CASE REPORT

Ultrasound in non-melanoma skin cancers, dermatology department, Riobamba's General Teaching Hospital, november 2019 march 2020.

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ABSTRACT

Technological advances in imaging have allowed one to use devices such as ultrasound equipment for the analysis of benign and malignant skin lesions, with the aim of direct lesional visualization. It is an inexpensive, effective, non-invasive method for the observation of lesions in real time. The image analysis of benign or malignant lesions of the skin enables direct assessment of both the lesion and the involvement of neighboring structures. Imaging facilitates the differentiation of basal cell carcinoma from squamous cell carcinoma, being the first one regular, defined, hypoechoic, with hyperechoic lesions inside. Moreover, these tumor lesions involve peripheral inflammatory processes and low vascular flow when analyzed with the Doppler. The second type is a poorly defined, irregular lesion with no epidermis, which is the most important characteristic of this type of tumor lesion.

INTRODUCTION

Skin cancer is the most common neoplasm worldwide, increasing its presence remarkably during the last decade. About 2 million new cases are diagnosed each year in the United States. In Mexico, it has been reported that skin cancer represents 14.6% of malignant neoplasms. In Ecuador, indexes for males and females corresponded to 28.09% and 32% respectively. In the city of Riobamba, 150 malignant neoplasms were diagnosed; 35% corresponded to men and 18% to women over 40 years of age. Skin neoplasms constitute a group of visible, common, accessible, and variable lesions. It is believed that between 40 to 50% of the elderly population (+60) will present this neoplasm at some point in their lives.

The skin surface covers an area of 180,000 square centimeters, surrounding the entire human body and enabling contact with the external environment.[6,7]

Ultrasound enables adequate assessment of the skin anatomy. Normally, the epidermis, shown as an echogenic line, corresponds to the interface between the coupling gel and surface of the skin. The ultrasound shows the dermis as a band measuring approximately 2-4 mm, with a hypoechoic superficial component, corresponding to the papillary dermis and a deep echogenic portion, corresponding to the reticular dermis. The hypodermis or subcutaneous tissue is represented as a hypoechoic tissue with echogenic linear

striations, representing the fibers that separate the adipose lobules.[9]

Most malignant skin lesions are located on photoexposed areas, affecting the elderly or immunocompromised patients. Non-melanoma skin neoplasms originate from progenitor precursor cells. These are basal cell, squamous cell and sweat gland carcinoma, along with Merkel cell carcinoma . Risk factors involve skin phototypes I and 2, chronic exposure to arsenic, or ionizing radiation, and genetic alterations, such as the p53 gene of Xeroderma Pigmentosum.

In recent years, ultrasound has been used as diagnostic aid in numerous skin diseases to correctly evaluate benign and malignant skin lesions in the epidermis, dermis and hypodermis, as well as blood vessels near the skin.

An accurate measurement of the thickness of skin and the evaluation of cutaneous internal structures can provide relevant information related to the performance of surgical or non-surgical procedures, therapeutic and cosmetic treatments, as well as patient follow-up.

As Jordi Mollet Sánchez indicates "Ultrasound and its features are ideal for the study of these tumors: it is fast, safe, cheap, and easily accessible. At a basic level, it provides data that helps to confirm the diagnosis, enabling the assessment of lesional size, along with depth and infiltration of contiguous structures".

Malignant skin lesions require ultrasound, as it is essential for the evaluation of lesions in real time.[10]

Basal cell carcinoma is characterized by being located on the dermoepidermal junction. It manifests as hypoechoic, heterogeneous with well-defined borders and presents with internal hyperechoic points, whose significance is completely unknown, as stated by Jordy Mollet Sanchez (2017). There is abundance of blood vessels, which are dependent on tributaries of low blood flow. There are two essential artifacts. One is the angulated appearance at the base of the lesion, which does not correspond with the tumor, but with an inflammatory component, and poorer margin definition due to isoechoic components corresponding to sebaceous gland hyperplasia.

Squamous cell carcinomas are the second group of tumor lesions affecting the skin. They are relatively benign, easily resectable with different methods, such as surgery, cryosurgery, or photodynamic therapy. However, there is a group of lesions that, due to their characteristics, can be identified as high risk. They have an aggressive biological behavior, with a tendency to local recurrence, and local or distant metastases. Sonographically, it is a more complex lesion than basal cell carcinoma, with a hypoechoic, homogeneous pattern of irregular and poorly differentiated morphology and margins, and a pattern reflecting posterior acoustic shadowing, manifesting epidermal ulceration and infiltration to deep planes.

Clinical and diagnostic value of the 17 MHz high-resolution ultrasound lies in its ability to differentiate lipomas from other skin lesions. In patients with melanoma and basal cell carcinoma, ultrasound enabled the planning of surgical resection due to measurements of tumor margins and depth. The hypoechoic pattern of the ultrasound allowed for the distinction of benign tumors from malignant ones.[12]

MATERIALS AND METHODS

All patients who attended the Dermatology consultation of the General Teaching Hospital of Riobamba from November 2019 to March 2020 were reached out. A case-control study was conducted with 50 patients, whose age matched the age of the risk group with clinical suspicion of malignant skin tumor. Thus, an analysis with the Mindray DC-N3 ultrasound system and 18 Hz transducer was carried out. Both the coronal and sagittal planes were analyzed. Many of them revealed the imaging descriptions found in medical literature.

RESULTS

Tumor lesions analyzed by imaging, especially basal cell carcinomas, were recognized as sonographically homogeneous, regular, defined lesions, with easily identifiable hyperechogenic microcalcifications, resembling a starry sky, with low vascular flow, originating from musculocutaneous perforator arteries. Histopathology revealed no calcifications, along with

abundant inflammation around the tumor lesion. Squamous cell carcinomas did not evidence any lymphatic or perineural infiltration.

CONCLUSION

Ultrasound in dermatology is recognized as a useful, easy-to-use, accessible, non-invasive tool that allows one to accurately determine the location and extent of the lesion, as well as the infiltration to deep planes. It also enables the local evaluation of possible lymph node involvement, and the complete evaluation of vascular territories with the aim of accomplishing a better flap design to cover the surgical defect. Another possibility ultrasound offers is the early detection of metastasis, as occurs in melanomas when detecting the sentinel node, in addition to evaluating the possibility of local recurrence.

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