CLINICAL, DERMATOSCOPICAL AND HISTOPATHOLOGICAL ASPECTS OF BASAL CELL CARCINOMA – STUDY ON 138 CASES

https://doi.org/10.26574/rojced.2018.5.4.124

Enache Andreea-Oana[1], Patrascu Virgil[1], Ciurea Raluca Niculina[2], Stoica Loredana Elena[1], Vaduva Alexandru[3], Stepan Alex Emilian[2], Simionescu Cristiana Eugenia[2]

[1]Department of Dermatology, University of Medicine and Pharmacy of Craiova, Romania
[2]Department of Pathology, University of Medicine and Pharmacy of Craiova, Romania
[3]Department of Histology, University of Medicine and Pharmacy of Craiova, Romania

Corresponding author:
Virgil Patrascu, Professor, MD, PhD,
University of Medicine and Pharmacy from Craiova,
Petru Rareș Street, No 2-4, 200345, Craiova, Romania
Tel.: 004-0724273676
Email: vm.patrascu@gmail.com

Open Access Article

Abstract

Background: Skin cancer represents 20% of all new diagnosed cancers in the world. The highest incidence rates of basal cell carcinoma have been reported in Australia followed by Europe and the USA. Basal cell carcinoma (BCC) is a slow-growing malignant tumor characterized by local invasiveness but an exceptionally rare metastatic potential.

Patients and methods: We performed a retrospective study on a group of 138 patients diagnosed with basal cell carcinoma, hospitalized in Dermatology Clinic of Craiova, aiming to highlight the clinical, dermatoscopical and histopathological aspects of basal cell carcinoma. Identification data, provenience area, clinical diagnosis, tumor site, particular aspects related to tumor evolution, histological subtype of the lesion, dermoscopic patterns, Fitzpatrick skin type of each patient were all recorded. The histopathological study was based on highlighting the following parameters: tumor stage, histopathological form, size and depth of invasion.

Results: Our study group included 75 men (54.3%) and 63 women. Patients were aged between 17 and 89 years, with a mean age of 70.92 years. Nodular BCC (49.2%) was the most common clinical presentation followed by pearly form and cicatricial BCC.

Dermoscopic structures were observed in all 138 patients. The most common dermoscopic pattern seen in nodular BCCs was featureless areas (90%), atypical red vessels (80%), arborizing vessels >0.2 mm in diameter (78%) and translucency (51.4%). Superficial BCCs mostly presented with comma vessels, white-red structureless areas background, hypopigmented areas and only 50% of them revealed telangiectatic vessels and blue-grey ovoid nests in our study. The most common vascular pattern was the presence of arborizing vessels (53 patients, 38.4%).

In our study, the histological polymorphism was revealed by the existence of various types of BCC: solid (nodular), cystic, keratotic, adenoid, morpheaform, superficial, pigmented, metatypical and mixed patterns. 29/138 cases were invasive, representing 21.01% of all tumors studied. Of these, 20 were at the level of the cephalic extremity.

Conclusions: BCC has an aggressive invasive behavior which is related to the histopathologic type, in our study, adenoid type was the most aggressive

Keywords:

Basal cell carcinoma, dermoscopy, histology.

Cite this article:
Enache Andreea-Oana, Patrascu Virgil, Ciurea Raluca Niculina, Stoica Loredana Elena, Vaduva Alexandru, Stepan Alex Emilian, Simionescu Cristiana Eugenia. Clinical, dermatoscopical and histopathological aspects of basal cell carcinoma – study on 138 cases. *RoJCED* 2018;5(4):124-129

https://doi.org/10.26574/rojced.2018.5.4.124

followed by solid and keratotic BCCs. Identification of clear diagnostic criteria for the aggressive behavior of basal cell carcinoma will allow the best therapeutic results for the patient.

https://doi.org/10.26574/rojced.2018.5.4.125

Introduction

Skin cancer represents 20% of all diagnosed cancers in the world. The highest incidence rates of basal cell carcinoma have been reported in Australia (2448/100,000, 2011) followed by Europe (129.3 in men, and 90.8 in women *per* 100,000 person-years) and the US (450 *per* 100,000 person-years) (1).

