



## CHARACTERISTICS OF MALIGNANT MELANOMA EXAMINED BY 20-MHz ULTRASOUND

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**Summary.** High frequency ultrasound examination of the skin lesions is a relatively new, increasingly important additional diagnostic method in dermatology. Using 20-MHz ultrasound, we have analysed eight skin lesions clinically suspected and subsequently pathohistologically verified as malignant melanoma. The echograms of the examined lesions showed in dermis, under the entry echo, nonechogenic formations, irregularly oval in shape, with more or less pronounced sharp-pointed hypo- or nonechogenic elongations spreading into the surrounding dermis. Lesion borders, particularly distal, were relatively clear, which enabled easier determination of the lesion diameter. The described echographic characteristics were related to clinically very suspected skin lesions for malignant melanoma. Final diagnosis of malignant melanoma is still in the domain of pathohistology. 20-MHz ultrasound may be useful for preoperative measurement of lesions diameter.

**Key words:** Malignant melanoma, 20-MHz ultrasound, diagnostics

### Introduction

Malignant melanoma is the most malignant skin tumor. It is very aggressive and inclined to early metastasing. Malignant melanoma is histologically made of melanocytes (1-3).

Malignant melanoma is most frequent between ages of 20 and 60, and more often diagnosed in the white population. Malignant melanoma incidence has been on the significant increase lately, so that it presently accounts for 2% of all malignant tumors (1-3).

In approximately 10% malignant melanomas develops on the clinically intact skin, in 10-20% it grows from lentigo maligna, and most frequently, i.e. in about 50%, from pigmented naevus naevocellulare (1-3). Its etiology is unknown. More intense sun exposure, traumas, irritation or inflammation are most frequently mentioned as possible etiologic or trigger factors. Experiments carried out on animals led to the discovery of a virus which may have a role in the etiopathogenesis of malignant melanoma (1-3).

Clinical feature, size and colour of malignant melanomas may be various. Most often it is dark brown, blue or black, although its parts or the whole tumor may be amelanotic. There is also evidence of certain secondary features, such as erosions, bleeding, crusts and the like.

Clinical features provide grounds for the differentiation of the following clinical types of malignant melanoma (1-3): lentigo maligna melanoma, superficial spreading malignant melanoma (the most frequent type), nodular malignant melanoma, acrolentiginous malignant melanoma, and some more rarely encountered specific malignant melanoma types.

The diagnosis of malignant melanoma is made on the basis of pathohistological examinations. Ultrasonographic skin examination, as a non-invasive additional diagnostic method, has gained an increasing significance lately.

The objective of the our study was to analyse the echograms of skin lesions subsequently (pathohistologically) verified as malignant melanoma.

### Patients and Methods

Echograms of eight skin lesions from eight patients (5 male and 3 female, 22-72 years old), clinically suspected for malignant melanoma, were analysed. All lesions were later on surgically removed and pathohistologically verified as a malignant melanoma.

In our study, we used 20-MHz ultrasound equipment **Dermascan C** (Cortex Technology, Denmark). The lesion image analysis was done by use of B- mode, and

the diameter analysis by A- and B- modes used in combination.

## Results

All examined patients had superficial spreading type of malignant melanoma. In four patients lesions were localized on the skin of the body (two on the abdomen and two on the back), in two patients on the skin of the face, in one case on the upper arm, and in one on the lower leg. All patients claimed that they had a "birthmark persisting since childhood" on the place of the lesion, which, after a trauma, or spontaneously, started changing – growing larger, darker and spreading to surrounding skin, or even occasionally bleeding (as remarked by three patients). All of them stated occasional sense of itch or pain on the place of the lesion.

Echograms of all skin lesions were similar – prominent, irregularly oval in shape, nonechogenic formations, located in dermis, under the entry echo. Their borders were hypoechogenic, but relatively clear (fig. 1). The distal borders were clear in all cases, while underlying dermis showed increased echoreflexion. This fact made it possible to determine the maximum diameter (depth) of the lesions, by a combined use of Dermascan C A- and B-mode (fig. 1). The diameter varied from 0,81mm to 3,08mm. Laterally from the prominent (clinically notable) part of lesions, the presence of more or less expressed, hypo- or nonechogenic sharp-pointed elongations of the lesions, spreading into surrounding dermis under the entry echo, was observable in all echograms (Fig. 1). In all echograms, surrounding dermis showed no observable echographic changes.

## Discussion

High-frequency ultrasound examination of skin and skin lesions is relatively new, non-invasive, additional diagnostic method in dermatology.

