Original Paper

Descriptive and Comparative Analysis of Skin Tumors of the Face

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ABSTRACT: Background: Facial skin tumors comprise a wide spectrum of benign and malignant lesions, among which basal cell carcinoma (BCC) and cutaneous squamous cell carcinoma (cSCC) are the most frequent malignancies. Because treatment in this region must achieve complete oncologic excision while preserving both function and appearance, detailed knowledge of the clinicopathological profile of these tumors is essential. This study aimed to evaluate the characteristics of surgically treated facial skin tumors and to compare the main tumor groups with respect to demographic and histopathological features. Materials and Methods: We conducted a retrospective observational study including 297 patients with 368 histopathologically confirmed facial skin lesions who underwent surgical treatment between January 2023 and December 2025 at the Department of Plastic and Reconstructive Surgery, Emergency County Clinical Hospital of Craiova. Demographic data, histopathological diagnosis, BCC subtype, SCC grade, ulceration, deep invasion, anatomical location, and reconstructive techniques were collected. Descriptive statistics were complemented by between-group comparisons using chi-square, Fisher's exact, and exact binomial tests, with Wilson 95% confidence intervals (CI) for proportions. Results: The sex distribution was balanced, with a non-significant male predominance (53.2%, p=0.296), and benign (51.1%) and malignant (48.9%) lesions occurred in nearly equal proportions (p=0.715). BCC was the most frequent malignancy (125/180), corresponding to a BCC:SCC ratio of approximately 2.7:1. Ulceration was significantly more frequent in BCC than in SCC overall (66.4% vs 42.6%, p=0.008), a difference driven by the uniformly non-ulcerated in situ SCC subgroup; among SCC, ulceration was strongly associated with invasive disease (p<0.001). Within the BCC group, the nodular subtype showed significantly higher rates of ulceration and deep invasion than the indolent adenoid and superficial subtypes (p<0.001 and p=0.007, respectively). The nasal region was the most commonly affected site (43.8%). Reconstruction was individualized according to defect size, location, and tissue availability, with local flaps representing the most frequently used technique. Conclusions: In this surgical series, benign and malignant facial tumors occurred with comparable frequency, BCC predominated among malignancies, and ulceration emerged as a clinically useful marker of invasive behavior. Successful management relies on complete surgical excision combined with individualized reconstruction, while careful histopathological assessment remains essential for risk stratification and follow-up.

KEYWORDS: *Facial skin tumor, cutaneous squamous cell carcinoma, basal cell carcinoma, surgical intervention.*

Introduction

Tumors of the facial skin encompass a broad spectrum of lesions, ranging from common benign entities such as melanocytic nevi, seborrheic keratoses, and cutaneous cysts to malignant neoplasms dominated by non-melanoma skin cancer. Basal cell carcinoma (BCC) is the most frequent malignant skin tumor, followed by cutaneous squamous cell carcinoma (cSCC), and the incidence of both continues to rise worldwide as a result of population aging, cumulative ultraviolet (UV) radiation exposure, and improved diagnostic awareness. Although most lesions are effectively managed by surgical excision, a proportion of malignant tumors follow a more aggressive course, with extensive local invasion, regional lymph node involvement, and, in advanced cases, distant metastasis. These high-risk tumors account for most of the morbidity and mortality associated with skin cancer and require prompt recognition and appropriate treatment [1].

The face is the anatomical site most commonly affected by skin tumors because of its chronic exposure to ultraviolet radiation. In this region, surgical treatment extends beyond complete tumor removal. Achieving clear margins must be balanced with preservation of facial function and appearance, particularly when lesions involve cosmetically and functionally important areas such as the nose, eyelids, lips, or auricle. Consequently, reconstructive planning becomes an essential part of the therapeutic strategy rather than a separate step performed after excision.

Several clinicopathological characteristics have been linked to unfavorable oncological outcomes. Tumor size, depth of invasion,

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histological differentiation, perineural and lymphovascular invasion, and surgical margin status are among the factors most consistently associated with local recurrence, nodal metastasis, and disease-specific survival. Careful assessment of these features not only provides prognostic information but also supports decisions regarding adjuvant treatment and postoperative surveillance.

The reconstructive approach should be tailored to the individual patient and to the characteristics of the surgical defect. Depending on its location and extent, reconstruction may range from primary closure and skin grafting to local or regional flaps designed to restore both function and facial contour. Selecting the most appropriate technique requires consideration of oncological safety, tissue availability, patient-related factors, and the anticipated aesthetic outcome [2].

The aim of the present study was to analyze the demographic and clinicopathological characteristics of patients with surgically treated facial skin tumors at a tertiary referral center, to compare the main tumor groups-benign versus malignant lesions, BCC versus SCC, and their histological subtypes-with respect to relevant pathological features, and to describe the reconstructive methods used following tumor excision. By examining both the oncological and reconstructive aspects of management, this study provides an overview of current clinical practice and highlights factors that may contribute to improved patient outcomes.

Materials and Methods

This retrospective observational study was conducted in the Department of Plastic and Reconstructive Surgery of the Emergency County Clinical Hospital of Craiova between January 2023 and December 2025.