Basal cell carcinoma (BCC) represents approximately 80% of non-melanoma skin cancers and is the most common type of cancer in the Caucasian population. The lifetime risk of developing a BCC was estimated to be 28–33% (2).

BCC is a slow-growing malignant tumor characterized by local invasiveness but an exceptionally rare metastatic potential (3).

Up to 80% of all the lesions are located on the cephalic extremity (head and neck) (4).

Patients and methods

We performed a retrospective study on a group of 138 patients diagnosed with basal cell carcinoma, hospitalized in Dermatology Clinic of Craiova, Romania, during 1 January 2017 and 31 December 2017, aiming to highlight the clinical, dermatoscopic and histopathological aspects of basal cell carcinoma. We selected only histologically confirmed cases in the Pathology Laboratory of the same hospital.

The biopsy specimens were fixed in 10% buffered neutral formalin, processed for paraffin embedding. Classical staining was performed with Hematoxylin–Eosin (HE).

One hundred and thirty eight histopathologically proven basal cell carcinomas were identified and closely analyzed, using Heine Delta 20 dermatoscope.

For each patient, we retained several clinical parameters such as identification data (name, sex, age, and profession), provenience area, clinical diagnosis, tumor site, particular aspects related to tumor evolution.

The histopathological study was based on highlighting the following parameters: tumor stage, histopathological form, size and depth of invasion. Histologic classification was done according to the WHO criteria.

Results

Our study included 138 patients with a diagnosis of basal cell carcinoma. Body-site distribution was as follows: cephalic extremity 106 cases (76.8%), trunk 29 cases (21%) and three cases on the limbs (2.2%).

Our study group included 75 men (54.3%) and the rest were women. There was a slight dominance in favor of the male gender (sex ratio 1.19). 71 patients were from rural areas (51.4 %) and 67 from urban areas (48.5%).

