Basal Cell Carcinoma

To understand this condition, it is imperative that one first of all understands the normal anatomy of the skin. The skin is made up of two layers; the epidermis and the dermis. In the developing foetus, the epidermis is formed from the outermost cell covering of the embryo, called the ectoderm. It acts as a sealant over the whole body. The dermis however, comes from within the foetus, from a layer called the mesoderm. When the skin is mature, the epidermis has a pluri-potential stem cell layer at its base. These cells subsequently divide and become basal cells, which in turn divide and become squamous cells, which then in turn divide and become prickly cells, then a clear cell layer is next seen, underlying a layer of keratinocytes. The keratinocytes subsequently die, but act as a sealant to the skin, much like the plastic laminate that is sometimes applied over paper sheets. All of these cell types are ectodermal in origin, and as such, are native to the outside covering of the body. It would appear that this effects the characteristics of malignancies (cancers), developing from these cells, as they tend to remain localized. When basal cells become malignant, they (for all intents and purposes) never metastasize, but are locally invasive.

Squamous cell carcinoma rarely metastasize and this again probably relates to the behaviour of these cells during the body's formation.

In contrast, malignant melanoma and other malignant skin tumours such as the Merkel cell tumour originate from cells not derived from the cell layers thus far described, and their behaviour is totally different to that of the non-melanocytic skin cancers. These will be discussed at a separate time.

The cause of basal cell carcinoma is varied, but essentially, is sun damage in susceptible individual. There are some genetic conditions that predispose to basal cell carcinoma formation, and some poisonings (such as low level arsenic poisoning) can produce multiple basal cell carcinomata. Basal cell carcinoma is almost unheard of in heavily pigmented people, but is quite common in fair skinned Caucasians. There is some conjecture as to whether or not trauma can produce basal cell carcinoma, and although there are some reports of this, the literature is not conclusive. Although over 20 different sub-types of basal cell carcinoma have been described, they basically fall into two main groups: The papillonodular group and the diffusely infiltrating group.

The papillonodular group of tumours have a well-demarcated edge, are well-defined, often have a raised pearly edge or look like a bleb of water has been injected under the skin. They also have characteristic blood vessels growing in them which are called telangiectasia.

The diffusely infiltrating group of tumours are much less distinct and it is very difficult to clinically assess the edge of the tumour. At times, they may look as indistinct as merely being a rough area of skin that is slightly reddened. Paradoxically, these tumours tend to be quite aggressive and can be very difficult to treat. As alluded to above, basal cell carcinoma may be multiple and both multiple papillonodular or diffusely infiltrating tumours can exist concurrently. Basal cell carcinomata are most commonly found in the head and neck region, but they can be found anywhere on the body.

Treatment

The treatment of basal cell carcinoma is varied. Although surgery is the gold standard and is curative in most instances (over 99%), sometimes the disadvantages of surgery (namely scarring, the ablative nature of the treatment and at times disfigurement) may outweigh the advantage of ablating basal cell carcinoma. To this end there are some chemotherapeutic agents that are available in cream form which can treat basal cell carcinoma. The cure rate of these various agents is usually only around 80%, and they have some disadvantages: sometimes these treatments are time-consuming, may produce painful blistering and may be costly. Nevertheless, off the potential benefits of curing some forms of basal cell carcinomata without the need for surgery (and therefore without leaving a scar) outweigh the benefits of a high cure rate. A good example of this is a superficial papillonodular basal cell carcinoma on the nose, where ablative treatment may require excision and flap repair or full thickness grafting, which leaves permanent scarring with associated cosmetic deformity, whereas chemotherapeutic treatment will not leave this scarring or deformity.

