-S) + FTSG + RT				♂ 94 y. CTP PST: External ear	♂ 78 y.	ERP (EE-MM) + PMf PST: External ear
♀ 82 y. CTP	♂ 76 y. CTP						♂ 83 y. ERP (S) + ND + PMf PST: Frontal skin	♂ 76 y.	ERP (EE-S) + ND + PMf PST: External ear	♀ 75 y. CTP + ND + RT PST: Cheek skin			
							s.c.c. ♂ 76 y. CTP + ND	♀ 92 y. ERP (VI-S) + PMf PST: Upper eyelid	Basal cell carcinoma		♂ 80 y. ERP (S-MAX-MB) + PMf PST: Overlying skin		
							u.c. ♂ 78 y. CTP + ND + RT	♀ 85 y. ERP (VI-S) + ND + Tf PST: Zygomatic skin	♂ 80 y. ERP (EE) + FTSG PST: External ear				

SP = Superficial Parotidectomy; CTP = Conservative Total Parotidectomy; RP = Radical Parotidectomy; ERP = Extended Radical Parotidectomy; VII = Facial nerve removed; S = Overlying skin; MM = Masseter Muscle; MB = Mastoid Bone; MAX = Maxillary Bone; EE = External Ear; ND = Neck Dissection; RT = Radiotherapy; PST = Primitive Site Tumour; CH = Chemothorapy; PMf = Pectoralis Major flap; LDF = Latissimus Dorsi flap; Tf = Trapezius Dorsi flap; FTSG = Full Thickness Skin Graft; MP = Muscledoplasty; s.c.c. = squamous cell carcinoma; m.c. = mucocleidroid carcinoma; u.c. = undifferentiated carcinoma; y = years

All 84 patients underwent ultrasonography (US), fine needle aspiration biopsy (FNAB), computerized tomography (CT) or magnetic resonance imaging (MRI) of the parotid space and neck according to case history and clinical pattern.

The patients > 75 years old with infections, sialoadenosis and benign lesions all showed swelling in the parotid region without pain or other symptoms, except the 82-year-old male with recurrent ameloblastoma which invaded the



Fig. 2. Same patient as Figure 1, with basal cell carcinoma of left external ear infiltrating parotid gland: c) full-thickness skin graft (FTSG) *in situ*; d) post-operative view after 1 year.

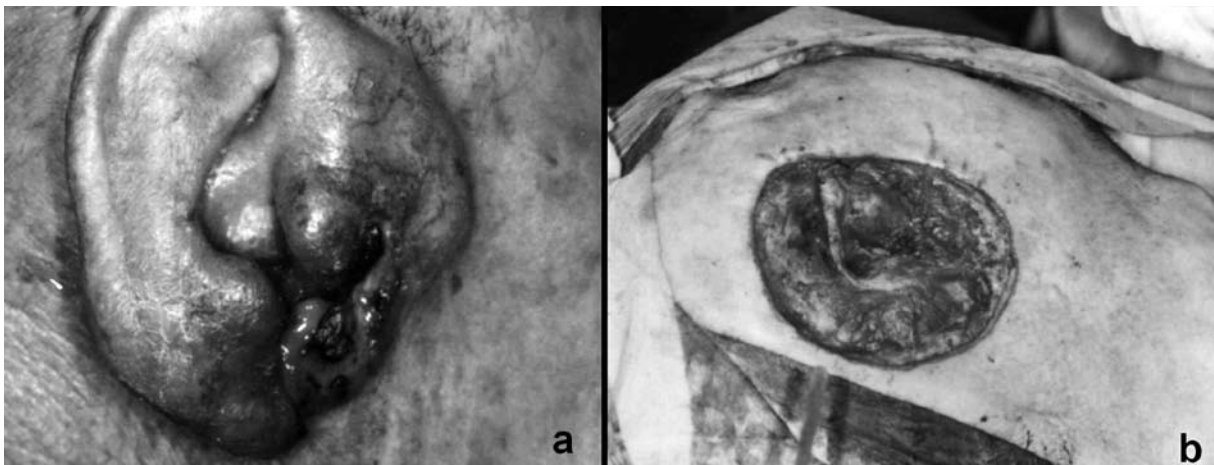


Fig. 3. Male, 86 years old, with squamous cell carcinoma of right external ear infiltrating parotid gland: a) pre-operative view; b) intra-operative view.