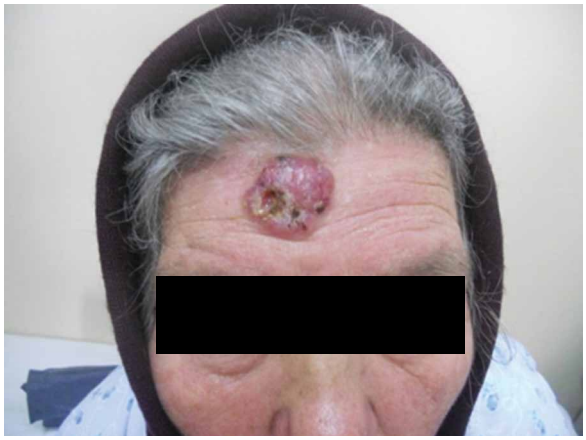

Figure 1. Nodular basal cell carcinoma

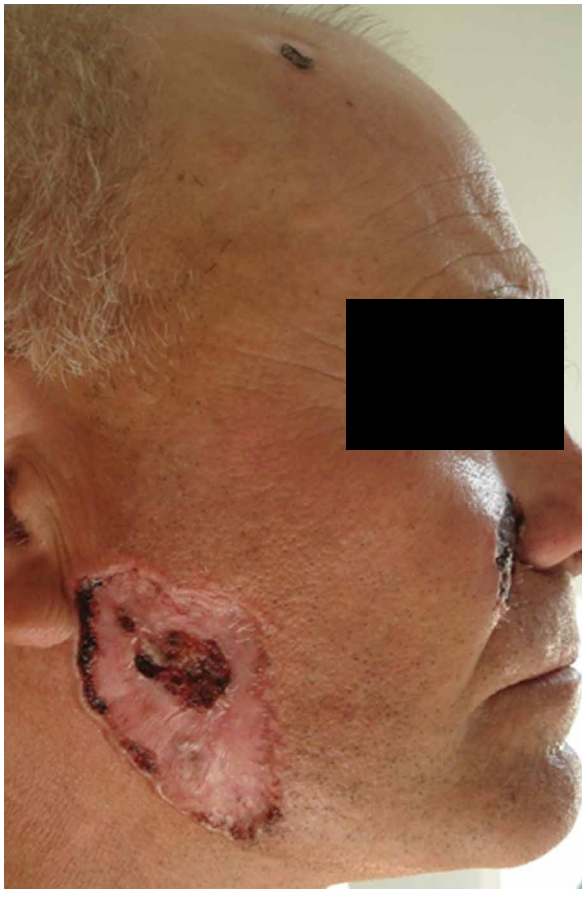

Figure 2. Cicatricial basal cell carcinoma

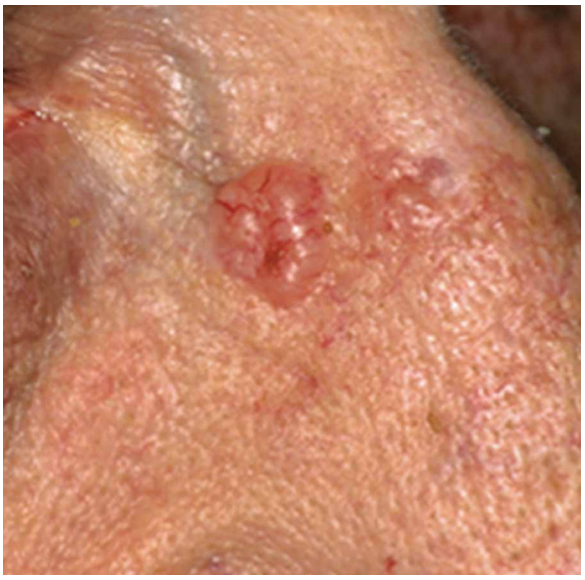

Figure 3. Pearly form of basal cell carcinoma

Patients were aged between 17 and 89 years, with a mean age of 70.92 years. The peak age incidence was between 60-80 years, during which 80 cases (57.97%) were placed. Family history of skin or systemic malignancies was not present in any of them.

All the cases belonged to Fitzpatrick skin types II and III.

Nodular BCC (49.2%) was the most common clinical presentation followed by pearly form and cicatricial basal-cell carcinoma (Figures 1-3). Of the 68 cases of nodular BCC studied, 18 had ulcerated areas.

The most common dermoscopic pattern seen in nodular BCCs was featureless areas (90%), atypical red vessels (80%), arborizing vessels > 0.2 mm in diameter (78%) and translucency (51.4%) (Figure 4).

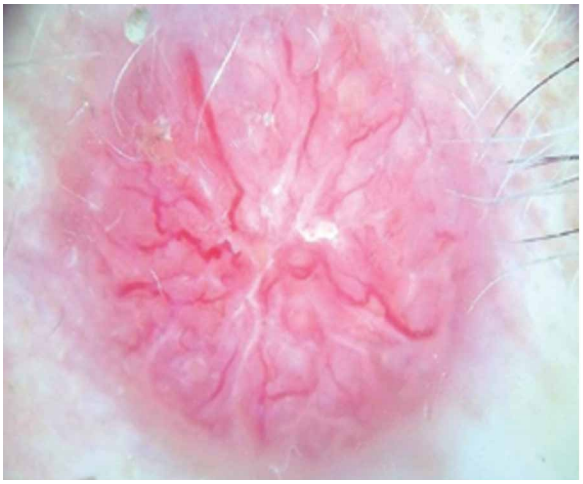

Figure 4. Nodular BCC – featureless areas, atypical red vessels, arborizing vessels > 0.2 mm in diameter and translucency

We used the Menzies criteria to diagnose pigmented BCC. The most frequently detected dermatoscopy features in pigmented basal cell carcinoma were large blue-grey ovoid nests (60%), followed by blue-grey globules (40%) and leaf-like area (Figures 5, 6).

