Basal cell carcinoma

What are basal cell carcinomas?

Basal cell carcinomas (BCCs) are slow-growing, locally invasive, malignant epidermal skin tumours which are thought to arise from hair follicles. The tumour infiltrates local tissues through the slow irregular growth of subclinical finger-like outgrowths, and morbidity results from local tissue invasion and destruction, especially on areas of chronic sun exposure, such as the face, head and neck .

Metastasis is relatively rare with a metastasis rate of 0.0028% to 0.5%. However, there is a 2% incidence of metastasis for tumours larger than 3 cm in diameter, 25% for tumours larger than 5 cm and 50% for tumours larger than 10 cm in diameter [1] .

Who gets basal cell carcinomas? (Epidemiology)

- Basal cell carcinoma predominantly affects Caucasians and is very uncommon in dark-skinned races. BCC is the most common type of carcinoma worldwide and is showing a worldwide increase in incidence [2] .
- An Australian study showed an incidence for superficial basal cell carcinoma of 336/100,000 men and 251/100,000 women per annum [3] .
- Inconsistent data collection means that accurate figures for the incidence in the UK are difficult to obtain .
- There is a regional variation in incidence - eg, approximately 120/100,000 in South West England compared with an incidence for the whole of England of approximately 90/100,000 population [4] .

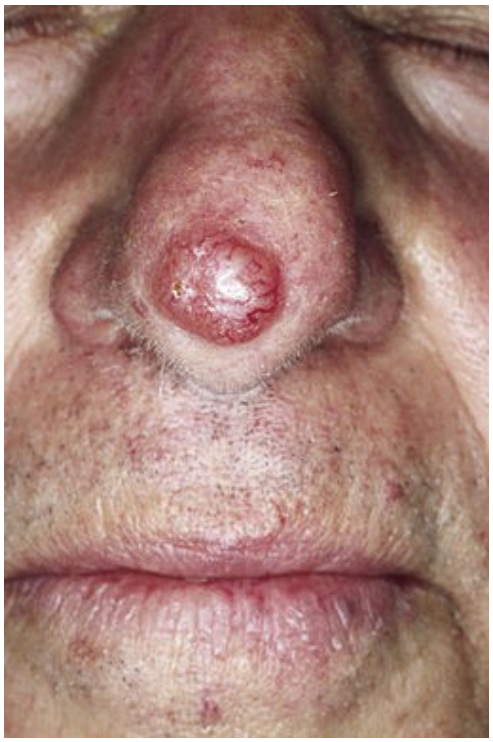
- Superficial basal cell carcinoma occurs at a younger age than other BCC variants, particularly in women[5] .

Risk factors for basal cell carcinomas

- The most significant aetiological factors appear to be genetic predisposition and exposure to ultraviolet (UV) radiation.
- The sun-exposed areas of the head and neck are the most commonly involved sites. Sun exposure in childhood may be especially important.
- Increasing age, male sex, skin types I and II (skin that always burns and never/only sometimes tans), immunosuppression and arsenic exposure are other recognised risk factors. A high dietary fat intake may also be relevant.
- The chance of developing a second BCC within three years of the first presentation is approximately 44%[4] .
- The incidence rates of basal cell carcinomas increase with age and, over the age of 55, the age-specific incidence rates are higher in males than in females. This gap between males and females increases with age[4] .
- Multiple basal cell carcinomas are a feature of basal cell naevus (Gorlin's syndrome):
    - Autosomal dominant inheritance.
    - Multiple BCCs.
    - Pitting of the palms and soles.
    - Jaw cysts.
    - Spine and rib anomalies.
    - Calcification of the falx cerebri.
    - Cataracts.
- Other conditions associated with an increased risk of BCC include xeroderma pigmentosa and albinism.

Basal cell carcinoma symptoms

- The sun-exposed areas of the head and neck are the most commonly involved sites . Approximately 80% occur on the head and neck, with the rest mainly on the trunk and lower limbs.
- Early lesions are often small, translucent or pearly and have raised areas with telangiectasia.
- The classic rodent ulcer has an indurated edge and ulcerated centre. It is slow-growing but can spread deeply to cause considerable destruction.



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Basal cell carcinoma types

Nodular

- Solitary, shiny, red nodule with large telangiectatic vessels.
- Commonly on the face.
- Cystic, pearly, telangiectasia.
- May be ulcerated.

- Micronodular and microcystic types may infiltrate deeply.

Superficial

- Often multiple, usually on the upper trunk and shoulders. Equal distribution over the face, trunk and limbs, although the site of predilection seems to vary according to sex (the head in women, the trunk in men) [6] .
- Erythematous well-demarcated scaly plaques, often larger than 20 mm at presentation. Central clearing and a thread-like border. A rolled edge can be seen if stretched. The lesion may bleed or weep.
- Slow growth over months or years; usually not aggressive, rarely become invasive and extremely rarely metastasise. Less likely to erode and ulcerate than nodular basal cell carcinomas.
- May be confused with Bowen's disease or inflammatory dermatoses.
- Particularly responsive to medical rather than surgical treatment.