The study included 297 consecutive patients with histopathologically confirmed facial skin tumors who underwent surgical treatment during the study period. Because some patients presented with multiple synchronous lesions, a total of 368 histopathologically examined formations were included in the lesion-specific analyses (benign versus malignant status, histological type and subtype, ulceration, and deep invasion), whereas demographic characteristics and anatomical distribution were analyzed on a per-patient basis (n=297).

Patients with recurrent tumors, lesions located outside the facial region, incomplete medical records, or those managed non-surgically were excluded.

Demographic, clinical, and histopathological data were retrieved from the medical records. The analyzed variables included sex, area of residence, anatomical location, the benign or malignant nature of the lesion, histological type, BCC subtype, SCC grade and histological variant, the presence of ulceration, invasion of deep tissue planes, and the reconstructive technique performed following tumor excision.

All tumors were treated by surgical excision using oncological safety margins appropriate for their size, location, and clinical characteristics.

Reconstruction was performed immediately after tumor removal whenever possible and was tailored to each defect. Depending on the anatomical site and tissue requirements, reconstruction consisted of primary closure, skin grafting, local or regional flaps, or more complex reconstructive procedures.

Statistical analysis was performed using Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) and Python 3 (SciPy library). Categorical variables are expressed as frequencies and percentages, with 95% confidence intervals (CI) for proportions estimated using the Wilson method. Between-group comparisons of categorical variables were performed using the chi-square test or Fisher's exact test, as appropriate, while binary distributions were compared against an equal distribution using the two-sided exact binomial test. A two-tailed p value <0.05 was considered statistically significant.

The study was approved by the Ethics Committee of the Emergency County Clinical Hospital of Craiova and was conducted in accordance with the principles of the Declaration of Helsinki. All patient data were anonymized before analysis to ensure confidentiality.

Results

A total of 297 patients underwent surgical treatment for facial skin tumors during the study period, accounting for 368 histopathologically confirmed lesions.

The sex distribution was balanced, with a slight male predominance (158 males, 53.2%, versus 139 females, 46.8%) (Figure 1).

The distribution according to the area of residence was likewise comparable, with 154 patients (51.9%) originating from urban and 143 (48.1%) from rural environments (Figure 2).

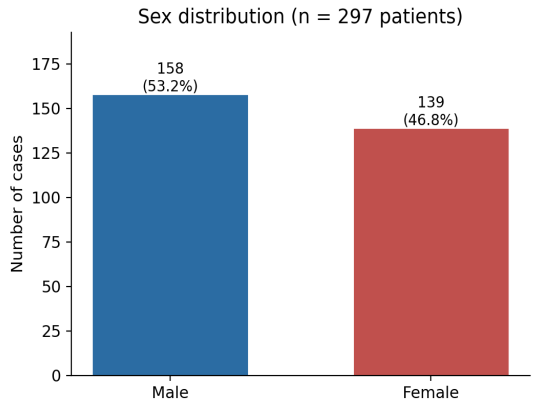


Figure 1. Sex distribution of patients with facial skin tumors.

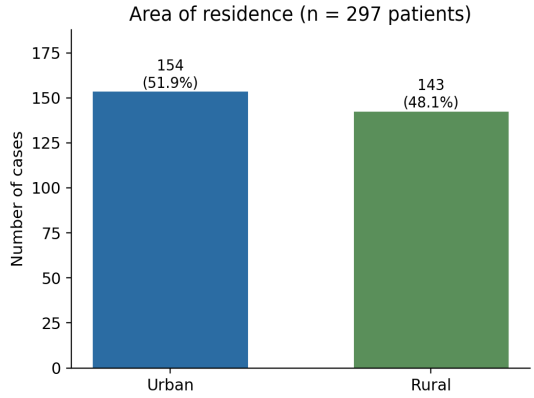


Figure 2. Distribution of patients according to place of residence.

Benign and malignant lesions occurred in nearly equal proportions, with 188 benign (51.1%) and 180 malignant (48.9%) formations (Figure 3).

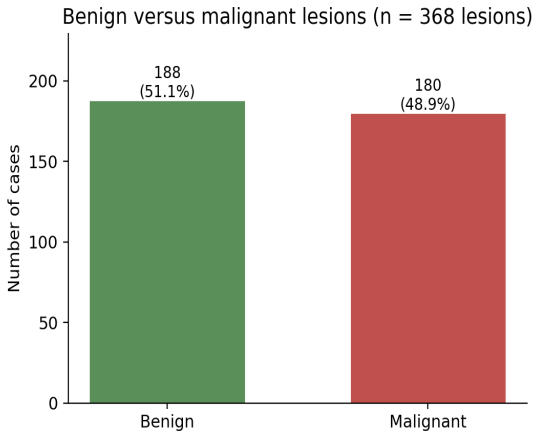


Figure 3. Distribution of benign and malignant facial lesions.

Among malignant tumors, BCC was by far the most frequent diagnosis (n=125; 69.4% of malignancies), followed by SCC (n=47; 26.1%), pilomatrix carcinoma (n=4), sebaceous carcinoma (n=3), and a single case of melanoma, corresponding to a BCC:SCC ratio of approximately 2.7:1 (Figure 4).

