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REVIEW OF NEVI FOR MEDICAL EDUCATION USING DIGITAL PATHOLOGY TOOLS

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The aim of the study is to use digital images of nevi as a diagnostic and prognostic tool for studying skin pathology.

Studies on pigmented nevi (moles) attract medical attention by the fact that they signal to the specialized medical team possible malignant degeneration.. Nevi samples were taken from different areas of the body in children under the age of 18 years. The analysis of pigmented nevi is undertaken by observations on microscopic preparations, usually colored using the Hematoxylin & Eosin stain (H&E), which enables comparative analyzes to be made with the adjacent regions of the nevi. Collated data can include classifications by age groups, by sex, by urban or rural area. In order to advance medical education, capturing digital images of nevi can provide a powerful training tool. For example through the presentation of data to medical students it is possible to draw attention to the types of traumatized nevi that could possibly degenerate into malignancy.

Key words: nevi, structure, analysis, observations, particularities

Pigmentary nevi, as visible, circumscribed, chronic lesions of the skin, can occur from childhood [6, 10, 17,]. It is likely that their appearance, from an early age, is part of the body's response to harmful radiation [7, 8, 9, 13]. Hence, for both preventive and protective purposes, it is useful to apply sunscreen creams onto the skin of children when the skin is likely to be exposed to sunlight during summer months. Unfortunately, the appearance of pigment nevi in adult age groups and in the elderly can no longer benefit from such protective treatment [12, 18, 19, 20].

The primary risk is with those skin lesions that are multi-colored or polychromatic, since these may be associated with skin cancer (particularly when the number of nevi are relatively high, such as above 100 on the upper torso). Given that the risk of developing an acquired melanocytic nevus is most commonly associated with children and adolescents, detecting the formation of the 'common mole' at an early stage forms an important part of preventative medicine.

Pigmentary nevi appear on different regions of the body, having specific characteristics [1, 2, 3, 15]. Adjacent skin areas can also be affected [4, 5, 11]. It is considered important to preserve the integrity of the pigmentary nevus, in order to avoid traumas that can affect both the nevus formations and lead to further damage to the adjacent skin regions [14, 16].

MATERIAL AND METHODS

For this study, a selection of 10 patients under the age of 18 years was made. The cohort was composed of both the female and male sex. The subjects resided within an urban environ-

ment. The subjects were diagnosed as having nevi. Samples were taken and permanent microscopic preparations were performed. From these, sections were cut to produce histological slides that were stained with Hematoxylin & Eosin. With this stain, hematoxylin dye stains cell nuclei blue, whereas the dye eosin stains the extracellular matrix and cytoplasm pink. Other structures appear as different shades, hues, and combinations of blue and pink. The prepared slides were analyzed under a regular Nikon microscope, with x10 and x20 magnification lenses. The pigmentary nevi samples were taken from different regions of the body.

RESULTS

From the microscopic observations it was noted that several skin areas were affected by the trauma of the nevi due to involuntary causes. These samples were captured as digital images, utilizing virtual microscopy.

A selection of the samples and digital data subjected to whole-slide imaging is outlined below.

The first slide shows a skin region adjacent to the hair follicle and nevus of the scalp. In this image, grouped sweat glands can be observed (Fig. 1). The second slide shows a sebaceous gland attached to the pyloric follicle near the intact pigmentary nevus (Fig. 2). The third slide shows regions of the scalp adjacent to the nearby pigment follicle and nevus follicle (Fig. 3). The fourth slide shows the epidermis and the underlying connective region, with sweat glands, adjacent to some snow formations (Fig. 4). The next slide presents morphological aspects similar to the previous one but in more detail (Fig. 5).

