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The Impact of the Absence of Frozen Section Biopsy in Facial Tumors in Plastic Surgery: Margin Compromise and Surgical Reapproach in a Secondary Hospital in the Federal District

The Impact Of The Absence Of Frozen Section Biopsy In Facial Tumors In Plastic Surgery: Margin Compromise And Surgical Reapproach In A Secondary Hospital In The Federal District

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Summary

Introduction: Non-melanoma skin cancer (NMSC) is the most common neoplasm in Brazil, with significant clinical and aesthetic impact, especially in sensitive areas such as the face. Surgical excision is the treatment of choice in most cases; however, the lack of intraoperative methods for assessing margins can compromise oncological control. This study analyzed the clinicopathological profile of facial lesions treated at the Sobradinho Regional Hospital (HRS) between 2020 and 2023, as well as the rate of margin compromise and reoperation. Results: 121 excised lesions from 68 patients were included, with a mean age of 70.4 years. Most cases were concentrated between the sixth and eighth decades, but 13.2% occurred in individuals under 50 years of age. Basal cell carcinoma (BCC) was the most prevalent diagnosis (59.5%), followed by actinic keratosis (10.7%), melanocytic nevus (6.6%), squamous cell carcinoma (3.3%), and basosquamous cell carcinoma (1.7%).

The most affected areas were the malar, alar, and frontal regions (37.1% of diagnoses). Marginal involvement occurred in 18.2% of cases, with 29.2% among blood counts. The need for surgical reintervention reached 9.9%. Conclusion: The study confirms the predominance of basal cell carcinoma (BCC) in sun-exposed areas of the face, with a significant incidence in the elderly, but also present in young adults. The high rate of compromised margins, structural reflections, mainly due to the lack of intraoperative evaluation, points to the need for surgical standardization and investments in diagnostic resources, leading to greater oncological safety and better aesthetic-functional results for patients.

Keywords: Frozen Sections; Surgical Margins; Quality Control; Skin Neoplasms.

Abstract

The results of this study show a higher rate of marginal involvement than described in much of the literature, especially among basal cell carcinomas (BCCs). This data reflects the structural limitations of the service, notably the absence of intraoperative frozen section biopsies during the analyzed period, a resource that could have considerably limited this rate. It should be noted, however, that this resource only became available at the hospital from 2025 onwards, which should be reflected in future studies. Furthermore, the lack of standardization in anatomopathological reports is highlighted, often lacking staging, an aspect that compromises integration between specialties and hinders the proper management of oncological follow-up of patients. Regarding the re-intervention rate found, although compatible with some publications, it is possibly underestimated. This observation is due to the presence of reports with somewhat unclear safety margins, such as "absence of residual tumor" or "central scar," terms that suggest additional resections but do not precisely specify the number or indication of these interventions. This inaccuracy limits the reliability of the data and reinforces the need for standardization of anatomopathological records in order to analyze future hospital reoperation rates. Another relevant aspect is that, although squamous cell carcinomas showed less marginal involvement in this study, the absence of permanence in many cases prevents more solid conclusions about their real distribution and clinical behavior. Furthermore, the heterogeneity of the reports makes comparative evaluation with other national and international case series difficult.

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Therefore, the findings described here expose a common reality in medium-sized public hospitals: despite having deficient staff, structural limitations and the absence of well-defined protocols directly impact oncological outcomes. Thus, improvements in the standardization of reports and access to intraoperative evaluation methods—now available in the service—should not be seen merely as technical improvements, but as essential public health measures to ensure greater oncological safety and equity in patient care.

Keywords: Frozen Section; Surgical Margins; Quality Assurance; Skin Neoplasms.

INTRODUCTION

According to DataSus, cancer is the second leading cause of death in Brazil (1), behind only Cardiovascular diseases. Among the types of neoplasms, non-melanoma skin cancers (NMSC) These cases accounted for almost a third of the 704,000 new cancer cases estimated by INCA for 2024. (2). These tumors represent a growing concern in dermatological surgical practice and Oncological, especially in anatomically exposed regions, such as the face.

Non-melanoma skin cancers (NMSCs) primarily include basal cell carcinomas (BCCs) and carcinomas Squamous cell carcinomas (SCCs), which preferentially affect areas exposed to ultraviolet radiation, such as Face, head, and neck. Despite the low mortality rate, these injuries can cause local destruction. significant and directly affect the quality of life of patients.

Surgical excision with clear margins is the treatment of choice for NMSC because, in addition to... By allowing for the safe removal of the lesion, it enables proper aesthetic reconstruction. However, in In sensitive areas such as the face, this procedure becomes particularly challenging. The surgeon must normally remove 4 to 6 millimeters of peripheral margin, according to the NCCN (4), in order to to deliver a satisfactory oncological outcome while preserving all viable tissue for Reducing the aesthetic impact on the patient. Addressing the dilemma of preserving surgical margins, Literature shows that the rate of margin involvement in CBC varies between 5.5 and 12.5%(3), with relapse rates reaching 14% (5).

