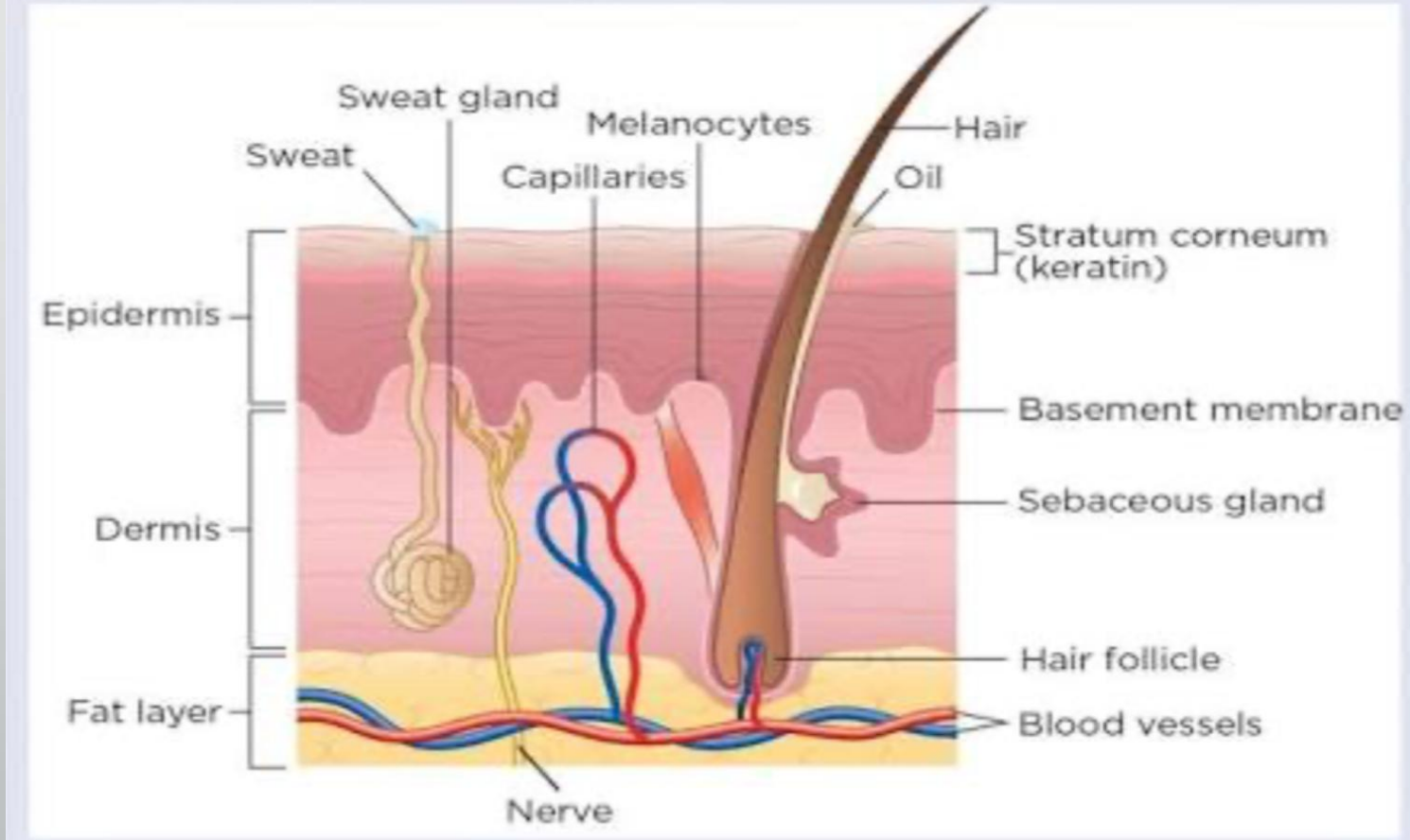
Benign & malignant conditions of skin and subcutaneous tissues

