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Advanced Cutaneous Malignant Tumors of the Face: A Retrospective Study of 72 Cases in Northern Morocco

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Abstract **Original Research Article**

Background: Advanced cutaneous malignant tumors of the face represent a significant public health challenge in Morocco, particularly due to delayed diagnosis and complex management requirements. This study aims to describe the epidemiological, clinical, histological, and therapeutic characteristics of these tumors in a Moroccan population. ***Methods****:* We conducted a retrospective study over a 2-year period (2021–2023) at the Department of Plastic and Aesthetic Surgery of Mohammed VI University Hospital in Tanger, including 72 patients with histologically confirmed advanced cutaneous malignant tumors of the face. ***Results:*** The median age was 64 years (range: 7–90), with a male predominance (sex ratio M/F = 1.88). Sixty-one percent of patients were from urban areas. Major risk factors included sun exposure (61%), active smoking (34.7%), and pre-cancerous lesions (24%). Basal cell carcinoma (BCC) was the most frequent histological type (61%), followed by squamous cell carcinoma (SCC, 32%) and melanoma (4%). The most common location was the periorbital region (23%). Surgical excision with safety margins was performed in all patients, with delayed reconstruction in 65% of cases. Flaps were used in 40.3% of cases, skin grafts in 28%, and direct suture in 11%. The recurrence rate was 16.7%, and one patient died from respiratory distress postoperatively. ***Conclusion:*** Advanced facial skin cancers require multidisciplinary management with emphasis on early detection, adequate surgical margins, and appropriate reconstruction techniques. Preventive measures targeting sun exposure and smoking remain essential to reduce incidence.

Keywords: Advanced skin tumors, face, basal cell carcinoma, squamous cell carcinoma, melanoma, reconstruction, Morocco.

INTRODUCTION

Cutaneous malignant tumors represent the most common dermatological and aesthetic problem in Morocco, driven by population aging and sun exposure behaviors [1,2]. Among these cancers, basal cell carcinoma (BCC) is the most frequent, followed by squamous cell carcinoma (SCC) and melanoma [3].

The advanced nature of these tumors poses significant challenges due to their multifactorial complexity, encompassing both surface and depth dimensions, tissue loss consequences, and potential involvement of vital adjacent structures [4]. Facial localization in advanced stages carries aesthetic and functional sequelae, as well as life-threatening complications, defining their severity and management complexity for both oncological excision and reconstructive surgery [5].

Management of advanced cutaneous malignant facial tumors is multidisciplinary, involving plastic surgeons, dermatologists, oncologists, radiologists, radiotherapists, and pathologists [6]. Close surveillance is necessary to detect any recurrence early.

The objective of this study was to define the epidemiological profile of advanced cutaneous malignant facial tumors and their risk factors, study their histological characteristics and anatomoclinical presentations in northern Morocco, and examine oncological and reconstructive management approaches after excision.

MATERIALS AND METHODS

Study Design and Population

We conducted a retrospective study over a 2-year period (2021–2023) at the Department of Plastic, Reconstructive, Aesthetic Surgery and Burns of

Mohammed VI University Hospital in Tanger, Morocco. We included 72 patients treated for advanced cutaneous malignant tumors of the face.

Inclusion criteria:

- Histologically proven malignant tumors (BCC, SCC, melanoma)
- Advanced stage tumors

Exclusion criteria:

- Other tumor types
- Inoperable patients

Data Collection

Data were collected from medical records using a standardized data sheet, including:

- **Epidemiological profile:** Age, sex, geographic origin, personal and family history, sun exposure, pre-cancerous lesions, smoking, phototype (Fitzpatrick classification)
- **Clinical profile:** Consultation delay, tumor characteristics (location, number, macroscopic appearance, size), functional signs, local and locoregional invasion degree, lymph node involvement
- **Paraclinical profile:** Histological type, extension workup, TNM classification
- **Therapeutic profile:** Surgical goal, excision margins, reconstruction timing and type, associated procedures, adjuvant treatment, follow-up

Statistical Analysis

Descriptive statistics were used to analyze the data. Categorical variables were expressed as frequencies and percentages, and continuous variables as means, medians, and ranges.