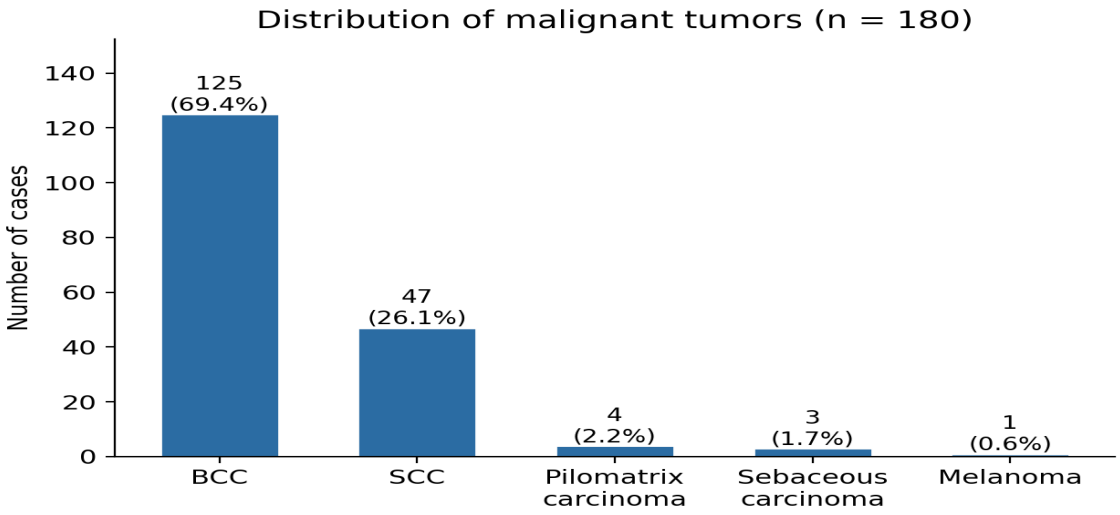


Figure 4. Distribution of malignant tumor types.

The benign group was dominated by melanocytic nevi (n=69; 36.7% of benign lesions) and seborrheic keratoses (n=37; 19.7%), followed by epidermal cysts (n=18), actinic keratoses (n=10), trichilemmal cysts and trichofolliculomas (n=6 each), lipomas (n=5), and a broad range of less frequent entities (Figure 5).

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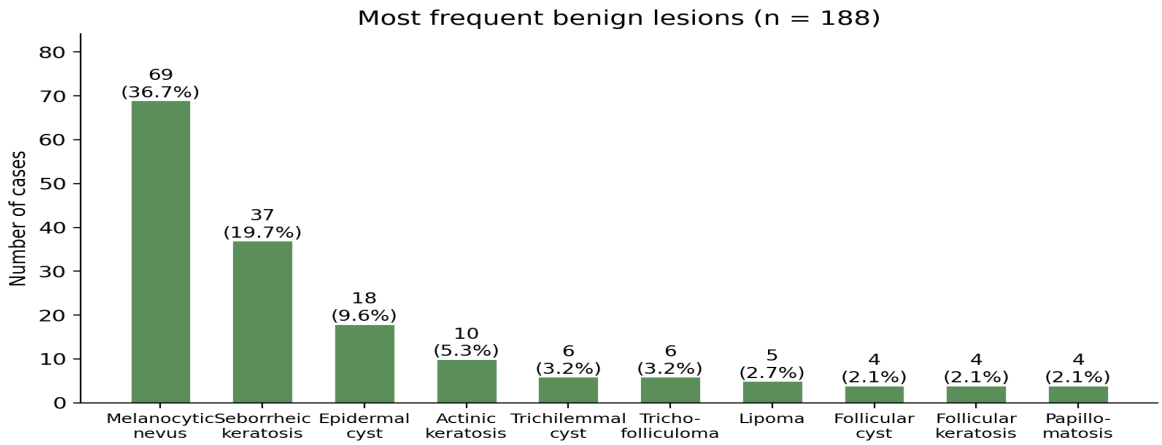


Figure 5. Most frequent benign lesions.

Analysis of BCC histology revealed a clear predominance of the nodular subtype (n=73; 58.4%), followed by the micronodular (n=14), adenoid (n=9), metatypical (n=6), superficial (n=5), mixed nodular-adenoid (n=4), and multifocal (n=1) variants; the subtype was not specified in 13 cases (Figure 6).

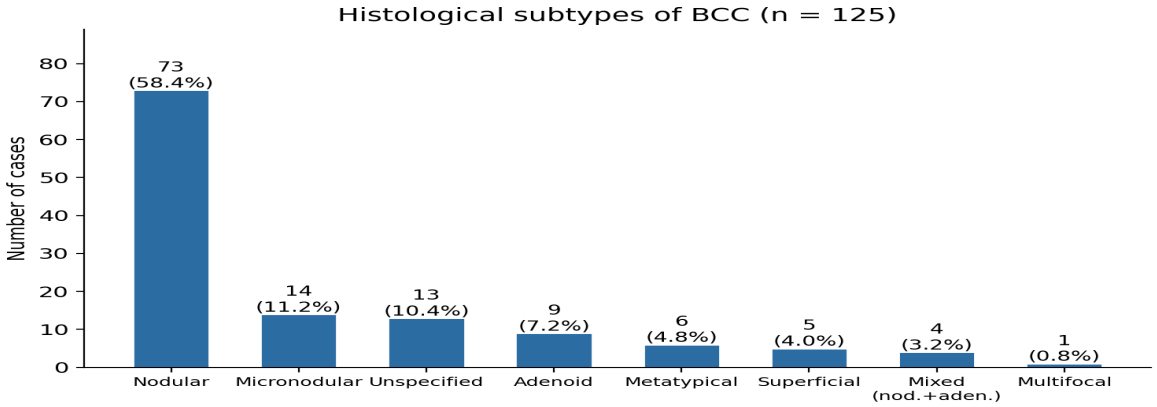


Figure 6. Histological subtypes of basal cell carcinoma.