The most common vascular pattern in BCCs was the presence of arborizing vessels followed by short fine telangiectasias described as vessels with a small diameter and length of < 1 mm, with few or no branches.

Superficial BCCs mostly presented with comma vessels, white-red structureless areas background, hypopigmented areas and only 50% of them revealed telangiectatic vessels and blue-grey ovoid nests in our study.

Ulceration, annular distribution of telangiectatic vessels, milky red background, annular hypopigmentation and arborizing vessels were the most frequent features in ulcerated BCCs.

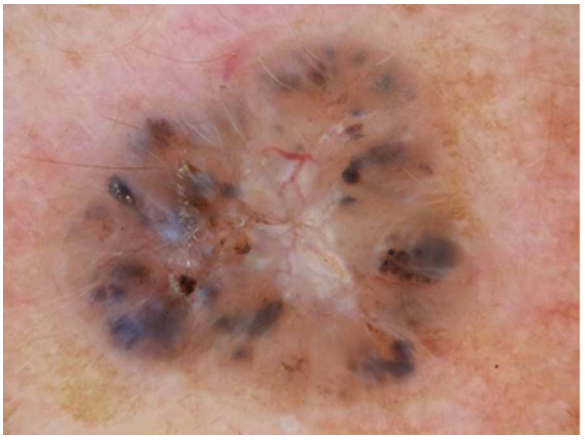

Figure 5. Pigmented BCC – pigmented islands with blue-gray globules and blue-gray ovoid nests, spoke wheel-like areas, arborizing vessels and white streaks/white areas

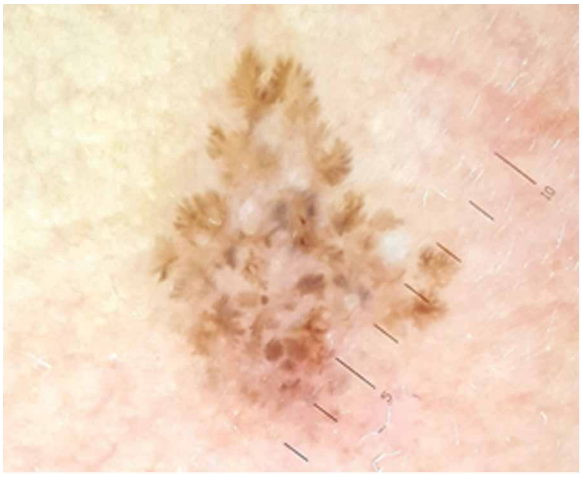

Figure 6. A pigmented distribution pattern, with maple leaflike structures, spoke wheel-like areas and multiple grey-blue globules

The staging of BCCs was made according to TNM classification, established by the American Joint Committee of Cancer (5). Most of the cases were classified as T1 stage which recorded a total of 108 cases, followed by T2 stage with 26 cases and four cases were in T3 stage. The mean diameter of the lesions was 1.3 cm.

In our study the histological polymorphism was revealed by the existence of various types of BCC: solid (nodular), cystic, keratotic, adenoid, morpheaform, superficial, pigmented, metatypical and mixed patterns.

We remind that any histopathological type of BCC may be invasive, with the exception of superficial BCC. In our study, 29 cases were invasive, representing 21.01% of all tumors studied. Of these, 20 were at the level of the cephalic extremity. The degree of depth invasion meant extends into the dermis, hypodermis, striated muscle fibers or cartilage.