Structure of skin

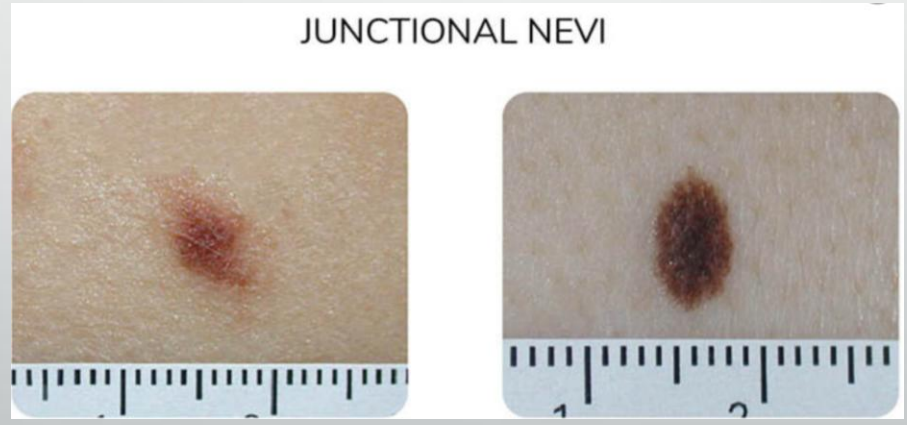
Fig 1. **Cross-section through the skin**



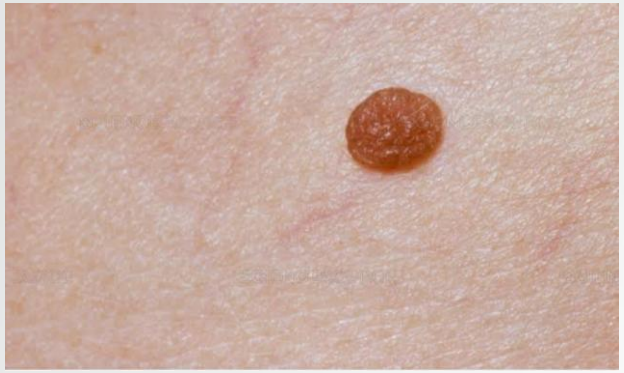
Benign lesions

- Basal cell papilloma: These vary from macular to soft, warty lesions which are pigmented and hyperkeratotic. These originate from basal layer of epidermal cells and contain melanocytes.
- Papillary wart: It arises from infection with HPV
- Freckle: An area of skin that contains normal number of melanocytes but producing an abnormally large number of melanin granules.

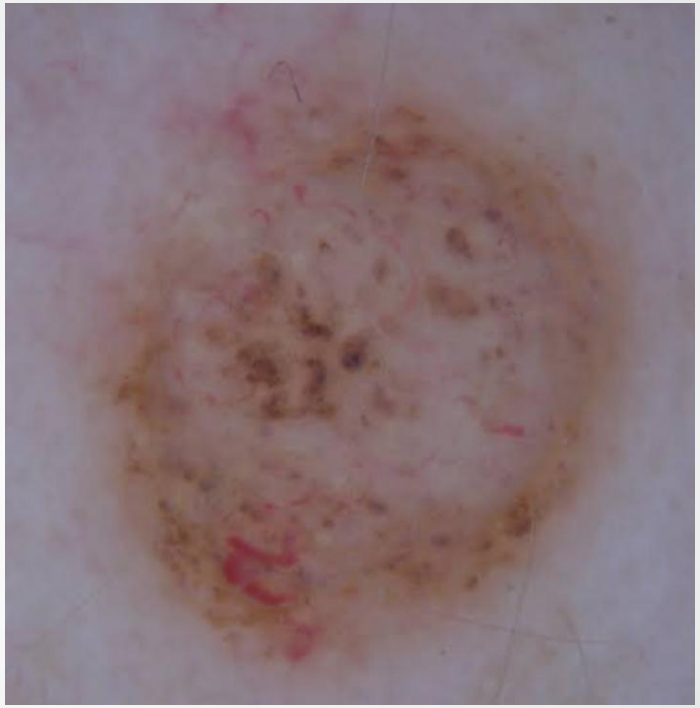
- Lentigo: Small circumscribed pigmented Macules which stem from sun damage and some systemic syndromes.
- Moles/Naevi: Normal melanocytes are present in basal epidermis. When melanocytes aggregate in the dermis or at the dermoepidermal junction, they are called naevus cells
- Junctional naevus: It is dermoepidermal proliferation of naevus cells, visible as deeply pigmented macules or papules usually progress to form compound and intradermal naevi with advancing age.