Ulceration was present in 83 of the 125 BCCs (66.4%), and invasion of deep tissue planes was documented in 57 (45.6%). Both features clustered in the nodular, micronodular, mixed, and metatypical subtypes, whereas the adenoid and superficial variants were predominantly non-ulcerated and non-invasive (Figure 7).

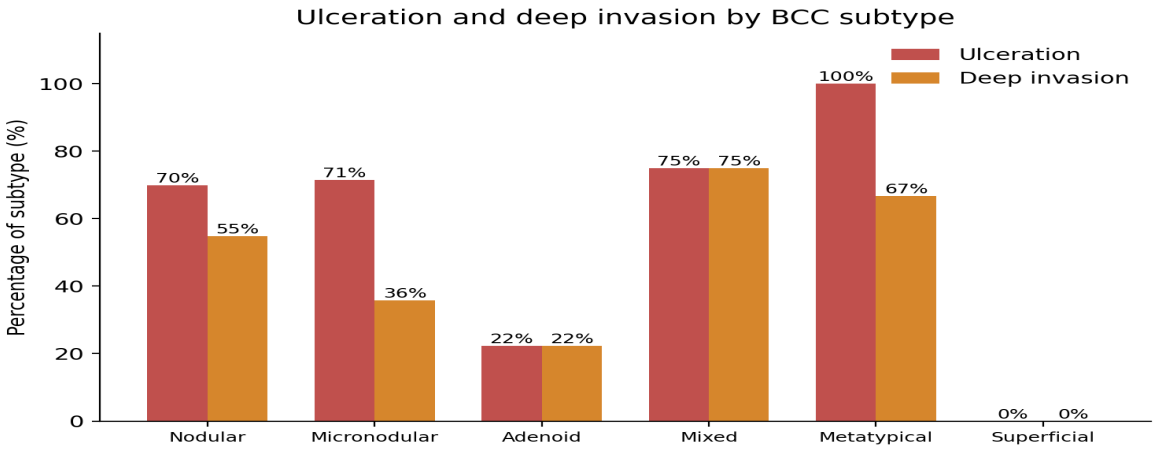


Figure 7. Ulceration and deep invasion according to BCC subtype

Within the SCC group, 13 lesions (27.7%) were in situ carcinomas, while the invasive tumors comprised 17 well-differentiated (G1), 7 moderately differentiated (G2), and 10 poorly differentiated (G3) carcinomas (Figure 8).

Rare histological variants included acantholytic (n=3), verrucous (n=2), keratinizing (n=1), and sarcomatoid (n=1) carcinomas.

Ulceration was recorded in 20 SCCs (42.6%) and deep invasion in 17 (36.2%), both features being unevenly distributed across grade categories (Figure 9).

