

Evaluation of surgical margins according to the histological type of basal cell carcinoma *

Charles Antonio Pires de Godoy^{1,3}
Sofia Silveira de Souza Leão²
Valeska Oliveira Fonseca Carvalho³

Alice Lima de Oliveira Neta²
Raul Lima Dantas²
Samuel Freire da Silva⁴

DOI: <http://dx.doi.org/10.1590/abd1806-4841.20175076>

Abstract: Basal cell carcinoma is the most common skin cancer in the world. The aim of this study was to evaluate the surgical margin of basal cell carcinoma and correlate this with its histologic subtype. A retrospective analysis of pathology laboratory records from 1990 to 2000 was performed and the following data was collected: age, sex, race, anatomical location, histological type, and state of the excision margins in 1,428 histopathological reports of basal cell carcinoma. Ages ranged from 6 to 99 years, with an average of 57. There was a slight predominance of lesions in white women patients, and the most common histological subtype was the nodular, followed by the superficial. The most common locations were in the head and neck, with highest prevalence appeared in the nose. Surgical margins revealed a lateral involvement of 20.14% and a deep involvement of 12.47%. The fibrosing basal cell carcinoma is the histological type that most often presented positive surgical margins.

Keywords: Carcinoma, basal cell; Neoplasms, basal cell; Neoplasm recurrence, local; Skin neoplasms

INTRODUCTION

Basal Cell Carcinoma (BCC) is a malign cutaneous neoplasia of cells, which are morphologically similar to the basal cells of the epidermis, and is normally found in anatomical regions containing pilosebaceous units, sparing the palms, soles, and mucosae.¹ This represents approximately 80% of all non-melanoma skin cancers² and has a strong connection with light-skinned individuals, with greater incidences occurring in photo-exposed areas and cumulative risks that develop throughout one's life, occurring generally 10 to 50 years after sun damage.³ Genetic propensity and environmental carcinogens are also involved in its genesis.⁴ Clinically speaking, BCC is referred to by patients as a wound that will not heal or as a friable lesion that bleeds spontaneously or upon minimal trauma.³ From a macroscopic outlook, its most common appearance is of a translucent lesion with a pearly white or yellow-straw colored aspect, which can be associated with central ulceration, telangiectasias, and raised edges. In its most aggressive form, one can observe an aspect of a depressed plate, like a scar, with poorly defined borders (Figure 1).⁵ There are commonly five clinical presentations of BCC: nodular, pigmented, sclerodermiform or fibrosing, superficial, and fibroepithelioma.³ Despite its high prevalence and the diversity of histological subtypes, it presents a metastatic potential that is almost inexistent.⁶ Surgical excision, together with histological evaluation of the surgical margins, it is considered to treatment of choice for BCC.² In more aggressive histological types and in areas of higher risk, the surgical technique of choice is Mohs micro-

graphic surgery, which allows for greater precision, with a histological evaluation of 100% of the peripheral margins of the lesion.⁷

BCCs are locally destructive tumors that grow slowly and can present recurrence even after treatment.⁸ Owing to the high incidence and to the risks attributed to the tumor, it is crucial to evaluate the tumor's histopathological aspects, especially concerning the surgical margins. Therefore, the present study seeks to evaluate



FIGURE 1: Sclerodermiform subtype of BCC – clinical aspect; Pink and depressed plaque, with the appearance of a scar with poorly defined borders

Received on 25.08.2015

Approved by the Advisory Board and accepted for publication on 02.12.2015

* Work conducted at the Dr. Nestor Piva Laboratory, Tiradentes University (Unit), Aracaju, SE, Brazil.

Financial support: none.

Conflict of interest: none.

¹ Department of Dermatology, Medical School, Tiradentes University (Unit) – Aracaju, SE, Brazil.

² Undergraduate student Medical School, Tiradentes University (Unit) – Aracaju, SE, Brazil.

³ Department of Medical Clinics, University Hospital of the Federal University of Sergipe (HU-UFS), Aracaju, SE, Brazil.

⁴ Department of Dermatology, University Hospital of the Federal University of Sergipe (HU-UFS), Aracaju, SE, Brazil.

©2017 by Anais Brasileiros de Dermatologia

the involvement of the surgical margins and correlate them with the different histological subtypes of BCC, given that its incomplete removal is considered to be an indicator of a poor prognosis, in addition to the unnecessary expenses incurred to healthcare services resulting from a large number of affected patients.

