

## Malignant Blue Nevus of the Right Arm

Spasimir Todorov Shopov\*

Department of Pathology at MBAL “Parvomai” Ltd, Parvomai, Bulgaria; Department of General and Clinical Pathology, Medical University - Plovdiv, Bulgaria

\***Corresponding author:** Shopov ST, Department of General and Clinical Pathology, Medical University - Plovdiv 15a Vassil Aprilov Blvd. 4000 Plovdiv, Bulgaria, Tel: 08786572561; E-mail: [sshopov1@abv.bg](mailto:sshopov1@abv.bg)

**Received:** May 24, 2019; **Accepted:** June 01, 2019; **Published:** June 08, 2019

### Abstract

The blue nevus is an abnormal collection of functioning dermal melanocytes and melanin. Clinical-grey-blue sometimes black colored patch or papula. Commonly it is localized on the head, back, hands and legs with size to 1 cm. Predominantly it is a benign process. The development of malignant melanoma from blue nevus is seldom. The malignant blue nevus is most frequently localized on the scalp. I am reporting a case of a 75-year-old woman with malignant melanoma on the right arm, which developed from a blue nevus.

**Keywords:** *Melanoma; Blue nevus; Malignant blue nevus*

### 1. Introduction

The blue nevus is composed of pigmented dermal dendritic melanocytes in the reticular dermis. It can develop anywhere on the body but half of them are on the scalp, gluteal region, dorsal surface of the hands and feet [1]. It is rarely localized on the mucosa [2]. Despite it being considered a benign process, sometimes a malignant transformation is possible. Malignant melanoma which originates from blue nevus is called Malignant blue nevus (MBN). This is an extremely rare form of melanoma.

It is supposed that it germinates from dermal melanocytes in correlation with cellular or normal blue nevus [3]. It is reported for the first time in 1953 by Allen and Spitz [4].

In 1956 by Fisher [5]. Clinically MBN is a grey-blue or black-blue skin lesion with size from 1cm to 10 cm in diameter [6]. The most common localization is on the scalp but it is also found in the lumbar region, back, legs, face, cervix, arms, ears, and mucosa [2,3,6,7]. MBN rarely originates from a giant congenital nevus, nevus of Ota or de novo.

## 2. Case Report

A 75-year-old woman was hospitalized as an emergency case in the surgical department. The reason is an old blue mole which in the last year had increased in size and in the last few days, the surrounding tissues had become swollen and flushed. She also had a fever.

Clinic: an uneven grey-blue nevoid lesion with an irregular shape, localized in the middle third of the right brachium. The surrounding tissue is edematous, flushed and with increased local temperature. A probability for deep purulent collection. Lymph nodes are not enlarged. Wide resection with part of the muscle fascia is performed. It is sent for histological examination.

Paraclinical: mild anemia, biochemistry - normal. Wound secretion-no microorganisms are isolated. Roentgenology of the humerus - the bones covered by the roentgenography are smooth, sharply-outlined with preserved bone structure.

Postoperative period - with no complications

Macroscopic: skin and dermis with size 5/3,5/3,5 cm. On the epidermis, a grey-blue lesion is observed with uneven shape and size 3/2 cm (FIG.1a). With a longitudinal section a rounded tumor formation 3cm in diameter in finding with two smaller ones with pale ochre cut surface. The tumor does not infiltrate the epidermis but infiltrates deeply the fatty tissue (FIG.1b).