To help overcome this difficulty, frozen section biopsy has emerged. Created in For over a century, the technique has allowed for intraoperative analysis of surgical margins, guiding the surgeon in the removal or preservation of tissue in order to reduce the need for re-interventions while delivering the best possible aesthetic result for the injury. However, despite accuracy of 91.1% (6), its availability is still limited, especially in smaller public institutions size.

It is within this context that the reality of the Sobradinho Regional Hospital (HRS) is situated, a center A public with a qualified and active plastic surgery team. Between the years 2020 and 2023, the team He performed more than 121 excisional surgeries for cutaneous tumors on the face. However, without access Routine intraoperative frozen section biopsy procedures are based solely on assessment. clinical and empirical adoption of safety margins, which may result in a higher rate of

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Marginal impairment and the need for re-intervention, generating burdens for the patient and increased costs.
public.

Therefore, the present study aims to identify the incidence of
Marginal compromise and re-approach in surgically treated NMSC of the face
The plastic surgery team at HRS during the period. This is a quantitative, observational study.
Retrospective study based on the review of anatomopathological reports. In a public service without
Intraoperative freezing: this study describes the local reality and provides support for treatment plans.
surgical procedures best suited to the public healthcare system.

OBJECTIVE

To quantitatively assess the extent of surgical margin involvement and the need for...
Re-interventions due to the absence of frozen section biopsy in facial tumors at a service.
regional office of the Federal District.

METHODOLOGY

This is a quantitative, observational, retrospective, and cross-sectional study, conducted in
Sobradinho Regional Hospital (HRS), Federal District, which evaluated facial skin tumors.
only those who underwent surgical excision between January 2020 and December 2023 were included.
patients diagnosed with non-melanoma skin cancer (NMSC) located on the face, whose
Medical records and anatomopathological reports were complete. Cases with incomplete medical records were excluded.
incomplete, lesions located outside the face, or tumors of a different nature, such as melanomas,
sarcomas or other skin neoplasms.

The data were extracted from the HRS computerized database and fully reviewed by
principal investigator, totaling 124 results after excluding irrelevant data.
The variables analyzed included the patients' age, anatomical location of the lesion (grouped into
regions such as nose, eyelid, lip, cheekbone, chin and forehead), histopathological diagnosis (carcinoma
basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and other non-melanoma skin cancers (NMSCs), presence of involvement
surgical margins, need for reoperation, and tumor staging, when available,
following the AJCC *TNM* system . Separate categories were created for incomplete variables.
such as: “unspecified” for location and “not informed” for margins, re-approach and
staging.

The data tabulation was performed in Microsoft Excel®, followed by statistical analysis in
Jamovi® software (version 2.7.6) was used. Descriptive statistics were employed, with presentation of

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Absolute and relative frequencies for categorical variables and measures of central tendency and dispersion.
(mean, median, standard deviation, and interquartile ranges) for continuous variables. The findings on
Margin compromises and reapproaches were interpreted within the institutional context.

The study was approved by the Research Ethics Committee of the Teaching and Research Foundation.
in Health Sciences (CEP/FEPECS).

RESULTS AND DISCUSSION

This study evaluated 121 facial lesions belonging to 68 patients treated at HRS.
between January 2020 and December 2023.

The patients' age range had an average of 70.4 years, with the youngest being 26 and the...
older than 94 years. The highest concentration of cases was observed between the sixth and eighth decades of life.
reflecting the relationship between time of exposure to oncogenic factors and the appearance of lesions(6). Despite
In addition, younger individuals (under 50 years old) showed similar statistical significance to that of
most extreme age range (80 years or older) when analyzed by patient, with 13.20% of
frequency of occurrence.

Table 1: Age of participants

Variable	N	Minimum	Maximum	Fashion	Average
Age (years)	68	26	94	80	70.4

Table 2: Relationship between age range and frequencies

Age range (years)	Frequency according to individuals	Frequency according to samples
<50	9	17
50–59	9	8
60–69	22	26
70–79	21	29
ÿ80	9	41
	Total: 68 individuals	Total: 121 biopsies

The most prevalent diagnosis is basal cell carcinoma (BCC), representing 59.5% of cases, in accordance with...
with the literature showing that CPNM is the most prevalent type (8). Other lesions include nevus
Melanocytic (6.6%), the pre-malignant lesion Actinic Keratosis (10.7%), and NMSCs with expression
lowest incidence: Squamous Cell Carcinoma (3.3%) and Basosquamous Cell Carcinoma (1.7%). Among other diagnoses.
Such as seborrheic keratosis and scar tissue fibrosis, totaling 22 benign lesions. This incidence reinforces the

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predominance of malignant tumors in areas exposed to ultraviolet radiation (7), but also reveals the coexistence of precursor and benign lesions that can complicate the differential diagnosis in clinical practice.