METHODS

This is a descriptive-analytical, retrospective study, based on the analysis of histopathological reports obtained between 1990 and 2000. All reports containing BCC diagnoses that presented an excision of greater than 0.7cm were included in this study. All reports of incisional biopsies were excluded. The analyzed variable included age, sex, race, anatomical location, histological subtype based on the clinical classification, and situation of the surgically resected margins. The anatomical locations were segmented in 5 regions: head and neck, trunk, upper limbs, lower limbs, and undetermined location. An anatomical division of the cephalic components was also performed in the nose, nasolabial folds, cheek, forehead, eye socket, ear, eyelid, neck, temporal, scalp, lips, chin, eyebrow, pre-auricular, retroauricular, and undefined. The histological subtypes were divided into nodular, superficial, fibrosing, and pigmented. An analysis of association was performed between the categorical variables – lateral and deep margins (free and affected) – and the histological type by means of the chi-square test, with a statistical significance stipulated at 5% ($p < 0.05$). The *Statistical Package for the Social Sciences* (SPSS 20.0) program was used for all analyses. The project was submitted to the Brazil Platform, with due permission granted by the institution.

RESULTS

This study collected 1,428 reports containing histopathological diagnoses of BCC identified in the Pathology Laboratory during the 11-year study period from 1990 to 2000. Of these, 97 incisional biopsies were excluded. Thus, our study was based on the final sample of 1,331 cases of BCC.

Of the 1,331 patients with a diagnosis of BCC, 689 were female (51.77%) and 642 were male (48.23%). Figure 2 illustrates this distribution. The sample age of the patients varied from 6 to 99 years, with an average of 57 (Figure 3). The most affected average age range was found between 61 and 70 years of age, with 328 cases, followed by the interval of 71 to 80 years of age, with 261 cases.

The lateral surgical margins were free in 1,063 lesions (79.86%) and positive in 268 lesions (20.14%). In relation to the deep margins, free margins were found in 1,165 lesions (87.53%) and positive in 166 lesions (12.47%).

As regards race, a higher incidence of lesions was found in white individuals, totaling 928 patients (69.72%) (Figure 4). By contrast, 203 patients were described as light-skinned blacks (15.25%), 12 patients as dark-skinned blacks (0.90%), 8 patients as yellow-skinned (0.60%), and 180 patients did not identify their race (13.52%).

According to figure 5, The most prevalent histological subtype of BCC was nodular, with 992 (74.53%) cases. The second most prevalent subtype was superficial, with 223 (16.75%) cases, followed by the fibrosing subtype, with 104 (7.81%) cases, and, finally, 12 (0.9%) cases of the pigmented subtype.

As regards the anatomical location of the lesions, as illustrated in figure 6, from an overall view, BCC was found more commonly on the head and neck region, with a total of 1,028 (77%) lesions. The second most common location occurred on the trunk, with 146 (11%) lesions. The lowest prevalence occurred on the lower limbs, with a total of 23 (2%) lesions.

As regards the distribution of the lesions located on the head and neck region, BCC was most prevalent on the nose, with 281 lesions. The second most common location, was the forehead, with a total of 89 lesions. There were also 220 lesions located on the face with no specific topographic identification (Figure 7).