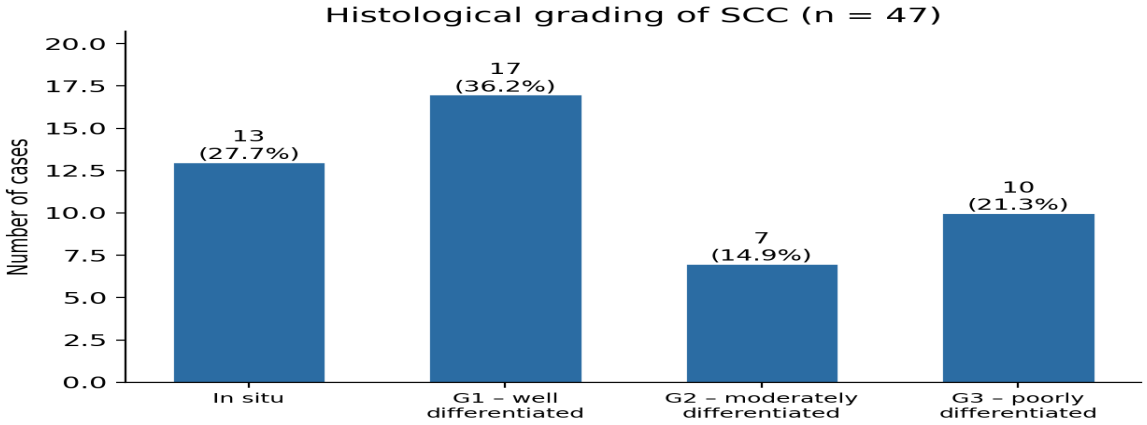


Figure 8. Histological grading of squamous cell carcinoma

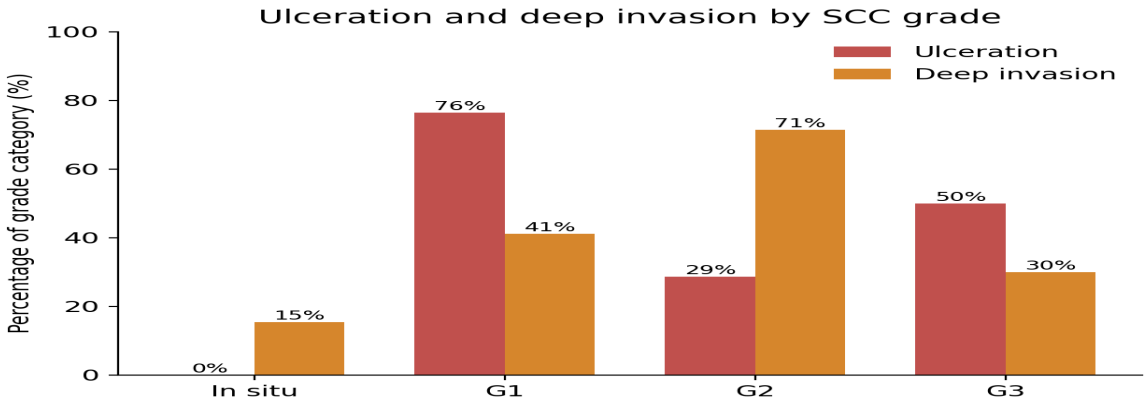


Figure 9. Ulceration and deep invasion according to SCC grade

The nasal region was the most commonly affected anatomical site (n=130; 43.8%), followed by the cheek/genian region (n=70; 23.6%), the frontal (n=30; 10.1%), periorbital (n=28; 9.4%), temporal (n=18; 6.1%), perioral (n=10; 3.4%), and auricular (n=6; 2.0%) regions, with 5 lesions (1.7%) arising in other locations (Figure 10).

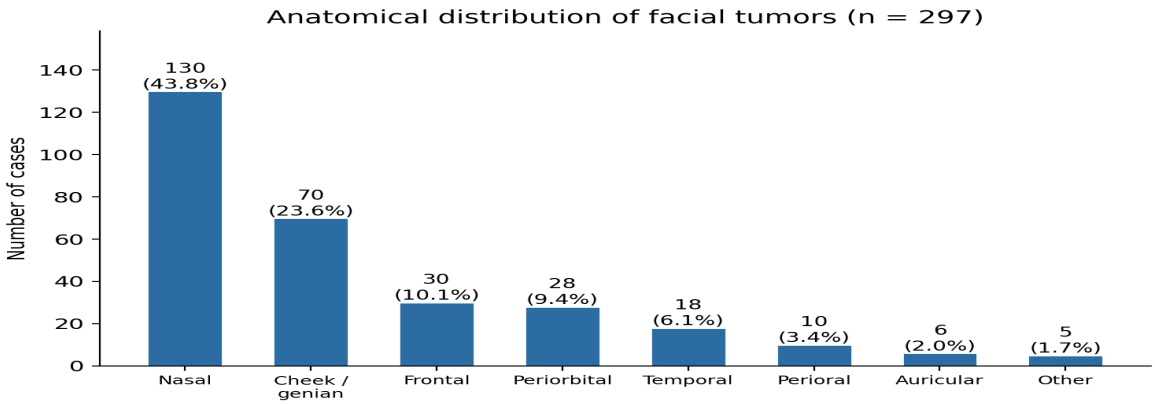


Figure 10. Anatomical distribution of facial tumors

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Comparative analysis

In the comparative analysis, neither the male predominance (53.2%, 95% CI 47.5-58.8%; p=0.296) nor the urban predominance (51.9%, 95% CI 46.2-57.5%; p=0.562) reached statistical significance, and the proportion of malignant lesions did not differ significantly from that of benign lesions (48.9%, 95% CI 43.8-54.0%; p=0.715). In contrast, the anatomical distribution deviated markedly from uniformity (chi-square goodness-of-fit test, p<0.001), the nasal region being significantly more frequently involved than the second-ranked cheek region (p<0.001).

Ulceration was significantly more frequent among BCCs than among SCCs overall (66.4%, 95% CI 57.7-74.1% versus 42.6%, 95% CI 29.5-56.7%; χ^2=7.12, p=0.008). This difference was driven entirely by the in situ SCC subgroup, none of which were ulcerated: when only invasive SCCs (G1-G3) were considered, the ulceration rate rose to 58.8% (95% CI 42.2-73.6%) and no longer differed from that of BCC (p=0.537).

Within the SCC group, ulceration was strongly associated with invasive disease, being present in 20 of 34 invasive carcinomas but in none of the 13 in situ lesions (Fisher's exact test, p<0.001), and histological grade was significantly associated with ulceration across the four SCC categories (χ^2=18.42, p<0.001). Among invasive SCCs, the difference in ulceration between well-differentiated (76.5%) and moderately/poorly differentiated tumors (41.2%) did not reach statistical significance in this small subgroup (p=0.080).

The frequency of deep tissue plane invasion did not differ significantly between BCC (45.6%, 95% CI 37.1-54.3%) and SCC (36.2%, 95% CI 24.0-50.5%; p=0.347), and the difference disappeared entirely after the exclusion of in situ lesions (44.1% for invasive SCC; p=1.000).