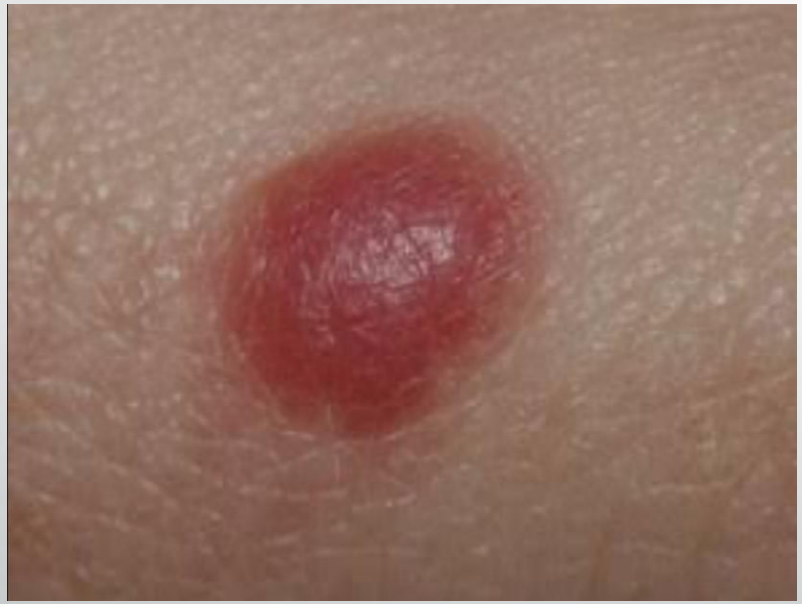


- Compound Naevus: It is maculopapular pigmented lesion that becomes most prominent during adolescence. It represents a junctional proliferation of naevus cells, which nests and columns in the dermis
- Intradermal naevus: Faintly pigmented papules in adults, showing no junctional proliferation, but a cluster of dermal melanocytes.
- Spitz naevus: These are reddish brown nodules. They most commonly occur on face and legs, growing rapidly initially then remaining static or regressing. The differential is melanoma and excision biopsy is warranted if there is doubt.



