CASE REPORT

An ulcerated nodule on the nose

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SUMMARY

A 75-year-old retired nurse, originally from Barbados, presented to her general practitioner (GP) with a scaling ulcerated nodule on the left side of her nose. She was taking medication for type 2 diabetes, hypertension and glaucoma, but was otherwise well with no systemic symptoms. Her GP diagnosed a patch of eczema; however, a trial of topical steroids was not effective and she was referred to dermatology. A skin biopsy confirmed the clinical suspicion that this patient had a nodular basal cell carcinoma (BCC). BCCs account for 75% of all skin cancers; they very rarely metastasise, but can spread to invade local structures. Our patient has type VI skin. Skin cancer is rare in patients with skin type VI; however, in this group, morbidity and mortality are disproportionately high in relation to cancer incidence.

BACKGROUND

The diagnosis in this case was delayed, and by the time this patient was seen by a dermatologist she had a disfiguring cancer. Her treatment required multiple surgical procedures. We wrote this case to highlight the fact that patients with all skin types are at risk of developing basal cell carcinomas.

CASE PRESENTATION

A 75-year-old retired nurse, originally from Barbados, presented to her general practitioner (GP) with a scaling ulcerated nodule on the left side of her nose (amended figure 1). She was taking medication for type 2 diabetes, hypertension and glaucoma, but was otherwise well with no systemic symptoms. She had no significant family history. Her GP diagnosed a patch of eczema; however, a trial of topical steroids was not effective and she was referred to dermatology.

Figure 1 An ulcerated nodule on the nose.

INVESTIGATIONS

A skin biopsy confirmed the clinical suspicion that this patient had a nodular basal cell carcinoma (BCC) also known as a rodent ulcer. Histology is shown in figure 2.

DIFFERENTIAL DIAGNOSIS

- ▶ Malignant: squamous cell carcinoma, malignant melanoma or premalignant change such as Bowen's disease.
- ▶ Inflammatory: discoid lupus erythematosus, cutaneous sarcoidosis, discoid eczema and contact dermatitis.
- ▶ Infective: tinea, leishmaniasis, lupus vulgaris (cutaneous TB) and ecthyma gangrenosum.

The nodule on our patient's nose had been gradually enlarging over 6 years. The location, slow growth, lack of systemic symptoms and central ulceration make a BCC the most likely diagnosis. However, on first inspection and without the knowledge of the patient's history, this nodule could represent a number of other diagnoses, which are discussed below.

Other malignancies

A squamous cell carcinoma (SCC) could be the cause of a nodule such as this, although central ulceration is more characteristic of a BCC. SCCs also tend to appear more rapidly (within weeks to months rather than years). In people with type VI skin, SCCs are more likely to appear on sun-protected sites. Bowen's disease (SCC in situ) is uncommon in people with type VI skin, but would also be taken into consideration.

Malignant melanoma and cutaneous metastases are other differentials. Malignant melanoma is unlikely in this case, because over a period of 6 years a melanoma would tend to progress more rapidly and possibly metastasise. This patient gave

Figure 2 Histology of pigmented basal cell carcinoma at high power.

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us no reason to suspect this was a metastasis from a primary at another site.

A skin biopsy and histological analysis is essential to differentiate a BCC from other skin cancers including SCC, melanoma and rarer cutaneous malignancies.

Inflammatory causes

Discoid lupus erythematosus (discoid LE) is the most common subtype of cutaneous lupus and usually first appears as a red, scaly patch on the face. Over time, the affected area may atrophy and scar. Discoid LE affects more women than men. The peak age of onset is in the middle age (40s). Lesions are often exacerbated by sunlight or local trauma. Our patient did not notice any change with the seasons, and her age (75 years) would not be typical for a first presentation of lupus.

Cutaneous sarcoidosis affects 20–35% of patients with systemic sarcoidosis and can occur without associated systemic disease. Cutaneous sarcoidosis can present in a variety of ways, often as a plaque or nodule; although there may be light scale and vascular dilation, the epidermis tends not to have extensive involvement. In the case of our patient, the epidermis was involved, she had no history of sarcoidosis and no systemic symptoms making this diagnosis unlikely.