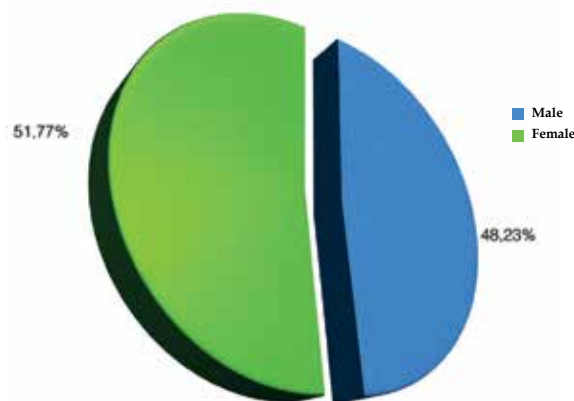


FIGURE 2: Distribution of BCCs according to sex

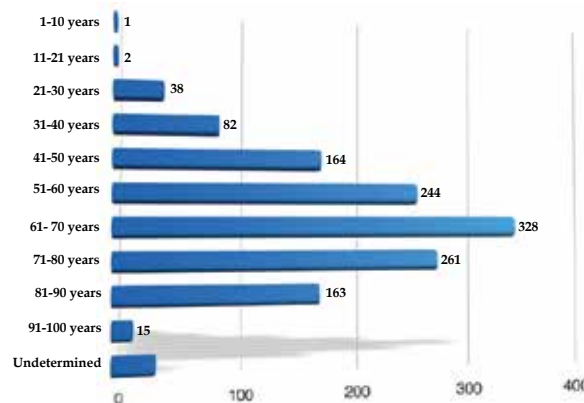


FIGURE 3: Distribution of BCCs according to age

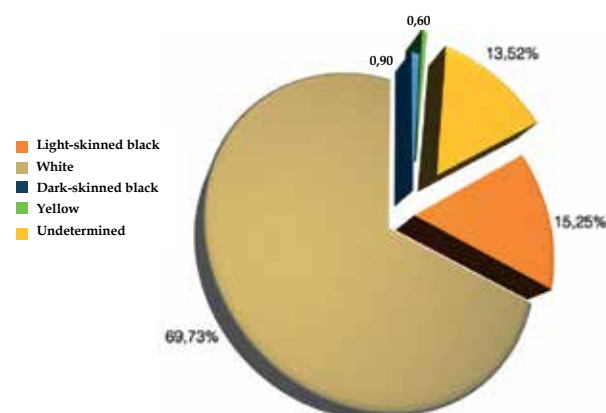


FIGURE 4: Distribution of BCCs according to race

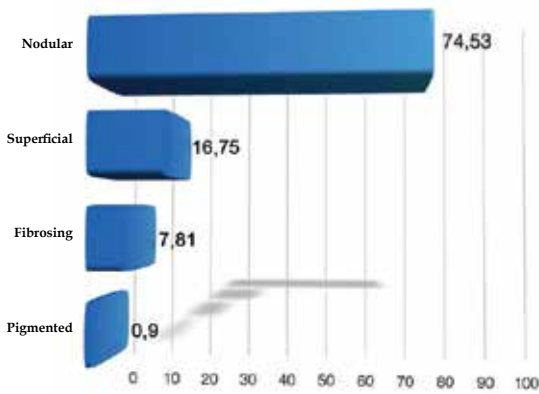


FIGURE 5: Distribution of BCCs according to histological subtype

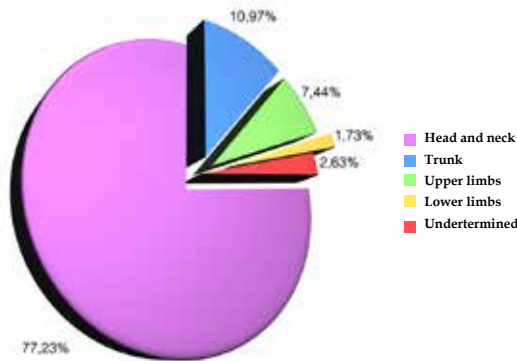


FIGURE 6: Distribution of BCCs according to anatomical location

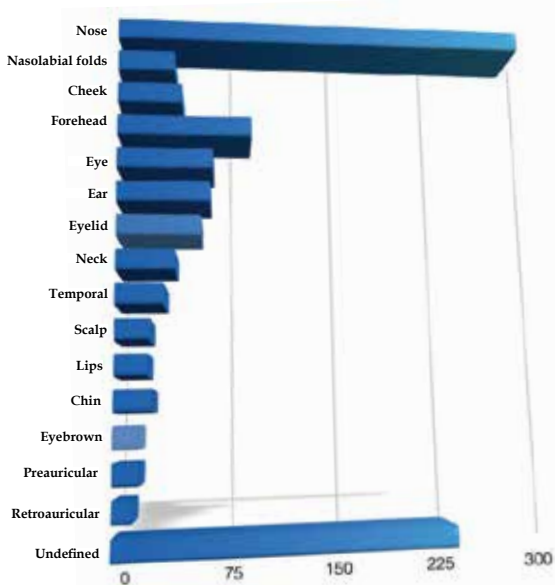


FIGURE 7: Distribution of BCCs located in the head and neck

As described in table 1, the involvement of the lateral surgical margins was greater in the fibrosing histological subtype, with 35 (33.65%) cases. The second most affected subtype was the nodular, with 198 (19.95%) cases, followed by the superficial, with 34 (15.24%) cases and, finally, the pigmented subtype with 1 (8.33%) case. As regards the deep margins, the most affected subtype was

the fibrosing, with 25 (24.03%) cases. The second most affected subtype was the nodular, with 129 (13.00%) cases (Table 2). The third was pigmented, with 1 (8.33%) case, and the last was superficial, with 11 (4.93%) cases. A statistically significant association was observed between these cited variables.