Table 03: Distribution of diagnoses

Anatomopathological diagnosis	Frequency
Basal cell carcinoma (malignant)	72
Actinic keratosis (pre-malignant)	13
Melanocytic nevus (benign)	8
Squamous cell carcinoma (malignant)	4
Basosquamous carcinoma (malignant)	2
Other (benign) diagnoses	22

The anatomical location of the lesions reinforces the pattern of appearance in more exposed areas. to oncogenic factors (7): central and photoexposed structures of the face such as the malar, alar and Fronts that together account for 37.1% of diagnoses. The involvement of higher-risk areas. Aesthetic concerns and increased oncological sensitivity highlight the importance of surgical strategies that... They reconcile these factors in order to deliver the greatest margin security combined with the best results. Aesthetic and functional.

Table 4: Incidence of lesions according to anatomical location

Location of the lesion	Frequency
Alar	16
Nasal bridge	12
Forehead	13
Malar	16
Nose	11
Nasal tip	10
Not specified	10
Other locations	33

As a result of this difficulty in balancing aesthetics with the complete removal of the lesion, we find... Surgical margin involvement. In the most prevalent lesion, BCCs, 29.2% (21 out of 72) of these had their margins compromised, representing 95.45% of the total compromised margins. in the study. The analysis of overall margin compromise in the study, although smaller than the Of the CBCs exclusively, the rate is 18.18% (22 compromises in 121 analyses). This rate is higher as described in international series, which place the rate between 5.5% and 12.5%(2), and reflects limitations in

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Intraoperative assessment. As a consequence of compromised surgical margins, the
The need for re-treatment reached 9.9% of the sample, mostly in CBC, but also
presenting a case of squamous cell carcinoma. However, it is necessary to emphasize that the rate of
The need for a re-approach may be underestimated, since the anatomopathological results do not show...
a presentation pattern; many results present terms such as "free of residual tumor" or
"Presence of a scar in the center of the piece," indicating that, although not identified as such, they are...
results of surgical re-intervention.

Table 5: Rate of surgical margin involvement in Basal Cell Carcinomas

Margin Commitment at CBC	Frequency	Percentage of the total
Yes	21	29.16%
No	49	68.05%
Not assessable due to fragmentation of sample	2	2.79%

Table 06: Surgical reoperation rate

Reapproach	Frequency	Percentage of the total
Yes	12	9.92%
No	109	90.08%

Comparing this to the literature, it is observed that techniques based on progressive control of margins, such as the intraoperative frozen section biopsy technique and Mohs surgery, with a rate with cure rates above 97% (9), they present satisfactory results aesthetically and oncologically. The absence The routine use of these types of resources in the HRS service contributes to the higher frequency of compromised margins.

Despite the quality of the plastic surgery team at the hospital, these findings place the profile HRS is in line with the reality of other centers without access to advanced techniques, but They also highlight areas for improvement. The predominance of tumors in critical regions of the face. The high rate of positive margins suggests that standardization of adequate surgical margins is crucial. and the adoption of some degree of intraoperative assessment could directly impact the quality of care, decreasing the morbidity associated with multiple procedures and potentially reducing local recurrence.

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COMMENTS

The results of this study show a higher rate of margin commitment than previously described.
This is largely found in the literature, especially among CBCs. This data reflects structural limitations.
of the service, notably the absence of intraoperative frozen section biopsies during the period
analyzed, a resource that could have considerably limited this index. It should be noted, however, that
This resource only became available at the hospital starting in 2025, which should be reflected in...
Future studies are needed. Furthermore, the lack of standardization in anatomopathological reports is highlighted.
in which there is often no reported staging, an aspect that compromises the integration between
specialties make it difficult to properly manage the oncological follow-up of patients. Regarding
the rate of re-engagement found, which, although consistent with some of the publications, is possibly
It is underestimated. This observation is due to the presence of reports with somewhat unclear safety data.
terms like "absence of residual tumor" or "central scar" suggest additional resections.
but they do not specify precisely the number or indication of these interventions. This imprecision
This limits the reliability of the data and reinforces the need for standardization of records.
anatomopathological analyses, in order to analyze future hospital readmission rates. Another aspect
What is relevant is that, despite squamous cell carcinomas showing less involvement...
Regarding margins in this study, the lack of permanence in many cases prevents more solid conclusions.
regarding its actual distribution and clinical behavior. Furthermore, the heterogeneity of the praise.
This makes comparative evaluation with other national and international case studies difficult. Therefore, the
The findings described here expose a common reality in medium-sized public hospitals: despite
due to having a deficient team, structural limitations, and a lack of well-defined protocols.
directly impact oncology outcomes. Therefore, improving the standardization of reports is crucial.
and access to intraoperative assessment methods — now available in the service — should not be
viewed not merely as technical improvements, but as essential public health measures for
to ensure greater oncological safety and equity in patient care.