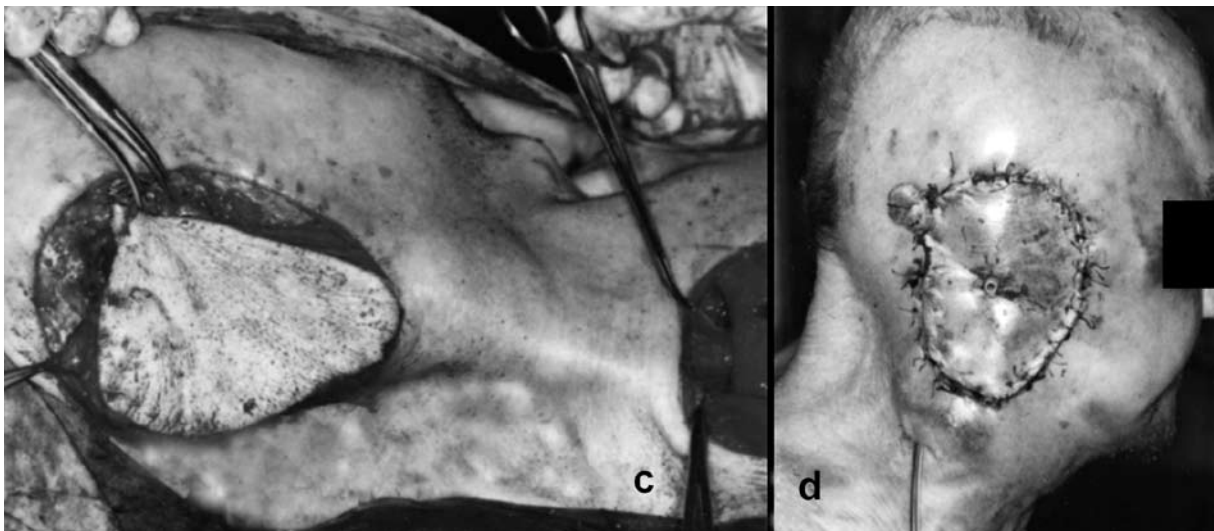


Fig. 4. Same patient as Figure 3, with squamous cell carcinoma of right external ear infiltrating parotid gland: c) pedicled *pectoralis major* myocutaneous flap *in situ* after the resection; d) post-operative view two days later.

facial nerve, causing paralysis (grade V, H-B) ¹¹. Those with malignant tumours had a case history of previous operations for parotid lesions in 4 cases, for external ear lesions in 7 cases (Figs. 1, 3) and for cutaneous lesions in the same half of the face in 8 cases (Fig. 5). Some of these patients complained of moderate pain and dysphagia and showed ulceration of the overlying skin in 5 cases, paralysis of the facial nerve in 2 cases (primary tumours) (grade V, H-B) ¹¹, neck metastasis in 9 cases (histologically confirmed) and extra-glandular extension in 10 cases (CT or MRI). Surgical treatment was carried out on the basis of the clinical data obtained from imaging techniques and cytological examinations and also considering intra-operative situations.

In particular, ERP involved complete removal of the parotid gland and one or more intra-glandular or adjacent structures: the facial nerve in 6 cases, the overlying skin in 10, the masseter muscle in 2, the external ear in 7, the mastoid bone in 3 and the maxillary bone in 2. Neck dissection was associated with the parotidectomy in 12 cases (levels I-V).

Reconstruction to compensate for the loss of substance was performed by employing pedicled myocutaneous flaps in 8 cases – 6 *pectoralis major* (Figs. 4, 6), 1 *latissimus dorsi*, 1 trapezius – and full-thickness skin grafts (FTSG) in 5 cases (Fig. 2).

Post-operative radiation therapy was performed in 7 cases and chemotherapy in 3 (chemo- and immunotherapy in the 3 patients with metastatic and infiltrating melanoma).

Results

The patients with infections, sialoadenosis and benign tumours are alive and disease-free without any influence on their life from the parotid diseases treated; only the patient treated for recurrent ameloblastoma died from a stroke 4 years later without evident disease (Table III).