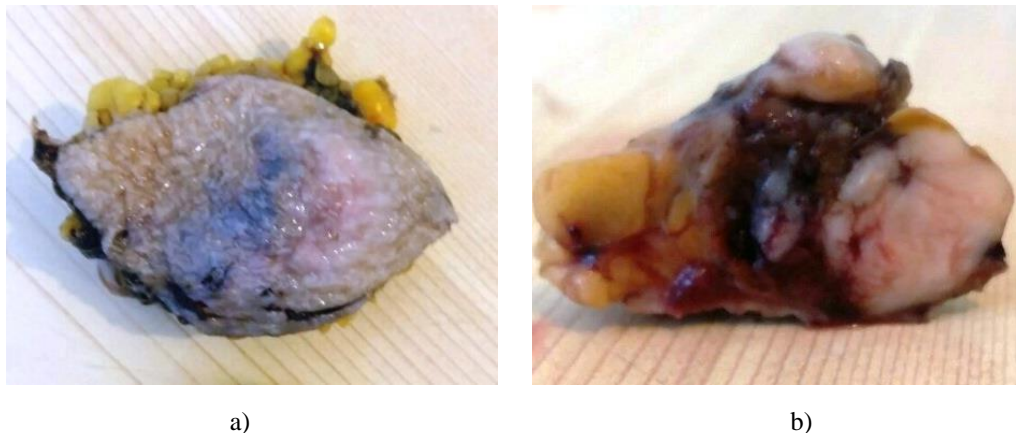
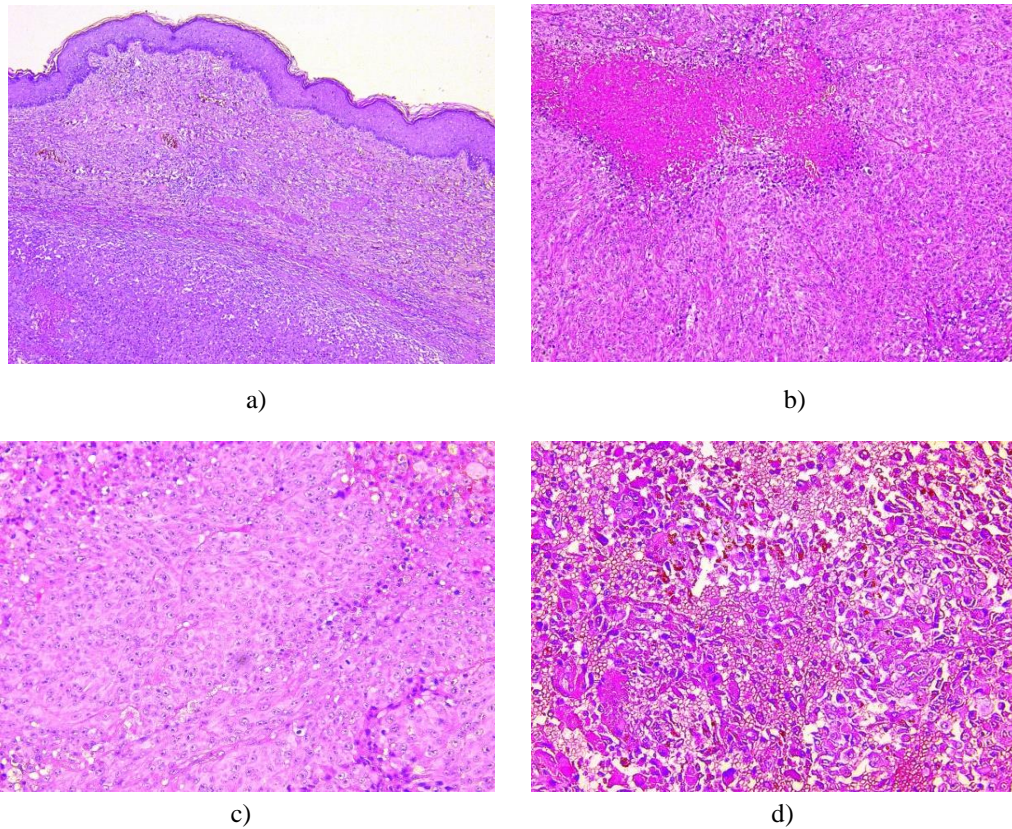


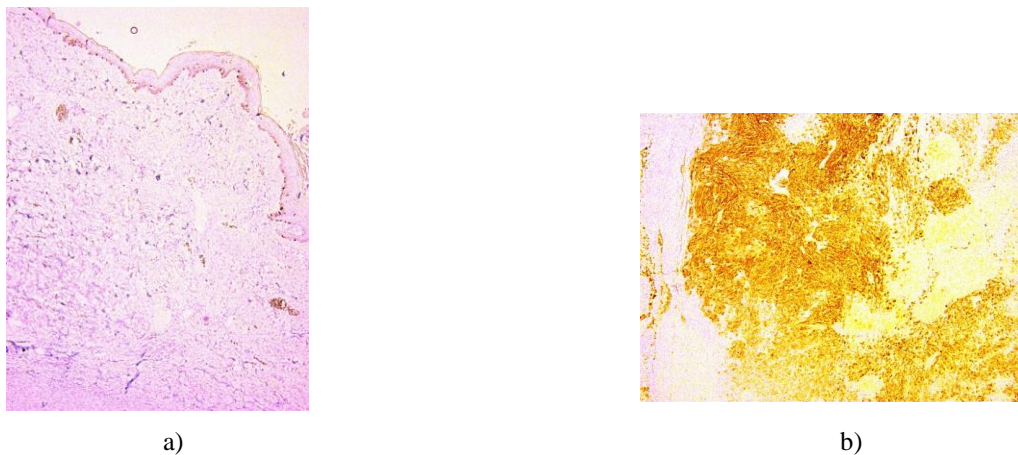
FIG. 1. Clinical presentation of an MBN 75-year old woman: a. A view from the epidermis; b. Cut surface.

