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MOHS Microscopically Controlled Surgery: Should it be the Routine Surgical Treatment for Non-melanoma Periocular Skin Malignancies?

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Skin cancers are the most common types of malignancies and their incidence is growing with an increasing of 4% to 8% per year over the last 40 years [1]. This is due to the aging of the population and stratospheric ozone depletion with subsequent increase in ultraviolet light exposure.

The majority of skin cancers (97%) are non-melanoma skin cancers. The most common types of skin cancer in the periocular region are basal cell (BCC) (80-90% in white population and 65% in Chinese population), squamous cell (SCC) (10-20%) and sebaceous gland carcinomas (2% whites-12% Chinese) [2-4]. It has been reported that 5% to 10% of all skin cancers occur in the periocular region, with eyelid malignancies representing more than 90% of all ophthalmic tumours. When we look in detail at the progressive increase in the incidence of periocular skin cancer, we can verify that there is a significant increment in the incidence of BCC, whereas the rates for SCC, sebaceous cell carcinoma, and malignant melanoma remain relatively constant [4]. Increasing evidence suggests that sun exposure in childhood and adolescence, rather than lifetime cumulative sun exposure, is critical for establishing adult risk of BCC [5]. Worldwide monitoring has shown that stratospheric ozone has been decreasing for the past few decades. The average loss in total ozone was about 3% at northern middle latitudes and 6% at southern middle latitudes between 1997 to 2000 compared to 1980 [6].

Regarding location, periocular malignancies develop most commonly on the lower eyelid (50%) and the medial canthal region (30%) [2,7].

Since BCCs constitute 90% of all eyelid malignancies, it is important to recognize these lesions. Mortality rate for BCCs ranges from 2% to 11%, and metastases may occur in 0.0028% to 0.5% of patients [8,9]. Although rarely fatal, these may result in considerable morbidity. Tumours may cause severe cosmetic deformity and significantly compromise the effective function of the eyelids and lacrimal system. Squamous cell carcinoma and sebaceous gland carcinoma are less common, but have a higher propensity for metastasis and a significant mortality rate.

Once diagnosed the periocular skin malignancy, the preferred treatment is surgical excision. Ensuring the complete excision of a carcinoma with minimal aggression is important in any location of skin tumour. Furthermore, sacrificing the smallest possible extension of healthy tissue is essential when performing a surgical excision in the periorbital area. The patient's vision and the integrity of the eyeball can be seriously compromised if the eyelid cannot perform its eye lubrication and protection function correctly. Moreover, the aesthetic role of the eyelids requires a careful reconstruction that also depends on the amount of tissue that needs to be replaced. The search for the ideal treatment modality for non-melanoma skin cancer led Frederic Mohs to develop his technique of micrographic surgery in the 1930s and 1940s [10]. Mohs microscopically controlled surgery (MMS) allows examination of 100% of the surgical margin, including the entire under surface (deep margin) of the lesion and all the epithelial edges. The subclinical extent of skin cancer is often difficult to assess prior to therapy or based on macroscopic appearances alone. There is a risk of choosing a margin that is too large or too small and complete removal of a tumour is the only way to ensure a cure. MMS allows the location of any residual tumour to be accurately identified, thus sparing unaffected tissue. Eighty percent of periorbital skin cancers settle on the lower eyelid or inner canthus. The lower eyelid has a length of about 20-25 mm and a safety margin of 3 to 5 mm is usually recommended for surgical treatment. Hence, 20-25% of the eyelid will be sacrificed by preserving the recommended safety margins. Some studies have reported the incidence of incomplete tumour excision to be between 16% to 40% when frozen section monitoring is not used, and it rises to 50% when the tumours are located on the lower lids and involve the lid margin [11,12]. Skin cancer affecting the medial canthal region are more prone to orbit extension and have been reported to have a high risk of recurrence after conventional treatment [13].

Considering the aforementioned facts, why is surgical exeresis of the periorbital skin cancers not routinely performed with an MMS technique? Arguments against routine use of Mohs surgery are based on the technique being more time consuming, more expensive and hence less available in some treatment centers [14]. Narayanan [15] did not find any study directly comparing the cost difference between MMS and surgical excision (SE) for periocular BCC. However, MMS is believed to be more expensive than SE due to the additional cost of the multiple visits and procedures involved to ensure tumour-free margins before reconstruction. Nevertheless, MMS allows immediate closure of the wound and fewer two-stage procedures are likely to be required. Furthermore, patients generally obtain better cosmetic and functional results. Consequently, the costs involved in the reconstructive surgery are reduced. Additionally, the cost of dealing with recurrent tumours should be significantly reduced [16].

To our knowledge, if the primary aim of the surgery is to cure the patient and prevent recurrence, MMS is the best choice for periocular non-melanoma skin cancer, because this area is especially sensitive to large exeresis and the best cosmetic and functional results must be ensured.

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Competing Interests

The author declare that no competing interests exist.

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