"DERMOSCOPIC FINDINGS IN COMMON BENIGN AND MALIGNANT TUMOURS OF THE FACE"

Submitted by

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in

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Under the guidance of

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LIST OF ABBREVIATIONS

SK	-	Seborrheic keratosis
AK	-	Actinic keratosis
TE	-	Trichoepithelioma
SG	-	Syringoma
BCC	-	Basal cell carcinoma
SCC	-	Squamous cell carcinoma
KA	-	Keratoacanthoma
PL	-	Polarized light
NPL	-	Non-polarized light
CSK	-	Common SK
DPN	-	Dermatosis papulosa nigra
sBCC	-	Superficial BCC
LED	-	Light emitting diodes
SD	-	Standard deviation
AD	-	Autosomal dominant
HPE	-	Histopathological examination

ABSTRACT

Background

Facial lesions are a cause of immense cosmetic concern. Dermoscopy is a non-invasive, in vivo technique used for examination of skin lesions. Face can be a site of various benign skin tumours like seborrheic keratosis (SK), actinic keratosis (AK), trichoepithelioma (TE) and syringoma (SG). Malignant tumours like basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and keratoacanthoma (KA) are also seen on the face. Though common facial tumors are well characterized clinically and histopathologically, dermoscopic features of these tumors originating in Indian skin are relatively unexplored.

Objective

To determine the dermoscopic findings in common benign and malignant tumours of the face.

Methods

It is a hospital-based, cross-sectional, descriptive study. Patients presenting with clinically suspicious skin tumours of the face irrespective of the age and who did not receive any treatment were included in the study. All patients were subjected to detailed history, clinical and dermoscopic evaluation. Clinical and dermoscopic images were recorded for each patient. The skin lesion which was examined with the dermoscope was biopsied and sent for the histopathological examination.The examined variables were vascular pattern & type, background colour and specific dermoscopic features of various skin tumours of the face.

Results

A total of 60 patients with benign and malignant tumours of the face were examined during the study period. Out of which, five patients had more than one type skin tumours. 36 lesions were of seborrheic keratosis, 13 were BCC and syringoma

each, 2 were AK and 1 each was hidrocystoma and trichoepithelioma.. Seborrheic keratosis was observed in middle to old age, with equal sex distribution. The presence of comedo like-openings, moth eaten border, network like structures, sharp dermarcation and less common findings; fissures and ridges, milia like cysts and fat fingers help to reach the diagnosis of SK.

Blue gray background, arborizing vessels, blue grey globules & dots, blue grey ovoid nest, featureless areas, maple leaf like area and shiny red white structureless areas are the predominant findings in BCC. The principal dermoscopic findings in syringoma were dilated pores, homogenous light brown areas, multiple hypopigmentation and light brown network at periphery.

In AK, telangiectasia, pink-red pseudonetwork, yellow keratotic plugs, multiple slate grey to dark brown dots and globules and targetoid like appearance help in the diagnosis.

Presence of sharp demarcation, white globules and homogenous skin coloured areas were the predominant findings in eccrine hidrocystoma. The dermoscopic findings in pigmented TE are tumour border, milia like cyst and black speckled globules.

Conclusion

The gold standard for diagnosis of facial skin tumors is histopathology, which is invasive and time consuming. There are specific dermoscopic pattern for each skin tumours of the face that improves the diagnosis of these disorders. Dermoscopy may obviate the need of skin biopsy in some cases and improves the accuracy of clinical diagnosis.

Key Word : Dermoscope. Seborrheic keratosis, Actinic keratosis, Trichoepithelioma Syringoma, Basal cell carcinoma, Hidrocystoma.

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INTRODUCTION

Dermoscopy is a non-invasive, in vivo technique used for examination of skin lesions. It is performed with a handheld instrument called "dermoscope," which allows visualization of subsurface skin structures in the epidermis, dermo-epidermal junction, and upper dermis that are usually not visible to the naked eyes[1].

Dermoscopy has significantly improved the diagnostic accuracy of pigmented and non-pigmented skin lesions. However, the dermoscopic diagnosis of lesions located on the face may be challenging, due to unique anatomic and histologic features of the facial skin and their progressive changes caused by chronologic and photo-induced aging.

Facial integrity is of immense concern for each person, as it is a marker of beauty according to the social norms. Any lesion on the face can alter the self-esteem and cause anxiety.

A "tumour" is an abnormal mass of tissue, the growth of which exceeds and is uncoordinated with that of the normal tissues and persists in the excessive manner after cessation of the stimuli which evoked the change. Tumours are broadly classified as benign and malignant[2].

Face can be a site of various benign skin tumours like seborrheic keratosis (SK), actinic keratosis (AK), trichoepithelioma (TE) and syringoma (SG). Malignant tumours like basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and keratoacanthoma (KA) are also seen on the face.

The gold-standard and confirmatory test for diagnosis of skin tumours over the face is the skin biopsy and histopathological examination. However, this is an invasive technique and requires time for processing and reporting of results. The possibility of a scar resulting from skin biopsy is a cause of concern among the

patients, which is sometimes a reason for refusal of consent for this procedure. Hence, an alternative to skin biopsy and histopathological examination for the diagnosis of tumours of the face is desirable.

The field of dermoscopy is relatively untapped and provides ample opportunities for original observations. The device has been largely used in the white-skinned individuals for the study of melanocytic nevi and melanoma.

There are a good number of studies on dermoscopy of tumours of the face in the international literature. But, these are conducted on the white-skinned individuals. The specific dermoscopic features of skin tumours of the face in coloured skin are hardly found in the literature.

It is prudent to study and report these dermoscopic features of the tumours of the face in the Indian population to known the differences when compared to other subsets of population.

The present study has been carried out to fill up the above lacunae in the existing knowledge about the dermoscopic features of skin tumours of the face in Indian skin.

OBJECTIVE OF STUDY

To determine the dermoscopic findings in common benign and malignant tumours of the face.

REVIEW OF LITERATURE

DERMOSCOPE:

German dermatologist Johann Saphier (1920) introduced the term "dermatoscopy". The term "dermoscopy" was later coined by Goldman. Various synonyms used for dermoscopy include: dermatoscopy, epiluminescence microscopy, skin surface microscopy and incident light microscopy. The first dermoscope was developed in 1989 by Stolz and Braun- Falco[3].

Dermoscope is a hand-held non-invasive diagnostic tool, which magnifies not only the subtle surface features of skin lesions but also unveils few skin sub-surface structures which are imperceptible to the naked eyes and even to the magnifying lens[4]. It is a link between macroscopic clinical dermatology and microscopic dermatopathology[5].

Pigmented and non-pigmented skin tumours can be diagnosed with a higher sensitivity and specificity as compared to clinical examination by dermoscope. This obviates the need for unnecessary excision of benign skin tumours and early detection of malignant tumours. Hence, dermoscope may on occasions obviate the need for invasive skin biopsy for diagnosis and follow up.

Other added advantages of dermoscopy over histopathology are:

- It is easy to use and is less time consuming.
- It is an office procedure that facilitates quick interpretation of skin lesions.
- Helps the observer to focus on the lesion and to isolate the suspicious foci within larger lesions.
- Precisely defines the border of some lesions for better pre-surgical margin mapping.

- Can be used for post-treatment follow-up as well as periodic monitoring of any changes in tumours.
- Provides facility for storage of images for future analysis and comparison[2.]

This diagnostic aid must be used in conjunction with a thorough clinical history and examination of skin lesions. Dermoscopy and clinical examination, increases the diagnostic accuracy by 5% to 30% compared to clinical visual inspection alone, depending on the type of skin lesion and experience of the physician[6].

Dermoscope is similar to magnifying lens with several add-on features like:

- It has a specialized illuminating system such as visible light, polarized light and ultraviolet sources,
- It has adjustable magnification,
- It's ability to visualize deeper structures up to the reticular dermis, and
- Advantage to capture the findings as digital images for documentation and comparison later[2].

Principle of dermoscope:

The main principle of dermoscopic visualization is to magnify the skin lesions with lenses along with illumination using different light sources [7]. Normally, any light ray that passes through the skin either gets reflected, refracted, diffracted or absorbed and this depends on the type of the skin (Figure 1)[8]. In dry scaly skin, the light gets reflected whereas in smooth oily skin the light reaches the deeper dermis and hence improves the visibility of the skin sub-surface. The latter principle is used in case of contact technique dermoscopy by visualizing the skin lesion following application of

linkage fluids like oil (immersion oil, olive oil and mineral oil), water, an antiseptic solution, glycerin and gels[9].

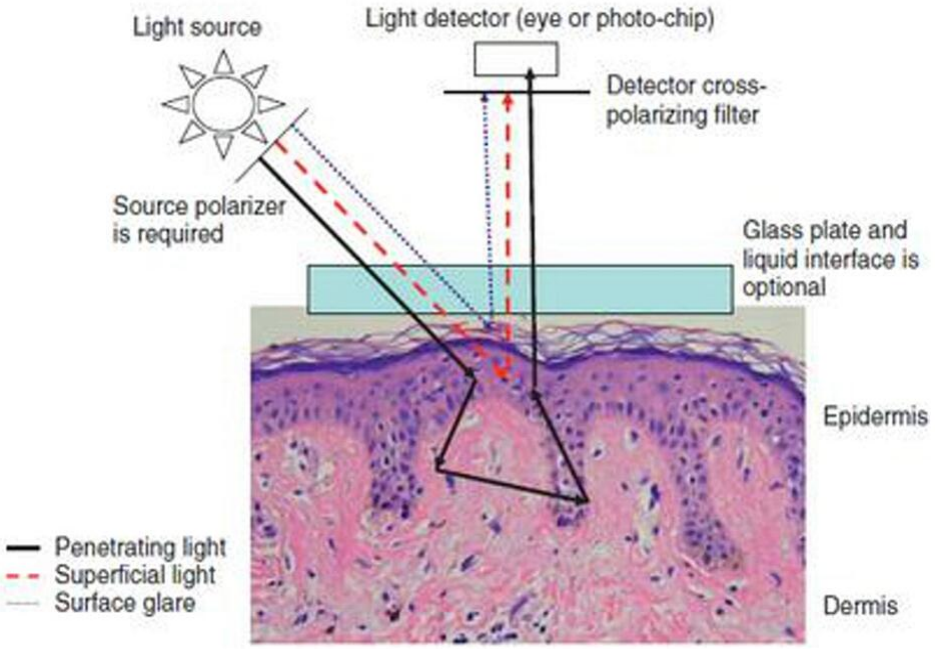


Figure 1: Optics of polarized and non-polarized light in dermoscopy

Parts of dermoscope:

The different parts of dermoscope are as follows[4].

1. *Achromatic lens*: Most instruments provide a magnification of 10X, but higher magnification of up to 1000X can be achieved with video-dermoscope.
2. *In-built illumination system*: Light emitting diodes (LED) are the standard sources that provide high intensity white light and consume 70% less power than classical halogen lamps, which emit yellow light. Illumination can also be altered by turning off a set of LEDs.

   Videodermoscope uses polarized light which allows them to display the sub-surface features of skin lesions without using contact plates and linkage fluid.
3. *Power supply*: Hand-held instruments are powered by batteries or have rechargeable handles.

4. *Display system*: Hand-held dermoscope have a see-through viewing window, while the video-dermoscope can be connected to a computer or other display devices or it may have its own display screen.
5. *Contact plate*: Large contact plate (20 mm diameter) and small contact plate (8 mm diameter) are the parts of contact technique dermoscopy. The contact plates are made up of multicoated silicone glass which can be sterilized with methylated spirit or 2% glutaraldehyde. Boiling or autoclaving at 134°C for 5 minutes also serves the purpose. Some of these plates are graduated with scales and others are non-graduated.
6. *Inbuilt photography system*: These have become an essential component of a dermoscope except in the hand-held dermoscope. The camera may be either an attachable conventional or a digital camera, or an in-built video camera. Supporting software, for the capture, storage, retrieval and even interpretation of images is incorporated in the latter cases.

Types of dermoscopy instruments:

Marghoob et al.[10] reviewed various models of dermoscopes and categorized them into the following types:

a) *Dermoscopes without image capturing facility*: These are hand-held, otoscope-like instruments that lack an inbuilt camera or any other image capture facility. However, cameras can be attached to some of these instruments with an adaptor. It incorporates four different colored polarized light, viz white, blue (surface pigmentation), yellow (superficial vessels), and red (deep pigment and vessels), to facilitate better visualization of skin structures based on the principle that, depth of penetration of light is proportional to the wavelength.

b) *Dermoscopes with image capturing facility*: These instruments either have an inbuilt image capture system or have a camera attached for photography. Also, whole body photography (body mapping) is possible with this instrument. Some have special lenses, which can be mounted onto a conventional or a digital camera. Both clinical and dermoscopic pictures of 10X magnification can be taken. A videodermatoscope has a higher resolution camera fitted to the hand piece and the image is seen on the computer screen. Small videos can be taken with this instrument, as well.

c) *Dermoscopes with image capture facility and analytical capability*: These instruments are mainly used in countries where the incidence of melanoma is high, mainly for pre-operative assessment of pigmented lesion. Archived images of the patient can be compared with the new ones. Any significant change in the lesion produces different colour signals. An artificial neural network mechanism helps to judge whether a melanocytic nevus is benign or not.