Histology (FIG. 2): 3µ slices were prepared and colored with (H&E). The slices show pigmented multinodular melanocytic tumor in the dermis and subcutaneous fatty tissue. In one region it reaches the muscle fascia. After a multitude of following slices, the epidermis was found to be unaffected (FIG. 2a). The tumor shows a mixture of pigmented dendritic melanocytes and melanocytes with a larger amount of brighter cytoplasm (FIG. 2c). Hypercellular regions of protracted, fusiform tumor cells arranged in bundles with significant cytological atypia. Focal changes of the epithelioid cells. More than 4 mitoses in 1mm<sup>2</sup> as well as atypical ×400 enlargement (FIG. 2d). Presence of focal necroses in the tumor parenchyma (FIG. 2b).



**FIG. 2. Histology (H&E): a. Epidermis and MBN no link between them (enlarged  $\times 50$ ); b. Necrosis among of the tumor parenchyma (enlarged  $\times 100$ ); c. Dendritic melanocytes and melanocytes with more abundant light cytoplasm and sparingly melanin (enlarged  $\times 200$ ); d. Spindle atypical cells with mitosis and plenty of melanin (enlarged  $\times 400$ ).**

Immunohistochemistry (Dako, Glostrup, Denmark) (FIG. 3): Over 75% of the tumor cells are positive for Melan A (FIG. 3b).  
Diagnosis: Malignant blue nevus on the right arm. The patient is directed to an oncology center for additional treatment and observation.



**FIG. 3. Histology (Melan A): a. Epidermis with remaining melanocytes and dermis which is not affected by the tumor e (enlarged  $\times 50$ ); b. Over 75% of tumor cells are Melan a positive A (enlarged  $\times 100$ ).**

### 3. Discussion

Blue nevus is benign lesions which consist of pigmented dermal dendritic melanocytes. Clinically they are grey-blue rarely black papules with a diameter reaching 1cm. The blue color is due to the Tyndall effect. There are different subtypes of blue nevus: common, cellular, epithelioid and deeply penetrating [1]. Very rarely a malignant melanoma can occur from such lesions [3]. The term “Malignant blue nevus” is a heterogeneous group of rare malignant melanocytic tumors. It is considered that this group is equally or even more aggressive than the other types of melanoma [8]. This term was first proposed by Allen and Spitz. They describe a heterogeneous group of tumors which resemble blue nevi but can metastasize and have the lethal outcome [4]. MBN typically originates from a cellular blue nevus. Seldomly it develops into a common blue nevus [7] or de novo. Histologically it resembles cellular blue nevus [9]. Clinical - pathologic research carried out by Martin RCW et al. analyzed 23 MBN most commonly found on the head, cervix, and back (34,8%), upper (17,4%) and lower limbs (13%) [10].

The presented case is an elderly woman with a malignant blue nevus in the region of the upper limb and falls in the 17.4% category. MBN can occur at a different age but it is most common in middle age [3]. From the analysis of Kachare SD, et al. the average age is 55.8 years [11]. From Martin RCW, et al. report the average age is 44 years [10]. In most of the cases of MBN, the lesions were present for years until their transformation. As is the case here. Particularly, in this case, is the accompanying inflammation, which initially misled the surgeon that it was phlegmon of the arm, but during the surgical intervention it turned out to be a tumor process. Blue nevus with the development of satellite lesions is considered to be a possibility for malignancy. Satellite lesions have been reported very rarely in cases with benign blue nevus [12]. Therefore the differential diagnosis for MBN includes cellular blue nevus, atypical blue nevus, primary melanoma, dermal melanoma metastases [3].

Histologically melanomas and MBN have similar characteristics: cytological atypia, pleomorphism, increase in mitotic activity, atypical mitoses, necroses, blood vessel invasion, expansive, destructive and infiltrative growth [3,10,13]. By MBN there is also a former or a concomitant blue nevus, which by definition does not include the epidermis (not typical for melanoma) [11]. As is the case here. In other research a successful plan for differential diagnosis of all subtypes of blue nevus, MBN and melanoma were made [13].

Some authors suppose that malignant blue nevus is just an analytical term and clinical -pathologic unit which is actually melanoma. Therefore the term “blue nevus-like melanoma” could be used. Nearly 50% of skin melanomas show BRAF and 15%-20% NRAS mutation, unlike the other nevi and MBN [14]. Most of the blue nevus (83%) and half of the uveal melanoma (46%) have somatic mutations in the heterotrimeric G-protein- $\alpha$  subunit GNAQ. The same mutation is found in 50% of MBN cases [15]. This offers a possibility for new therapeutic research for patients with MBN.

The data about MBN prognosis is controversial. In one big research about MBN in spite of the depth of the invasion in the dermis, the clinical symptoms and the survival rate are similar to melanoma [11]. Out of the data from different authors MBN should be considered as an aggressive melanoma.

In the presented case a clinical - morphologic algorithm was carried out before the diagnosis MBN was reached.