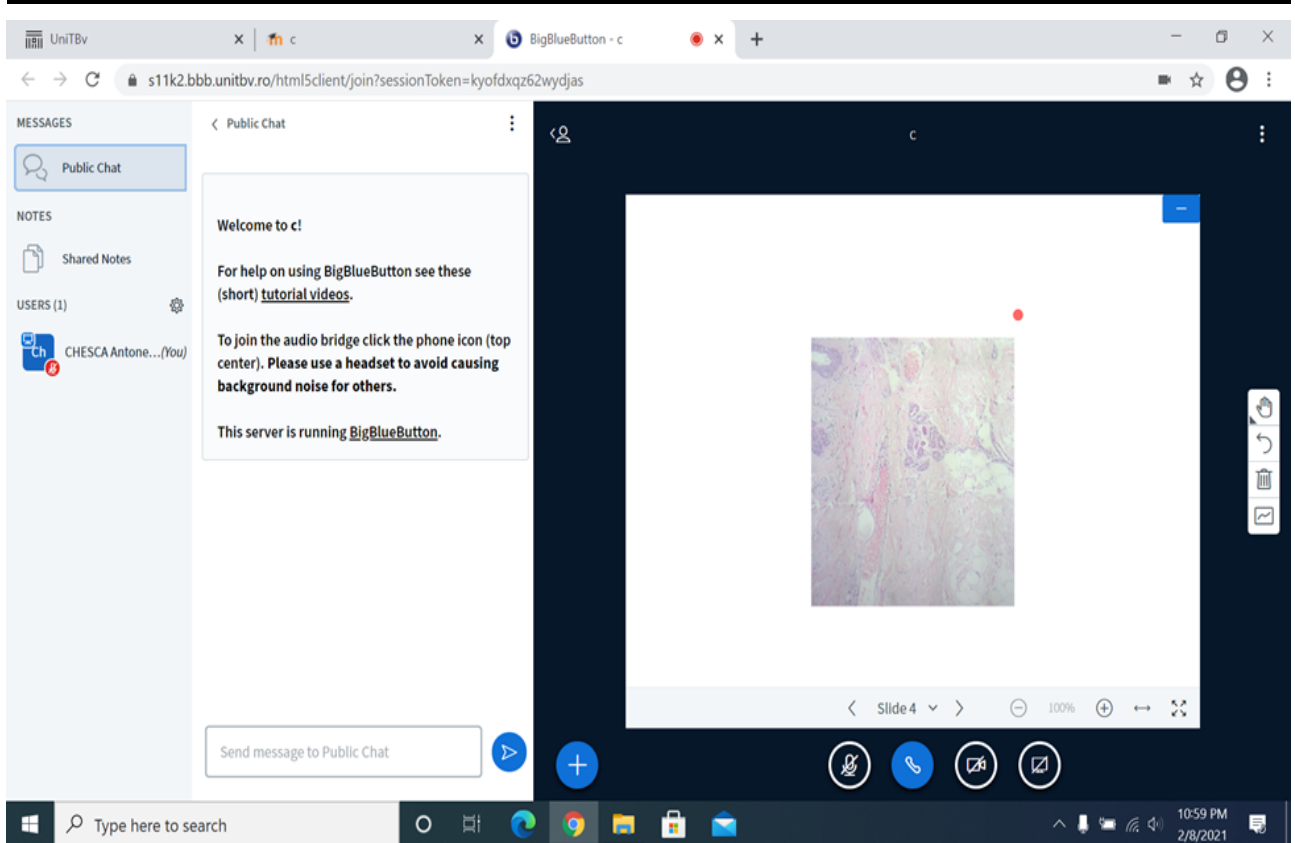


Figure 1 – A skin region adjacent to the hair follicle and nevus of the scalp

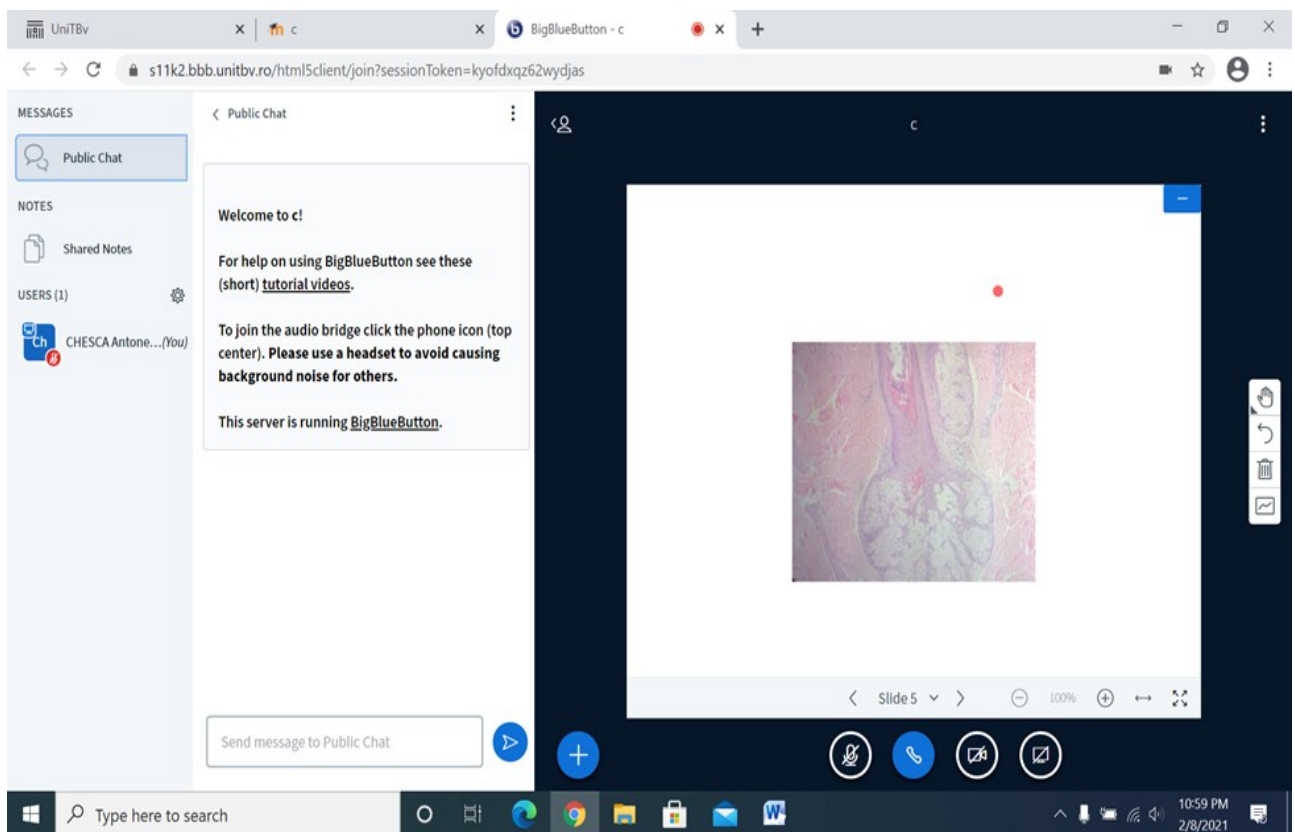


Figure 2 – A sebaceous gland attached to the pyloric follicle near the intact pigmentary nevus