Technique of dermoscopy

The dermoscope can be used either by *contact* or *non-contact techniques*. In contact technique dermoscopy, using the non-polarized light (NPL), the glass plate or contact plate is applied to the surface of the lesion with an interface fluid. In non-contact technique, using the polarized light (PL) there is no contact with the skin surface, which gives an added advantage of avoiding nosocomial infections[11].

Polarized light offers better visualization of structures located deeper in the skin, whereas NPL allows for improved visualization of more superficial structures[12].

The dermoscope facilitates the visualization of skin in a horizontal view; hence the vessels that run parallel to the skin surface are visualized as lines, while the vessels, those run perpendicular are visualized as dots or loops. Vessels are better visualized by the non-contact technique, as it doesn't compress the vascular structures[13].

IMMERSION FLUID

In dermoscopic examination, the most preferable linkage fluid is the immersion oil[4].

Linkage or immersion fluid can be divided into four groups:

i) Water-based gels,

ii) Oils,

iii) Disinfectant solutions, and

iv) Water.

The characteristics of an ideal immersion liquid are:

i) Cheap and easily procurable,

ii) Makes structural parameters of skin lesions well visible, without changing color,

iii) Should produce less air-bubbles,

iv) Non-volatile,

v) Can be used in special locations like circumocular skin, and

vi) Should not lead to very matte or excessive bright light.

In identification of the pigment network, which is an important parameter for the diagnosis of melanocytic lesions, immersion oil is more appropriate as an immersion fluid. For structural components other than pigment network, ultrasound gel or immersion oil can be used. In dermoscopic examination of non-pigmented skin lesions, ultrasound gel is a better alternative because it is cheap and easily removable

from the skin whereas immersion oil is not preferred, as it contains chlorinated paraffin and dibutyl phthalate; which have teratogenic, fetotoxic , and carcinogenic effects.

An evidence-based study by Gewirtzmanet AJ et al.[14] showed that a 70% alcoholic solution gives best results in terms of image clarity, eliminating air bubbles, and better patient tolerance, as it has less strong odour. Alcohol potentially decreases the rate of transmission of infections, it is better used in inflammatory dermatoses.

Glass has a refractive index (1.52) almost similar to that of skin (1.55) and hence when placed over linkage fluid coated skin (as in contact plates), further enhances transillumination of the lesion. Ultrasound gel is useful in performing dermoscopy of solid curved areas, particularly the area surrounding the nail plate[15]. It is also preferred for examination of nail bed, mucosa, genitals, and eyelids[4]. By using gel, the entire curved area of the nail can be viewed as the viscose gel fills up and remains in the space between the surface to be viewed and the contact plate unlike liquids which escapes out.

DERMOSCOPIC CRITERIA

Color

It is the melanin in the skin, whether inside the melanocytes, nevic cells, or keratinocytes that determines the color in dermoscopy (Figure 1)[8]. The other important chromophore is the hemoglobin[16].

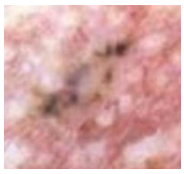
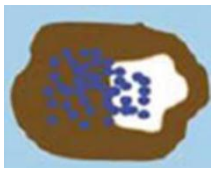
Figure 2. .Dermoscopy – Color and location of melanin

Dermoscopic structures

Melanin also determines certain "structures" by its appearance as clusters in various cells, in isolation, or concentration at the lesion periphery[3]. Similarly hemoglobin, depending on its distribution in the lesion, also determines the structures (Table 1) and patterns of vascularization[16].

Table 1. Dermoscopic structures and their histopathological correlation.

Pigment network 	- Honeycomb like network consisting of pigmented lines (rete ridges) and hypopigmented holes (dermal papillae).
Dots 	- Small round structures < 0.1mm in diameter representing focal melanin accumulation in upper part of epidermis.
Globules 	- Symmetrical round to oval well demarcated structures > 0.1mm in diameter. - Represent melanocytes, clumps of melanin and/or melanophages situated in lower epidermis, dermo-epidermal junction, or in papillary dermis.
Branched streaks	- An altered pigment network - Represents remnants of pigmented rete ridges and bridging nests of melanocytic cells within epidermis and papillary dermis.
Radial streaming	- Fringe type structure at periphery of lesion. - Representing confluent pigmented junctional nests of pigmented melanocytes.
Pseudopods 	- Finger-like projections of dark pigment at periphery of lesion. They may have knobs at their tips. - Correspond to intra-epidermal or junctional confluent radial nests of melanocytes.

Streaks 	- Term used interchangeably with radial streaming or pseudopods. - Can be irregular or regular.
Structureless areas 	- Amorphous or homogenous areas devoid of any dermoscopic structures. - Usually hypopigmented.
Blotches 	- Large collection of melanin pigment localized throughout epidermis and/or dermis visually obscuring the underlying structures.
Regression pattern 	- White scar like depigmentation or peppering (speckled multiple blue-gray granules within a hypopigmented area). - Shows fibrosis.
Blue-white veil 	- Irregular, indistinct, confluent blue pigmentation with an overlying white, ground-glass haze. - Correspond to aggregation of heavily pigmented cells or melanin in dermis with compact orthokeratosis.
Milia like cysts 	- Round white or yellowish structures that shine brightly under NPL. - Correlate with intraepidermal keratin filled cysts.

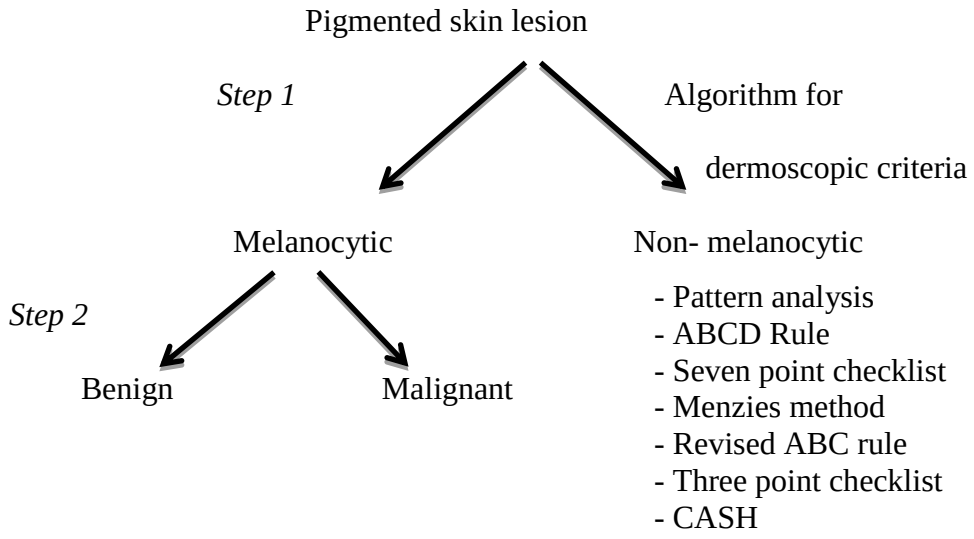
Comedo-like openings (crypts, pseudofollicular openings) 	- Blackhead like follicular keratin plugs on surface of lesion. - Corresponds to keratin filled invagination of epidermis.
Fissures and ridges (“cerebriform pattern”, “gyri and sulci”, “mountain and valley”) 	- Irregular, linear keratin filled depressions.
Fingerprint-like structures 	- Tiny ridges running parallel.
Moth eaten border 	- Concave borders
Leaf-like areas (maple leaf like areas) 	- Brown to gray-blue discrete bulbous blobs forming a leaf like pattern.
Spoke wheel-like structures 	- Well circumscribed, brown to gray-blue-brown, radial projections meeting at darker brown central hub.

Blue-gray ovoid nests 	- Large, well circumscribed, confluent or near confluent pigmented ovoid areas, larger than globules.
Multiple blue-gray globules 	- Round, well circumscribed structures.
Chrysalis 	- White shiny streaks due to increased dermal collagen.
Ulceration 	- Absence of epidermis, not associated with a history of trauma seen as large, irregular shaped, dull red or red-brown structureless areas.
Structures found on the face 	- Pseudo-net: Rough reticular pattern as a result of absence of epidermal cones. Present around clear spaces which represent hair follicle openings and ostia of sweat glands. - Asymmetric follicular openings. - Rhomboid structures.

Evaluation of pigmented lesions:

A two- step procedure is put forward by the Board of the Concensus Net meeting, for the classification of pigmented lesion of the skin (Fig 3)[8]. The first step of the algorithm distinguishes the melanocytic lesions from the non-melanocytic lesions. For a lesion to be melanocytic, it should either have a pigment network, pseudonetwork, aggregated globules, branched streaks, or parallel pattern. If these are absent, look for specific features to diagnose pigmented BCC, SK or haemangioma. If none of these lesions can be diagnosed, treat the lesion as melanocytic[17].

Figure 3: The Two step algorithm for pigmented skin lesions :



The second step is to determine if the melanocytic lesion is benign or malignant, using one of the following approaches:

- *Pattern analysis*: It was the first melanocytic algorithm developed by Pehamberger et al. This method is the most sensitive and specific amongst all but is quiet cumbersome and requires a detailed, qualitative assessment of multiple dermoscopic criteria. It is most often used by experienced dermoscopists[16].

- *ABCD rule of dermoscopy*: It was described by Stolz et al in 1993[16]. This algorithm is relatively easy to learn (Table 2)[18]. False positive scores may be seen in nevi with a globular pattern, nevi with papillary, lentiginous, or congenital components or spitz nevi. This rule is not applicable for pigmented lesions on face, palms and soles[18].

Table 2: ABCD rule of dermoscopy

DERMOSCOPIC CRITERION DEFINITION SCORE WEIGHT FACTOR
Asymmetry in 0, 1, or 2 perpendicular axes; assess contour, colors and structures 0-2.
Border abrupt ending of pigment pattern at periphery in 0-8 segments 0-8.
Color presence of up to 6 colors (white, red, light-brown, dark-brown blue-gray, black) 1-6.
Dermoscopic structures presence of network, structureless(homogeneous) areas, branched streaks, dots, and globules 1-5.
Formula for calculating total dermatoscopy score (TDS) = (A score x 1.3) + (B score x 0.1) + (C score x 0.5) + (D score x 0.5)
Interpretation of total score: Benign melanocytic lesion <4.75; Suspect lesion (close follow-up or excision recommended): 4.75-5.45; Lesion highly suspect for melanoma >5.45.

- *7- point checklist:* Dal Pozzo et al developed an algorithm based on 3 major and 4 minor criteria (Table 3)[18]. Each major criterion has a score of 2 points while each minor criterion has a score 1 point. By simple addition of the

individual scores a minimum total score of 3 is required for the diagnosis of melanoma.

Table 3: The SEVEN point checklist

DERMOSCOPIC CRITERION SCORES
Major criteria:
1. Atypical pigment network
2. Blue-whitish veil
3. Atypical vascular pattern
Minor criteria:
1. Irregular streaks
2. . Irregular dots/globules
3. Irregular blotches
4. Regression structure

- *Menzies scoring method:* Menzies et al in 1996 identified 11 features for their high specificity and low sensitivity (Table 4)[18]. For the diagnosis of melanoma, both the negative features (which must be absent) and the positive features (one or more must be present) are taken into consideration[16].

Table 4: Menzies scoring method

Dermoscopic criterion

Negative Features

- Symmetry of pattern
- Presence of single color

Positive Features

- Blue-veil
- Multiple brown dots
- Pseudopods (streaks)
- Radial streaming (streaks)
- Scar-like depigmentation
- Peripheral black dots/globules
- Multiple (5 or 6) colors
- Multiple blue/gray dots
- Broadened network

- *CASH method*: This is a new algorithm put forward by Kopf et al. (Table 5)[16,18]. Four parameters were analyzed to give a total score of 2 to 17. A score of 7 or less is likely benign and a score of 8 or more is suspicious of melanoma.