Medical history: long-term bluish lesion which increased in size in the last year. This overrules the possibility of a de novo process. No data about previous malignant skin or another malignant disease.

Clinic: a grey-blue lesion with uneven shape and size 3/2 cm. Common, desmoplastic and epithelioid blue nevus have grey-blue lesions, which can be prominent but their size isn't more than 1cm. Cellular blue nevus lesions are a bit prominent, 1 to 3 cm in size but with a smooth surface. Only the lesions from atypical blue nevus can be ulcerated and with size reaching 5 cm [13].

Histology: common blue nevus has bipolar and dendritic melanocytes in the reticular dermis or deeper. Significant dermal fibrosis is associated with a desmoplastic blue nevus. Epithelioid blue nevus-epithelioid and a few dendritic melanocytes with a small amount of melanin. These types of nevus do not show cellular atypia, higher mitotic activity, atypical mitosis, and necrosis. Although atypical blue nevus has cellular atypia, infiltrating growth and the mitotic activity is 2 mitosis in 1mm<sup>2</sup> there are no atypical mitosis and necrosis.

In the current case, there are nests of atypical cells with melanocytic genesis and preserved epidermal melanocytes in the deep dermis and subcutaneous fatty tissue. Infiltrating growth, nuclear pleomorphism, hyperchromasia, atypical mitosis, and necrosis confirm the diagnosis MBN [13].

#### 4. Conclusion

MBN is a rare type of tumor which clinically and histologically resembles some types of blue nevus but are aggressive as malignant melanoma. Due to its rarity cellular blue nevus remains a diagnostic challenge. Essential factors to differentiate nevus from melanoma are: size, cellular atypia, mitoses, hypercellularity, atypical mitosis, necrosis, and recidivation. The subject of future vast researches is the distinction between atypical blue nevus and MBN. Research about genetic-molecular markers can be useful. Currently, the thorough clinical-morphologic valuation is most commonly used. Therefore MBN should be treated with the same attention as is malignant melanoma.

#### REFERENCES

1. Zembowicz A, Phadke PA. Blue nevi and variants: an update. *Arch Pathol Lab Med.* 2011;135(3):327-36.
2. Fistarol SK, Itin PH. Plaque-type blue nevus of the oral cavity. *Dermatol.* 2005;211(3):224-33.
3. Granter SR, McKee PH, Calonje E, et al. Melanoma associated with blue nevus and melanoma mimicking cellular blue nevus: a clinicopathologic study of 10 cases on the spectrum of so-called 'malignant blue nevus'. *Am J Surg Pathol.* 2001;25(3):316-23.
4. Allen AC, Spitz S. Malignant melanoma; a clinicopathological analysis of the criteria for diagnosis and prognosis. *Cancer.* 1953;6(1):1-45.
5. Fisher ER. Malignant blue nevus. *AMA Arch Derm.* 1956;74(3):227-31.
6. Barnhill RL, Mihm MC Jr. The histopathology of cutaneous malignant melanoma. *Semin Diagn Pathol.* 1993;10(1):47-75.
7. Connelly J, Smith JL Jr. Malignant blue nevus. *Cancer.* 1991;67(10):2653-7.
8. Shirbacheh MV, Mihm MC, Stadelmann WK. The use of selective lymphadenectomy in malignant blue naevus of

- the scalp. *Br J Plast Surg.* 2003;56(1):44-6.
9. Böni R, Panizzon R, Huch Böni RA, et al. Malignant blue naevus with distant subcutaneous metastasis. *Clin Exp Dermatol.* 1996;21(6):427-30.
  10. Martin RC, Murali R, Scolyer RA, et al. So-called “malignant blue nevus”: a clinicopathologic study of 23 patients. *Cancer.* 2009;115(13):2949-55.
  11. Kachare SD, Agle SC, Englert ZP, et al. Malignant blue nevus: clinicopathologically similar to melanoma. *Am Surg.* 2013;79(7):651-6.
  12. Lourari S, Lamant L, Viraben R, et al. Photoletter to the editor: Blue nevus with satellitosis mimicking melanoma. Contribution of dermoscopy and reflectance confocal microscopy. *J Dermatol Case Rep.* 2012;6(2):54-6.
  13. Savoia F, Gaddoni G, Re G, et al. The long history of a melanoma associated with a congenital large plaque type blue nevus with subcutaneous cellular nodules. *Dermatol Pract Concept.* 2015;5(3):17-21.
  14. Chattopadhyay C, Ellerhorst JA, Ekmekcioglu S, et al. Association of activated c-Met with NRAS-mutated human melanomas. *Int J Cancer.* 2012;131(2):E56-65.
  15. Van Raamsdonk CD, Bezrookove V, Green G, et al. Frequent somatic mutations of GNAQ in uveal melanoma and blue naevi. *Nature.* 2009;457(7229):599-602.