CONCLUSION AND RECOMMENDATION

The results of this study demonstrate the predominance of BCC (59.5%) among NMSCs.
especially among facial injuries. Furthermore, the high prevalence of diagnoses is evident.
Benign and pre-malignant tumors make differential diagnosis difficult in daily clinical practice.
The age distribution, with a predominance of older individuals, confirms the length of exposure to radiation.
ultraviolet radiation is considered one of the main oncogenic factors. However, the high frequency of ultraviolet radiation is also observed.
Younger patients raise concerns about the need for screening these populations. Regarding...

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Regarding surgical margin compromise, the analysis demonstrated rates higher than those described in...
medical literature, especially in basal cell carcinoma. This factor indicates possible limitations.
structural issues within the service, particularly the low availability of intraoperative margin assessment.
This scenario reflects both the complexity of treatment in aesthetically critical areas of the face.
Regarding the need to adapt protocols to reconcile oncological safety and preservation.
Functional. Among the study's limitations, the temporal aspect stands out, given its duration of less than 5 years.
Furthermore, the results shown reflect the need for further studies following up on the...
Evolution of the degree of margin involvement and re-approaches in NMSCs at the Regional Hospital
from Sobradinho, and in other services that do not have ample resources for evaluation.
of intraoperative margins. It is expected that the current study will contribute to the improvement of the treatment of
non-melanoma skin cancers, demonstrating the importance of frozen section biopsy.
intraoperative and/or Mohs surgical technique.

REFERENCES

Ministry of Health. DATASUS: Tabnet [Internet]. Brasília: Ministry of Health; 2022. Available at: www.gov.br/inca/pt-br/assuntos/cancer/numeros/estimativa/referencias.

Brazil. Ministry of Health. National Cancer Institute José Alencar Gomes da Silva (INCA).
2020 Estimate: Cancer Incidence in Brazil. Rio de Janeiro: INCA; 2019.

Pagung C, Santiago ED, Andrade JN, Pissolato L, Silva Júnior CFD, Korte RL. Non-melanoma skin cancer: an analysis of margin involvement in excisions. Rev Bras Cir Plást [Internet]. 2023;38(1):e0666. Available from: https://doi.org/10.5935/2177-1235.2023RBCP0666-PT

Quazi SJ, Aslam N, Saleem H, Rahman J, Khan S. Surgical Margin of Excision in Basal Cell Carcinoma: A Systematic Review of Literature. Cureus. 2020 Jul 15;12(7):e9211. doi: 10.7759/cureus.9211. PMID: 32821563; PMCID: PMC7430350.

Gal AA. The centennial anniversary of the frozen section technique at the Mayo Clinic. Arch Pathol Lab Med. 2005 Dec;129(12):1532-5. doi: 10.5858/2005-129-1532-TCAOTF. PMID: 16329725.

Kiyan KM, Broetto J, Fischler R, Sperli AE, Freitas JOG de. Accuracy of frozen section biopsy in non-melanoma skin cancer. Rev Bras Cir Plást [Internet]. 2012 Jul;27(3):472–4. Available from: https://doi.org/10.1590/S1983-51752012000300025

Godinho NJS, Pinhati MES, Soares HHDQ, Souza GMC. Non-melanoma skin cancer: A study on the epidemiological profile and flow at HC-UFMG. Revista Brasileira de Cirurgia Plástica. 2024;39(3):e0928. https://doi.org/10.5935/2177-1235.2024RBCP0928-EN

Bachtold GA, Welter CDS, Cerrutti CM, Frainer DA, Fiamoncini H, Penteado R. Non-melanoma skin tumors: a retrospective study of the epidemiological profile and outcome based on margins.

Year VI, v.1 2026 | Submission: 03/14/2026 | Accepted: 03/16/2026 | Publication: 03/18/2026

compromised. Rev Bras Cir Plást [Internet]. 2022Jul;37(3):320–5. Available from: https://doi.org/10.5935/2177-1235.2022RBCP.619-pt

Di Maria A, Barone G, Ferraro V, Tredici C, Manara S, De Carlo C, Gaeta A, Confalonieri F. Recurrence of Basal Cell Carcinoma Treated with Surgical Excision and Histopathological Analysis with Frozen Section Technique with Complete Margin Control (CMC-FS): A 15-Year Experience of a Reference Center. Cancers. 2023;15:3840. https://doi.org/10.3390/cancers15153840