Compound naevus

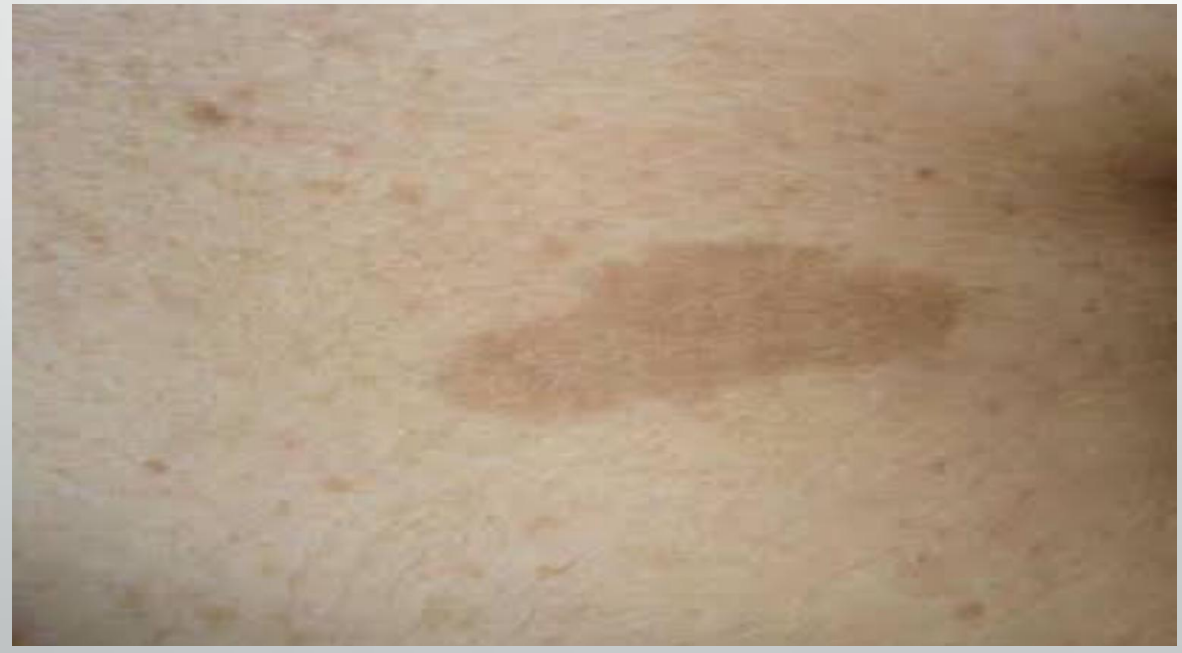




- Intradermal papilloma

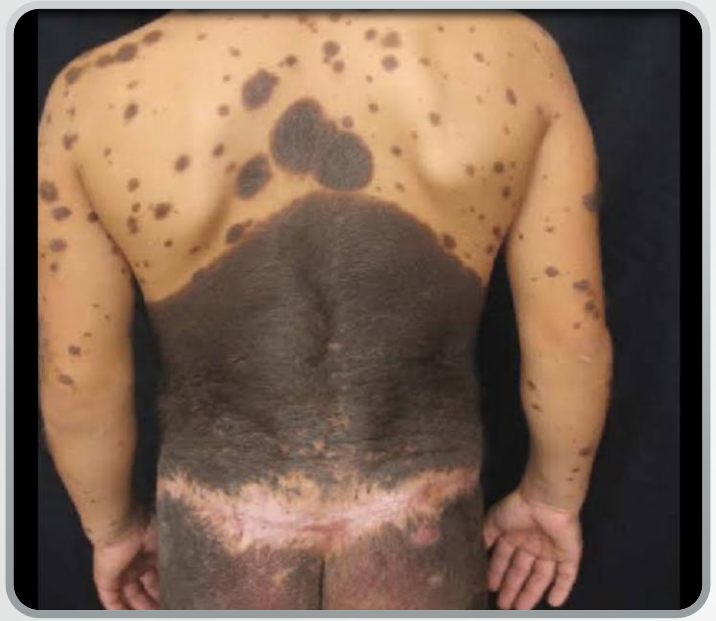
- Spitz naevus

Café-au-lait spots: These are coffee coloured macules of different size (from few mm to 10 cm). Multiple lesions are associated with NF1 and McCune Albright syndrome