RESULTS

Epidemiological Profile

Age and Sex:

Patients ranged from 7 to 90 years with a median age of 64 years. Age distribution was: 0–20 years (6 cases, 8.3%), 20–40 years (4 cases, 5.6%), 40–60 years (18 cases, 25%), 60–80 years (35 cases, 48.6%), and 80–100 years (9 cases, 12.5%). There was male predominance with 47 men and 25 women (sex ratio M/F = 1.88).

Geographic Origin:

Sixty-one percent (44 patients) were from urban areas versus 39% (28 patients) from rural areas.

Risk Factors:

- **Phototype:** Type III predominated (57%), followed by type IV (30%), type V (7%), and type II (6%)
- **Sun exposure:** Significant in 61% of patients, related to outdoor occupational activity
- **Pre-existing lesions:** 17 cases (24%) had pre-cancerous lesions: 6 actinic keratoses (8.4%), 7 xeroderma pigmentosum (10%), and 4 pigmented lesions (5.6%)

Figure 1: multiple facial tumors in an 11-year-old boy with xeroderma pigmentosum (XP)

- **Smoking:** 34 patients (47.2%) were smokers (25 active, 9 passive)
- **Comorbidities:** Hypertension (43%), diabetes (32%), systemic disease (7%), cardiopathy (5.6%), tuberculosis history (5.6%)

Table 1: Epidemiological Data

Category	Subcategory	Percentage (%)
Age Distribution	0–20 years	8.3
	20–40 years	5.6
	40–60 years	25.0
	60–80 years	48.6
	80–100 years	12.5
	Total / Range	100
Sex	Male	65.3
	Female	34.7
Geographic Origin	Urban	61.0
	Rural	39.0
Phototype	Type II	6.0
	Type III	57.0
	Type IV	30.0
	Type V	7.0
Sun Exposure	Significant exposure	61.0
Pre-existing Lesions	Any pre-cancerous lesion	24.0
	Actinic keratoses	8.4
	Xeroderma pigmentosum	10.0
	Pigmented lesions	5.6
Smoking Status	Smokers (total)	47.2
	Active smokers	34.7
	Passive smokers	12.5
Comorbidities	Hypertension	43.0
	Diabetes	32.0
	Systemic disease	7.0
	Cardiopathy	5.6
	Tuberculosis history	5.6

Clinical Profile

Consultation Delay: Varied from 5 months to 10 years. Fifty-five patients (76.4%) presented with primary lesions, while 17 (23.6%) had pre-existing lesions.

Functional Signs: Ulceration (49%), pain (40%), bleeding (11%)

Locoregional Invasion Signs: Present in 27 patients (37.5%): periorbital infiltration (4), external table involvement (2), blindness (6), deafness (2), lymph node involvement (10), facial paralysis (1), parotid infiltration (1)

Metastases: One patient (1.4%) had pulmonary metastases associated with lymph node involvement.

Macroscopic Appearance: Ulcerovegetative (49%), ulcerated (21%), vegetative (18%), nodular (12%)

Figure 2: Ulcerative, exophytic appearance of a basal cell carcinoma of the nose in a 72-year-old patient

Location: Periorbital (23%), nasal (17%), labial (14%), jugal (14%), temporal (11%), nasogenian (8%), canthal (7%), frontal (3%), ear (3%)