Discoid eczema appears as a coin-shaped plaque with a clear edge, often on the hands, forearms, limbs and trunk. Infection with *Staphylococcus* and preceding dry skin may contribute to the development of a plaque. Contact dermatitis would be suspected if the lesion is severe, persistent and not responding adequately to topical emollients and steroids. Our patient did not complain of itching, had no history of dermatitis and did not have dry skin elsewhere. There was no change in occupation, lifestyle or cosmetic products used to suggest a contact dermatitis. The nodule showed no improvement with emollients and steroids making dermatitis unlikely.

Infective

Tinea faciei (or ringworm of the face) is a fungal dermatophyte infection that may be caused by a variety of species including *Trichophyton rubrum*. Skin on the face may be directly infected or infection may spread from tinea at another site such as the fingernails. Tinea is usually seen as a flat, scaly patch of erythema. Diagnosis is made by sending scrapings of the skin. The patient may complain of itching and irritation which is worse after sun exposure. The symptoms often improve temporarily with the application of topical steroids and flare when steroids are stopped. Our patient did not complain of itching or irritation, had no evidence of tinea elsewhere and did not notice an improvement with steroids making this diagnosis unlikely.

Leishmaniasis is a parasitic infection spread by sand flies. The majority of cases affect people living in or visiting Central and South America, Asia, the Middle East or North Africa. The papules and nodules associated with cutaneous leishmaniasis are often found on the face and extremities. Our patient had not travelled abroad in recent years making this diagnosis extremely unlikely.

Lupus vulgaris is a rare, chronic form of cutaneous tuberculosis (TB) which can occur via direct invasion of the skin by mycobacterium, via the spread from active TB in underlying tissues including lymph nodes and bone or via haematogenous or lymphatic spread. Most lesions occur on the head and neck, especially around the nose. Our patient had no history of TB, no systemic symptoms and had not lived in a country with a high incidence of TB making lupus vulgaris unlikely.

Ecthyma gangrenosum (EG) is an infection of the skin usually caused by *Pseudomonas aeruginosa*, resulting in round, red macules with a necrotic centre. Patients developing EG are usually immunocompromised or critically ill which makes this diagnosis an unlikely cause of our patient's nodule.¹

TREATMENT

When planning treatment, the goal is tumour eradication with a good cosmesis. Patient- and tumour-specific factors need to be considered. BCCs may be stratified into low or high risk according to tumour size, site (lesions in the centre of the face are at higher risk of recurrence) histological subtype, the presence of vascular or neural involvement and the consideration of tumour margins (poorly defined tumours are more likely to recur). Patient factors would include comorbidities and drug history. Long-term immunosuppression is likely to increase risk of recurrence.

A number of treatment modalities are available for the treatment of BCCs depending on histological subtype. Superficial BCCs can be treated by cryotherapy, topical immunomodulatory agents such as Imiquimod, photodynamic therapy and curettage and cautery. Surgical excision and radiotherapy are the main options of treatment for other subtypes.

Mohs micrographic surgery involves the excision of a skin cancer with immediate examination of the entire surgical margin under light microscopy. In areas such as the eyelid, nose and lips, this means the cancer can be removed with low recurrence rates (5-year recurrence rate for primary BCC is 1%). This is particularly important in areas where a skin flap may have to be used to reconstruct the defect. Mohs is the gold standard treatment recommended for high-risk primary BCCs and recurrent BCCs. Where a standard excision is suitable, a 4 mm margin is used as the margin for the removal of tumour. As can be seen from figure 2, it is unlikely that standard excision would have achieved a tumour-free result. Figure 3 shows the patient immediately following Mohs surgery. Radiotherapy can be used as an adjuvant treatment in high-risk disease or for patients unable to tolerate surgery (figure 3).

OUTCOME AND FOLLOW-UP

Following Mohs surgery, our patient had nasal reconstruction with a forehead flap, carried out in three stages by the plastic surgeons. Unfortunately, she had delayed healing from the donor site on her forehead. She is currently being reviewed on a four-monthly basis.

