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Unravelling the Molecular Basis and Therapeutic Implications for Cellular Oncology

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Introduction

This approach is crucial for early cancer detection, monitoring disease progression and reducing patient discomfort and risk associated with invasive methods. Several non-invasive techniques and strategies are employed in cancer detection. Skin cancer is indeed the most prevalent form of cancer worldwide and its incidence continues to rise. Historically, the diagnosis of skin cancers has relied on various conventional techniques, many of which involve invasive procedures. However, advancements in medical technology have introduced non-invasive and more precise methods for detecting skin cancer. Dermatoscopy is a non-invasive technique that involves using a handheld device called a dermatoscope to magnify and examine skin lesions. It provides detailed visualization of structures within the skin, helping dermatologists differentiate between benign and malignant lesions. Non-invasive cancer detection refers to the identification and diagnosis of cancer without the need for invasive procedures such as biopsies or surgical interventions [1].

Description

Total body photography is a comprehensive imaging technique that captures high-resolution photos of a patient's entire skin surface. These images serve as a baseline for tracking changes in moles or lesions over time, aiding in early cancer detection. Mole mapping involves creating a digital map of a patient's moles and skin lesions. This method allows for easy tracking of changes and the early detection of potentially cancerous developments. RCM is a non-invasive imaging technique that provides real-time, high-resolution images of skin lesions at a cellular level. It aids in diagnosing and monitoring skin cancers without the need for a biopsy. OCT is an imaging method that uses light waves to create cross-sectional images of skin layers. It assists in evaluating the depth and characteristics of skin lesions, helping to differentiate between benign and malignant growths. AI algorithms are being developed to analyze images of skin lesions and assist dermatologists in making more accurate diagnoses. These algorithms can identify patterns and features associated with skin cancer. Teledermatology allows patients to consult with dermatologists remotely, often using images or videos of skin lesions. This approach improves access to dermatological expertise and timely diagnosis, especially in underserved areas. While traditional biopsies involve invasive procedures, modern techniques like punch biopsies and shave biopsies are less invasive and often sufficient for diagnosing skin cancer. Micrographic surgery is a precise method for removing cancerous tissue while preserving healthy skin. Skin cancer is categorized into three types which are basal cell skin cancer, squamous skin cancer and malignant skin cancer. The first two skin cancers are grouped together as non-melanoma skin cancers [2].

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Multispectral imaging systems use various wavelengths of light to capture images of skin lesions. This can reveal information about blood flow, pigmentation and other characteristics, aiding in diagnosis. Emerging technologies, such as terahertz imaging and fluorescence imaging, are being explored for their potential in detecting skin cancer by revealing different tissue properties and markers. Skin cancer is a common type of cancer that emerges from the skin. It is extended due to the development of abnormal growth of cells. These cells can invade other parts of the body. More than 90% of cases occur due to the exposure of UV radiation. The UV radiation wavelength ranges from 100 nm to 400 nm. Cancer occurs due to unrepaired DNA damage to skin cells which are caused mostly due to UV radiation. In melanoma, cancer cells arise from moles on the skin which causes inflammation around the epidermal layer which in turn increases the temperature around it. BCC typically presents as a flesh-colored or pearly bump on the skin, often resembling a pearl [3].

It can also appear as a pinkish patch of skin. BCC lesions usually grow slowly and are often painless. BCC has a low death rate compared to other forms of cancer, primarily due to its slow growth and limited metastatic potential. However, if left untreated, it can cause significant local damage and disfigurement. The primary treatment for BCC involves surgically removing the cancerous tissue. This is often done using techniques like Mohs micrographic surgery, which ensures precise removal while sparing healthy tissue. His procedure involves scraping away the tumor and then using an electric current to destroy any remaining cancer cells. It is suitable for some superficial BCCs. Radiation therapy is an effective non-surgical option, especially for patients who may not be good candidates for surgery or have tumors in hard-to-reach areas. Medications like fluorouracil (5-FU) or imiquimod can be applied topically to the skin to treat superficial BCCs. These medications work by destroying cancer cells over a period of several weeks. Liquid nitrogen is used to freeze and destroy BCCs. This is often used for small, superficial lesions. Certain types of lasers can be used to target and remove BCCs, particularly when they are on the surface of the skin. PDT involves applying a photosensitizing agent to the skin and then exposing it to light. This treatment can be effective for certain types of BCCs [4,5].

Conclusion

These modern diagnostic tools and auxiliary techniques have significantly improved the accuracy and convenience of skin cancer detection. They allow for earlier diagnosis, which is crucial for successful treatment and better patient outcomes. Regular skin examinations and screenings, especially for individuals at higher risk, are essential in the fight against skin cancer. Regular skin examinations and sun protection measures, such as wearing sunscreen and protective clothing, are essential for preventing BCC. Early detection and treatment offer the best chances of a cure and minimize the potential for complications or disfigurement associated with more advanced cases of BCC.

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Conflict of Interest

There are no conflicts of interest by author.

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