Figure 3: Tumor Location Distribution

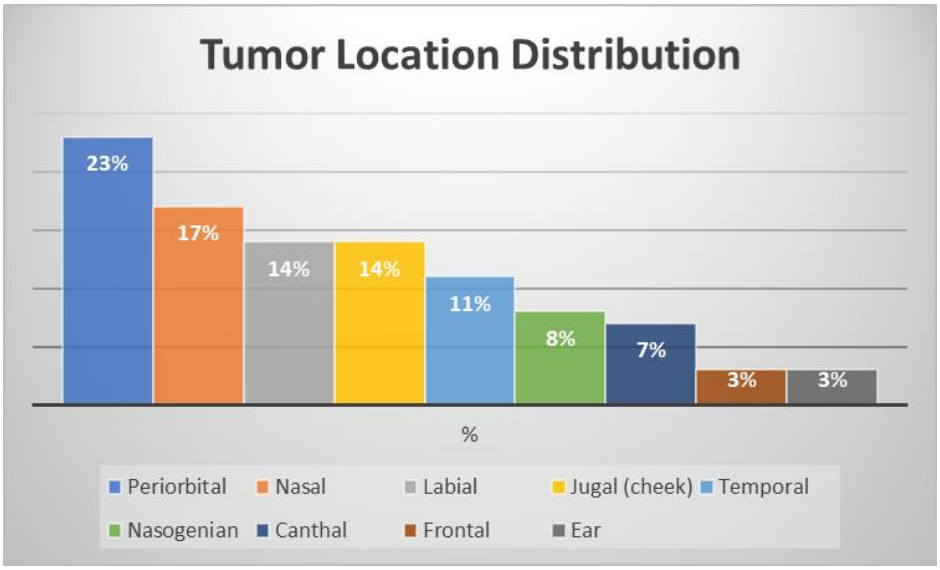

Figure 4: Ulcerative, exophytic lesion of a squamous cell carcinoma on the auricle of the ear in an 80-year-old patient

Figure 5: Ulcerative, exophytic lesion of a basal cell carcinoma of the lower eyelid, without involvement of the conjunctival fornix, in a 35-year-old female patient

Figure 6: Ulcerative, exophytic lesion of a temporal squamous cell carcinoma with left periorbital tissue infiltration measuring 10 cm, progressing over 5 years in a 64-year-old patient

Figure 7: Ulcerative, exophytic lesion of the lower eyelid basal cell carcinoma infiltrating the eyeball, progressing over 18 months in a 71-year-old female patient

Tumor Size: Ranged from 0.5 cm to 10 cm in largest diameter

Tumor Number: 58 patients (80.6%) had single tumors, 14 (19.4%) had multiple tumors

3.3 Paraclinical Profile

Histological Types: BCC (61%, 44 cases), SCC (32%, 23 cases), melanoma (4%, 3 cases), associated forms (3%, 2 cases)

Figure 8: Ulcerative, exophytic lesion of a buccal melanoma in a 61-year-old patient.

BCC Subtypes: Nodular (52.5%), infiltrating (20.5%), superficial (18%), mixed (9%)

SCC Subtypes: All were infiltrative—well-differentiated (10 cases, 43.5%), moderately differentiated (13 cases, 56.5%)

Table 2: Histologique types

Category	Type / Subtype	Percentage
Histological Types	Basal Cell Carcinoma (BCC)	61%
	Squamous Cell Carcinoma (SCC)	32%
	Melanoma	4%
	Associated forms	3%
BCC Subtypes	Nodular	52.5%
	Infiltrating	20.5%
	Superficial	18%
	Mixed	9%
SCC Subtypes	Well-differentiated (infiltrative)	43.5%
	Moderately differentiated (infiltrative)	56.5%

Biopsy: Simple biopsy in 81% of cases, excisional biopsy in 18%, intraoperative examination in 1%

Extension Workup: Facial CT scan (14 patients), craniofacial MRI (2 patients), thoracoabdominopelvic CT (12 patients), cervical ultrasound (all SCC patients), brain CT (31 patients)