DISCUSSION

As regards the distribution of BCC according to sex, a slight predominance of BCC in females was identified in this report, as demonstrated in figure 1. This datum diverges from prior literature, which points out a higher incidence, of approximately 30%, in men.⁴ However, some more recent studies have pointed out changes in the epidemiological profile of BCC, which has been growing in younger individuals, in non-photo-exposed areas, and in females.^{3,9,10} Another factor that corroborates this finding consists of the greater search for medical care by females, demonstrating their greater concern with their own health, the greater number of doctor’s appointments, and for this reason, more reported cases.¹¹

Concerning age, a larger number of incidences were observed in individuals above 60 years of age, with the most affected age range between 61 and 70 years, with 328 cases. The present study runs in line with findings from Vittalle *et al.* (2010), which found an average of 63 years of age and in which the most affected age range was of 70-79 years of age. According to the literature, the incidence is nearly 100 times greater in individuals of 55-75 years of age than in individuals of less than 20 years of age.³

Of the 1,331 analyzed lesions, 268 lesions (20.14%) presented positive lateral surgical margins and 166 lesions (12.47%) presented positive deep surgical margins after the resection performed with histopathological analysis. According to the National Cancer Institute (INCA), the incidence of positive surgical margins in BCC

TABLE 1: Distribution in percentage of cases with free and positive lateral margins, according to the histological subtypes

Variable	Free (n=1,063)	Positive (n=268)	p
Histological Subtype			
Nodular	80.0% (n=794)	20.0% (n=198)	0.001**
Fibrosing	66.4% (n=69)	33.6% (n=35)	
Superficial	84.8% (n=189)	15.2% (n=34)	
Pigmented	91.7% (n=11)	8.3% (n=1)	

**Chi-square test

TABLE 2: Distribution in percentage of cases with free and positive deep margins, according to the histological subtypes

Variables (n=1.165)	Free (n=166)	Positive	p
Histological Subtype			
Nodular	87.0% (n=863)	13.0% (n=129)	0.001**
Fibrosing	76.0% (n=79)	24.0% (n=25)	
Superficial	95.1% (n=212)	4.9% (n=11)	
Pigmented	91.7% (n=11)	8.3% (n=1)	

**Chi-square test

is 10.2%.¹² Findings from Quinta *et al.* (2008) revealed that the involvement of the margins after resection varies from 5.5% to 12.5%, with a value of 8% found in the present study.¹² In findings from Codazzi *et al.* (2014), the involvement of the margins varied between 7% and 25%.¹³ This data is disturbing, since, though the BCC presents very low mortality rates, slow growth, and the risk of minimal metastasis, varying from 0.05% to 0.01%, this carcinoma has a high local destructive power and high rates of recurrence, with a risk of new lesions appearing in three years in approximately 44% of the cases and can reach 50% in 5 years. These are frequently related to the positive surgical margins in anterior resections and to aggressive histological growth.^{2,3,6} Completely excised tumors present recurrence rates of approximately 5.9%, whereas those that are not fully excised show recurrences in 26.8% of the cases on average.¹³ The analysis of the involvement of the surgical margins in BCC is essential, as this is a common phenomenon that is directly linked to the high indexes of lesion recurrence, which in turn generate high costs for healthcare services to employ an efficient treatment.^{8,9} It is also important to emphasize that there is no clear consensus in the literature regarding the proper conduct to treat positive surgical margins. Some authors defend that lesions with less aggressive patterns, that are not located in high risk regions and that present involvement only in the lateral margins, do not need to be excised and can be followed up through the "wait and see" method.¹⁵ Other studies defend that all of the BCCs with positive surgical margins must be excised due to the difficulty in maintaining the follow-up and due to the risk of recurrence after 5 years.¹⁶

As regards race, this study found 928 (69.72%) lesions in white-skinned individuals, as compared to only 12 (0.9%) in black-skinned individuals. This finding runs in line with studies that point to photo-types of light skin, especially Fitzpatrick phototypes I and II, as well as light eyes and hair, as being major risk factors.⁴ Studies show that black-skinned individuals present lower incidence of BCC in photo-exposed areas when compared to white-skinned individuals. However, in the non-photo-exposed area, the incidence is equal between blacks and whites, which demonstrates the importance of the natural barrier that melanin promotes against ultraviolet (UV) radiation.^{3,4}