Among BCC subtypes, the nodular variant showed significantly higher rates of both ulceration (69.9%, 95% CI 58.6-79.2%) and deep invasion (54.8%, 95% CI 43.4-65.7%) than the indolent adenoid and superficial subtypes combined (14.3% for each parameter; Fisher's exact test, p<0.001 and p=0.007, respectively).

The results of the comparative analysis are summarized in Table 1.

Table 1. Comparative analysis of demographic and histopathological features of facial skin tumors

Comparison	Groups-n/N (%)	Test	p value
Sex distribution	Male 158/297 (53.2) vs female 139/297 (46.8)	Binomial	0.296
Area of residence	Urban 154/297 (51.9) vs rural 143/297 (48.1)	Binomial	0.562
Nature of lesions	Malignant 180/368 (48.9) vs benign 188/368 (51.1)	Binomial	0.715
Ulceration: BCC vs SCC (all)	83/125 (66.4) vs 20/47 (42.6)	χ^2	0.008
Ulceration: BCC vs invasive SCC (G1-G3)	83/125 (66.4) vs 20/34 (58.8)	χ^2	0.537
Ulceration: invasive vs in situ SCC	20/34 (58.8) vs 0/13 (0.0)	Fisher	<0.001
Ulceration across SCC grade categories	In situ 0/13; G1 13/17; G2 2/7; G3 5/10	χ^2	<0.001
Ulceration: G1 vs G2-G3 (invasive SCC)	13/17 (76.5) vs 7/17 (41.2)	Fisher	0.080
Deep invasion: BCC vs SCC	57/125 (45.6) vs 17/47 (36.2)	χ^2	0.347
Ulceration: nodular vs adenoid/superficial BCC	51/73 (69.9) vs 2/14 (14.3)	Fisher	<0.001
Deep invasion: nodular vs adenoid/superficial BCC	40/73 (54.8) vs 2/14 (14.3)	Fisher	0.007

BCC-basal cell carcinoma; SCC-squamous cell carcinoma; χ^2-chi-square test; Binomial-two-sided exact binomial test against an equal (50:50) distribution. Percentages with Wilson 95% confidence intervals are reported in the text.

Reconstructive strategies were tailored to individual defect characteristics.

Primary closure was utilized for minor defects exhibiting sufficient surrounding tissue laxity.

Local flaps constituted the primary reconstructive modality for small-to-medium-sized defects; specifically, Limberg flaps were employed for rhomboid-shaped defects, whereas V-Y advancement flaps were indicated for regions requiring linear tissue advancement with

minimal architectural distortion. For larger defects, rotation flaps were selected to facilitate the redistribution of tension across a broader surface area.

Split or full-thickness skin grafts were reserved for cases with constrained local tissue availability, or instances of suspected positive surgical margins.

Conversely, Keystone flaps were selectively applied to ensure robust vascularization and predictable defect coverage.

Adjunctive techniques, including W-plasty, were incorporated to optimize scar camouflage, while the Karapandzic flap was deployed for the reconstruction of complex perioral defects.

Overall, local flap reconstruction emerged as the predominant approach, consistently yielding favorable functional and aesthetic outcomes.

Discussion

This three-year retrospective study characterized the clinicopathological profile and reconstructive management of 297 patients with 368 surgically treated facial skin lesions between January 2023 and December 2025, in the Department of Plastic and Reconstructive Surgery at the Emergency County Clinical Hospital of Craiova. The cohort showed a balanced sex and residence distribution, and benign and malignant lesions occurred in nearly equal proportions. Basal cell carcinoma was the dominant malignancy, outnumbering squamous cell carcinoma by nearly three to one, and the nasal region was by far the most commonly affected site-a chronically sun-exposed facial subunit where oncological clearance and aesthetic restoration must be carefully balanced.

The comparative analysis identified ulceration as a clinically useful marker of invasive behavior: it was absent in all in situ squamous cell carcinomas but present in most invasive lesions, and within the BCC group it clustered, together with deep invasion, in the nodular and other biologically more aggressive subtypes, whereas the adenoid and superficial variants remained predominantly indolent.

Complete surgical excision with adequate margins remained the therapeutic target. Immediate coverage was individualized to defect size, depth, and the facial subunit involved. Local flaps represented the predominant modality of closure that consistently delivered favorable functional and aesthetic outcomes. Selected regional or advanced flaps (Keystone, Karapandzic) were used for specific defects.

Several limitations should be acknowledged. The retrospective, single-center design and reliance on pre-existing records limited the analysis to the variables systematically available in the pathology reports; data on surgical margins, perineural invasion, nodal involvement, and pathological staging were not uniformly documented, precluding formal survival or recurrence analysis. These gaps underscore the need for standardized histopathological reporting and prospective, structured follow-up.

In the present series, benign and malignant facial lesions occurred with comparable frequency, and basal cell carcinoma outnumbered squamous cell carcinoma by nearly three to one, in line with the established epidemiology of non-melanoma skin cancer. Because malignant tumors-and cSCC in particular-carry the greatest prognostic implications, the following discussion focuses primarily on the clinicopathological determinants of their behavior and management.

Cutaneous squamous cell carcinoma (cSCC) comprises a heterogeneous group of malignancies characterized by a broad spectrum of biological behavior, ranging from indolent lesions to highly aggressive tumors with significant metastatic potential. Consequently, the accurate identification of high-risk disease represents a fundamental step in therapeutic decision-making and prognostic assessment.