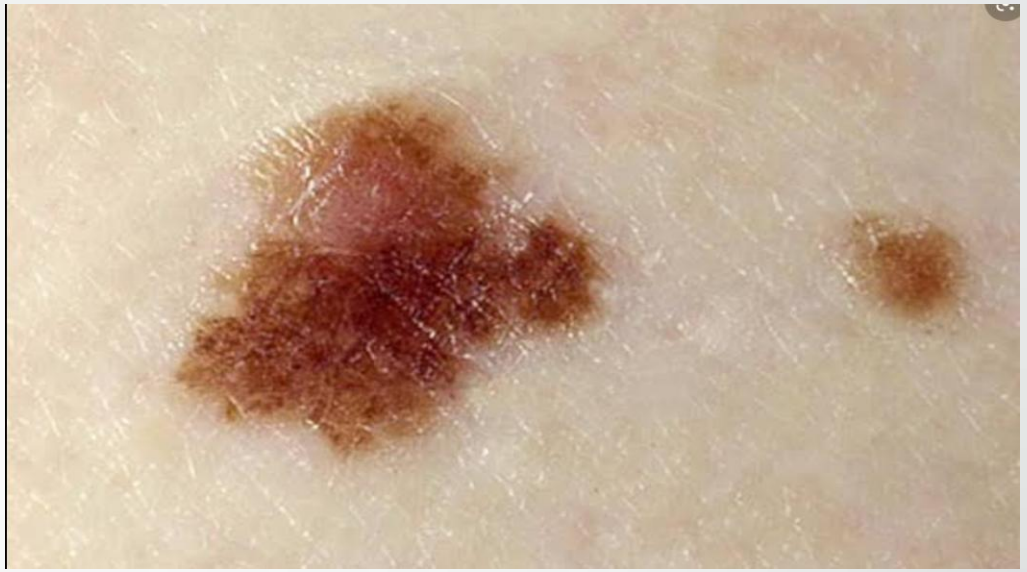


Premalignant lesions

- Giant congenital pigmented naevus: It is hamartoma of Nuevo-melanocytes that has tendency to dermatomal distribution. These are precursors of melanoma.
- Dysplasia naevus: For atypical naevus it has following three characteristics: variegated pigmentation; I'll defined borders; undulating irregular surfaces; or measures >5mm. Histologically, they are irregular proliferations of melanocytes at the basal layer of epidermis.



Giant pigmented naevus



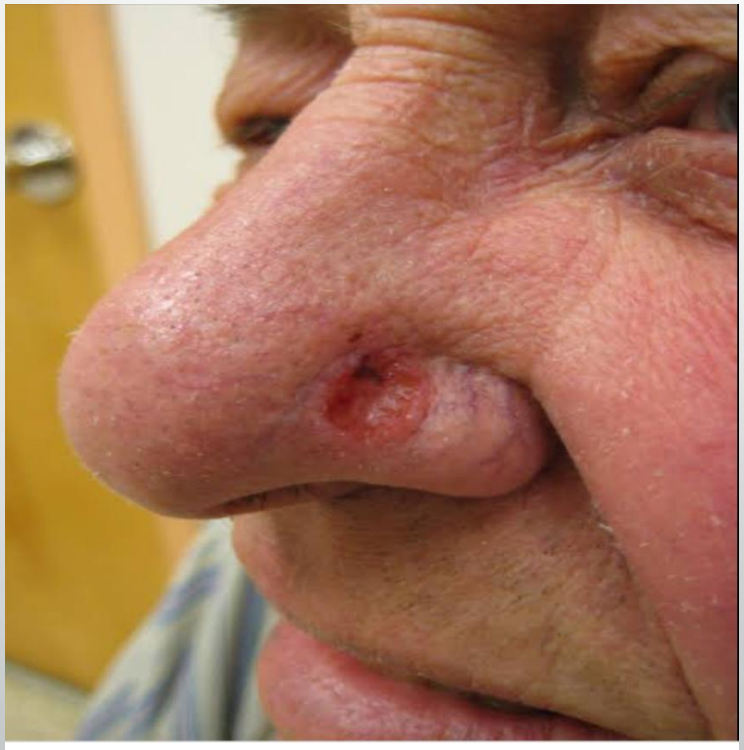
Dysplastic naevus

Malignant lesions

- Basal cell carcinoma: It is slow growing, locally invasive, malignant Timor of pluripotential epithelial cells arising from basal epidermis and hair follicles; hence it affects the pilosebaceous skin
- Risk factors: strongest risk factor is UV radiation, others are exposure to arsenical compounds, coal tar, aromatic hydrocarbons, ionising radiations,, genetic skin cancer syndromes, white skinned people and men affected more common than women.
- Types
- Macroscopic: localised (Nodular; nodulocystic; cystic; pigmented and naevoid) Generalised (superficial multifocal and superficial spreading; or infiltration) Nodular and nodulocystic account for 90% of BCC

Prognosis

- High Risk BCC are large >2cm; located at sites where direct invasion gives access to cranium; recurrent tumours; tumours forming in the presence of immunosuppression; or that have micro Nodular or infiltrating histological subtypes.