Histological examination revealed depth invasion in nine cases of adenoid BCC (31%), eight cases of solid BCC (27.6%), six cases of keratotic BCC (20.7%), three cases of metatypical carcinoma

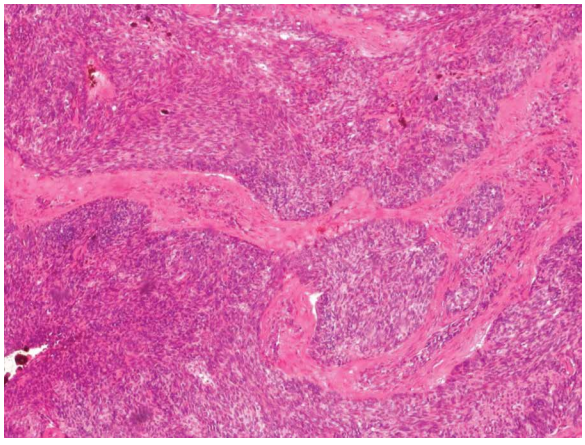

Figure 7. Solid basal cell carcinoma, col HE X40

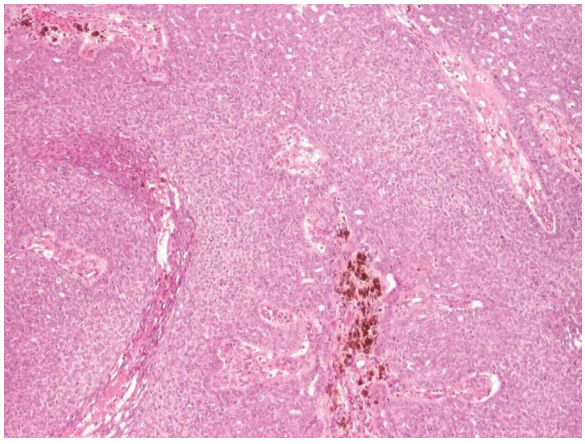

Figure 8. Solid basal cell carcinoma with pigmented areas, col HE, ob X 40

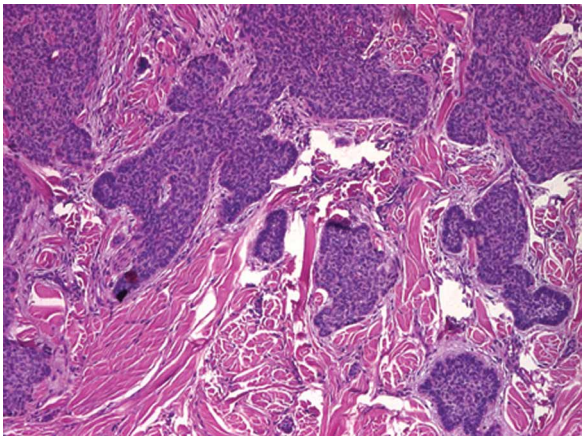

Figure 7. Invasive nodular basal cell carcinoma, col HE, ob X40

(10.4%), two cases of cystic BCC (6.9%) and one case of sclerodermiform BCC (3.4%).

In our study, the solid form was the most common type of BCC (70/138 cases), representing 50.7% of the tumors studied (Figures 7, 8). Of these, eight cases (11.4%) were invasive (Figure 9). Of the eight invasive cases, two were pure solid forms, and the remaining six cases had a keratotic component, adenoid areas, pigmented areas or a sclerodermiform component.

Metatypical carcinoma showed a rate of 4.3%, which was observed in six cases, of which three cases were invasive.

In two patients we noticed the transformation of basal cell carcinoma in metatypical carcinoma after repeated electrocautery.

Discussion

Skin carcinomas represent 90-95% of all skin cancers (5).

Basal cell carcinoma is characterized by slow extension, local invasiveness and an exceptionally rare metastatic potential (1, 6). Despite this relatively benign appearance, there are aggressive clinical forms that produce significant local tissue destructions.

Given the increasing solar activity in recent years and the ozone layer depletion, there are expected to be major increases in global skin carcinoma (7, 8).

Approximately 2.8 million new cases of BCC are diagnosed each year in USA, the annual growth rate ranging between 3% and 7% (9, 10).

Multiple studies have shown a higher rate of basal cell carcinoma in men, this being due to prolonged outdoor activities under the action of ultraviolet radiation (farmers, gardeners, fishermen, builders) (11, 12). In our study, we observed a male predominance of 54.3%.