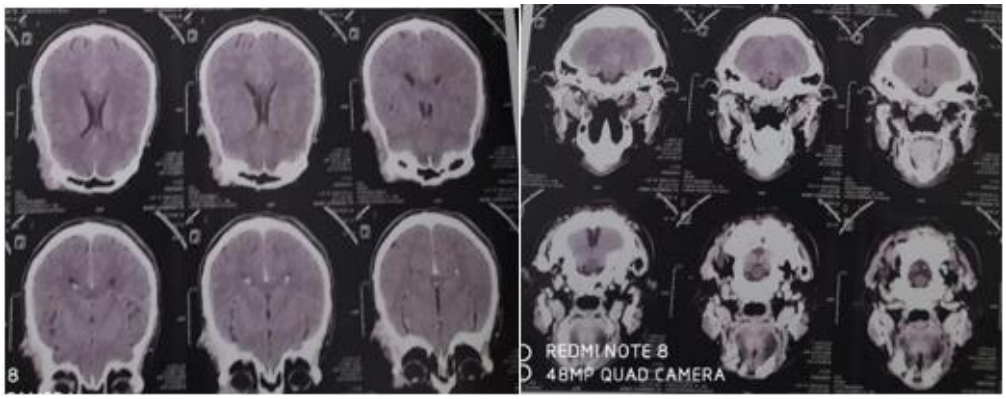

Figure 9: Brain CT scan of a patient with a well-differentiated squamous cell carcinoma.

TNM Classification: T1 (5), T2 (28), T3 (16), T4 (23); N1 (5), N2 (5), N3 (0); M1 (2)

3.4 Therapeutic Profile

Surgical Goal: Curative (64 patients, 88.9%), palliative (8 patients, 11.1%)

Anesthesia: General (52 patients, 72.2%), local (20 patients, 27.8%)

Excision Margins: 5 mm (22 cases), 10 mm (47 cases), 20 mm (2 cases), 30 mm (1 case)

Organ Resection: Deep muscles (61%), cartilage (4 patients—2 ear, 2 nose), orbital exenteration (9 patients, 12.5%), ear amputation (2 patients, 2.8%)

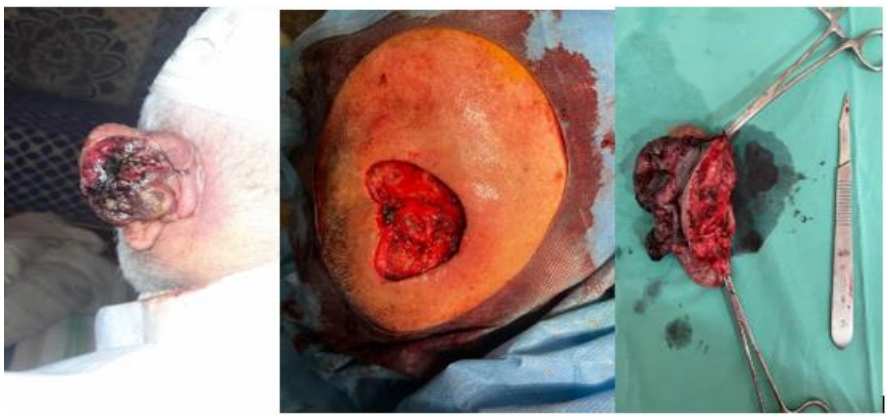

Figure 10: Amputation of the left auricle due to squamous cell carcinoma

Figure 11: Amputation of the right auricle in a patient with squamous cell carcinoma

Figure 12: Recurrence of a melanoma in the left parietal region, which underwent intraoperative frozen section examination (single case)

Figure 13: Orbital exenteration with delayed temporal flap reconstruction for an infiltrating basal cell carcinoma involving the eyeball

Margin Status: Complete excision in 87%, positive margins requiring re-excision in 13%
Lymph Node Dissection: Performed in 10 patients (9 SCC, 1 BCC), with parotidectomy in 1 SCC case
Reconstruction Timing: Immediate (35%), delayed (65%)

Reconstruction Techniques:

- Direct suture: 8 cases (11%)
- Directed healing: 16 cases (22.2%)
- Skin grafts: 20 cases (28%)—all full-thickness, from supraclavicular fossa (11) or arm (9)

Figure 14: Delayed skin graft for a nasal basal cell carcinoma, harvested from the supraclavicular region

Figure 15: Excision with delayed skin graft

- Flaps: 29 cases (40.3%)
- Local flaps: 20 cases (Mustardé 6, Karapandzic 2, nasogenian 3, Rintala 4, jugal 4, heteropalpebral 1)