Table 5: The CASH algorithm

CASH	SUSPICION FOR MELANOMA		
Color	1-2	3-4	5-6
Architectural Disorder	No/Mild	Moderate	Marked
Symmetry	Biaxial	Monoaxial	None
Homogeneity/ Heterogeneity	1 Structure	2 Structures	3+ Structures

Algorithm for dermoscopic evaluation of the non-pigmented skin lesions:

Step 1: Evaluation of the lesion number

(single: tumour or multiple: inflammatory/ infectious disease)[19].

Step 2: Evaluation of the morphologic type of vascular pattern (Table 6)[20].

Step 3: Evaluation of the architectural arrangement of the vascular patterns within the lesion (Table 7)[20].

Step 4: Evaluation of additional dermoscopic criteria.

Step 5: Diagnosis.

Vessels located in the dermis are generally pink and appear out of focus due to the effect of the dispersion of light through the dermal connective tissue. Those found closer to the surface (immediately under the epidermis), by contrast, are bright red and in focus[20].

Table 6. Vessel morphology

VASCULAR PATTERN	DESCRIPTION	DIAGRAM
Arborizing vessels or telangiectasias	In-focus large calibre vessels that branch into finer secondary vessels	
Hairpin vessels	Vessels that double back on themselves and are seen as loops.	
Crown vessel	Barely branching peripheral vessels that do not cross the centre of the lesion.	

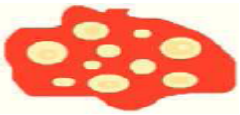
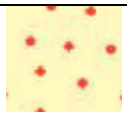
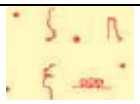
Comma	Thick linear curved lines with little branching and occasionally one end thicker than the other.	
Dotted	Tiny red dots densely aligned next to each other in a very regular fashion	
Glomerular	Tortuous capillaries often distributed in clusters mimicking the glomerular apparatus of the kidney	
Corkscrew	Linear irregular spiral vessels	
Milky–red areas/ globules	Unfocused milky-red colour usually corresponding to an elevated part of lesion	
Strawberry pattern	Structureless erythematous areas with heterogenous whitish areas forming a type of pseudonetwork	
Linear irregular	Straight vessels varying in shape and size	
Polymorphous	Different vascular morphologies in same lesion	

Table 7. Vessel distribution pattern

VESSEL PATTERN	DESCRIPTION	DIAGRAM
Regular	Vessels distributed evenly throughout the lesion	
String of pearls	Dotted vessels arranged linearly in a pattern resembling a string of pearl	
Clustered	Tendency to group together in lesional area	
Radial	Vessels at periphery of lesion not crossing or occupying the centre.	
Branching	Large vessels that branch into smaller vessels.	
Irregular	Vascular polymorphism without a specific pattern	
Rope-ladder pattern	Short slightly dilated loops that emerge from edges of scar and cross it completely.	

TUMOURS OF THE FACIAL SKIN

Skin tumours develop as a result of proliferation of a single or multiple components of the skin. The benign lesions merely are a cause of cosmetic concern. Morphologically these present as smooth papules, nodules or keratotic lesions that grow slowly and are usually multiple. Malignant tumours are solitary, irregular, rapidly growing plaques or nodules that may ulcerate and metastasize. The classification of the facial skin tumours has been outlined in (Table 8)[21-22].

Table 8: Classification of the benign and malignant tumours of the face based on their primary cells / structures of origin.

CELL TYPES	BENIGN TUMOUR	MALIGNANT TUMOUR
KERATINOCYTES	Seborrheic keratosis	Basal cell Carcinoma
	Leukokeratosis of lips / Actinic cheilitis	Squamous cell Carcinoma
	Melanoacanthoma	
	Keratoacanthoma	
SKIN APPENDAGES		
Hair	Pilar sheath acanthoma	Tumour of follicular Infundibulum
	Trichoadenoma	Trichilemmal Carcinoma
	Trichofolliculoma	
	Desmoplastic trichoepithelioma	
	Basaloid follicular hamartoma	
	Pilomatricoma	
	Trichodiscoma	
Sebaceous gland	Sebaceous adenoma	Sebaceous Carcinoma
	Sebaceoma	
Apocrine gland	Apocrine Hidrocystoma	
Eccrine gland	Syringoma	
	Eccrine Hidrocystoma	

MELANOCYTES		Melanoma
OTHERS		Mucinous Carcinoma
		Adenoid cystic Carcinoma
		Mixed tumour of skin
		Merkel cell Carcinoma

DERMOSCOPIC FINDINGS IN COMMON BENIGN AND MALIGNANT TUMOURS OF THE FACE:

The dermoscopic diagnosis of a skin tumour is based on a stepwise algorithm that considers vascular morphology, the architectural pattern of blood vessels and presence of additional dermoscopic criteria[17]. In the following section, clinical and dermoscopic features of various common facial tumours have been discussed.

SEBORRHEIC KERATOSIS

Seborrheic keratosis is the most common benign cutaneous tumour composed of epidermal keratinocytes. It usually occurs in middle-aged individuals and can arise as early as in adolescence. Males and females are equally affected. The lesions can occur at any site except palms and soles, but are most frequent on the face and the upper trunk. Lesions are usually asymptomatic but may be itchy. They begin as multiple, well circumscribed, dull, flat, tan or brown patches. Follicular prominence is one of the clinical hallmark. As SK grow, they become more papular or polypoidal with a waxy, verrucous or "stuck-on" appearance. Multiple eruptive pruritic forms are associated with internal malignancy, mostly adenocarcinoma of the stomach ("Leser trélat sign")[22-23].

Variants of SK are:

CLINICAL:

- Stucco keratosis,
- Melanoacanthoma,
- Inver ted follicular keratosis,
- Irritated SK,
- Flat SK,
- Pigmented SK, and
- DPN.

HISTOPATHOLOGICAL:

- Acanthotic,
- Clonal type,
- Adenoid or reticulated, and
- Hyperkeratotic or digitate

Multiple milia-like cyst and comedo-like openings are the characteristic dermoscopic findings. SK is usually seen as light brown to dark brown in colour. Sharp dermarcation, fissures and ridges, finger-print like structure, fat fingers, globule like structures, moth-eaten border and vascular pattern including hairpin-like vessels, comma vessels, point vessels, tree like vessels, and pigment network consisting of lines and holes are also seen[24-32].

Rajesh et al.[29] analyzed 250 cases of SK and following were the observations:

- SK were commonly seen in the age group of 60 years and above,
- Most frequent clinical type was common seborrheic keratosis (CSK), followed by DPN, pedunculated SK and stucco keratosis,

- Sharp demarcation (83%), comedo-like openings (80%), and fissures and ridges (52%) were the dermoscopic features consistent with CSK, and
- Network-like (88%) and fingerprint (55%) structures were commonly seen in flat SK.

In the 203 cases studied by Braun et al.[30] it was observed that the classical dermoscopic criteria for SK (milia-like cysts and comedo-like openings) have higher prevalence and the use of additional features like fissures, hair-pin blood vessels, sharp demarcation and moth-eaten borders improved the diagnostic accuracy. Hence the proper identification of pigment network and network-like structures is important for correct diagnosis.

In another study by Lin et al.[31], a total of 416 lesions were analyzed. The study concluded that the combination of lack of blue-grey or blue-white colour, sharp demarcation, mica like structure and yellowish colour with two-step algorithm could improve the diagnostic accuracy of SK.

TRICHOEPITHELIOMA

Trichoepithelioma is a rare benign neoplasm regarded as a poorly differentiated hamartoma of hair germ composed of immature islands of basaloid cells with focal, primitive, follicular differentiation and induction of cellular stroma. It occurs as a solitary sporadic lesion in childhood or early adulthood. It usually presents as multiple, asymptomatic, yellowish, firm, annular plaques with a raised border in the nasolabial folds and adjacent skin. It has three distinct subtypes; solitary, multiple and desmoplastic. Dermoscopic features include ivory white colour with well-defined borders, cysts and prominent arborizing telangiectasias in the central area and periphery of the lesion[22-23]. On contact polarized dermoscopy shiny, bright white,

orthogonally oriented white streaks, also known as crystalline or chrysalis structures are seen.

In a dermoscopic study of trichoepithelioma by Khelifa et al.[33] well-defined borders, ivory white colour and prominent arborizing telangiectasias in the central area were the findings. There were no leaf-like structures and no ovoid nest.

SYRINGOMA

Syringoma is a benign adnexal tumour arising from the ducts of the eccrine sweat glands, usually multiple in number and most commonly seen in females at puberty. The lesions are limited to the lower eyelids and cheeks. The individual lesions are skin-coloured, yellowish or mauve, but sometimes appear translucent and cystic. The surface may be dome-shaped or flat-topped and the outline is sometimes angular[22-23]. Dermoscopy shows the "cloud" or "cloud sky" pattern. Homogenous light brown area and a partial delicate, light brown pigment network is seen at the periphery. Multifocal hypopigmentation may be seen in some lesions[34].

BASAL CELL CARCINOMA

Basal cell carcinoma is the most common malignant epithelial skin tumour predominantly affecting middle aged and fair skinned individuals, with a male preponderance. It originates from the basal layer of the epidermis[22-23]. Since they grow exceedingly slowly, most BCCs are innocuous, but if left untreated they can cause extensive destruction of tissue locally, and may lead to death by infiltrating and destroying vital structures[23].

Clinical types of BCC are as follows:

- Nodular or nodulo- ulcerative (rodent ulcer)
- Micronodular
- Morpheaform
- Pigmented BCC
- Superficial BCC (sBCC)
- Fibroepithelioma of Pinkus
- Ulcerated
- Metastatic

There are various histopathological variants of BCC, which include solid nodular, nodular, adamantinoid, baso-squamous, clear cell, cystic, giant cell, granular cell, keloidal cell, keratotic and trichilemmal types.

The common sites of occurrence of BCC are eyelids, inner canthus of eye and behind the ears. Early BCCs are usually small, translucent or pearly, with raised telangiectatic edges. Advanced lesions can present as classical rodent ulcer with an indurated edge and an ulcerated centre[22-23]. Increased palpability of the lesion indicate a chronic lesion and more likelihood that it belongs to a male as they are less likely to attend skin cancer clinics.[36]

Non-pigmented BCCs are much more common than pigmented BCC. In dermatological examination, non-pigmented BCC can easily be distinguished from any other skin lesion by their asymmetrical arborizing vessels, pink colour and focal ulceration. White regression areas may be seen. Pigmented BCC can be clinically indistinguishable from melanoma[32].

Menzies et al.[32] proposed a simple dermoscopic method for diagnosing pigmented BCCs. In this method, a pigment BCC to be diagnosed must have the negative feature and at least one of the positive features (Table 9).

Table 9: Dermoscopic features of pigmented BCC

Negative feature: Absence of pigment network. *Positive features:* - Linear and arborizing telangiectasia - Leaf-like or structureless areas on the periphery of the lesion - Multiple blue-gray globules - Large blue-gray ovoid nests - Focal ulceration - Spoke wheel areas

Arborizing vessels are a specific dermoscopic finding of nodular, cystic and morpheaform BCC. Superficial BCC can be diagnosed by fine micro-arborizing vessels, shiny red-white structure-less areas and multiple small erosions. Other features rarely seen are scattered global pattern of vessels, featureless areas, atypical red vessel, corkscrew vessels, comma vessels, brown globules and dots, telangiectasia, atypical red vessels, red dots, hemorrhage, ulceration, hypopigmented areas, blue-grey ovoid nests, spoke-wheel areas, maple leaf-like areas and red globules on dermoscopy.

In a study by Trigoni et al.[34], 138 lesions of BCC were evaluated, of which 42 were superficial, 96 were nodular, 102 pigmented and 36 non-pigmented. Hallmark dermoscopic features of BCC were scattered atypical vessels, featureless areas and white-red structureless background. Superficial BCC are characterized by comma vessels, haemorrhage, small ulcerations, hypopigmented areas, telangiectasis and blue-gray ovoid nests while non- pigmented BCC by arborizing vessels.

Tschandi et al.[35] analyzed 114 patients out of which 21 had BCC. Grey structures (dots, clods, circles, lines) were found in 95.2% of BCCs. Dermoscopic clues almost exclusively found in BCC were branched vessels, serpentine vessels, and ulceration.

In the 501 histopathologically proven BCC by Suppa et al.[36], 66.9% were sBCC, mainly located on trunk and 33.1% nodular BCC, mainly over the face. Short fine telangiectasias, leaf-like areas, spoke-wheel areas, small erosions and concentric structures were significantly associated with sBCC whereas arborizing telangiectasias, blue-white veil-like structures, white shiny areas and rainbow pattern with nodular BCC. Scalp BCCs were heavily pigmented.

DERMOSCOPIC FEATURES OF UNCOMMON TUMOURS OF THE FACE:

Dermoscopic features of other less common tumours of the face have been described in table 10[22, 23, 38, 39-42] .