The 3 subjects with melanoma died within 3 years. Among the patients with primary carcinomas, 3 are NED after 5 years, 2 years and 1 year, 2 died from the disease after 1 and 2 years, respectively, and one died without disease after 1 year. Three of the patients treated for parotid lymph node involvement from carcinoma are alive; 2 are NED after 2 years and 1 year, one is alive with disease after 2 years. Two patients, one very old, died without disease after 4 years and 8 months, respectively; one patient, the last to be treated, died in the post-operative period (heart attack). The patients with direct infiltration from squamous cell carcinoma died. Two subjects died in the post-operative period from heart attack and the other 2 cases died without disease after 3 and 2 years. The 2 subjects operated on for direct invasion from

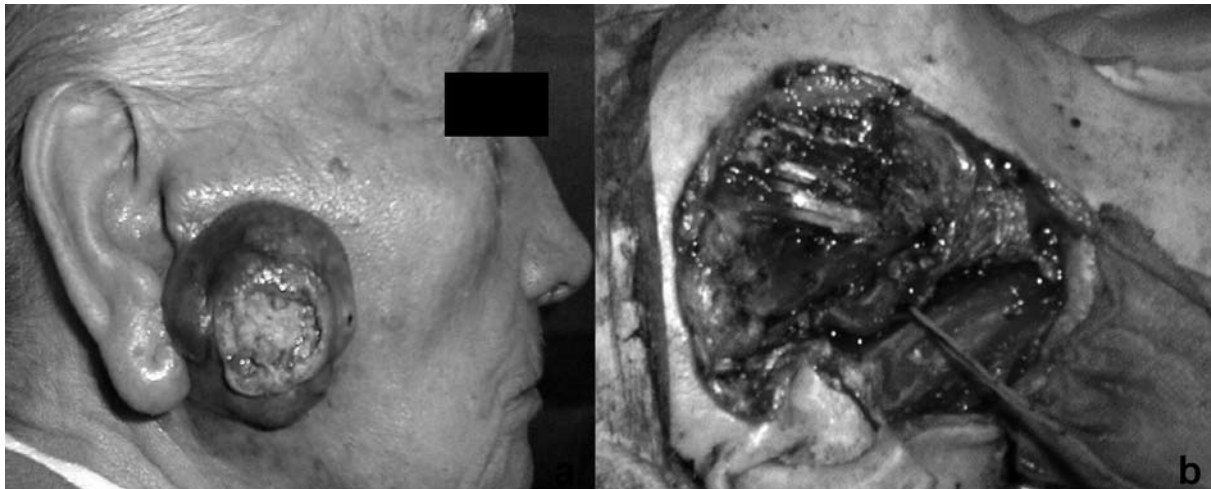


Fig. 5. Female, 92 years old, with a parotid gland metastasis from squamous cell carcinoma of right upper eyelid treated 2 years previously: a) pre-operative view; b) intra-operative view.



Fig. 6. Same patient as Figure 5, with parotid gland metastasis from squamous cell carcinoma of right upper eyelid treated 2 years previously: c) pedicled *pectoralis major* myocutaneous flap *in situ* after resection; d) post-operative view after 5 months.

Table III. Follow-up of the 30 patients over 75 years old.

Infection & sialadenosis (2)	Benign tumours (6)			Malignant tumours (22)					
	Adenoma	Enameloblastoma	Melanoma	Primary	Carcinoma		Merkel's Tumour		
	Pleomorphic	Direct infiltration	N		N	Secondary			
No recurrence and no influence on survival	Warthin's Tumour		♂ 76 y. DOD after 3 years	♂ 89 y. DOD after 3 years	♂ 78 y. NED after 2 years	Squamous cell carcinoma	N	♂ 75 y. NED after 2 years	
									Others

DWD: Died Without Disease; DOD: Died Of Disease; NED = No Evident Disease; AWD = Alive With Disease; D in p.o.p. = Died in post-operative period; s.c.c. = squamous cell carcinoma; m.c. = mucoepidermoid carcinoma; u.c. = undifferentiated carcinoma

basal cell carcinoma are NED after 4 and 2 years, respectively. The female patient treated for parotid lymph node metastasis from Merkel's tumour is NED after 2 years.

Discussion

The parotid space is a relatively frequent site of swelling due to benign or malignant tumours.

Benign neoplasms, like some infections and sialoadenosis, require surgical treatment; in almost all cases, this consists of SP or CTP, which have no influence on survival but can cause small, often transient, functional problems.

In contrast, malignant tumours may require more extensive operations, such as RP or ERP, with neck dissection and other surgical procedures on intra-glandular or adjacent structures (facial nerve, external ear, temporal bone, mandibular bone, skin, etc.), often with a final reconstructive step, greatly influencing survival and the quality of the remaining life of the patient¹²⁻¹⁴.