Figure 16: Karapandzic flap

- Locoregional flaps: 9 cases (temporal 6, frontal 2, mediofrontal 1)

Figure 17: Immediate median forehead flap in a 64-year-old patient with a squamous cell carcinoma invading the nasal cartilage

- Cartilage graft: 2 cases (3%)

Figure 18: Nasal squamous cell carcinoma in a 38-year-old female patient

Adjuvant Radiotherapy: 25 patients (34.7%)—9 SCC with positive lymph nodes, 1 BCC with positive nodes, 9 after exenteration, 6 for palliative intent

Figure 19: Excision with orbital exenteration combined with a local advancement flap for a basal cell carcinoma of the left lower eyelid invading the eyeball in a 90-year-old patient

Figure 20: Reconstruction after excision of a basal cell carcinoma infiltrating the eyeball with orbital exenteration using the temporal muscle

Figure 21: Orbital exenteration with temporal flap reconstruction

Table 3: Therapeutic Profile

Category	Variable	%
Surgical Goal	Curative	88.9%
	Palliative	11.1%
Anesthesia	General	72.2%
	Local	27.8%
Excision Margins	5 mm	30.6%

	10 mm	65.3%
	20 mm	2.8%
	30 mm	1.4%
Organ Resection	Deep muscles	61.1%
	Cartilage resection	5.6%
	Orbital exenteration	12.5%
	Ear amputation	2.8%
Margin Status	Complete excision	87.5%
	Positive margins	12.5%
Lymph Node Dissection	Performed	13.9%
	Not performed	86.1%
Reconstruction Timing	Immediate	34.7%
	Delayed	65.3%
Reconstruction Techniques	Direct suture	11.1%
	Directed healing	22.2%
	Skin grafts	27.8%
	Flaps (total)	40.3%
Flap Subtypes	Local flaps	27.8%
	Locoregional flaps	12.5%
Cartilage graft	Used	2.8%
Adjuvant Radiotherapy	Given	34.7%
	Not given	65.3%

3.5 Postoperative Follow-up and Evolution

Immediate Complications: Infection (9 patients), hematoma (2), bleeding (1), partial graft necrosis (6)

Short-term Complications: Wound inflammation (5), suture dehiscence (5), wound suffering with microstomia (3), hypertrophic scar (1)

Long-term Complications: Healing issues (2), recurrent conjunctivitis (4), nostril retraction (1), ectropion (2), fistulization (1), granulation hypertrophy (1)

Recurrence: 12 patients (16.7%)—3 BCC (6.8%), 2 SCC (8.7%), 1 melanoma (33.3%), 6 others. New lesions appeared in 5 XP patients.

Reoperations: 15 patients required reoperation—skin graft (3), delayed reconstruction (9), commissuroplasty (2), ectropion correction (2)

Mortality: One patient (1.4%) died 3 weeks postoperatively from respiratory distress; this patient had COPD, underwent tracheotomy, and had palliative excision with lymph node dissection for lower lip SCC.

Functional and Aesthetic Results: Satisfactory (31 patients, 43.1%), mediocre (29 patients, 40.3%), unsatisfactory (8 patients, 11.1%), death (1 patient, 1.4%)

Table 4: Postoperative Follow-up and Evolution

Category	Outcome / Complication	%
Immediate Complications	Infection	12.5%
	Hematoma	2.8%
	Bleeding	1.4%
	Partial graft necrosis	8.3%
Short-term Complications	Wound inflammation	6.9%
	Suture dehiscence	6.9%
	Microstomia-related wound dysfunction	4.2%
	Hypertrophic scar	1.4%
Long-term Complications	Delayed/poor healing	2.8%
	Recurrent conjunctivitis	5.6%
	Nostril retraction	1.4%
	Ectropion	2.8%
	Fistulization	1.4%
	Granulation hypertrophy	1.4%
Recurrence	Any recurrence	16.7%
	└ BCC recurrence	4.2%
	└ SCC recurrence	2.8%
	└ Melanoma recurrence	1.4%
	└ Other tumors	8.3%