Table 10: Dermoscopic features of other tumours of the face.

SCC	- Polymorphous vascular pattern (hallmark) - Targetoid hair follicles - White structureless areas - Central mass of scales and keratin - Ulceration over a whitish background.
Actinic keratosis	Strawberry pattern: - Pink/red pseudo network and erythema surrounding hair follicles - White to yellow surface scales - Linear or wavy vessels surrounding

	hair follicles - Hair follicle openings filled with yellowish keratotic plugs
Keratoacanthoma	- Central yellowish-brownish keratin surrounded by elongated & sometimes thick telangiectasia. - Hair-pin (looped) or linear irregular (serpentine or branched serpentine) vessels common. Glomerular (coiled) vessels may be seen. - White-yellow background halo surround these blood vessels. - Pearl-like structures surrounded by white circles.
Malignant melanoma (uncommon in Indian skin)	- Heterogeneous and asymmetric (colour and structures) - Irregular pigment network - Structure-less areas - Grey-blue or red-rose wheals - Pseudopods/radial streaming - Point and hair-pin vessels
Sebaceous adenoma	- Central opaque whitish structures - Yellowish background
Sebaceoma	- Homogenous yellowish central structure - Peripheral telangiectasia (crown vessels)
Mucinous carcinoma	- Whitish network - Light brown nodules

Trichodiscoma	- Whitish globular structures - Blue-grey nests - Blurred linear vessels
Trichilemmal carcinoma	- Polymorphous vascular pattern - White-yellowish area - Ulceration
Pilomatricoma	- Irregular white and/or yellow structures - White streaks
Merkel cell carcinoma	- Milky red background - Polymorphous vascular pattern (dotted, glomerular, arborizing, linear, irregular)

METHODOLOGY

SOURCE OF DATA

A hospital-based, cross-sectional, descriptive study to evaluate the "dermoscopic findings in common benign and malignant tumours of the face" was conducted in the department of Dermatology, Venereology and Leprosy at B.L.D.E. University's Shri.d B.M. Patil Medical College, Hospital and Research Centre, Vijayapur. Sixty patients with facial tumours were recruited from the out-patient section of the department. The study was conducted from November 2014 till July 2016.

COLLECTION OF DATA:

INCLUSION CRITERIA:

- Patients presenting with clinically suspicious facial skin tumours irrespective of age and sex.

EXCLUSION CRITERIA:

- Patients who are on or have received treatment for the facial tumours.

METHOD:

In this study, a hand-held dermoscope (Dermlite DL3®) was used. It is crafted from solid aluminium which integrates a 25 mm four-element lens with magnification of 10X and offers greatly reduced optical distortion with sharper image across the field of view. This dermoscope combines advantages of both PL and NPL. It has 28 high-powered LEDs, and a fully retractable and removable faceplate spacer design. The spacer comes with a glass faceplate with 10 mm scale.

It has a focal range in excess of ±4 mm. The design eliminates any leakage of immersion fluids into the interior. The device is camera compatible and is powered by rechargeable lithium-ion battery.

Informed consent was taken from all the patients included in the study. All patients were subjected to detailed history, clinical examination and recording of clinical images.

Following clinical examination, dermoscopic evaluation was done in the following steps:

1. Most recent skin lesion was selected.
2. Contact plate was sterilized with spirit.
3. Lesion was first visualized by the non-contact technique.
4. Ultrasound gel was then applied to the surface of the lesion and contact dermoscopy was performed.
5. Dermoscopic images were captured.

Dermoscopic examination included background of the lesion, morphology and pattern of vessels, scale distribution and color, and specific dermoscopic criteria's for each tumour. The findings were recorded. After recording the dermoscopic features, wherever necessary a 3mm punch biopsy was performed from the same lesion, under local anaesthesia. The sample was then sent for the histopathological examination and the findings were recorded.

STATISTICAL ANALYSIS

All characteristics were summarized descriptively. For continuous variables, the summary statistics of N, mean, standard deviation (SD) were used. For categorical data, the number and percentage were used in the data summaries. Data were analyzed using SPSS software v.23.0.

ETHICAL CLEARANCE:

Institutional ethical committee clearance was taken for the study.

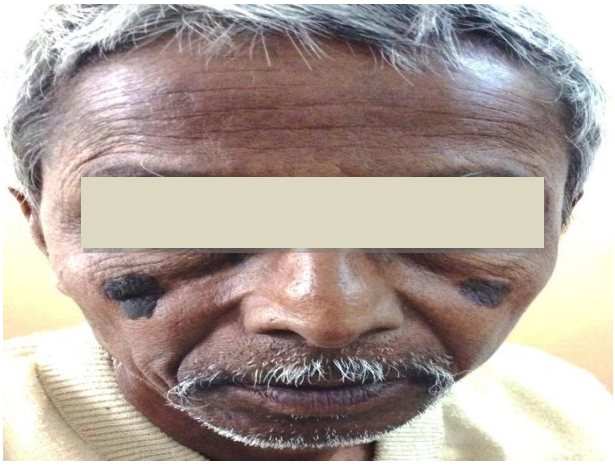


Figure 4: Well circumscribed, dull, flat, hyperpigmented hyperkeratotic plaques over bilateral malar areas with the characteristic "stuck-on" appearance.

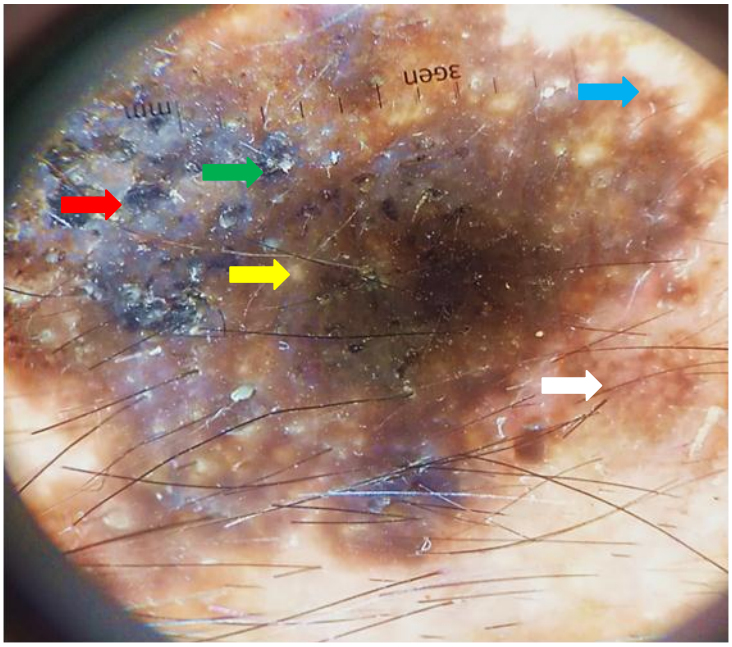


Figure 4a: Dermoscopy showing comedo like openings (red arrow), milia like cysts (yellow arrow), moth eaten border (blue arrow), white scales (green arrow) and pigmentary network (white arrow).

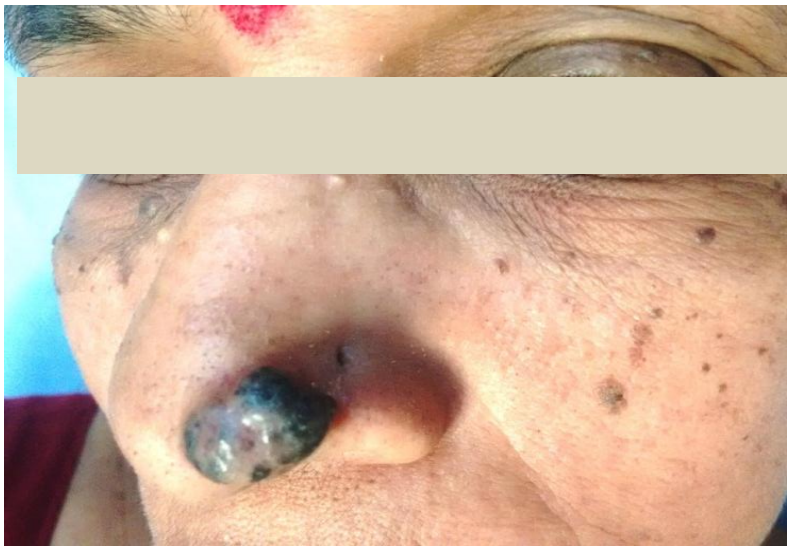


Figure 5: A solitary nodular pigmented BCC present at the tip of the nose.

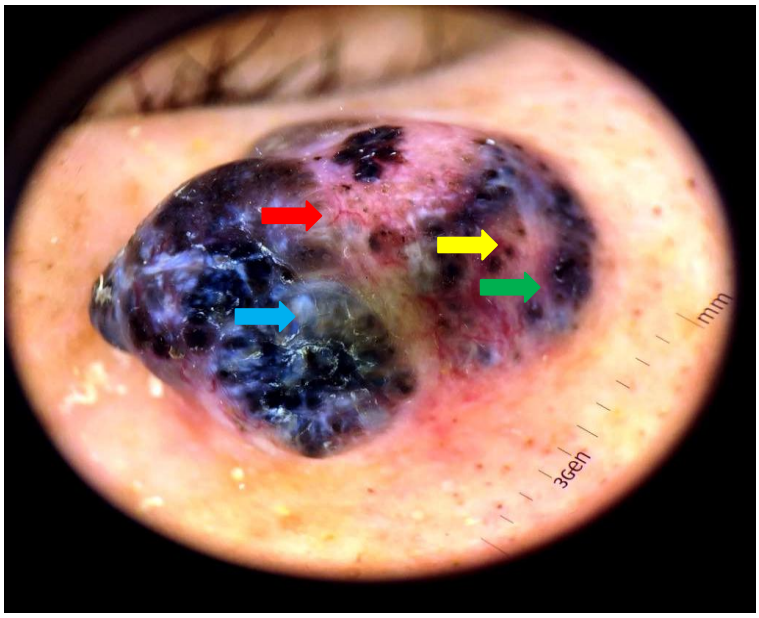


Figure 5a: Dermoscopy showing arborizing vessels (red arrow), blue grey dots & globules (yellow arrow), blue grey ovoid nest (green arrow) and white shiny areas (white shiny areas).

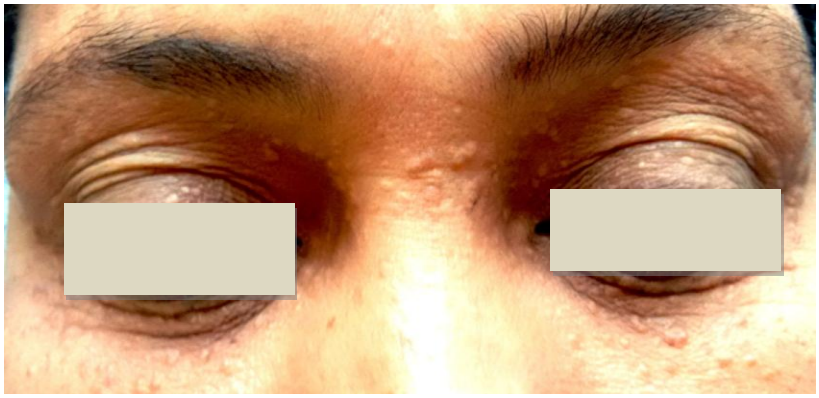


Figure 6: Multiple, 2-3mm, smooth, skin to yellowish coloured, small papules in the periorbital area.

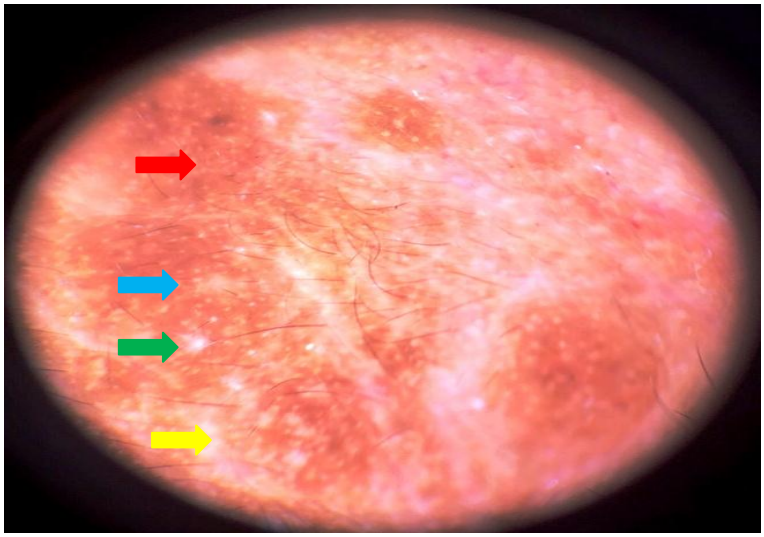


Figure 6a: Dermoscopy showing homogenous light brown area (red arrow), multiple hypopigmentation (yellow arrow), milia like cysts (green arrow) and dilated pores (blue arrow).