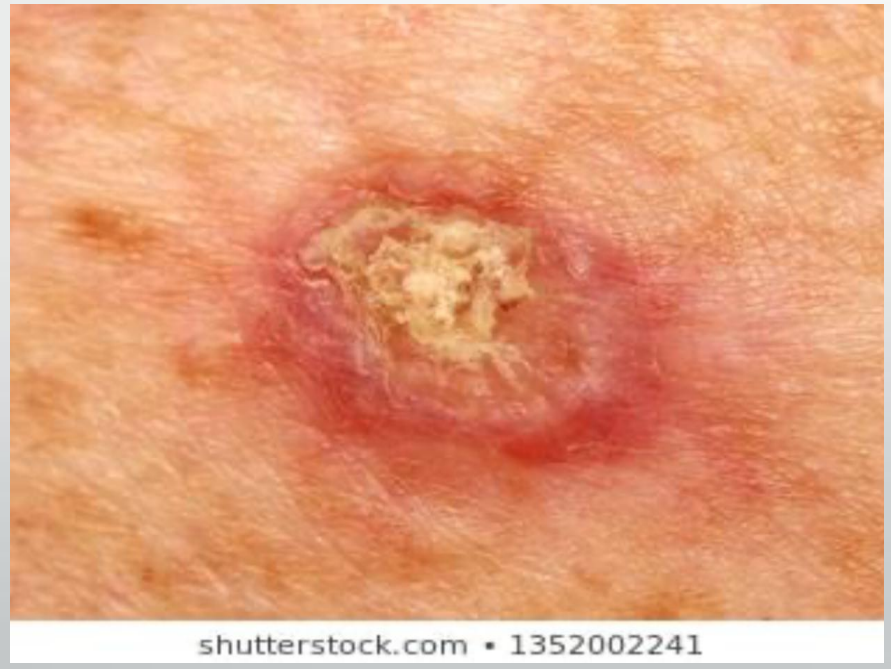


Management

- It can be surgical or non surgical
- Tumor and surrounding margins should always be assessed and marked under loupe magnification
- MOHs micrographics surgery is advisable. It is a two stage surgical approach with subsequent reconstruction after confirmation of clear margins
- Radiotherapy can be used
- Superficial tumors can be treated with topical treatments 5fluorouracil, imquimod.

Squamous cell carcinoma

- It is a malignant tumor of keratinising cells of the epidermis or its appendages
- It arises from the stratum basalis of the epidermis and expresses cytokeratins 1 and 10.



- Risk factors
- Cumulative sun exposure and damage , chronic inflammmation(chronic sinus tracts, preexisting scars, osteomyelitis, burns , burns , vaccination points) and immunosuppression
- Marjolin’s ulcer: When a SCC appears in a scar it is known as a marjolin’s ulcer.
- Ionising radiations and chemical carcinogens, infection with HPV 5 and 16

- The appeance of SCC may vary from smooth Nodular, verrucous, papillomatous to ulcerating lesion. Ulcers have exerted edges
- Following is tumor classification and staging:

TABLE 40.1 TNM Classification and staging.

Size	Nodes	Mets	Stages
TX Primary tumour cannot be assessed	NX Nodal involvement cannot be assessed	M0 No metastatic disease	Stage 0 Tis, N0, M0
T0 No evidence of primary tumour	N0 No regional nodes	M1 Metastatic disease present	Stage I T1, N0, M0
Tis In situ (confined to full thickness epidermal) disease	N1 Spread to 1 ipsilateral, nearby node that is <3 cm diameter		Stage II T2, N0, M0
T1 Primary <2 cm	N2a Spread to 1 ipsilateral nearby node that is 3–6 cm diameter		Stage III T3, N0, M0 or T1–T3, N1, M0
T2 Primary >2 cm	N2b Spread to >1 ipsilateral, nearby nodes, but none >6 cm diameter		Stage IV T1–T3, N2, M0 or any disease that is N3, or T4 or M1
T3 Primary invasion of a facial bone	N2c Spread to contralateral node(s), but none are >6 cm diameter		
T4 Invasion of muscle, base of skull or other bones	N3 Spread to any node >6 cm diameter		

Prognosis

- There are several prognostic variables for SCC
- Depth: the deeper the lesion, the worse the prognosis
- Surface size: lesions >2cm have a worse prognosis than smaller ones
- Histological grade: the higher the histological grade the worse the prognosis
- Microscopic invasion of lymphovascular spaces or nerve tissue carries a high risk of metastatic disease.
- Site: SCCs on the lips and ears have higher local recurrence rates than lesions elsewhere, and tumors at the extremities fared worse than those on the trunk.