Morphoeic

- Also known as sclerosing or infiltrative basal cell carcinoma.
- Usually found in mid-facial sites.
- More aggressive and have poorly defined borders.
- Characterised by thickened yellowish plaques [7] .
- Often present late and may become very large and then require extensive plastic surgical reconstruction. May infiltrate cutaneous nerves (perineural spread).
- Prone to recurrence after treatment.

Pigmented

- Brown, blue or greyish lesion.
- Nodular or superficial histology.
- Seen more often in individuals with dark skin [8] .
- May resemble malignant melanoma.

Basosquamous

- Mixed basal cell carcinoma and squamous cell carcinoma (SCC).
- Potentially more aggressive than other forms of BCC.

Differential diagnosis

- Nodular basal cell carcinoma:
    - Intradermal naevus.
    - Sebaceous hyperplasia.
    - Fibrous papule.
    - Molluscum contagiosum.
    - Keratoacanthoma.
- Superficial basal cell carcinoma:
    - Discoid eczema.
    - Psoriasis.
    - Actinic keratosis (solar keratosis).
    - Lichen simplex.
    - Bowen's disease.
    - SCC.
    - Seborrhoeic wart.
- Pigmented basal cell carcinoma (see the separate article Black and Brown Skin Lesions):
    - Malignant melanoma of the skin.

- Morphoeic basal cell carcinoma:

    - Scar tissue.
    - Localised scleroderma.

Referral

The National Institute for Health and Care Excellence (NICE) recommends[9] :

- Consider routine referral for people if they have a skin lesion that raises the suspicion of a BCC.
- Only consider a suspected cancer pathway referral (for an appointment within two weeks) for people with a skin lesion that raises the suspicion of a BCC if there is particular concern that a delay may have a significant impact, because of factors such as lesion site or size.

Investigations

- Investigation is primarily by visual inspection and removal for histology where necessary[4] .
- All excised specimens should be sent for histopathological examination.
- **When non-surgical treatments are used, an incisional biopsy must be sent before treatment for confirmation of the diagnosis**.
- Biopsy is also indicated when clinical doubt exists or when the histological subtype of BCC may influence treatment selection and prognosis .
- For most patients with non-melanoma skin cancer (NMSC) no formal staging beyond clinical examination for lymphadenopathy is required[4] .
- CT or MRI scan is indicated in cases where bony involvement is suspected or where the tumour may have invaded major nerves, the orbit or the parotid gland .

Basal cell carcinoma treatment and management[10]

Low-risk basal cell carcinomas[4]

NICE recommends that low-risk basal cell carcinomas be managed in primary care as long as the GP meets the requirements to perform skin surgery within the framework of the Direct Enhanced Services and Local Enhanced Services. There should be no diagnostic uncertainty that the lesion is a primary nodular low-risk BCC and meets the following criteria:

- The patient is not:
    - Aged 24 years or younger (that is, a child or young adult).
    - Immunosuppressed or has Gorlin's syndrome.
- The lesion:
    - Is located below the clavicle (that is, not on the head or neck).
    - Is less than 1 cm in diameter with clearly defined margins.
    - Is not a recurrent BCC following incomplete excision.
    - Is not a persistent BCC that has been incompletely excised according to histology.
    - Is not morphoeic, infiltrative or basosquamous in appearance.
    - Is not located:
        - Over important underlying anatomical structures (for example, major vessels or nerves).
        - In an area where primary surgical closure may be difficult (for example, on digits or the front of the shin).
        - In an area where difficult excision may lead to a poor cosmetic result.
        - At another highly visible anatomical site (for example, the anterior chest or shoulders) where a good cosmetic result is important to the patient.

If the basal cell carcinoma does not meet the above criteria, or there is any diagnostic doubt, following discussion with the patient they should be referred to a member of the local hospital skin cancer multidisciplinary team (LSMDT).

If the lesion is thought to be a superficial BCC, the GP should ensure that the patient is offered the full range of medical treatments (eg, photodynamic therapy (PDT)) and this may require referral to a member of the LSMDT. Incompletely excised BCCs should be discussed with a member of the LSMDT.

Management options [4]

A Cochrane review found that [11] :

- Surgical interventions have the lowest recurrence rates.
- There may be slightly fewer recurrences with Mohs' micrographic surgery over surgical excision for high-risk facial primary BCC.
- Non-surgical treatments, when used for low-risk BCC, are less effective than surgical treatments, but recurrence rates are acceptable and cosmetic outcomes are probably superior.
- Of the non-surgical treatments, imiquimod has the best evidence to support its efficacy.

Recurrent basal cell carcinoma is more difficult to cure than primary lesions .

Surgical

- Excision with primary closure, flaps and grafts: an excision margin of 4 mm around the tumour is recommended where possible, especially for all high-risk BCCs [5] .
- Tumours which have been incompletely excised, especially high-risk BCC and lesions incompletely excised at the deep margin are at high risk of recurrence and should be re-excised.