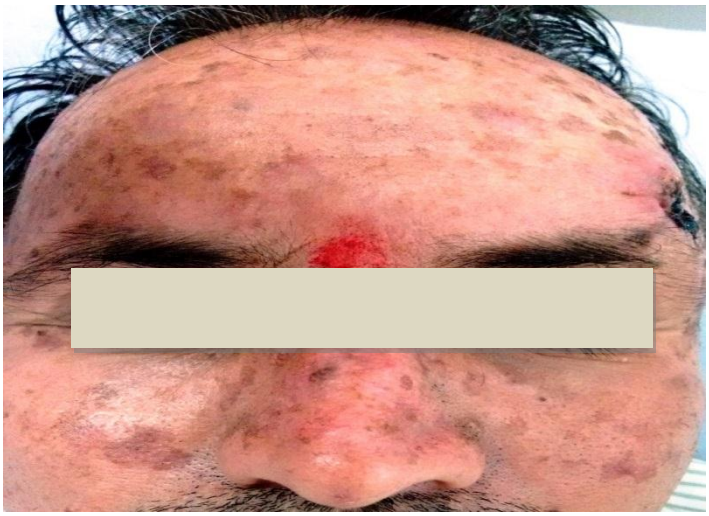


Figure 7: Multiple yellowish hyperkeratotic scaly plaques over the face.

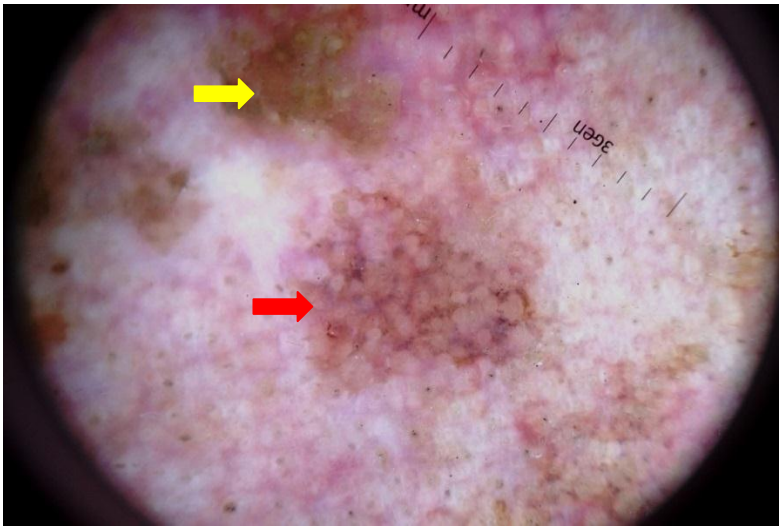


Figure 7a: Dermoscopy showing red-brown pseudonetwork (red arrow) and yellow keratotic plugs (yellow arrow).

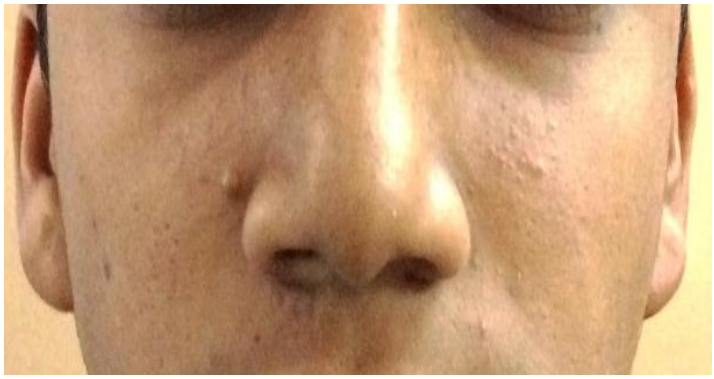


Figure 8: A solitary skin coloured cyst seen over the right perinasal area.

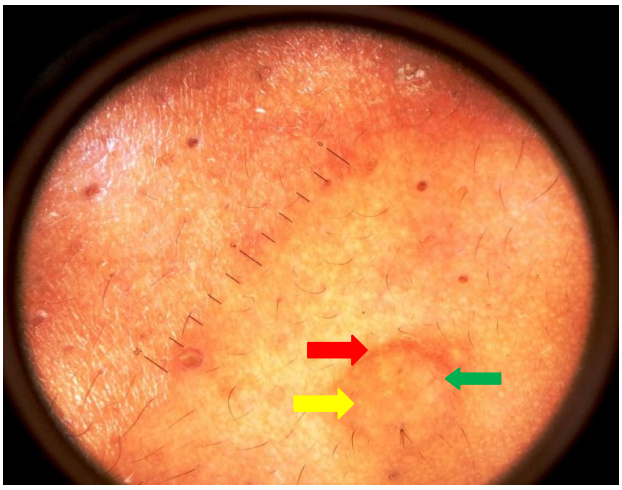


Figure 8a: Dermoscopy showing a well demarcated border (red border), white globules (yellow arrow), homogenous skin coloured areas (green arrow).

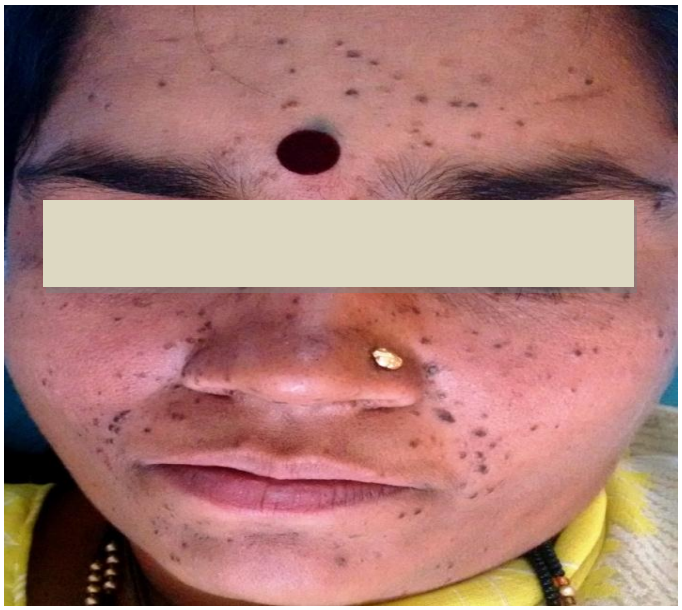


Figure 9: Multiple brown coloured hemispherical transluscent papules in the nasolabial fold and adjacent skin on the face.

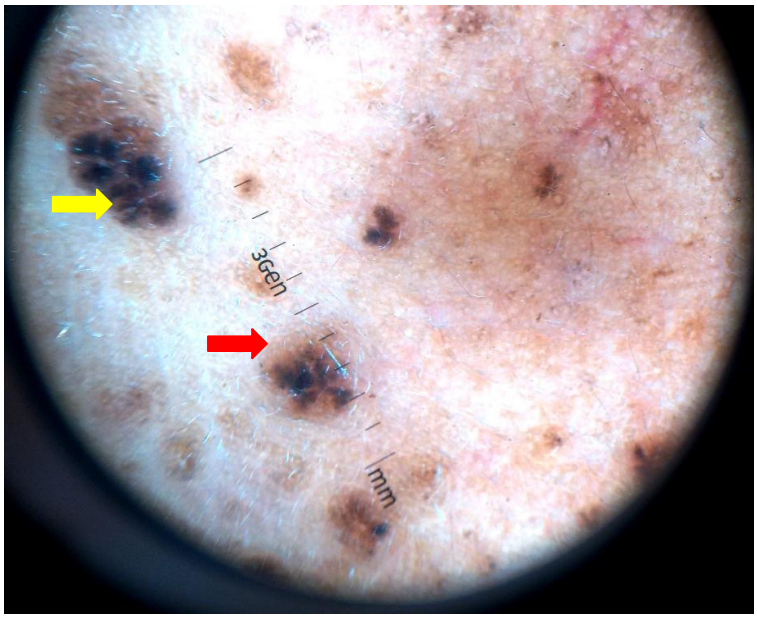


Figure 9a: Dermoscopy showing tumour border (red arrow) and black speckled globules (yellow arrow).

RESULTS

A total of 60 patients with benign and malignant tumours of the face were examined during the study period. Out of which, five patients had more than one type of skin tumours. 36 lesions were of seborrheic keratosis, 13 were BCC and syringoma each, 2 were AK and 1 each was hidrocystoma and trichoepithelioma.(Table 11).

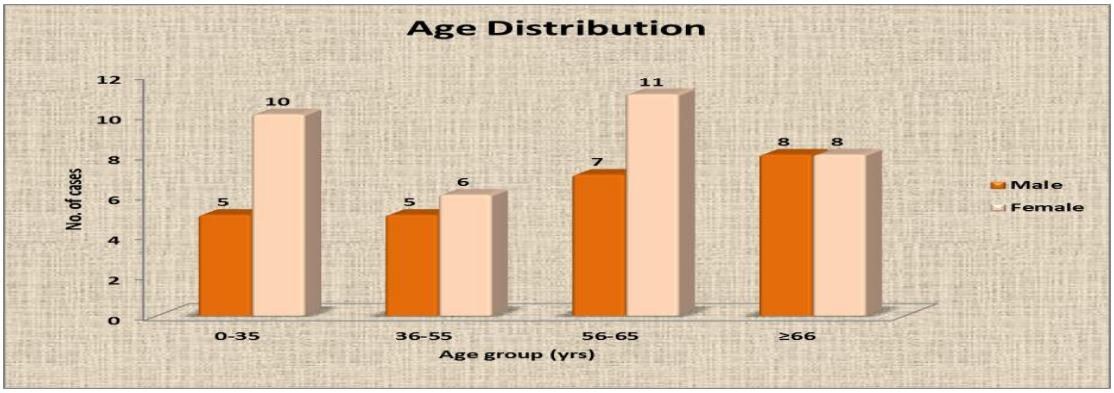
Table 11: Distribution of cases by Clinical diagnosis

Clinical Diagnosis	No. of cases	Percent (out of total 60 cases)
Actinic Keratosis (AK)	2	3.3
Basal Cell Carcinoma (BCC)	13	22.03
Hidrocystoma (HC)	1	1.7
Seborrheic Keratosis (SK)	36	61
Syringoma (SG)	13	22.03
Trichoepithelioma (TR)	1	1.7

AGE INCIDENCE AND GENDER DISTRIBUTION

The age of the study subjects ranged from 16 to 89 years, with mean (± SD) age value of 53.5 (±18.2) years. There was a female preponderance as compared to males overall.

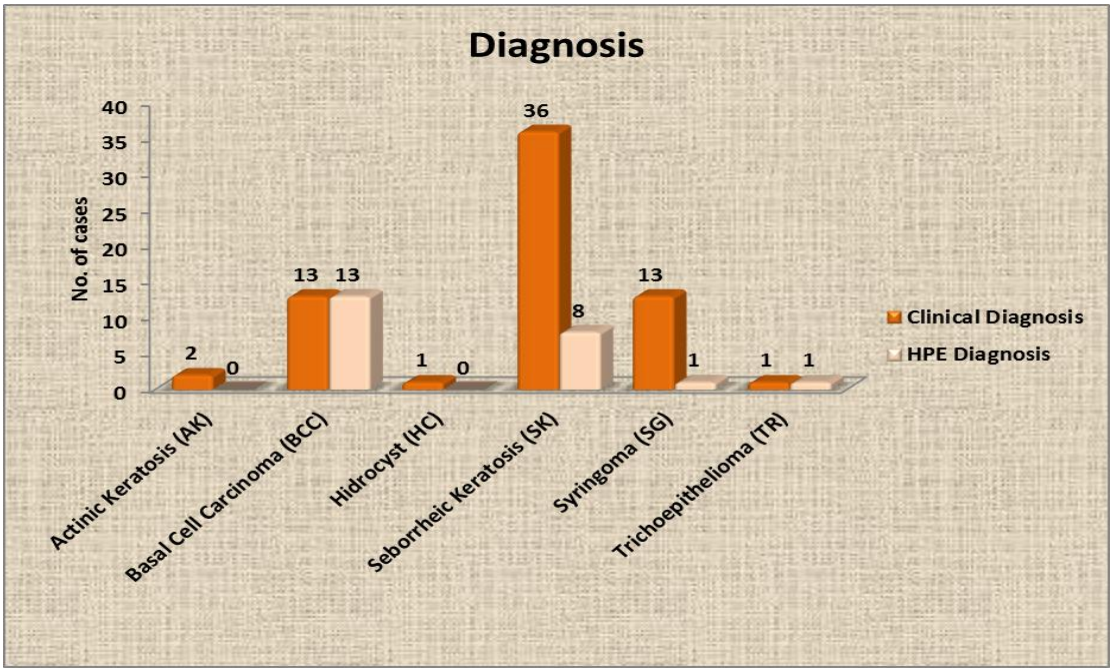
Graph1: Distribution of cases by Age (years) and Sex



CLINICAL DIAGNOSIS AND HISTOPATHOLOGICAL ANALYSIS:

23 (38.43%) patients underwent histopathological examination out of the total number of patients included. In all, the histopathological examination diagnosis correlated to the dermoscopic examination accept in one female patient who was clinically diagnosed as BCC but on non-polarized dermoscopy features were suggestive of seborrheic keratosis while on polarized dermoscopy as BCC, the diagnosis was confirmed on histopathology as BCC.