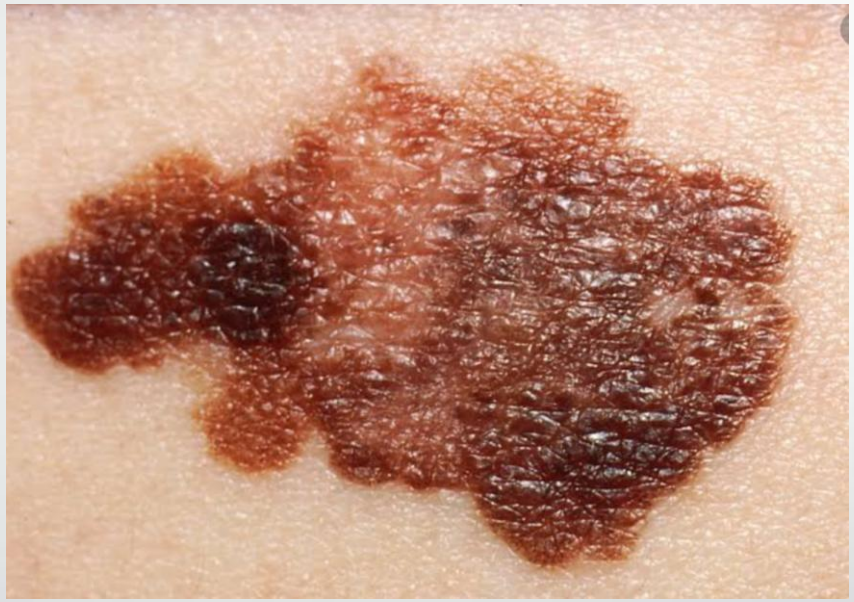
- Aetiology: SCCs that arise in the burn scars, osteomyelitis, skin sinuses, chronic ulcers and areas of skin that have been irradiated have a higher metastatic potential.
- Immunosuppression

Management

- Margins for primary excision should be tailored to surface size in the first instance. A 4mm clearance margin should be achieved if the SCC measures< 2cm across, and a 1cm clearance margins if >2cm.

Cutaneous malignant melanoma

- It is a cancer of melanocytes and can arise in skin, mucosa, retina and the leptomeninges
- Risk factors
- It is caused by exposure to UV radiation
- It has genetic predisposition also.
- Macroscopic appearance: Only 10-20% of MM form in pre existing naevi with the remainder arising de novo in previously normally pigmented skin. The most likely naevi to form MM are atypical naevi, atypical junctional lentiginous naevi and giant pigmented congenital naevi.



- Macroscopic features suggestive of malignant melanoma
- Change in size
- Shape
- Colour
- Thickness
- Satellite lesions
- Itching/ serosanguinous discharge

Management

- History and clinical examination should be directed at discovering the primary lesion and identification of local, regional or distant spread.
- An excision biopsy with 2-3 mm margin of skin and a cuff of subdermal fat is acceptable. Staging is as follows