It is well known that survival of the patients with malignant parotid tumours depends on the histotype of the neoplasm, its stage, involvement of the adjacent structures and neck lymph node invasion as well as the general condition of the patient. Parotid metastases are a clinical sign of initial disease spread and, in these cases, we have to exclude the presence of other metastases in the neck and/or in distant organs.

Direct infiltration of the parotid space is a disease that is still limited but not, for this reason, less serious. These secondary tumours must be treated radically with a very wide surgical approach, also in the neck and adjacent structures, and may often require a phase of reconstruction.

Finally, the performance status of the patient is very important in parotid surgery because many malignant tumours, whether primary or secondary, arise in the last decades of life^{6,15}.

In our experience with 84 patients, 30 subjects (35.7%) were > 75 years old and 22 of these presented malignant neoplasms. Interestingly, only 6 patients had a primary malignant neoplasm (4 squamous cell carcinomas, one mucoepidermoid carcinoma, one undifferentiated carcinoma), while 16 patients presented parotid metastases (9 cases) and direct infiltration of the gland from surrounding cutaneous tumours (7 cases).

Enameloblastoma is a benign neoplasm, from a histological point of view, but in our case this tumour, which had reappeared after more than 30 years, involved the entire upper maxillary bone and parotid tissue and invaded the facial nerve so that it was impossible to preserve it.

Therefore, we had 17 cases of secondary involvement of the parotid space out of 30 patients > 75 years old with parotid swelling. This fact implies that, in old age, malignant tumours, in particular when secondary, metastatic and directly infiltrating, are relatively more frequent than in younger subjects, in the present study 31 malignant tumours out of 86 swellings of the parotid in the overall series (36%) against 22 (73%) (23 if we include the enameloblastoma involving the parotid tissue and facial nerve) of 30 parotid growth expansions in the patients > 75 years of age.

The operations carried out in these 30 patients were: 2 SP; 13 CTP; 1 RP and 14 ERP.

The ERP was extended to the facial nerve in 6 cases but the facial nerve was not reconstructed by anastomosis or graft due to the very old age of the patients. In all cases, we performed a partial tarsorrhaphy with acceptable results and a muscleplasty in only one case. Because of the old age of the patients, we did not compensate for the loss of substance by means of a microvascular free flap, preferring simpler solutions, such as pedicled myocutaneous flaps or full-thickness skin grafts, with excellent final results.

Mean hospitalization was 15 days and the most common complications consisted of functional and cosmetic problems following facial palsy in the 6 cases with sacrifice of the nerve, hypoesthesia of the greater auricular nerve in almost 50% of the cases, Frey syndrome in 4 cases and limited skin-flap necrosis (FTSG) which healed naturally in a few days.

In 9 patients, we also performed a modified radical type III neck dissection and in 3 patients (a 76-year-old female with N+ from melanoma, an 87-year-old female with primary squamous cell carcinoma and a 76-year-old male with squamous cell carcinoma from the external ear) a radical neck dissection.

Post-operative radiation therapy was performed in the patients in whom the tumour showed particularly aggressive histological characteristics: 4 primitive parotid carcinomas and 3 intraparotid lymph-node metastases (2 deriving from a carcinoma of the external ear and of the lacrimal tract, one from a Merkel's cutaneous cheek tumour).

Post-operative chemotherapy was performed in the 3 cases of melanoma, employing cytostatic drugs and immunotherapy.

The survival rate was greatly influenced by the old age of the patients as well as, the stage and histology of the parotid tumours, which were malignant in 22 cases, with 3 melanomas and 13 secondary neoplasms. Three patients died in the post-operative period from heart attack; they were 76, 85 and 86 years old, had a very advanced loco-regional disease and underwent a very wide operation (ERP with a reconstructive step and neck dissection in 2 cases). Five patients died from the disease (3 melanomas and 2 primary carcinomas); 6 patients died, without disease, from different causes (including the patient with recurrent enameloblastoma); 9 patients are alive, 8 NED and 1 with limited disease in the ethmoid after 2 years.

Conclusions

The large number of subjects aged over 75 years in our series (30 patients out of 84 – 35.7%) showed that parotid swellings, due, in particular, to malignant tumours, are relatively frequent in the last decades of life.

These neoplasms are mostly secondary, i.e., intraparotid lymph node metastases or the final result of direct invasion from malignant outer ear tumours or from neighbouring cutaneous neoplasms, which were very frequent in all our subjects.