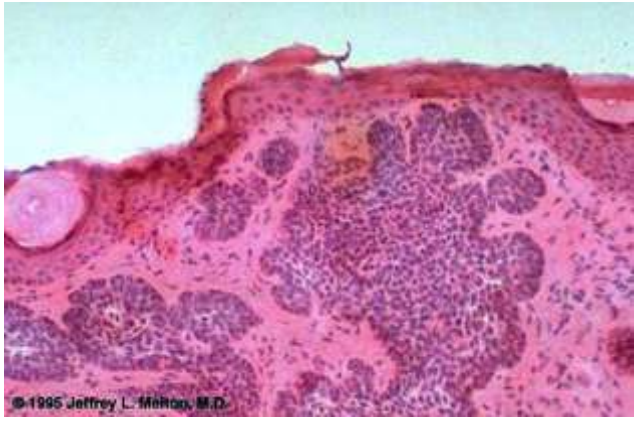
The development of non-surgical modalities for treating basal cell carcinoma are improving and also changing with time. A few years ago interferon [1] alpha was placed on the PBS schedule (which means that Medicare will pay for the treatment) for the treatment of basal cell carcinoma in cosmetically sensitive areas. This treatment modality required injection of the tumour three times a week with an agent, and the treatment had significant side-effects including severe flu-like illness. This drug has been withdrawn from the PBS schedule, so although it is still available, a treatment course costs well in excess of $1,000 and offers a cure rate of only 70-80%. The immune stimulating agent Imiquimod (Aldara cream), which has been used for a long time to treat genital warts, has now been shown to be effective against some kinds of basal cell carcinoma. There are various regimes for using this cream, but in my practice, I have it applied twice daily for three consecutive days over 10 consecutive weeks. The cream produces

quite severe blistering, which is then treated with vitamin E cream. Once the process is complete and the blistering has resolved, the basal cell carcinoma is cured in approximately 80% of cases.

The sap of the common garden weed, euphorbia peplus (Milkweed) contains alkaloids that are effective against some superficial forms of basal cell carcinoma or squamous cell carcinoma. A company in Brisbane (Peplin Biotech) is currently marketing the active ingredient of this sap, but as yet, it is not available to be purchased as a pharmaceutical. Nevertheless, a home remedy for treatment of some conditions is to apply the sap of the Milkweed to roughened areas of skin. It is recommended that this not be undertaken without previously biopsying the area to obtain histological confirmation of the lesion that is being treated. It is always inadvisable to treat skin lesions without having histological confirmation, as some melanomas do not contain pigment, and can mimic basal cell carcinoma.

Having said all of this, surgery remains the most definitive way to treat skin cancer and in many instances the procedure can be performed in such a way to minimize or mask scarring and the cosmetic results are in most instances, excellent.

In this practice, scar management is routinely undertaken to aid and speed up the maturation of scarring so that the best outcome is achieved. Surgery may be as simple as excising the lesion and closing the defect primarily. However, for larger lesions or lesions that are removed from areas such as the nose or eyelids, where direct closure of a defect would cause unsightly deformity or even functional impairment, then either a flap or a graft is used. As a general principle, local flap skin gives the best colour match and functional outcome, although this may be at the expense of a contour deformity. These contour changes may either be insignificant or may be doctored up at a later date to produce the best result. A new generation of neurovascular island flaps is revolutionizing flap reconstructions and giving vastly superior reconstructions when compared with traditional flap repairs. Grafts tend to change colour with time, and although in some instances, they give an excellent result, they must be used with great discretion.



There is a new modality of treatment that involves laser called PDT (photo-dynamic therapy) and this involves applying a cream to the tumour which is taken up selectively by malignant cells, and renders them ultra-sensitive to laser light beams. The laser is then applied to the tumour, which is killed by heat ablation, but the normal surrounding skin is left unscathed. Early trials would suggest that this form of therapy may become more popular in the future, and offers another non-surgical option in the treatment of these non-life threatening skin malignancies.
I purposely have not mentioned laser or cryotherapy in my list of treatment options. This essentially involves burning or freezing of the lesion, and creating a full thickness defect that is then allowed to heal secondarily. My personal opinion is that this is an unsatisfactory mode of treatment, given the other options that are available.

JOHN
CROCK
MB.BS(Melb). Dip Anat. MD. FRACS

Plastic and Reconstructive Surgery

Contact (03) 9899 6144
Fax (03) 9899 6188
Email info@johncrock.com

www.johncrock.com