Current classification systems recognize several clinicopathological features associated with an increased risk of recurrence and metastasis, including tumors arising in high-risk anatomical locations such as the central face, lips, ears, scalp, hands, feet, and genitalia, as well as lesions demonstrating invasion of the subcutaneous tissue. Additional adverse characteristics include rapid tumor growth, poorly defined clinical margins, and the development of tumors within chronically inflamed or previously damaged skin. Despite the widespread recognition of these risk factors, considerable variability persists among existing staging systems because of differences in the definition and relative importance assigned to individual prognostic features, highlighting the need for a more standardized approach to risk stratification [1,5,6].

Accurate diagnosis constitutes the cornerstone of appropriate management and begins with careful clinical examination, dermoscopic evaluation, and histopathological confirmation [7].

In recent years, several advanced imaging techniques have further improved the

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characterization of cSCC. Reflectance confocal microscopy enables non-invasive evaluation of cutaneous lesions over larger tissue areas than conventional histopathology, while multiphoton microscopy provides additional information regarding tissue architecture, collagen organization, metabolic activity, and patterns of tumor invasion, including perineural extension.

Similarly, ex vivo confocal microscopy has emerged as a valuable technique for the microscopic assessment of freshly excised tissue, offering rapid evaluation while preserving tissue integrity.

Following diagnosis, the identification of prognostic factors becomes essential for estimating disease outcome and guiding therapeutic management. Among the most consistently reported predictors of poor prognosis are increased depth of invasion, incomplete surgical excision, regional lymph node metastasis, perineural invasion, lymphovascular invasion, and poor histological differentiation [5,6,8-10].

Collectively, these features have been associated with higher rates of local recurrence, disease progression, reduced disease-specific survival, and impaired overall survival. In particular, tumor extension beyond the dermis has been recognized as a major determinant of incomplete resection, further emphasizing the importance of meticulous preoperative assessment and adequate surgical planning [5,6].

These prognostic considerations should be interpreted within the biological context of the tumor itself. Conventional cSCC may develop either de novo or on the background of chronic wounds, ulcers, radiodermatitis, or persistent inflammatory dermatoses. Histopathologically, it is characterized by infiltrative nests and cords of atypical squamous epithelium extending from the epidermis into the dermis, with variable invasion of deeper structures including subcutaneous tissue, fascia, muscle, cartilage, and bone. This broad histological spectrum largely explains the heterogeneous clinical behavior observed among patients and underlines the importance of integrating pathological findings into individualized risk assessment and treatment planning [5,6].

Against this background, the findings of the present study provide additional insight into the clinicopathological profile of facial skin tumors.

Within our cohort, the sex distribution was nearly balanced, with a slight, non-significant male predominance. This observation is broadly consistent with the findings reported by Kim et al., who demonstrated a sex-related variation in the anatomical distribution of cSCC, with tumors occurring more frequently in the head and neck region among men, whereas lesions involving the lower extremities predominated in women [11].

Since our analysis was restricted exclusively to facial tumors, any residual differences may reflect variations in patient selection or population characteristics rather than a true discrepancy in disease epidemiology.

Beyond demographic characteristics, our results emphasize the relationship between macroscopic ulceration and invasive tumor behavior. Ulceration was entirely absent among in situ SCCs but present in more than half of the invasive carcinomas, and within the BCC group it clustered, together with deep invasion, in the nodular, micronodular, mixed, and metatypical subtypes, which are recognized as biologically more aggressive variants. These associations support the value of ulceration as a readily assessable clinical marker of more aggressive disease. In the literature, additional histopathological features such as perineural invasion carry major prognostic weight: clinically apparent perineural invasion is associated with significantly poorer oncologic outcomes than incidental microscopic perineural invasion, including higher rates of local recurrence and disease-specific mortality [12].

Consequently, the presence of such adverse features, particularly when accompanied by deep tissue extension or positive surgical margins, should prompt careful postoperative surveillance and a more individualized assessment of recurrence risk.

The biological mechanisms underlying the aggressive behavior of cSCC have also attracted increasing attention. Ventura et al. highlighted the contribution of telomere shortening, telomerase activation, and TERT promoter mutations to cSCC pathogenesis, molecular alterations that are strongly associated with chronic ultraviolet radiation exposure [13].

Considering that all tumors included in our study originated from the facial region, a chronically sun-exposed anatomical site, these molecular mechanisms may provide a plausible biological explanation for tumor initiation and progression within our patient population.

In addition to molecular alterations, recent evidence suggests that tumor progression is strongly influenced by the interaction between neoplastic cells and the surrounding microenvironment. Rather than representing simple passive extension along neural structures,

perineural invasion appears to result from a complex bidirectional communication involving tumor cells, Schwann cells, nerve fibers, and stromal components, thereby promoting local invasion and disease progression [14].

Collectively, these observations reinforce the concept that accurate histopathological evaluation extends beyond diagnostic confirmation, providing essential prognostic information that supports risk stratification, postoperative surveillance, and individualized therapeutic planning.