- Mohs' micrographic surgery:

    - Excision of the BCC is carried out in stages and each stage checked histologically.
    - It is advocated for use in cases where it is critical to obtain a clear margin while preserving the maximum amount of normal surrounding tissue, especially for recurrent and high-risk aggressive growth pattern BCCs such as morphoeic BCCs.
    - High-risk and recurrent tumours are best treated by Mohs' micrographic surgery where this is available.
    - Overall cure rates for primary BCC are almost 100% and 95% for recurrent BCC [8] .
    - The main problems are the length of the procedure, the need for special equipment and training, the relatively high cost and the limited availability in the UK.
    - A Cochrane review found that no reliable conclusions could be made as to whether Mohs' micrographic surgery or surgical excision resulted in a lower recurrence or complication rate for periocular BCC [12] .

Curettage and cautery/electrodesiccation

- Not recommended for recurrent, large, morphoeic tumours or tumours on the face.
- The overall cure rate is over 90% for low-risk BCCs.
- Performed using a curette to remove soft material from the tumour.
- The base of the tumour is then destroyed, using either hyfrecation or cautery.
- Curettage and cautery is a good treatment for low-risk BCC.
- The histology may be difficult to interpret, as the lesion may be incompletely removed and margins of excision cannot be assessed optimally.

- The evidence on the safety of electrochemotherapy for primary BCC has raised no major concerns. However, the evidence on its efficacy is limited in quantity and quality [13] .

Cryotherapy/cryosurgery

- Cryotherapy is well established for treating small low-risk lesions, including superficial BCCs.
- Histology is not available unless an incisional biopsy is taken first.

Non-surgical

- Topical treatment:
    - Imiquimod 5% cream:
        - Topical Imiquimod appears to be effective in the treatment of primary small superficial BCCs.
        - Is an immune response-modifying agent that has been licensed for the treatment of small superficial BCCs.
        - More effective for superficial than for nodular tumours [8] .
    - Topical fluorouracil 5% cream is useful in the management of multiple superficial BCC on the trunk and limbs. Cure rates are in the region of 80%.

PDT

- PDT appears to be effective for the treatment of superficial basal cell carcinoma and nodular BCC.
- Involves the use of light therapy in combination with a topical photosensitising agent to destroy cancer cells.
- Its use has been well described in the treatment of superficial BCC. Evidence of efficacy is adequate to support its use [14] .
- The average clearance rate for superficial BCC is about 85% but is lower in nodular BCC [5] .

- Advantages of PDT include a low rate of adverse effects and a good cosmetic outcome.
- The disadvantages are that the patient has to be available for a period of at least 3-4 hours for treatment, and that the photosensitiser and equipment are relatively expensive.
- There is currently little information available on long-term cure rates.

Radiotherapy

- The best indications for radiotherapy are BCC with incomplete excision, recurrent BCC, nodular BCC of the head and neck under 2 cm and BCC with invasion of bone or cartilage.
- Useful treatment for patients with NMSC who cannot be, or prefer not to be, treated by surgery.
- The cure rates are over 90% for most skin lesions but the long-term cosmetic outcome, especially for young patients, is worse than for other treatments.
- The same area cannot be treated twice and so surgery is required for any recurrence.
- Radiotherapy can also be used in cases when the margins of excision appear to be incomplete on histopathological examination.
- It should not be used to treat patients with Gorlin's syndrome because of the carcinogenic potential of low-dose irradiation at the margins of the treated areas.

Sometimes, especially in the very elderly and debilitated, it may be appropriate to provide no treatment (given the slow growth and low risk of many superficial BCCs) or palliative (debulking or radiotherapy) treatment if the tumour is symptomatic.

Basal cell carcinoma prognosis

- Mortality is low because basal cell carcinomas rarely metastasise [15] .
- Recurrent tumours have poorer cure rates than primary tumours.

- Following development of a BCC, patients are at significantly increased risk of developing subsequent BCCs at other sites .
- High-risk groups for the development of further BCC include patients with truncal BCC and those presenting with tumour clusters [16] .
- Patients with BCC also have an increased risk of developing SCC and malignant melanoma.
- There may also be a small increased risk of other malignancies, such as cancer of the lung, thyroid, mouth, breast and cervix and also non-Hodgkin's lymphoma [5] .

Basal cell carcinoma prevention

- Education on sun avoidance:
    - Avoid UV exposure in susceptible individuals, particularly children and adolescents.
    - Stay out of the sun between 10 am and 4 pm.
    - Use high-factor sunscreens.
    - Wear wide-brimmed hats, long-sleeved shirts and trousers.
- Education of patients to seek early assessment if further lesions develop. Earlier treatment is more effective.
- Oral retinoid treatment may prevent or delay the development of new basal cell carcinomas [5] .

Further reading

- Basal Cell Carcinoma; DermIS (Dermatology Information System)
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