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Basal Cell Carcinoma Treatment Options and Reconstructive Surgery

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ABSTRACT

Basal cell carcinomas (BCCs), a kind of skin cancer, can result in substantial harm to a specific area. They are the most common type of cancer in Western countries. There is a possibility of experiencing this condition at some point in one's life, with a maximum occurrence rate of 39%. UV exposure is the most common risk factor. The majority of these tumors are seen in the craniofacial area. While basal cell carcinomas (BCCs) are frequently non-cancerous, their high prevalence means that treating them substantially increases the burden on the healthcare system, which is already overwhelmed. It is crucial to possess a comprehensive understanding of the many prospective options available to you. Several factors, including the patient's age, comorbidities, the location and subtype of the lesion, among others, might influence the decisions made about treatment. The treatment options for basal cell carcinomas (BCCs) on the face may vary significantly compared to those for BCCs occurring in other areas, primarily because achieving a positive esthetic outcome and complete cure are of utmost importance. Obtaining high-quality randomized controlled trials that compare various treatment modalities is challenging. Although conventional excision has traditionally been the favored treatment method, there are currently several other options available. These include radiation, cryosurgery, curettage and cautery, Mohs micrographic surgery, topical imiquimod, photodynamic therapy, and topical 5-fluorouracil. We review and assess the data and literature that supports the existing array of treatment choices for face basal cell carcinoma (BCC).

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OVERVIEW

Basal cell carcinomas (BCCs), a kind of skin cancer, can result in substantial localized harm. They are the most common type of cancer in the United States, Europe, and Australia. Although basal cell carcinomas (BCCs) are mostly non-cancerous, their frequent frequency indicates that treating them substantially contributes to the NHS's continuously growing burden [1].

Genetic predisposition and exposure to UV light appear to be the primary causative causes. Approximately 74% of basal cell carcinomas (BCCs) occur on the head and neck due to the fact that these abnormal growths tend to form in areas that

are frequently exposed to the sun for extended periods of time. Although basal cell carcinomas (BCCs) generally progress slowly and seldom metastasize, if left untreated or incompletely removed, they can result in localized harm and disfigurement [2].

Several factors, including the precise location of the lesion, the age of the patient, any underlying medical problems, and the specific type of tumor, influence the approach to treatment. The location of the lesion is important because cancers that occur in areas that are essential for function or appearance are most effectively treated with minimally invasive techniques that have a favorable prognosis. Due to the sluggish progression of BCCs in older individuals, less invasive treatments may be employed, despite some of them having higher risks of recurrence [2,3].

Various treatments have been implemented in recent years, in addition to traditional excision, with the aim of improving results in terms of appearance, patient acceptability, and recurrence rate. Although there are several treatments now accessible for BCCs, there is a lack of research that adequately evaluates these different treatment regimens for different types of tumors in different locations. The treatment options for tumors that originate on the face might differ significantly from those for BCCs that develop in other areas, primarily because achieving a desirable aesthetic outcome is of enormous importance [4].

Non-surgical Treatment

Radiotherapy

Radiotherapy is a viable treatment option for primary, recurrent, or partly removed basal cell carcinomas (BCCs). It comprises electron beams and X-rays that are emitted from the surface. Brachytherapy is used for surfaces that have a curved or uneven shape. Generally, cutaneous lesions have cure rates above 90%. It can be used to treat cancers that occur in areas where surgery would be difficult owing to technical challenges or would result in significant tissue damage. Therefore, radiation is essential for treating head and neck basal cell carcinomas (BCCs). Radiotherapy is a potential treatment for cancers located in the lower eyelid, inner canthus, lip, nose, and ear. Nevertheless, due to the process of keratinization of the conjunctiva, it is not advisable to apply radiation to the upper eyelid. In addition, it is important to handle ear lesions with caution to avoid harming the underlying cartilage. Furthermore, radionecrosis is particularly prevalent on the nasal bridge. Radiotherapy may be advantageous for elderly individuals with large scalp basal cell carcinomas. Radiation therapy is contraindicated for patients with connective tissue disease, Gorlin's syndrome, or reoccurring basal cell carcinomas (BCCs). Younger individuals are often not given this therapy because to the suboptimal long-term cosmetic results and the potential for skin cancers to arise from radiation field scars. Telangiectasia, atrophy, and radionecrosis are instances of adverse reactions. A solitary fractional treatment may not produce equivalent cosmetic outcomes as several sessions distributed over an extended duration. However, as compared to a solitary surgical operation, a weekly regimen may significantly inconvenience the patient. Pertaining to a certain subject or theme [5].