The identification of high-risk clinicopathological features has direct therapeutic implications, making surgery the cornerstone of cSCC management. Complete surgical excision remains the gold standard for achieving local disease control and minimizing the risk of recurrence. Although surgery alone is curative in the majority of patients, tumors exhibiting adverse pathological characteristics require a more individualized therapeutic approach because of their increased risk of regional metastasis and disease-specific mortality. High-risk features such as large tumor size, increased depth of invasion, poor histological differentiation, perineural or lymphovascular invasion, recurrent disease, immunosuppression, and localization within high-risk regions of the head and neck should therefore be carefully evaluated during preoperative planning and postoperative risk assessment [1,5,8-10].

The presence of these adverse prognostic factors has also raised important questions regarding the optimal management of clinically node-negative patients. Although sentinel lymph node biopsy has been proposed as a valuable tool for detecting occult nodal metastases in selected high-risk cases, its prognostic value remains controversial, as regional recurrence may still occur despite negative sentinel lymph node findings [15].

Consequently, treatment decisions should be individualized by integrating both tumor-related characteristics and patient-specific factors rather than relying on a single prognostic parameter.

When complete surgical excision is indicated, the choice of operative technique plays a critical role in long-term oncological outcomes. Wide local excision remains one of the most frequently performed procedures, aiming to achieve histologically negative peripheral and deep margins. However, Mohs micrographic surgery has gained increasing acceptance for tumors located in cosmetically and functionally important regions, particularly within the head and neck, because it enables comprehensive microscopic margin assessment while maximizing preservation of healthy surrounding tissue. Comparative studies have consistently demonstrated lower local recurrence rates and superior local control with Mohs micrographic surgery in appropriately selected patients presenting with high-risk cSCC [16].

Despite continuous advances in surgical management, the optimal treatment of regional lymph nodes remains a matter of ongoing debate.

Elective neck dissection has not consistently demonstrated a clear survival advantage over careful clinical surveillance in patients without clinically evident nodal disease. Therefore, contemporary management strategies increasingly emphasize individualized treatment planning based on tumor biology, anatomical location, overall patient condition, and the cumulative burden of adverse prognostic factors, with the ultimate goal of maximizing both oncological safety and functional outcomes [17].

Although complete surgical excision provides excellent local control in most patients, the biological behavior of high-risk cSCC remains unpredictable, and the potential for regional or distant dissemination continues to represent a major challenge during long-term follow-up.

While the majority of tumors are diagnosed at an early stage, a subset of patients subsequently develop regional lymph node metastases or, less frequently, distant spread, both of which are associated with a substantial reduction in survival. In addition to well-established histopathological risk factors, accurate postoperative surveillance has therefore become an essential component of patient management [18,19].

Modern imaging modalities, including ultrasonography, computed tomography, magnetic resonance imaging, and positron emission tomography/computed tomography, have assumed an increasingly important role in the detection of occult nodal disease and in the surveillance of patients presenting with high-risk cSCC, particularly those with tumors arising in the head and neck region [7].

More recently, attention has shifted from the prognostic significance of isolated clinicopathological variables toward the cumulative effect of multiple adverse features occurring within the same tumor. Increasing evidence indicates that the coexistence of several high-risk characteristics confers a substantially greater likelihood of local recurrence, regional metastasis, distant dissemination, and disease-

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specific mortality than the presence of any individual risk factor alone. This cumulative risk model further supports the need for comprehensive clinicopathological assessment when estimating prognosis and selecting the most appropriate therapeutic strategy [20].

Overall, the findings of the present study, interpreted in conjunction with current evidence, reinforce the concept that the management of malignant facial skin tumors-and of cSCC in particular-should extend beyond complete tumor excision alone. Careful evaluation of established histopathological risk factors, individualized surgical planning, and structured postoperative surveillance remain fundamental for optimizing long-term oncological outcomes. Given the persistent risk of occult nodal disease and the well-documented impact of multiple concurrent adverse prognostic factors on disease progression, patients presenting with high-risk tumors should undergo individualized follow-up protocols aimed at facilitating early detection of recurrence or metastatic disease and ultimately improving long-term disease control and survival [18,20].

Conclusions

Overall, the management of facial skin tumors should extend beyond tumor excision alone, integrating systematic assessment of established histopathological risk factors, individualized surgical and reconstructive planning, and well-defined postoperative follow-up. Given the persistent risk of occult nodal disease in high-risk carcinomas and the compounding effect of multiple concurrent adverse features, patients with high-risk tumors merit tailored follow-up protocols aimed at the early detection of recurrence or metastasis, ultimately improving long-term disease control and survival.

Acknowledgement

None to declare.

Author Contributions

Conceptualization, A.N. and D.P.; Methodology, M.C., A.N, R.M., O.N. and C.O.; Investigation, A.N., M.P., A.A., B.D., A.M.C., D.P. and R.M.; Data analysis, A.N., O.N., and R.M.,; Manuscript writing and initial draft preparation, A.N., M.C., D.PP., O.N., R.M., C.O., and A.M.C.; Manuscript review and editing, M.C., A.A. and A.M.C.; Supervision, M.C. and A.M.C.

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Conflicts of interest

The authors declare no competing interests.

Institutional Review Board

The study was approved by the Ethics Committee of the Emergency County Clinical Hospital of Craiova and was conducted in accordance with the principles of the Declaration of Helsinki.

Consent Statement

All patient data were anonymized before analysis to ensure confidentiality.

Data availability

All data presented in the manuscript are available from the authors upon request.

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