Figure 3 Defect following Mohs micrographic surgery.

There is no formal guidance regarding the follow-up post-treatment in the UK. Patients should be given advice regarding sun protection and self-monitoring. Older, immunocompromised patients or those with multiple BCCs are at a higher risk of future lesions and should be monitored either in primary or secondary care.²

DISCUSSION

A biopsy confirmed the clinical suspicion that this patient had a nodular BCC also known as a rodent ulcer. BCCs account for 75% of all skin cancers, they very rarely metastasise (less than 0.6%), but can spread to invade local structures.³ Most evidence suggests that BCCs are tumours derived from follicular epithelium.^{4 5} They most frequently appear on sun-exposed sites such as the head and neck and are classified according to histological appearances. Nodular BCCs are the most common and have a pearly, raised appearance often with visible telangiectasia, usually appearing slowly over many years (our patient noticed the start of a lesion 6 years ago).

Risk factors for developing a BCC include fair skin (Fitzpatrick skin types 1 and 2 (table 1)) fair or red hair, ultraviolet (UV) exposure (particularly increased exposure to sunlight in childhood), male sex, older age and a previous history of a BCC.^{3 6 7} The majority of BCCs are thought to develop when UV radiation causes mutations to the tumour suppressor gene PTCH. Inactivation of PTCH can lead to uncontrolled basal skin cell proliferation.^{3 8}

Nevoid basal cell carcinoma syndrome (NBCCS) or Gorlin's syndrome is an autosomal dominant familial cancer syndrome; those affected have mutations in the PTCH gene and develop multiple BCCs from adolescence onwards, as well as other features including skeletal abnormalities and palmar and plantar pits.^{1 4} Xeroderma Pigmentosum (XP) is a rare autosomal recessive disease. The skin of patients with XP is unable to repair damage to DNA caused by UV radiation, which leads to premature skin aging and the early development of skin cancer.

Our patient has type VI skin, as classified according to Fitzpatrick.⁹

Skin cancer is rare in patients with skin type VI; however, in this group, morbidity and mortality is disproportionately high in relation to cancer incidence.

The epidermis of darker skin has larger melanosomes and increased melanocyte activity compared to lighter skin. Larger melanosomes are able to absorb and scatter light more effi-

ciently meaning approximately half the amount of UV radiation is transmitted in type VI compared to type I skin. Basal cell carcinoma is the most common skin cancer in Caucasians, Chinese, Asians and Japanese, but SCC is more common in Asian Indians and Afro-Caribbeans. Exposure to UV radiation remains the most risk-significant factor in the development of BCC in darker skins (the role of UV as a risk factor for the development of melanoma and SCC in people with type VI skin is less direct).

BCCs in darker skins are more likely to be pigmented meaning that features such as telangiectasia and the characteristic pearly border may be more difficult to identify. It may also be more challenging to differentiate BCCs from other lesions such as seborrhoeic keratoses or melanoma. NBCCS and XP occur in all races and should be considered if a patient with type VI skin presents with multiple BCCs.¹⁰

Learning points

- ▶ Non-melanoma skin cancers are more common in Caucasians, but may occur in any skin type.
- ▶ Basal cell carcinoma (BCCs) in darker skin may be difficult to diagnose: features such as telangiectasia and a pearly border are more difficult to identify.
- ▶ Risk factors for developing a BCC include fair skin or hair, ultraviolet exposure, older age and a previous history of BCC.
- ▶ Treatment depends on the histological subtype and tumour location. Options include imiquimod, photodynamic therapy, surgical excision and Mohs micrographic surgery.

Competing interests None.

Patient consent Obtained.

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Table 1 Fitzpatrick skin type

Skin type	Description	Skin colour
I	Always burns, never tans	White
II	Always burns, tans minimally	White
III	Burns minimally, tans slowly	White
IV	Burns minimally, tans well	Olive
V	Rarely burns, tans profusely/darkly	Brown
VI	Rarely burns, always tans	Black

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