Graph 2: Clinical diagnosis & its histopathological examination



Results related to individual tumours have been presented below.

Seborrheic keratosis:

Total of 36 patients had SK. Male and females were equally affected [M = 18 (50%), F = 18 (50%)]. Patients presented at an age of more than 55 years predominantly and had lesion for more than 5 yrs. Lesion were usually multiple. Scales were present in 23 patients which were white in colour and diffusely distributed in almost all the cases.

The most common dermoscopic lesional background colour (*n*=23) was light brown followed by dark brown (*n*=15).

Blood vessels were absent (*n*=25) in maximum number of patients, most common type was linear vessels (*n*=7) which were peripherally (*n*=10) distributed.

The commonest dermoscopic findings seen were comedo like-openings (n=32), moth eaten border (n=30), network like structures (n=28), sharp dermarcation (n= 27) and less common findings were fissures and ridges (n=18), milia like cysts (n=15) and fat fingers (n=13). Five of the patients had highly pigmented lesions (Table 12).

Table 12: Distribution of cases of SK and their dermoscopic predictors

Sex	**No. of cases (36)**	**% (out of total 60 cases)**
Male	18	30.0
Female	18	30.0
Age (Years)		
0-35	3	5.0
36-55	7	11.7
56-65	13	21.7
≥66	13	21.7
Duration of lesion		
<1	7	11.7
1-2	7	11.7
3-4	6	10.0
>5	16	26.7
No of Lesions		
Single	4	6.7
Multiple	32	53.3
Scales color		
Absent	13	21.7
White	23	38.3
Scale distribution		

Absent	13	21.7
Central	1	1.7
Diffuse	20	33.3
Peripheral	2	3.3
Background Colour		
Black	2	3.3
Blue Gray	1	1.7
Dark Brown	15	25.0
Light Brown	23	38.3
Red	0	0.0
Yellowish	0	0.0
Vessel Type		
Absent	25	41.7
Arborizing /Telangiectasias	4	6.7
Comma	0	0.0
Linear/ Irregular vessels	7	11.7
Polymorphous	0	0.0
Vessel Pattern		
Absent	25	41.7
Branching	0	0.0
Clustered	0	0.0
Irregular	1	1.7
Radial	10	16.7
Dermoscopic Features		
Network like structures	28	80
White globules	2	3.3
Filliform projections	3	5
Fingerprint like structures	3	5.0
Highly pigmented	5	8.3
Dilated pores	6	10.0
Cerebriform pattern	10	16.7
Fingerprint like structures	12	20.0

Fat fingers	13	21.7
Milia-like cysts	15	25.0
Fissures and ridges	18	30.0
Pigment network	22	36.7
Sharp demarcation	27	45.0
Moth eaten border	30	50.0
Comedo-like openings	32	53.3

Basal cell carcinoma

Thirteen patients were diagnosed clinically and histopathologically as BCC. All BCCs were of the pigmented type clinically; of which 9 were superficial and 4 nodular or ulceronodular BCC. There was a significant female preponderance (F=12, M=1). Most of the patients were above the age of 66 years (n=7) followed by patients within the age group of 55-65 years (n=4). Lesions existed for less than 1 year in majority of patients (n=5) and were usually solitary (n=12).

More than half of the patients (n=7) didn't have scales on dermoscopic examination. Background colour was noted to be blue gray (n=13) for all the study patients. Scattered (n=5) arborizing vessels (n=8) were significant.

Predominant dermoscopic features were blue grey globules & dots (n=20), blue grey ovoid nest (n= 13), featureless areas (n=11), maple leaf like area (n= 9) and shiny red white structureless areas (n=9). The less common features noted were white shiny areas (n=5), erosions (n= 5) and blue grey veil (n=4) (Table 13).

Table 13: Distribution of cases of BCC and their dermoscopic predictors

Sex	**No. of cases**	**%(out of total 60 cases)**
Male	1	1.7
Female	12	20.0
Age(Years)		

0-35	0	0.0
36-55	2	3.3
56-65	4	6.7
≥66	7	11.7
Duration of lesion		
<1	5	8.3
1-2	3	5.0
3-4	3	5.0
>5	2	3.3
No of Lesions		
Single	12	20.0
Multiple	1	1.7
Scales color		
Absent	6	10.0
White	7	11.7
Scale distribution		
Absent	6	10.0
Central	2	3.3
Diffuse	4	6.7
Peripheral	1	1.7
Background Colour		
Black	1	1.7
Blue Gray	13	21.7
Dark Brown	0	0.0
Light Brown	0	0.0
Red	1	1.7
Yellowish	1	1.7
Vessel Type		
Absent	3	5.0
Arborizing /Telangiectasias	8	13.3
Comma	1	1.7
Linear/ Irregular vessels	1	1.7

Polymorphous	0	0.0
Vessel Pattern		
Absent	3	5.0
Branching	2	3.3
Clustered	1	1.7
Regular	1	3.3
Scattered	6	8.3
Dermoscopic Features		
Yellow structureless areas	1	1.7
White globules	1	1.7
Milia like cysts	3	5.0
Spoke wheel area	3	5.0
Ulceration	3	5.0
Blue white veil	4	6.7
Erosion	5	8.3
White shiny areas	5	8.3
Shiny red white structureless areas	7	11.7
Mapple leaf like areas	9	15.0
Blue grey dots and globules	20	33.3
Featureless areas	11	18.3
Blue grey out nests	13	21.7
Brown globules and dots	7	11.7

Syringoma

Thirteen patients with syringoma were examined, with female preponderance (n=9). All the patients had multiple lesions and were less than 35 years (n=10). Duration of lesions was between 1 to 2 years predominantly (n=5). Absence of scales was observed in all the patients studied. Background color was predominantly light brown (n=10) and majority had no vessels (n=11). Dilated pores, homogenous light brown areas, multiple hypopigmentation and light brown network at periphery were seen in all individual (Table 14).

Table 14: Distribution of cases by syringoma and their dermoscopic predictors

Sex	**No. of cases**	**%(out of total 60 cases)**
Male	4	6.7
Female	9	15.0
Age(Years)		
0-35	10	16.7
36-55	1	1.7
56-65	2	3.3
≥66	0	0.0
Duration of lesion		
<1	3	5.0
1-2	5	8.3
3-4	1	1.7
>5	4	6.7
No of Lesions		
Single	0	0.0
Multiple	13	21.7
Scales color		
Absent	13	21.7
White	0	0.0
Scale distribution		
Absent	13	21.7
Central	0	0.0
Diffuse	0	0.0
Peripheral	0	0.0
Background Colour		
Black	0	0.0
Blue Gray	0	0.0
Dark Brown	0	0.0
Light Brown	10	16.7
Red	1	1.7
Yellowish	1	1.7

Vessel Type		
Absent	11	18.3
Arborizing /Telangiectasias	1	1.7
Comma	0	0.0
Linear/Irregular vessels	1	1.7
Polymorphous	0	0.0
Vessel Pattern		
Absent	11	18.3
Branching	0	0.0
Clustered	0	0.0
Irregular	2	3.3
Regular	0	0.0
Dermoscopic Features		
Yellow structureless areas	1	1.7
Dilated pores	13	21.7
Homogenous light brown areas	13	21.7
Light brown network at periphery	13	21.7
Multiple hypopigmentation	13	21.7

Actinic keratosis

Only 2 patients presented with multiple AK. One was male (55years) and the other female (70 years). Both had lesions for 1-2 years. Scales observed were white in colour in the female and white-yellow in the male patient and diffusely distributed in both on dermoscopy.

Background colour was blue grey for the female and light brown to red for the male. Vessels were absent in female but telangiectasia was present in the male.

The specific dermoscopic findings observed were pink-red pseudonetwork and yellow keratotic plugs in both. Multiple slate grey to dark brown dots and globules and targetoid like appearance were seen in the female (Table 15).

Table 15: Distribution of cases of AK and their dermoscopic predictors

Sex	**No. of cases**	**%(out of total 60 cases)**
Male	1	1.7
Female	1	1.7
Age(Years)		
0-35	0	0.0
36-55	1	1.7
56-65	0	0.0
≥66	1	1.7
Duration of lesion		
<1	0	0.0
1-2	2	3.3
3-4	0	0.0
>5	0	0.0
No of Lesions		
Single	0	0.0
Multiple	2	3.3
Scales color		
Absent	0	0.0
White	2	3.3
Yellow	1	
Scale distribution		
Absent	0	0.0
Central	0	1.7
Diffuse	2	1.7
Peripheral	0	0.0
Background Colour		
Black	0	0.0
Blue Gray	1	1.7
Dark Brown	0	0.0
Light Brown	1	1.7

Red	1	1.7
Yellowish	0	0.0
Vessel Type		
Absent	0	3.3
Arborizing /Telangiectasias	1	0.0
Comma	0	0.0
Linear/ Irregular vessels	0	0.0
Polymorphous	0	0.0
Vessel Pattern		
Absent	2	3.3
Branching	0	0.0
Clustered	0	0.0
Irregular	0	0.0
Regular	0	0.0
Dermoscopic Features		
Yellow keratotic plugs	2	3.3
Pink red pseudonetwork	2	3.3
Multiple slate grey to dark brown dots & globules	1	1.7
Targetoid like appearance	1	1.7

Hidrocystoma

A 16 year old male patient presented with a solitary eccrine hidrocystoma. There were no scales and vessels on dermoscopic examination. Background colour noted was light brown. Characteristic findings were presence of sharp demarcation, white globules and homogenous skin coloured areas (Table 16).

Table 16: Distribution of cases of hidrocystoma and their dermoscopic predictors

Sex	**No. of cases**	**%(out of total 60 cases)**
Male	1	1.7
Female	0	0.0
Age(Years)		
0-35	1	1.7
36-55	0	0.0
56-65	0	0.0
≥66	0	0.0
Duration of lesion		
<1	0	0.0
1-2	1	1.7
3-4	0	0.0
>5	0	0.0
No of Lesions		
Single	1	1.7
Multiple	0	0.0
Scales color		
Absent	1	1.7
White	0	0.0
Scale distribution		
Absent	1	1.7
Central	0	0.0
Diffuse	0	0.0
Peripheral	0	0.0
Background Colour		
Black	0	0.0
Blue Gray	0	0.0
Dark Brown	0	0.0
Light Brown	1	1.7
Red	0	0.0

Yellowish	0	0.0
Vessel Type		
Absent	1	1.7
Arborizing /Telangiectasias	0	0.0
Comma	0	0.0
Linear/ Irregular vessels	0	0.0
Polymorphous	0	0.0
Vessel Pattern		
Absent	1	1.7
Branching	0	0.0
Clustered	0	0.0
Irregular	0	0.0
Regular	0	0.0
Dermoscopic Features		
Sharp demarcation	1	1.7
White globules	1	1.7
Homogenous skin coloured area	1	1.7

Trichoepithelioma

A 32 year old female presented with multiple dark coloured trichoepithelioma of 3 to 4 years duration. There were no scales and vessels on dermoscopic evaluation. Background colour was light to dark brown and specific features observed included a tumour border and black speckled globules (Table 17).