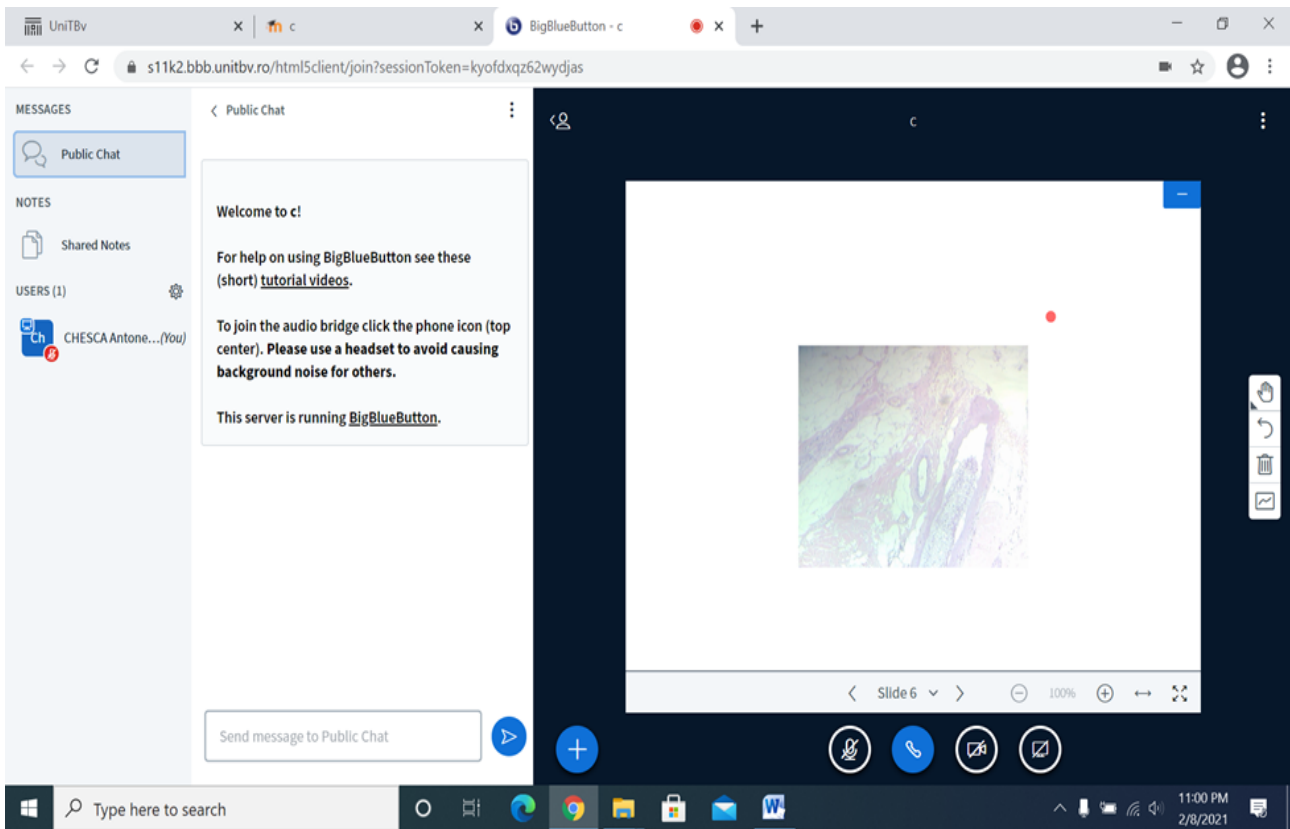


Figure 3 – Regions of the scalp adjacent to the nearby pigment follicle and nevus follicle