It is known that UV radiation is the most important risk factor in the development of BCC, and more than 80% of basal cell carcinomas develop on the

cephalic extremity, which was also found in our study (13-15).

In our study, another argument supporting the role of actinic radiation in BCC development is that over 68% of patients showed clinical signs of cutaneous photoaging (prominent wrinkling, yellow skin with rhomboid pattern on the posterior neck, solar lentigo).

Nowadays, the dermatoscope is considered to be the key tool for the diagnosis of BCC, being a valuable method to differentiate BCC from other skin tumors and inflammatory skin diseases. For BCC diagnosis, the reported diagnostic accuracy has been reported to range from 95% to 99% (16).

In 1997 Püspök-Schwarz *et al* reported for the first time the dermoscopic features of pigmented BCC. Arborizing vessels were found in more than 50% of pigmented BCCs and they were described as the strongest model for diagnosis. It has been therefore established that arborizing vessels present a strong diagnostic accuracy and a positive predictive value of 94.1% (17).

In our study, arborizing telangiectasias were found in 53% of pigmented BCCs.

In 2005, Menzies *et al* defined dermoscopic criteria of pigmented BCC. They proposed a dermoscopic model for the diagnosis of pigmented BCC, based on the absence of a pigment network (negative feature) and the presence of at least one of the following features: leaf-like areas, spoke wheel areas, large blue-gray ovoid nests, multiple blue-gray globules, arborizing telangiectasias, ulceration. The dermoscopic features of pigmented BCC in our study were provided using these criteria (18).

The dermoscopic criteria for the diagnosis of non-pigmented BCC are based on absence of pigmentation and presence of some dermoscopic features such as arborizing telangiectasia, short fine superficial vessels, nonarborizing vessels, ulceration and multiple small erosions. The small erosions are smaller in size than ulcerations, and are usually seen as a yellowish crust (19, 20).

According to Betti R *et al*. the presence of short fine telangiectasia, multiple small erosions corresponding to dermo-epidermal pigmentation predict the superficial subtype. In contrast, the presence of ovoid nests should exclude the diagnosis of superficial BCC, while arborizing telagiectasias and ulcerations are also suggestive of nodular, sclerodermiform or infiltrative tumors (21).

In our study, the dermoscopic features observed in superficial BCCs were: shiny white to red areas, scattered vascular pattern, short fine telangiectasia, arborizing microvessels, milky-pink background and brown dots or globules (22).

The spoke-wheel areas, found in superficial BCCs, are representative of tumor nests arising and connected to the epidermis, characterized by finger-like projections and centrally located pigmentation. In pigmented superficial tumors, the pigment is located at the level of dermo-epidermal junction, being dermatoscopically seen as translucent light brown to grayish concentric structures, spoke-wheel areas or maple leaf-like areas (23, 24).

Histological examination revealed marked epidermal atrophy, hyperkeratosis, and large areas of collagen degeneration in the dermis.

The histological polymorphism is revealed by the existence of various types of BCC: solid (nodular), cystic, keratotic, adenoid, morpheaform, superficial, pigmented, metatypical (25).

The ***solid form*** was the most common type of BCC in our study which is in concordance with other studies. We found solid basal cell carcinoma in 70 cases, representing 50.7% of all studied tumors.

In solid type of basal cell carcinoma, we find large masses of basaloid cells in relation to a delicate, specialized tumor stroma. The peripheral cell layer of the tumor masses is cylindrical and shows a palisade arrangement, as in the basal layer of the epidermis. There is a chaotic arrangement of those in the centers of the islands. Commonly there are areas of retraction of the stroma from tumor islands, resulting in peritumoral lacunae. The presence of peritumoral lacunae makes the differentiation of BCC from other cancers, such as squamous cell carcinoma.

Adenoid basal cell carcinoma was encountered in 23 cases representing 16.6% of all studied tumors. Histological picture showed thin strands of basaloid cells resembling tubular, gland-like structures, resulting in a tumor with a lace-like pattern. Rarely cells with secretory aspect can appear.