A detailed medical history and a complete ENT examination are mandatory to reveal any previous operations for malignant cutaneous tumours of the head and neck, which can spread into the intraparotid lymph nodes, or the presence of malignant epidermic tumours invading the parotid space.

The final results are influenced by the old age of the patients and by the stage and histological characteristics of the tumours (melanoma, metastatic carcinomas, etc.).

Our limited study population does not allow us to differentiate the prognosis between metastatic and infiltrating parotid diseases; in either case, we were dealing with a very serious condition.

Surgery is possible and indicated even in very old age. We did not perform tracheotomy or open the upper diges-

tive tract, which can cause complications in the post-operative period (infections, weight loss, dysphagia).

Although the final results are not satisfactory in all cases, it is, in our opinion, unjustified, on the grounds of their age, to forget treating all those patients for whom surgical treatment is of fundamental importance, whether performed as a single therapeutic procedure or associated with post-operative radiotherapy or chemotherapy.

References

- ¹ Bron LP, Traynor SJ, McNeil EB, O'Brien CJ. *Primary and metastatic cancer of the parotid: comparison of clinical behavior in 232 cases.* Laryngoscope 2003;113:1070-5.
- ² De Vincentiis M, Magliulo G, Soldo P, Manciocco V, Pagliuca G, Del Gaizo R, et al. *Extended parotidectomy.* Acta Otorhinolaryngol Ital 2005;25:169-73.
- ³ Fiorella R, Di Nicola V, Fiorella ML, Spinelli DA, Coppola F, Luperto P, et al. *Major salivary gland diseases. Multicentre study.* Acta Otorhinolaryngol Ital 2005;25:182-90.
- ⁴ Speight PM, Barrett AW. *Salivary gland tumours.* Oral Dis 2002;8:229-40.
- ⁵ Moore BA, Weber RS, Prieto V, El Naqqar A, Halsinger FC, Zhou X, et al. *Lymph node metastases from cutaneous squamous cell carcinoma of the head and neck.* Laryngoscope 2005;115:1561-7.
- ⁶ O'Brien CJ, McNeil EB, McMahon JD, Pathak I, Lauer CS, Jackson MA. *Significance of clinical stage, extent of surgery, and pathologic findings in metastatic cutaneous squamous carcinoma of the parotid gland.* Head Neck 2002;24:417-22.
- ⁷ Khurana VG, Mentis DH, O'Brien CJ, Hurst TL, Stevens GN, Packham NA. *Parotid and neck metastases from cutaneous squamous cell carcinoma of the head and neck.* Am J Surg 1995;170:446-50.
- ⁸ Nuyens M, Schüpbach J, Stauffer E, Zbären P. *Metastatic disease to the parotid gland.* Otolaryngol Head Neck Surg 2006;135:844-8.
- ⁹ O'Brien CJ, McNeil EB, McMahon JD, Pathak I, Lauer CS. *Incidence of cervical node involvement in metastatic cutaneous malignancy involving the parotid gland.* Head Neck 2001;23:744-8.
- ¹⁰ Tullio A, Bianchi B, Sesenna E. *Lymphatic metastases in the parotid region from malignant skin neoplasm of the head: considerations for surgical treatment based on personal clinical experience.* Acta Otorhinolaryngol Ital 2001;21:44-9.
- ¹¹ House JW, Brackmann DE. *Facial nerve grading system.* Otolaryngol Head Neck Surg 1985;93:146-7.
- ¹² Audet N, Palme CE, Gullane PJ, Gilbert RW, Brown DH, Irish J, et al. *Cutaneous metastatic squamous cell carcinoma to the parotid gland: analysis and outcome.* Head Neck 2004;26:727-32.
- ¹³ Lay SY, Weinstein GS, Chalian AA, Rosenthal DI, Weber RS. *Parotidectomy in the treatment of aggressive cutaneous malignancies.* Arch Otolaryngol Head Neck Surg 2002;128:521-6.
- ¹⁴ Malata CM, Camilleri IG, McLean NR, Piggott TA, Kelly CG, Chippindale AJ, et al. *Malignant tumours of the parotid gland: a 12-year review.* Br J Plast Surg 1997;50:600-8.
- ¹⁵ Kokemueller H, Swennen G, Brueggemann N, Brachvogel P, Eckardt A, Hausamen JE. *Epithelial malignancies of the salivary glands: clinical experience of a single institution – a review.* Int J Oral Maxillofac Surg 2004;33:423-32.

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