The most prevalent histological subtype was the nodular, with 992 (74.53%) cases. According to the literature, nodular BCC is completely predominant, representing nearly 60% of the cases, 90% of which appeared on the face.⁴ The second most frequent BCC subtype, corresponding to 30% of the cases, is the superficial.⁴ In the present study, the superficial was also the second most frequent subtype, with 223 (16.75%) cases. The third most common was the fibrosing or sclerodermiform, with 104 (7.81%) cases (Figure 8). For Wu *et al.* (2015), the prevalence found was of 5-10%. This study also identified 12 (0.9%) cases of the pigmented subtype, which demonstrates its rare occurrence.³

As regards the anatomic location of the lesions, 1,028 (77%) lesions were found on the head and neck region. This finding was expected, since it is known that BCC prefers photo-exposed areas. Wu *et al.* (2015) found 70% of the lesions to be located on the face. In New Mexico, USA, 86% of the lesions were found on the head and neck region¹; in Australia, approximately 57%; and, in Taubaté,

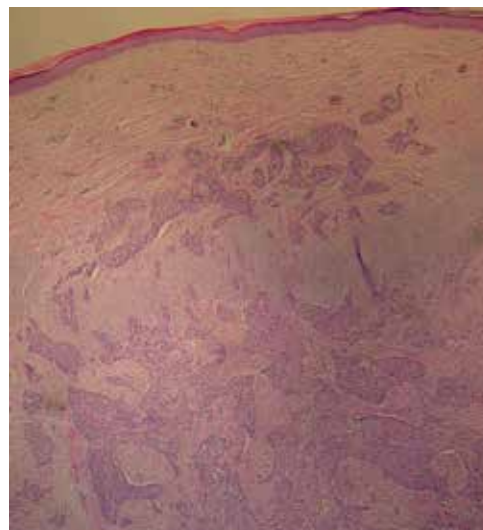


FIGURE 8: Sclerodermiform subtype of BCC - histopathological aspect. Neoplastic epithelial cells are grouped in blocks with speckled cords within the area of collagen fibrosis

SP, Brazil, 68,7%.¹ Of the lesions distributed on the head and neck, we observed a prevalence on the nasal regions, with 281 cases. The second most frequent region was the forehead, with 89 cases. According to Wu *et al.* (2015), the nasal region is responsible for nearly 30% of the lesions located in the head and, due to the difficulty in handling its anatomy, presents high rates of recurrence, most likely due to the difficulty to perform the resection of its margins.^{3,17}

Both the nasal region, as well as all other regions located in the "H" zone of the face, such as the nasolabial fold and the retroauricular, perinasal, periorbital and peripalpebral areas, present larger indexes of positive surgical margins than did other areas of the body due to the lack of proximal tissues, to the difficulty to reach these tissues, to the greater concern over the esthetic results, and because these are areas of embryological fusion.¹⁰ The second most common location that we found was on the trunk, with 146 (11%) lesions. Findings from Wu *et al.* (2015) reported that 15% of lesions appeared on the trunk. Similar studies in the literature found the following figures: 17% in Australia; 14.4% in Taubaté, SP, Brazil; and 9.1% in New Mexico, USA.¹ Lesions on the trunk are generally found in young patients, primarily in males, and associated with exposure to intense recreation under the sun without sunblock.³ On the upper limbs, 99 lesions (7%) were detected. These data disagree with that found in Australia and in Taubaté (SP), which reported 18% and 13.8%, respectively. However, this finding does agree with that reported in New Mexico (USA), which found values of 3.5%.¹ On the upper limbs, a total of 23 (2%) lesions were found, with one case on the inguinal region and another on the perianal region.

Relating the surgical margins to the histological subtypes, as described in table 1, the involvement of the lateral and deep surgical margins was greater in the fibrosing histological subtype, with 35 (33.65%) and 25 (24.03%) cases, respectively. Wu *et al.* (2015) illustrated that the most aggressive histological patterns, such as fibrosing and infiltrative, present greater involvement in the surgi-

cal margins.³ Gualdi *et al.* (2015) reported greater involvement in the lateral surgical margin with the fibrosing subtype; however, the involvement of the deep surgical margin was greater with the nodular subtype.⁸ The present study found involvement of the lateral margin and of the deep margin in the pigmented subtype in only 1 (8%) case, which proves, as described in other studies, its lesser involvement in the surgical margins due to the facility of removal because of its pigmentation, which contrasts with the skin around the lesion.³ A statistically significant association was observed among the analyzed variables.