	New lesions in XP patients	6.9%
Reoperations	Any reoperation	20.8%
	Skin graft revision	4.2%
	Delayed reconstruction	12.5%
	Commissuroplasty	2.8%
	Ectropion correction	2.8%
Mortality	Death	1.4%
	Cause: respiratory distress (COPD + palliative SCC case)	1.4%
Functional & Aesthetic Outcome	Satisfactory	43.1%
	Mediocre	40.3%
	Unsatisfactory	11.1%
	Death	1.4%

DISCUSSION

Epidemiological Analysis

Our study's median age of 64 years is comparable to the Marrakech study (63 years) [7] and the Ankara study (56 years) [8], but lower than the Greek study (72 years) [9]. Male predominance (sex ratio 1.88) is consistent with literature, attributed to outdoor occupational sun exposure [7,8,10]. The urban predominance (61%) differs from some Moroccan studies showing rural predominance [7,11], possibly reflecting our hospital's geographic catchment area.

Sun exposure (61%) and smoking (47.2%) are major modifiable risk factors. The high prevalence of xeroderma pigmentosum (10%) reflects the consanguinity patterns in our region [12].

Clinical Analysis

The prolonged consultation delay (5 months to 10 years) reflects socioeconomic and educational barriers to healthcare access. The ulcerovegetative appearance (49%) and advanced locoregional signs (37.5%) indicate late presentation. Periorbital predominance (23%) differs from Western literature where nasal location predominates [13,14], possibly due to cultural veil-wearing practices protecting the central face but leaving periorbital area exposed.

Histological Analysis

BCC predominance (61%) is consistent with global literature [3,7,15]. The nodular BCC subtype predominance (52.5%) matches the Marrakech study [7]. All SCCs were infiltrative, confirming their aggressive nature in our population. The higher rate of simple biopsy (81%) versus excisional biopsy reflects our approach of confirming diagnosis before definitive surgery, allowing better margin planning.

Therapeutic Analysis

Our excision margin practices (5–10 mm for BCC, 10–30 mm for SCC) align with ANAES recommendations [16]. The 13% incomplete excision rate is comparable to literature (11–22.4%) [17,18]. The high rate of delayed reconstruction (65%) ensures oncological certainty before complex reconstruction.

Flap usage (40.3%) is comparable to the Ankara study (40%) [8] but lower than Marrakech (85%) [7], reflecting different institutional practices and case complexity. The temporal flap was our most used locoregional flap (8.3%), particularly for orbital exenteration reconstruction.

The 34.7% adjuvant radiotherapy rate is higher than Marrakech (14.5%) [7], reflecting more advanced stages in our series. The 16.7% recurrence rate is acceptable given the advanced nature of tumors, with BCC recurrence (6.8%) lower than literature (3.8–13.4%) [9,19], possibly due to wider margins.

Prognosis and Prevention

The generally favorable BCC prognosis contrasts with the more guarded SCC prognosis due to metastatic potential. Melanoma's poor prognosis in our series (33.3% recurrence) reflects advanced presentation. Prevention through sun protection, smoking cessation, and early detection campaigns remains crucial [20].

Limitations

This study's retrospective design, limited follow-up (<2 years), incomplete photographic documentation, and single-center nature are limitations. Loss to follow-up and lack of centralized medical records may introduce bias.

CONCLUSION

Advanced cutaneous malignant tumors of the face represent a significant challenge in our context, characterized by late presentation, advanced stages, and complex reconstruction needs. Multidisciplinary management with adequate surgical margins, appropriate reconstruction techniques, and adjuvant therapy when indicated improves outcomes. Prevention through public education on sun protection and early detection remains essential to reduce the burden of these tumors.

Future directions include implementing Mohs micrographic surgery for margin control, sentinel lymph node biopsy for melanoma, and standardized follow-up protocols. General practitioner education on early

recognition and referral could significantly improve prognosis.

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