Table 17: Distribution of cases of trichoepithelioma and their dermoscopic predictors

Sex	**No. of cases**	**%(out of total 60 cases)**
Male	0	0.0
Female	1	1.7
Age(Yrs)		
0-35	1	1.7
36-55	0	0.0
56-65	0	0.0
≥66	0	0.0
Duration of lesion		
<1	0	0.0
1-2	0	0.0
3-4	1	1.7
>5	0	0.0
No of Lesions		
Single	0	0.0
Multiple	1	1.7
Scales color		
Absent	1	1.7
White	0	0.0
Scale distribution		
Absent	1	1.7
Central	0	0.0
Diffuse	0	0.0
Peripheral	0	0.0
Background Colour		
Black	0	0.0
Blue Gray	0	0.0
Dark Brown	1	1.7
Light Brown	1	1.7
Red	0	0.0

Yellowish	0	0.0
Vessel Type		
Absent	1	1.7
Arborizing /Telangiectasias	0	0.0
Comma	0	0.0
Linear/ Irregularvessels	0	0.0
Polymorphous	0	0.0
Vessel Pattern		
Absent	1	1.7
Branching	0	0.0
Clustered	0	0.0
Irregular	0	0.0
Regular	0	0.0
Dermoscopic Features		
Milia-like cyst	1	1.7
Tumour border	1	1.7
Brown speckled globules	1	1.7

DISCUSSION

Dermoscopy is a skin surface microscopy technique that rapidly grew during the past years enhancing the non-invasive dermatological diagnostic techniques effectively.

Our study suggests various specific dermoscopic clues for diagnosis of facial tumours in Indian skin in comparison to the data available in white skin. Besides the specific dermoscopic features, the vascular morphology and pattern are of equal importance in diagnosis of non-pigmented skin tumours.

Seborrheic keratosis

Seborrheic keratosis is a benign tumour composed of epidermal keratinocytes, displaying variable morphological features, frequently pigmented and more commonly in elderly. Although the classical dermoscopic criteria of SK include multiple milia-like cysts and comedo like openings that had a higher prevalence, additional structures such as hairpin blood vessels, fissures, sulci and gyri improved the diagnostic accuracy[32].

In present study, 36 patients had SK on face with no gender preponderance. Patients presented at an age of more than 55 years predominantly and had lesion for more than 5 years, similar findings were seen by Rajesh et al.[29]

A comparison of the findings of SK in a study by Braun et al.[24], Rajesh et al.[29] and the present study, have been presented in Table 18. In all three studies the patients had pigmented SK commonly showing light to dark brown background colour on dermoscopy. Dermoscopic findings like comedo like openings, sharp demarcation and fissures & ridges were comparable in the three studies. In the present study and that by Rajesh et al.[29], hair pin blood vessels were not observed in any patient in

comparison to 63 % in Braun et al.[24], this may be because of the skin types of Indians belongs to type 4 or 5 predominantly and the blood vessels could not be seen through the brown-coloured Asian skin, which could also be the reason for lower incidence of network like structure in the Indian studies. Fingerprint like structures found in our study was comparable to that of Rajesh et al.[29] Moth eaten border was seen in 83.3% of our patients in comparison to 46% and 31.3 % by Braun et al.[24] and Rajesh et al.[29] respectively. This could be explained by the fact that all the patients with SK only on face were included in our study and they were commonly of flat & common clinical types while the lesions were predominantly present over the trunk and various other clinical types of SK were seen in the other two studies indicating that certain dermoscopic findings are consistent with a particular clinical variant (Eg. Flat SK which are the early lesions of SK had more commonly fingerprint like structures and network like structures and common SK which were more thickened had more commonly comedo like openings, fissures and ridges and sharp demarcation).

Table 18. Comparison of demographic and dermoscopic findings in the present study to that by Braun et al.[24] and Rajesh et al.[29]

SK	**Braun et al (Switzerland)**	**Rajesh et al (Pondicherry)**	**Present study**
Total number of patients	203	250	36
M:F	NC	1:1.04	1:1
Age of patients (years)	NC	> 60	> 55
Hairpin blood vessels	63	0	0
Comedo like openings	71	80	88.9
Moth eaten border	46	31.3	83.3

Milia like cysts	66	24	41.6
Network like structures	46	4	5.5
Sharp demarcation	90.14	82.6	75
Fissures & ridges/ cerebriform pattern	61	78.58	77.78
Finger print like structures	NC	55	33.33

NC- Not commented

In a study by Kopf et al.[25], fat fingers were noted in 44% of patients which was comparable to the present study (36.1%). Also, diffuse white scales were observed in 59.7% of our study patients in comparison to 12 % in a study by Lin et al.[31] where the finding was described as mica like structure which may be due to the difference in the location of the lesions studied.

Basal cell carcinoma

Basal cell carcinoma is the most common human cancer. It has a slow progressive course of peripheral extension. 80% of BCC occur on the head and neck[32]. There are various clinical and histopathological types known as described earlier. Pigment when present is usually unevenly distributed throughout the tumour.

In the present study, 9 superficial and 4 nodular or nodulo-ulcerative clinical variants of BCC were seen, all were of pigmented variety. The diagnosis was confirmed histopathologically in all cases. There was a significant female preponderance noted. Most of the patients were above the age of 55 years. Lesions existed for less than 1 year in majority of patients and were usually solitary. More than half of the patients didn't have scales on dermoscopic examination. Background colour was noted to be blue gray for majority of the study patients.

On comparing the demographic and dermoscopic studies by Suppa et al.[36] and Trigoni et al.[34] with the present study (Table 19), it was observed that BCC was found to be more common in males in previous two studies compared to the present study where there was a significant female preponderance which may be due to the predominant patch to plaque palpability of sBCC. Age of the patients presenting with BCC was above 50 years in the three studies. On dermoscopic examination, arborizing telangiectasia, white shiny areas and ulceration was comparable in the three studies. However, there was a considerable difference in dermoscopic findings of blue-grey ovoid nest which was found in all of our patient compared to 31% and 17 % in that by Suppa et al.[36] and Trigoni et al.[34] respectively, this could be because of the difference in anatomic location of lesions (Table 19), degree of pigmentation and clinical palpability among sBCC subtype. Blue-white veil like structures which indicate the late stage of BCC was comparable in our study to that by Suppa et al.[36] Featureless areas seen in 84.6% of our patients was comparable to 78% in study by Trigoni et al.[34] Ulceration, mapple leaf like areas and spoke wheel areas were more commonly seen in our study as 23%, 69.2% and 23% respectively compared to that in other two studies. This difference was thought to be due to more number of sBCC in the present study. Spoke wheel areas and mapple leaf like areas are considered to be exclusive findings of sBCC. The dermoscopic differences noted could also be explained because of the less number of patients and the skin type studied in the present study.

Table 19: Comparison of demographic and dermoscopic findings of BCC in the present study to that by Suppa et al.[36] and Trigoni et al.[34]

BCC	Suppa et al Rome	Trigoni et al Greece	Present study
Number of patients	153	138	13
Age of patients (years)	64	> 50	> 65
M : F	1.1: 1	1.7:1	1: 12
Predominant site of lesions	Trunk	Trunk	Face
Blue grey ovoid nest	31.4	17	100
Arborizing telangiectasia	72.6	63	61.5
White shiny area	35.3	26	39
White-red structureless area	NC	61	38
Erosion	12.6	26	39
Ulceration	43.8	26	23
Mapple leaf like areas	13.7	6	69.2
Blue grey globules	23.5	21	84.6
Spoke wheel areas	3.9	6	23
Blue-white veil-like structures	12.4	NC	30.7
Pigment network	2	NC	0
Featureless area	NC	78	84.6

Syringoma

Syringoma is a benign skin tumour composed of sweat ducts that is usually multiple, vary in size from 1 to 5 mm. They manifest as bilaterally symmetrical flat topped skin coloured cysts.[23]

Thirteen patients with syringoma on face were evaluated in our study. It was observed that females of age less than 35 years were significantly affected. Duration of lesions was 1 to 2 year. Dermoscopic examination showed absence of scales and vessels. Homogenous light brown areas, multiple hypopigmentation and light brown

network at periphery were seen in all patients. These findings were consistent with a study by Hayashi et al.[42] in Japanese females.

Present study also showed the presence of dilated pores in all patients with syringomas, which has not been reported in the previous study. This may probably be due to the inclusion of only facial lesions which are known to have more number of sebaceous glands.

Actinic keratosis

Actinic keratosis are hyperkeratotic lesions occurring on chronically light exposed adult skin such as face, scalp, ears and dorsa of hands, which are focal areas of abnormal proliferation and differentiation that carry a low risk of progression to invasive SCC. These are common in both sexes but there is preponderance in males. Lesions are usually multiple and comprise either as macules or papules with a rough scaly surface resulting from disorganized keratinization and a variable degree of inflammation. Lesions are better felt than seen [22, 23].AK can be pigmented or non-pigmented[32].

In our study two patients, an elderly male and a female presented with multiple AK. On dermoscopic evaluation, white coloured scales were noted in case of the female and white-yellow in the male patient and these were distributed diffusely in both. Background colour was blue grey for the female and light brown to red for the male. Vessels were absent in female but telangiectasia was seen in the male. The specific dermoscopic findings observed were pink-red pseudonetwork and yellow keratotic plugs in both. Multiple slate grey to dark brown dots and globules and targetoid like appearance were seen in the female. The variability in the findings observed in the patients could not be commented upon because of the less number of the patients studied.

These findings were consistent with the studies by Zaluadek et al.[32] and Lee et al.[40]

Hidrocystoma

Hidrocystoma typically presents as a solitary, 0.5-1 cm, dome shaped lesions on the face containing a clear or bluish fluid. Multiple lesions have been described and other sites may be affected including perineum. Both sexes are affected equally in middle age or older people. The cysts enlarge in summers and flatten in winters. They can be apocrine or eccrine[22, 23, 43].

In the present study, a 16 year old male patient presented with a solitary hidrocystoma. On dermoscopic examination, light brown to skin coloured background was noted. Characteristic findings were presence of sharp demarcation, white globules and homogenous skin coloured areas.

Zaballos et al.[44] conducted dermoscopic study on 22 patients with apocrine hidrocystoma showing homogenous skin (31.8%), yellow (31.8%) and blue (22.7%) coloured areas in the study subjects. Vascular structure were identified in 81.8% patients; arborizing vessels in 68.2% and linear-irregular in 9.1% of the cases. Whitish structures were identified in 22.7% of the lesions.

Correia et al.[45] defined dermoscopic features of eccrine hidrocystoma as well-demarcated, vessel free cystic lesions.

Duman et al.[46] showed well demarcated lesions with a homogenous bluish purple central area surrounded by a characteristic pale halo in case of eccrine hidrocystoma.

In our study we made a dermoscopic diagnosis of eccrine hidrocystoma for the patient which needs to be confirmed by histopathological examination, which could not be performed due to the denial of consent.

Trichoepithelioma

Trichoepitheliomas are benign neoplasms derived from the hair follicles. They present as asymptomatic, smooth, yellowish hemispherical 5-7mm, firm papules in the nasolabial folds and adjacent skin. They may occur singly and sporadically, but multiple TE is often inherited as an AD trait. The heritable form (multiple familial TE) may be caused by mutation in a tumour suppressor gene on chromosome 9. Lesions are more common in females and arise most often during childhood or early adolescence[22, 23].

In our study, a 32 year old female presented with multiple dark coloured trichoepitheliomas of 3 to 4 years duration. Light to dark brown colour was noted on the background and specific dermoscopic features observed included a tumour border, milia like cyst and black speckled globules. The diagnosis was confirmed by histopathological examination.

Ardigo et al.[47] concluded that all TE lesions showed arborizing telangiectasias. The desmoplastic lesions also had an ivory-white background throughout.

A study by khelifa et al.[47] on the dermoscopic findings in desmoplastic TE showed well defined borders and an ivory-white colour, as well as prominent arborizing telangiectasias in the central area and on the right side.

There are no reports yet on the dermoscopic findings in case of dark coloured TE.

CONCLUSION

Skin tumours develop as a result of proliferation of single or multiple components of the skin. They range from benign lesions that merely cause cosmetic concern to premalignant lesions and aggressive tumours. Dermoscopy is a non-invasive technique combining digital photography and light microscopy for in vivo observation and diagnosis of pigmented and recently, non-pigmented skin lesions. The visualization provided by dermoscope can be compared to the aerial view of the skin whereas the histopathology provides a deeper view of skin. Biopsy and histopathological examination has always been a gold standard for the diagnosis of skin tumours of the face. However, since HPE is an invasive technique, it is often associated with anxiety for scarring among the patients and frequent refusal for the procedure. Moreover, interpretation of histopathological examination is time consuming, resulting in delay of decision making.

Since the invention of the dermoscope, its use has been explored in various dermatological diseases. Dermoscope is a simple, easy to use instrument that can be used in the outpatient department.