The findings based on ultrasound examinations are, as far as their precision is concerned, ranked somewhere between the findings obtained by clinical examinations, and those based on pathohistological methods (4,5). Ultrasound examination of skin lesions is performed rather easily, in vivo, providing significant data about the structure of the examined skin lesions, which is a respectable fact.

High-frequency ultrasound examination cannot confirm or exclude malignancy of the examined skin lesion (5-8). Previous examinations based on high-frequency ultrasound focused on malignant melanoma problem, pointed to certain characteristics of such lesions which are, however, not pathognomonic or indicative only for malignant melanoma lesions, i.e. could not provide for early diagnosis and malignant melanoma differentiation in an early stadium, from pigmented naevus, for instance (4-8).

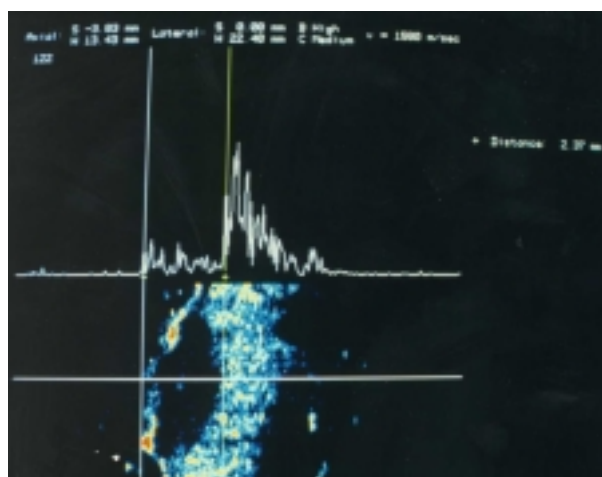


Fig.1. Combined A- and B- mode echograms of malignant melanoma lesion.

The echographic malignant melanoma characteristics observed in our study relate to clinically and anamnestically highly suspected malignant melanoma lesions. Similarly to most malignant skin tumors (as well as a numerous nonmalignant skin lesions), malignant melanoma shows low echogenicity (4,5). Hyperechogenicity of the underlying dermis is, most probably, a consequence (among some other reasons) of the higher speed of ultrasound through the lesion (4,5). The lateral borders are relatively sharp and clear, while the nonechogenic sharp-pointed elongations of the lesions may embody the invasive (superficial) spreading of the melanoma. However, it should be noted that similar ultrasound findings can be obtained for the inflamed naevus as well. A clear distal border enables easier determination of tumor dimensions (by combined use of A- and B- modes), and almost all previous examinations (7-11) showed high reliability of the obtained results in comparison with the micromorphological measures obtained on pathohistological sections, although with some limitations (12,13).

Our intention was to analyze general characteristics of malignant melanoma echograms; the equipment we used for this purpose – Dermascan C (Cortex Technology, Danmark), with axial resolution of 0,05mm – may be considered as very reliable for the measurement of skin lesions.

## Conclusion

High-frequency ultrasound examination of skin lesions suspected for malignant melanoma cannot be used to establish diagnosis. Final diagnosis of malignant melanoma is still in the pathohistological domain. 20-MHz ultrasound examination is additional, non-invasive, comfortable diagnostic method, which provides, in vivo, very useful data about the structure and dimensions of the examined skin lesions. As such, it is very suitable for preoperative determination of malignant melanoma dimensions.

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## KARAKTERISTIKE MALIGNOG MELANOMA ISPITIVANE 20-MHz ULTRAZVUKOM

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Kratak sadržaj: *Primena visokofrekventnog ultrazvuka u analiziranju kožnih promena je relativno nova i sve aktuelnija pomoćna dijagnostička metoda u dermatologiji. 20-MHz ultrazvukom smo analizirali 8 kožnih promena klinički veoma suspektnih, a naknadno i patohistološki verifikovanih kao maligni melanom. Ehogrami ispitivanih promena su pokazali neehogene formacije u dermu, neposredno ispod ulaznog eha, nepravilno ovalnog oblika, sa manje ili više izraženim izduženim hipo- ili neehogenim bočnim produžecima, koji se ispod ulaznog eha šire u okolni derm. Granice promene su relativno jasne, naročito distalna, što olakšava određivanje dijametra promene. Opisane ehografske karakteristike se odnose na promene već i klinički veoma suspektne na maligni melanom. Definitivna dijagnoza malignog melanoma je još uvek u domenu patohistologije. 20-MHz ultrazvuk može biti veoma koristan za preoperativno određivanje dimenzija promene.*

Ključne reči: *Maligni melanom, 20-MHz ultrazvuk, dijagnostika*

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