CONCLUSION

It can therefore be concluded that there is statistically significant evidence showing the relationship between the histological type of BCC and the involvement of the surgical margins, both lateral and deep. Thus, one can confirm the observations reported in some prior studies that associate the difficulty of obtaining free surgical margins with the fibrosing histological subtype of BCC. □

REFERENCES

- Marques SA, Biancolini SE, Stolf HO, Abbade LPF, Campos EBP de, Marques MEA. Carcinoma basocelular de localização inguinoescrotal: relato de caso. *Diagn Tratamento*. 2010;15:21-4.
- Berking C, Hauschild A, Kölbl O, Mast G, Gutzmer R. Basal cell carcinoma-treatments for the commonest skin cancer. *Dtsch Arztebl Int*. 2014;111:389-95
- Chinem VP, Miot HA. Epidemiology of basal cell carcinoma. *An Bras Dermatol*. 2011;86:292-305.
- UpToDate [Internet]. Wu PA. Epidemiology pathogenesis, and clinical features of basal cell carcinoma. 2014 [cited 2015 May 15]. Available from: <http://goo.gl/ZgXkXg>.
- Wolff K, Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Leffell DJ, editors. *Fitzpatrick's Dermatology in General Medicine*. 7 edition. New York: Ed.MacGraw Hill; 2008.
- UpToDate [Internet]. Vidimos A, Stultz T. Evaluation for locoregional and distant metastases in cutaneous squamous cell and basal cell carcinoma. 2014 [cited 2015 May 15]. Available from: <http://goo.gl/RyOeRS>.
- UpToDate [Internet]. Aasi SZ, Chartier TK. Treatment of basal cell carcinomas at high risk for recurrence. 2014 [cited 2015 May 15]. Available from: <http://goo.gl/xHP7ND>.
- Gualdi G, Monari P, Crotti S, Damiani G, Facchetti F, Calzavara-Pinton P, et al. Matter of margins. *J J Eur Acad Dermatol Venereol*. 2015;29:255-61.
- Schmitt JV, Chinem VP, Marques ME, Miot HA. Increase in the incidence of basal cell carcinoma in a university hospital between 1999 and 2009. *An Bras Dermatol*. 2011;86(2):375-7.
- Souza CF, Thomé EP, Menegotto PF, Schmitt JV, Shibue JR, Tarlé RG. Topography of basal cell carcinoma and their correlations with gender, age and histologic pattern: a retrospective study of 1042 lesions. *An Bras Dermatol*. 2011;86:272-7.
- Gomes R, Nascimento EF, Araújo FC. Why do men use health services less than women? Explanations by men with low versus higher education. *Cad Saude Publica*. 2007;23:565-74.
- Quintas RCS, Coutinho ALF. Fatores de risco para o comprometimento de margens cirúrgicas nas ressecções de carcinomas basocelular. *Rev Bras Cir Plást*. 2008;23:116-9.
- Codazzi D, Van Der Velden J, Carminati M, Bruschi S, Bocchiotti MA, Di Serio C, et al. Positive compared with negative margins in a single-centre retrospective study on 3957 consecutive excisions of basal cell carcinomas. Associated risk factors and preferred surgical management. *J Plast Surg Hand Surg*. 2014;48:38-43.
- Silverberg MJ, Leyden W, Warton EM, Quesenberry CP Jr, Engels EA, Asgari MM. HIV infection status, immunodeficiency, and the incidence of non-melanoma skin cancer. *J Natl Cancer Inst*. 2013;105:350-60.
- Fernandes JD, de Lorenzo Messina MC, de Almeida Pimentel ER, Castro LG. Presence of residual basal cell carcinoma in re-excised specimens is more probable when deep and lateral margins were positive. *J Eur Acad Dermatol Venereol*. 2008;22:704-6.
- Longhi P, Serra MP, Robotti E. Incompletely excised basal cell carcinomas: Our guidelines. *Onco Targets Ther*. 2008;1:1-4.
- Ocanha JP, Dias JT, Miot HA, Stolf HO, Marques ME, Abbade LP. Relapses and recurrences of basal cell face carcinomas. *An Bras Dermatol*. 2011;86:386-8.

MAILING ADDRESS:

Charles Antonio Pires de Godoy
Av. Maria Rezende Machado, 150 - Casa A14
Aruana
49035-230 - Aracaju - SE
Brazil
E-mail: charlesgodoy@gmail.com

How to cite this article: Godoy CAP, Oliveira Neta AL, Leão SSS, Dantas RL, Carvalho VOF, Silva SF. Evaluation of surgical margins according to the histological type of basal cell carcinoma. *An Bras Dermatol*. 2017;92(2):226-30.