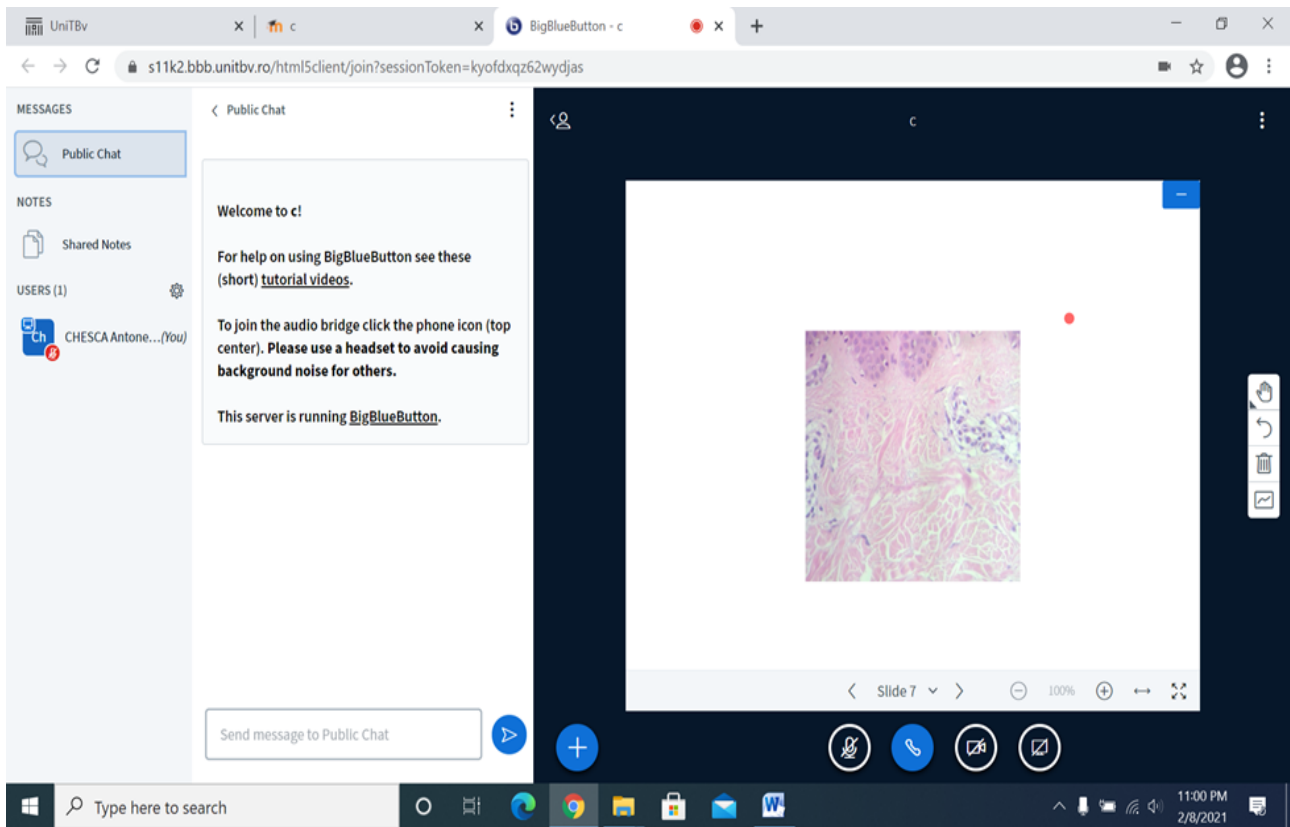


Figure 4 – Epidermis and the underlying connective region, with sweat glands, adjacent to some snow formations