In our study it has been observed that skin tumours of the face have specific dermoscopic features which help their early detection. In SK, most of the dermoscopic characteristics are in accordance with the literature published, SK appears to be more common in middle and old age, with equal sex distribution. Presence of comedo like-openings, moth eaten border, network like structures, sharp dermarcation and less common findings like, fissures and ridges, milia like cysts and fat fingers help to clinch the diagnosis. Blue gray background, arborizing vessels, blue grey globules & dots, blue grey ovoid nest, featureless areas, maple leaf like area and shiny red white structureless areas are the predominant findings in BCC. A consistent

variability in dermoscopic features of BCC is displayed according to the clinical types and the anatomic location of the lesion. The principal dermoscopic findings in syringoma were homogenous light brown areas, multiple hypopigmentation and light brown network at periphery. Dilated pores could be correlated to the lesions on the face. In AK, telangiectasia, pink-red pseudonetwork, yellow keratotic plugs, multiple slate grey to dark brown dots and globules and targetoid like appearance help in the diagnosis. Presence of sharp demarcation, white globules and homogenous skin coloured areas were the predominant findings in eccrine hidrocystoma. The dermoscopic findings in dark coloured TE are tumour border, milia like cyst and black speckled globules. The number of publications on dermoscopic features of majority of tumours of the face are limited in the literature, more so in the Indian literature.

The limitations of the study were the small sample size and the correlation of the dermoscopic findings with the histopathological examination could not be done due to refusal for biopsy, which was statistically significant. Further studies are needed to evaluate specificity and sensitivity of the dermoscopic features and to conclude that dermoscope could be a substitute for the invasive and time-consuming skin biopsy and HPE in a busy out-patient department.

SUMMARY

A hospital based, cross-sectional, descriptive study to determine the dermoscopic findings in common benign and malignant tumours of the face was conducted during the period of November 2014 to July 2016. Patients presenting with clinically suspicious skin tumours of the face irrespective of the age and who did not receive any treatment were included in the study. All patients were subjected to detailed history, clinical and dermoscopic evaluation. Clinical and dermoscopic images were recorded for each patient. The skin lesion which was examined with the dermoscope was biopsied and sent for the histopathological examination.

Following are the salient findings of the study:

Dermoscopic findings are specific for each skin tumour of the face.

- In SK, the presence of comedo like-openings, moth eaten border, network like structures, sharp dermarcation and less common findings; fissures and ridges, milia like cysts and fat fingers help to reach the diagnosis.
- Blue gray background, arborizing vessels, blue grey globules & dots, blue grey ovoid nest, featureless areas, maple leaf like area and shiny red white structureless areas are the predominant findings in BCC.
- The principal dermoscopic findings in syringoma were dilated pores, homogenous light brown areas, multiple hypopigmentation and light brown network at periphery.
- In AK, telangiectasia, pink-red pseudonetwork, yellow keratotic plugs, multiple slate grey to dark brown dots and globules and targetoid like appearance help in the diagnosis.
- Presence of sharp demarcation, white globules and homogenous skin coloured areas were the predominant findings in eccrine hidrocystoma.

- The dermoscopic findings in pigmented TE are tumour border, milia like cyst and black speckled globules.
- The number of publications about the dermoscopic features of majority of benign and malignant tumours of the face are limited in the literature, more so in the Indian literature.
- Many new dermoscopic findings were reported for the first time in this study which require further studies with larger number of patients.
- The dermoscopic findings could not be correlated with the histopathological examination due to lack of consent for the invasive procedure by the patients.

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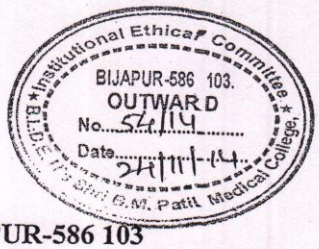
ANNEXURES

ETHICAL CLEARANCE CERTIFICATE



B.L.D.E. UNIVERSITY'S
SHRI.B.M.PATIL MEDICAL COLLEGE, BIJAPUR-586 103
INSTITUTIONAL ETHICAL COMMITTEE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Ethical Committee of this college met on 22-11-2014 *at* 3-30pm *to scrutinize the Synopsis of Postgraduate Students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected & revised version synopsis of the Thesis has been accorded Ethical Clearance.*

Title "Dermoscopic findings in common benign and malignant tumours of the face"

— x — x — x —

Name of P.G. student Dr. Neha Khurana.
Dept of Dermatology.

Name of Guide/Co-investigator Dr Arun. C. Inamadar, Prof & HOD
Dept of Dermatology

for

DR.TEJASWINI. VALLABHA
CHAIRMAN
INSTITUTIONAL ETHICAL COMMITTEE
BLDEU'S, SHRI.B.M.PATIL
MEDICAL COLLEGE, BIJAPUR.

Following documents were placed before E.C. for Scrutinization
1) Copy of Synopsis/Research project.
2) Copy of informed consent form
3) Any other relevant documents.

SAMPLE INFORMED CONSENT FORM

B.L.D.E.U's SHRI B. M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, VIJAYAPUR.

Department of Dermatology, Venereology and Leprosy.

RESEARCH INFORMED CONSENT FORM

TITLE OF THE PROJECT:- "DERMOSCOPIC FINDINGS IN COMMON BENIGN AND MALIGNANT TUMOURS OF THE FACE"

PG GUIDE :- DR. A.C. INAMADAR

PG STUDENT :- DR. NEHA KHURANA

PURPOSE OF RESEARCH:-

I have been informed that this project will determine the dermoscopic findings in common benign and malignant tumours of the face.

BENEFITS:-

I understand that my participation in this study will help the investigator in early identification and management of skin tumours.

PROCEDURE:-

I understand that relevant history will be taken and I will undergo detailed clinical, histopathological and dermoscopic examination.

RISK AND DISCOMFORTS:-

I understand there is no risk involved and I will experience no discomfort during the clinical examination.

CONFIDENTIALITY:-

I understand that medical information produced by this study will become a part of my hospital records and will be subjected to the confidentiality and privacy regulation of the said hospital. Information of a sensitive personal nature will not be a part of the medical records, but will be stored in the investigator's research file.

If the data are used for publication in the medical literature or for teaching purposes no names will be used and other identifiers such as photographs and audio or videotapes will be used only with my special written permission. I understand I may see the photographs, videotapes and hear the audiotapes before giving this permission.

REQUEST FOR MORE INFORMATION:-

I understand that I may ask more questions about the study at any time concerned. Dr. Neha Khurana, the researcher is available to answer my questions or concerns. I understand that I will be informed of any significant new findings discovered during my participation.

REFUSAL OR WITHDRAWAL OF PARTICIPATION:-

I understand that my participation is voluntary and I may refuse to participate or may withdraw consent and discontinue participation in this study at any time without prejudice.

INJURY STATEMENT:-

I understand that in the unlikely event of injury to me resulting directly from my participation in this study and if such injury were reported promptly, then medical treatment will be available to me, but no further compensation will be provided. I

understand that by my agreement for my participation in this study, I am not waiving any of my legal rights.

I have explained to (patient's / relevant guardian's name) the purpose of the study, the procedures required, and the possible outcome to the best of my ability in patient's own language.

_____ _____

Investigator / P. G. Guide Date

I confirm that …….(Name of the PG guide / chief researcher) has explained to me the research, the study procedures that I undergo and the possible risks and discomforts as well as benefits that I may experience. I have read and I understand this consent form. Therefore, I agree to give my consent for my participation as a subject in this research project.

_____ _____

Participant / guardian Date

_____ _____

Witness to signature Date

PROFORMA

B.L.D.E.U'S SHRI B. M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, VIJAYAPUR.

Department of Dermatology, Venereology and Leprosy.

S.NO: Date:

Name: IP/OP NO:

Age/sex: Religion:

Address: Occupation/Contact no.:

HISTORY:

1. Presenting feature :

2. Past history:

   Any previous treatment received:

3. Family history:

GENERAL PHYSICAL EXAMINATION

Weight: BP: Pulse rate:

Pallor: Cyanosis: Icterus

Clubbing: LN: Edema:

SYSTEMIC EXAMINATION

CVS: RS:

CNS: PA:

CUTANEOUS EXAMINATION

Site: Size:

Surface: Scale / Telangiectasia / Shiny / Lustureless / Prominent follicular opening / Presence of hair

Border: Color:

Discharge: Pus / Blood / any other

Tenderness: Regional Lymphadenopathy:

PROVISIONAL DIAGNOSIS:

SKIN BIOPSY: Done / Not Done

HISTOPATHOLOGY REPORT:

OTHER INVESTIGATIONS:

<u>DERMATOSCOPIC FINDINGS</u>

Table 1: Number of lesions

NUMBER OF LESIONS	
SINGLE	
MULTIPLE	

Table 2: Color of scales

SCALE COLOR	
YELLOW	
WHITE	

Table 3: Distribution of scales

SCALES DISTRIBUTION	
PERIPHERAL	
CENTRAL	
DIFFUSE	
PATCHY	

Table 4: Background color

COLOR	
LIGHT BROWN	
DARK BROWN	
BLUE GRAY	
YELLOWISH	
RED	
BLACK	
WHITE	

Table 5: Type of vessel

TYPE OF VESSEL	
ARBORIZING VESSELS OR TELANGIECTASIAS	
DOTTED	
HAIRPIN	
GLOMERULAR	
COMMA	
CROWN	
MILKY-RED GLOBULES/AREAS	
LINEAR/ IRREGULARVESSELS	
RED DOTS	
CORKSCREW	
STRAWBERRY PATTERN	
POLYMORPHOUS VESSELS	

Table 6: Pattern of vessels

PATTERN OF VESSELS	
REGULAR	
IRREGULAR	

PATCHY	
PERIPHERAL/RADIAL	
CENTRAL	
CLUSTERED	
STRING OF PERALS	
BRANCHING	
ROPE-LADDER PATTERN	

DIFFERENTIAL STRUCTURES:

DERMOSCOPIC DIAGNOSIS:

DERMATOSCOPIC FEATURES:

SEBORRHEIC KERATOSIS

Milia like cysts	
Sharp demarcation	
Comedo like openings	
Light to dark brown coloured	
Fissures & ridges/cerebriform pattern	
Finger print like structures	
Moth eaten border	

SYRINGOMA

Homogenous light brown area	
Light brown network at periphery	
Multiple hypopigmentation	

BASAL CELL CARCINOMA

Shiny red white structure-less areas	
Featureless areas	
Brown globules & dots	
Blue grey ovoid nest	
Spoke wheel areas	
Maple leaf like areas	
Red globules	

SCC

Centrally located scales	
Polymorphous vascular pattern	

KERATOACANTHOMA

Central yellowish to brown structureless areas	
White yellow background halo	
Pearl like structures	

TRICHOEPITHELIOMA

Ivory white color	
Well defined borders	
Chrysalis	

KEY TO MASTER CHART

M	-	Male
F	-	Female
SK	-	Seborrheeic keratosis
BCC	-	Basal cell carcinoma
pBCC	-	Pigmented BCC
TE	-	Trichoepithelioma
Mu	-	Multiple
ND	-	Not done
S	-	Solitary
Y	-	Yellow
W	-	White
A	-	Absent
D	-	Diffuse
C	-	Central
P	-	Peripheral
B	-	Black
BG	-	Blue gray
DB	-	Dark brown
LB	-	Light brown
R	-	Red

LV	-	Linear vessels
AV	-	Arborizing vessels
CV	-	Clustered
PM	-	Polymorphous vessels
R	-	Radial
B	-	Branching
IR	-	Irregular vessels
BGD	-	Brown globules & dots
PN	-	Pigmentary network
BGG	-	Blue grey globules & dots
BGON	-	Blue grey ovoid nest
BWV	-	Blue white veil
C	-	Crysalis
CLO	-	Comedo like openings
CP	-	Cerebriform pattern
DP	-	Dilated pore
E	-	Erosion
FF	-	Fat fingers
FA	-	Featureless area
FR	-	Fissure & ridges
FPS	-	Fingerprint like structures
GLS	-	Globule like structures

YKP	-	Yellow keratotic plugs
HLBA	-	Homogenous light brown areas
IWC	-	Ivorywhitecolour
LBN	-	Light brown network
MC	-	Milia like cysts
MEB	-	Moth eaten border
MH	-	Multiple hypopigmentation
ML	-	Mapple leaf like areas
NLS	-	Network like areas
PRP	-	Pink-red pseudo network
RG	-	Red globules
SD	-	Sharp demarcation
SLA	-	Shiny red white structureless areas
SWA	-	Spoke wheel areas
U	-	Ulceration
WDA	-	Well defined areas
WSA	-	White shiny areas
YSA	-	Yellow structureless areas
WG	-	White globules
HSCA	-	Homogenous skin coloured areas
FP	-	Filliform projections
HP	-	Highly pigmented

TB	-	Tumour border
BSG	-	Black speckled globules
TL	-	Targetoid like structures
SG	-	Syringoma
HC	-	eHidrocystoma