Keratotic basal cell carcinoma was encountered in 17 cases, representing 12.3% of the tumors studied. Keratotic BCC shows parakeratotic cells and horn cysts in addition to undifferentiated cells. The parakeratotic cells are arranged in concentric whorls or around the horn cysts.

Superficial basal cell carcinoma (multifocal, multicentric) accounts for 10 15% of all BCCs and is found more often in young people. This subtype is characterized by the presence of numerous, small, basaloid nests attached to the undersurface of the epidermis. The tumoral nests are often surrounded by a narrow zone of fibrous stroma with lymphocytic infiltrate and an increase in thin walled vessels. We found this form in 13 cases, representing 9.4% of the tumors studied.

Metatypical carcinoma (basosquamous cell carcinoma), first described in 1910 by MacCormac, represents about 5% of skin carcinoma. In our study we found it in six cases, representing 4.3% of all studied tumors.

It is considered to represent a transition from basal cell carcinoma to squamous cell carcinoma. Clinically, the tumor simulates a basal cell carcinoma, but, compared to it, behaves aggressively,

with higher tendency for metastasis (between 5% and 7.4%). Recurrence rates between 10% and 48% have been reported (25).

Cystic basal cell carcinoma has kept in general the architecture of the solid basal cell carcinoma, but, some tumoral islands contain cystic spaces filled with necrotic material or mucoid substance. The mechanism of the cyst formation can be the massive cell necrosis in the central part of the tumor or the degeneration of the stroma portion included within the tumor mass. In our study we found it in five cases, representing 3.6% of all studied tumors.

Pigmented basal cell carcinoma shows similar histologic characteristics with solid type, but contains melanocytes interspersed between the tumor cells. These melanocytes have numerous melanin granules in their cytoplasm and dendrites. In our study was found in three cases, representing 2.1% of the studied tumors.

Morpheaform basal cell carcinoma (morphea-like or fibrosing variant) showing widespread invasion of the reticular dermis and penetration into the subcutaneus tissue. Small thin strands of the tumor cells are surrounded by a dense fibrous stroma. In our study, these were found in two cases, representing 1.4% of all studied tumors.

In most of the cases mixed patterns are described, as well as in our study. Invasive BCC has a higher local recurrence rate with a high risk for metastasis. Depth of invasion and size of basal cell carcinomas are independent prognostic factors.

Conclusions

BCC has an aggressive invasive behavior which is related to the histopathologic type, in our study, adenoid type was the most aggressive followed by solid and keratotic BCCs.

Identification of clear diagnostic criteria for the aggressive behavior of basal cell carcinoma will allow the best therapeutic results for the patient.

Conflicts of interest: none declared.
Financial disclosure: none.
Patient informed consent obtained.