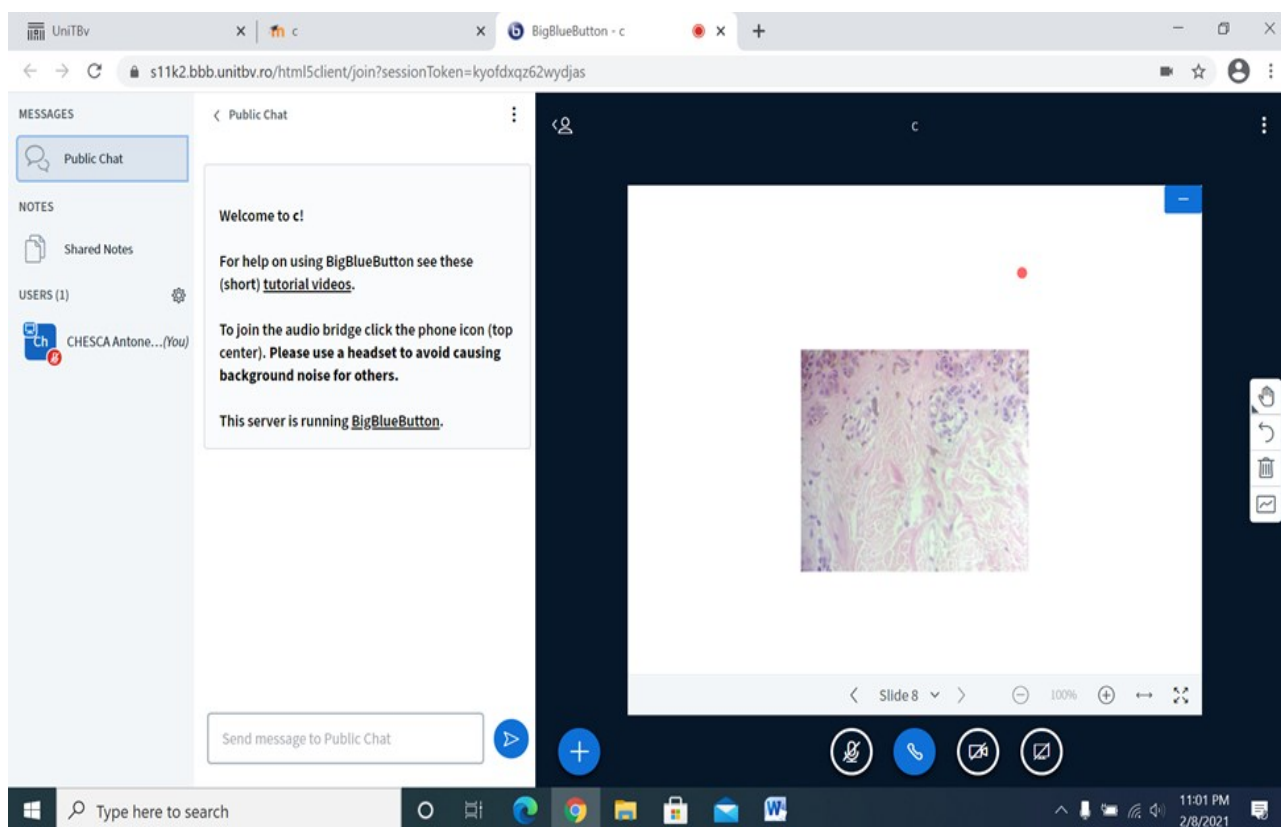


Figure 5 – Morphological aspects similar to the previous one but in more detail

DISCUSSIONS

It is important that medical students, as well as practicing physicians, have a grounded understanding of nevi and the associated risks of skin cancer. It is also important that the general public have an understanding regarding the causes of the appearance of pigment nevi. This should lead to medical guidance designed to enhance the quality of life. Medics need to be aware of the factors that shape the appearance of pigment nevi have been taken into account, and the significance of these chronic lesions of the skin. This is not least because there are numerous types of melanocytic nevi. For example, a nevus may appear macule, smooth-surfaced papule, or papillary nodule; there are different developmental stages (such as junctional, compound, and intradermal) and there are the variations with pigmentation that have been noted. Understanding the variances and the relative risk that a nevus capable of leading to skin cancer may cause represents an important part of medical education. This form of digital pathology also enables the use of web-enabled workflows, case management, and research collaboration, through the sharing and co-analysis of images online.

Awareness among medical students can be enhanced through embracing digital patholo-

gy, facilitated through appropriate software and digital imaging, as presented in this article.

The examples presented in this paper can provided the basis for enabling an interdisciplinary medical team to develop programs and guides for appreciating and presenting medical information regarding pigmented nevi, and hence to help to advance epithelial pathology.

CONCLUSIONS

The early detection of pigmented nevi is of utmost importance, especially in children where it is easier to undertaken preventive measures. To facilitate this, medical education should include details relating to skin pathology. This can be advanced through the use of digital imaging, along the lines presented in this article.

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ИЗОБРАЖЕНИЯ НЕВУСОВ КАК ДИАГНОСТИЧЕСКИЙ И ПРОГНОСТИЧЕСКИЙ ИНСТРУМЕНТЫ ПРИ ИЗУЧЕНИИ ПАТОЛОГИИ КОЖИ