Imiquimod Cream with a concentration of 5%

Imiquimod is an example of an immune response modulator. It attaches to toll-like receptors in order to initiate its function. This leads to the production of proinflammatory cytokines and the subsequent destruction of cells by cytotoxic T lymphocytes. It is approved for use in treatment for superficial basal cell carcinoma (sBCC). Effective imiquimod treatment requires tissue penetration. Due to their limited depth of penetration, superficial basal cell carcinomas (sBCC) may have a more favorable response to topical treatments. The lower clearance rates are a result of inadequate drug penetration into nodular tumors, which is owing to their increased depth. Imiquimod may be a preferable alternative to surgery for patients with primary superficial basal cell carcinomas (BCCs) on the face. However, it is important to note that its long-term effectiveness in completely eliminating the cancer is not as high as certain other treatment methods. It is a beneficial treatment option for elderly folks who are frail and for those who are not inclined towards surgery. However, it is not recommended for those with reoccurring illnesses [6].

Photodynamic Therapy (PDT)

Photodynamic therapy (PDT) employs a light source to eliminate sensitive cells. Either methyl aminolaevulinic acid (MAL) or 5-aminolaevulinic acid (ALA) is applied topically as a prodrug on the skin. The tumor cells convert this substance into protoporphyrin IX within the cell. Protoporphyrin IX-containing tumor cells' cell membranes experience a cytotoxic interaction with reactive oxygen when exposed to intense red or blue light. This interaction leads to the death of the tumor cells while leaving the surrounding skin unharmed. PDT is generally not recommended for the treatment of nodular BCCs on the head or neck due to inferior clearance rates compared to surgical treatments. While treatment may be feasible for first superficial basal cell carcinomas (BCCs) on the face, it is not recommended for recurrent cases. Topical 5-Fluorouracil 5% 5-fluorouracil is a fluorinated pyrimidine that disrupts DNA by inhibiting the methylation process between deoxyuridylic acid and thymidylic acid. It should only be utilized in low-risk locations and is infrequently employed to treat small, superficial BCCs. Therefore, it is not recommended to manage facial basal cell carcinomas (BCCs) [7].

Surgical Intervention

Excision of the primary basal cell carcinoma (BCC) using predetermined margins according to standard protocol. Traditionally, the most widely used treatment for primary BCC has been routine surgical excision, which has proven to be highly effective. Usually, the removal of BCCs involves cutting out a certain amount of healthy skin, known as a predetermined excision margin, which is often around 3-4

mm. When it comes to repairing wounds, especially on the face, grafts and flaps may be necessary instead of directly closing the incision [8].

Generally, individuals perceive that performing a regular surgical removal produces a satisfactory aesthetic outcome. However, the removal of large tumors with adequate excision margins might result in disfigurement due to tissue loss, grafting, and subsequent scarring. Special attention must be given to the placement of the basal cell carcinoma (BCC) on the face, since there are several places, such as the areas around the mouth, eyes, and nose, that are important both in terms of function and appearance [9, 10].

When adequate margins are achieved, routine surgical excision is often considered a favorable treatment option for all basal cell carcinomas (BCCs) arising on the face, resulting in 5-year recurrence rates of up to 10%. Hence, for a standard surgical removal, it is recommended to maintain a minimum margin of 3 millimeters. Although it may appear logical to increase margins at sites with significant subclinical spread, it is crucial to find the appropriate balance when considering Mohs micrographic surgery as a backup option. This is because these sites hold great significance in terms of both cosmetic appearance and functionality [10].

Figure 1. Nasal basal cell carcinoma in a male patient

Figure 2. Surgical margins and flap desing

Figure 3. Postoperative image

Mohs micrographic surgery

Dr. Mohs, an American physician and general surgeon, first introduced Mohs micrographic surgery (MMS) in 1941 17. The excised tissue is cryopreserved and bisected horizontally. Subsequently, a comprehensive intraoperative histological assessment of the whole margin can be performed. If more removal is necessary, it can be performed from the specific area that is directly impacted [10].

In conclusion

A comprehensive range of therapeutic options for BCCs has been discussed. However, due to the high-risk nature of facial lesions, some of the therapeutic options that are typically advised may not always be appropriate. Prior histological diagnosis is often necessary, especially when contemplating a potentially harmful treatment. While Mohs micrographic surgery remains the most superior option, it is not financially accessible to everyone. Standard surgical excision often produces good results in the majority of cases. For patients who are not eligible for surgery, radiation may be considered

as an alternative. Additional therapeutic alternatives encompass topical imiquimod, photodynamic therapy (PDT), laser treatment, curettage and electrocautery, and cryosurgery. Nevertheless, these therapies should not be employed as the first choice in the majority of patients due to the risk of recurrence. However, they may serve as a viable substitute for the elderly population. When formulating a management plan, it is crucial to consider the patient's desire, practicalities, potential side effects, and the resulting esthetic outcome.

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