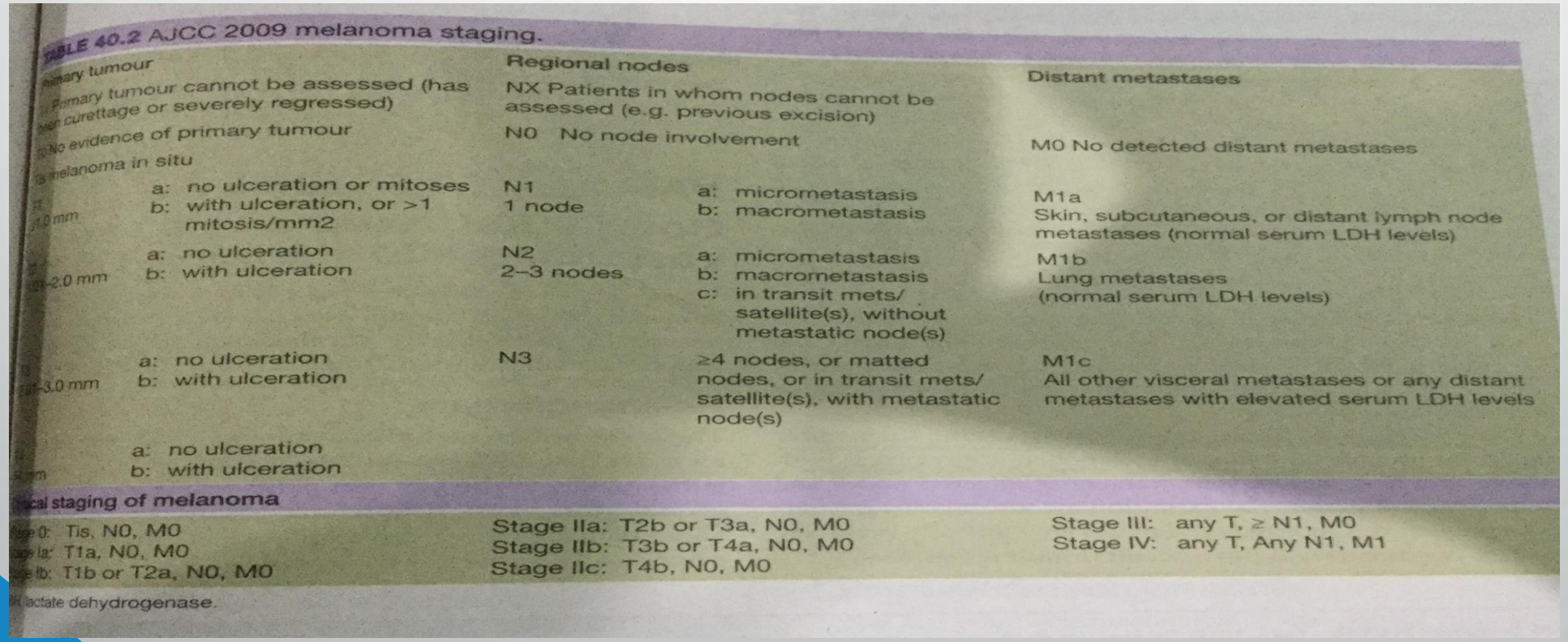


TABLE 40.2 AJCC 2009 melanoma staging.

Primary tumour	Regional nodes		Distant metastases
Primary tumour cannot be assessed (has been curettage or severely regressed)	NX Patients in whom nodes cannot be assessed (e.g. previous excision)		
No evidence of primary tumour	N0 No node involvement		M0 No detected distant metastases
Melanoma in situ			
a: no ulceration or mitoses b: with ulceration, or >1 mitosis/mm2	N1 1 node	a: micrometastasis b: macrometastasis	M1a Skin, subcutaneous, or distant lymph node metastases (normal serum LDH levels)
a: no ulceration b: with ulceration	N2 2–3 nodes	a: micrometastasis b: macrometastasis c: in transit mets/ satellite(s), without metastatic node(s)	M1b Lung metastases (normal serum LDH levels)
a: no ulceration b: with ulceration	N3	≥4 nodes, or matted nodes, or in transit mets/ satellite(s), with metastatic node(s)	M1c All other visceral metastases or any distant metastases with elevated serum LDH levels
a: no ulceration b: with ulceration			

Clinical staging of melanoma

Stage 0: Tis, N0, M0	Stage IIa: T2b or T3a, N0, M0	Stage III: any T, ≥ N1, M0
Stage Ia: T1a, N0, M0	Stage IIb: T3b or T4a, N0, M0	Stage IV: any T, Any N1, M1
Stage Ib: T1b or T2a, N0, M0	Stage IIc: T4b, N0, M0	

LDH, lactate dehydrogenase.

Local treatment

- Local treatment for melanoma is surgery. Melanoma in situ should be excised completely in most clinical situations because of risk of it entering the vertical growth phase, A wide excision of 5mm is sufficient. For melanoma <1mm deep, a 1cm margin is sufficient; and for deeper lesions, a 2cm only margin is recommended.
- For regional lymph nodes, sentinel node biopsy should be done
- Adjuvant therapy: targeted therapy in stage 4 melanoma using dabrafenib or vemurafenib has shown promising results

Thank you