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Цель исследования – использовать цифровые изображения невусов в качестве диагностического и прогностического инструмента для изучения патологии кожи.

Исследования пигментных невусов привлекают внимание врачей тем, что они сигнализируют специализированной медицинской бригаде о возможном злокачественном перерождении. Образцы невусов были взяты из разных участков тела у детей в возрасте до 18 лет. Анализ пигментированных невусов проводится путем наблюдения за микроскопическими препаратами, обычно окрашенными гематоксилином с эозином, что позволяет проводить сравнительный анализ с прилегающими к невусу областями. Полученные данные могут включать в себя классификации по возрастным группам, полу, городским или сельским районам.

Для повышения уровня медицинского образования получение цифровых изображений невусов может стать мощным средством обучения. Например, представляя данные студентам-медикам, можно привлечь внимание к типам травмированных невусов, которые могут переродиться в злокачественные новообразования.

Ключевые слова: невусы, структура, анализ, наблюдения, особенности.

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ЦИФРЛЫҚ ПАТОЛОГИЯ ҚҰРАЛДАРЫН ҚОЛДАНА ОТЫРЫП МЕДИЦИНАЛЫҚ БІЛІМ АЛУҒА АРНАЛҒАН НЕВУСТАРДЫ ЗЕРТТЕУ

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Зерттеудің мақсаты – терінің патологиясын зерттеу үшін диагностикалық және болжамды құрал ретінде невустың сандық суреттерін пайдалану. Пигментті невустарды зерттеу дәрігерлердің назарын аударады, өйткені олар мамандандырылған медициналық топқа қатерлі дегенерация туралы сигнал береді. Невус үлгілері 18 жасқа дейінгі балалардың денелерінің әртүрлі бөліктерінен алынды. Пигменттелген невусты талдау, әдетте, гематоксинмен және эозинмен (H&E) боялған микроскопиялық препараттарды бақылау арқылы жүзеге асырылады, бұл невустың іргелес аймақтарымен салыстырмалы талдау жасауға мүмкіндік береді. Салыстырмалы мәліметтерге жас тобы, жынысы, қалалық немесе ауылдық жерлер бойынша жіктемелер кіруі мүмкін.

Медициналық білімнің деңгейін көтеру үшін невустардың цифрлық бейнелеулерінің алынуы білімнің күшті құралы бола алады. Мысалы, медициналық студенттерге мәліметтерді ұсына отырып, қатерлі ісікке айнала алатын жарақаттанған невус түрлеріне назар аударылады

Кілт сөздер: невус, құрылымы, талдауы, бақылаулары, ерекшеліктері