Bibliography

1. Kumar S, Mahajan BB, Kaur S, et al. A Study of Basal Cell Carcinoma in South Asians for Risk Factor and Clinicopathological Characterization: A Hospital Based Study. *J Skin Cancer* 2014;17:1137-1143.
2. Donaldson MR, Coldiron BM. No End in Sight: The Skin Cancer Epidemic Continues. *SeminCutan Med Surg* 2011;30:3-5.
3. Lomas A, Leonardi-Bee J, Bath-Hextall F. A systematic review of worldwide incidence of nonmelanoma skin cancer.*Br J Dermatol* 2012;5:1069-1080.
4. Sarma DP, Olson D, Olivella J, et al. Clear Cell Basal Cell Carcinoma. *Patholog Res Int* 2011;2011:386921.
5. Warner CL, Cockerell CJ. The new seventh edition American Joint Committee on Cancer staging of cutaneous non-melanoma skin cancer: a critical review. *Am J Clin Dermatol* 2011;12(3):147-54.
6. Jemal A, Siegel R, Ward E, et al. Cancer statistics. *CA Cancer J Clin* 2006;2:106-130.
7. Bath-Hextall F, Leonardi-Bee J, Smith C, et al.Trends in incidence of skin basal cell carcinoma. Additional evidence from a UK primary care database study. *Int. J Cancer* 2007;9:2105-2108.
8. Fellner C. Vismodegib (erivedge) for advanced basal cell carcinoma. *P T* 2012;12:670-682.
9. LeSueur BW, Silvis NG, Hansen RC. Basal Cell Carcinoma in Children. *Arch Dermatol* 2000;3:370-372.
10. Bauer A, Diepgen TL, Schmitt J. Is occupational solar ultraviolet irradiation a relevant risk factor for basal cell carcinoma? A systematic review and meta-analysis of the epidemiological literature. *Br J Dermatol* 2011;3:612-625.
11. Zoccali G, Pajand R, Papa P, et al. Giant basal cell carcinoma of the skin: literature review and personal experience. *J EurAcad Dermatol Venereol* 2012;8:942-952.
12. Enache A-O, Pătrașcu V, Ciurea RN, Stoica LE, Cernea N, Stepan D, Simionescu C. Basal cell carcinoma: review of epidemiology and risk factors. *RoJCED* 2016;1:22-28.
13. Virgil Pătrașcu, Elena Larisa Oprea, Andreea-Oana Enache. Subsequent mixed and basal cell carcinomas in a patient after kidney transplant – case report. *RoJCED* 2017;4:90-94.
14. Christenson LJ, Borrowman TA, Vachon CM, et al. Incidence of basal cell and squamous cell carcinomas in a population younger than 40 years. *JAMA* 2005;6:681-690.
15. Fabbrocini G, Triassi M, Mauriello MC, et al. Epidemiology of skin cancer: role of some environmental factors. *Cancers* (Basel) 2010;4:1980-1989.
16. Demirtasoglu M, Ilknur T, Lebe B, et al. Evaluation of dermoscopic and histopathologic features and their correlations in pigmented basal cell carcinomas. *J Eur Acad Dermatol Venereol* 2006;20:916-920.
17. Püspök-Schwarz M, Steiner A, Binder M, Partsch B, Wolff K, Pehamberger H. Statistical evaluation of epiluminescence microscopy criteria in the differential diagnosis of malignant melanoma and pigmented basal cell carcinoma. *Melanoma Res* 1997;4:307-311.
18. Menzies SW, Westerhoff K, Rabinovitz H, Kopf AW, McCarthy WH, Katz B. Surface microscopy of pigmented basal cell carcinoma. *Arch Dermatol* 2000;8:1012-1016.
19. Lallas A, Apalla Z, Argenziano G, et al. The dermatoscopic universe of basal cell carcinoma. *Dermatol Pract Concept* 2014;4:11-24.
20. Lallas A, Argenziano G, Zendri E, et al. Update on non-melanoma skin cancer and the value of dermoscopy in its diagnosis and treatment monitoring. *Expert Rev Anticancer Ther* 2013;13:541-558.
21. Betti R, Crosti C, Ghiozzi S, et al. Basosquamous cell carcinoma: a survey of 76 patients and a comparative analysis of basal cell carcinomas and squamous cell carcinomas. *Eur J Dermatol* 2013;23:83-86.
22. Giacomel J, Zalaudek I. Dermoscopy of superficial basal cell carcinoma. *Dermatol Surg* 2005;31:1710-1713.
23. Scalvenzi M, Lembo S, Francia MG, et al. Dermoscopic patterns of superficial basal cell carcinoma. *Int J Dermatol* 2008;47:1015-1018.
24. Suppa M, Micantonio T, Di Stefani A, et al. Dermoscopic variability of basal cell carcinoma according to clinical type and anatomic location. *J Eur Acad Dermatol Venereol* 2015;29:1732-1741.
25. Situm M, Buljan M, Bulat V, et al. The role of UV radiation in the development of basal cell carcinoma.*CollAntropol* 2008;32 Suppl 2:167-170.