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VESICOBULLOUS DISORDERS WITH THE HELP OF DERMOSCOPIC FINDINGS

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ABSTRACT

DS is a noninvasive diagnostic technique that enables the visualization of morphological features that are not discernible to the unaided eye. As a result, it serves as a bridge between macroscopic clinical DS and microscopic dermatopathology. Thus, the aim of the study was to evaluate and assess the dermoscopic findings associated with vesicobullous disorders(VBD). A comprehensive history and dermatological exam were performed. Examation of the disease's was performed. The demographic photos were taken and saved using a dermlite 4 DS at 10 X magnification and an iPhone camera. We used ultrasound gel as an interface material for polarized and non-polarized modes. On the "target" lesions, if needed, Tzanck smear and skin biopsy procedures were performed to validate the diagnosis. In our study we found that, DS of five cases of erythema multiforme showed red, blue, and black dots at the center, a yellowish translucent area surrounding it, and red and blue dots at the periphery with homogenous erythema. We concluded that, DS differentiation points may not even be necessary because DS results can help with the diagnosis on their own.

Keywords: DS, Tzanck smear, skin biopsy, vesicobullous disorders.

INTRODUCTION

The technique of dermoscopy (DS), which is generally regarded as the most widely accepted method, was originally introduced by Friedman[1]. Furthermore, according to many researchers, the method of skin surface microscopy was first employed in the early 20th century by Johann Saphier in 1920. For this objective, Saphier employed a binocular microscope that was equipped with an integrated light source. The technique of dermatoscopy, which is usually attributed to Leon Goldman, was first developed in 1951 as a means of evaluating pigmented lesions. MacKie (1971) conducted a study wherein a procedure was utilized to assess pigmented lesions before undergoing surgical intervention.[2]

The utilization of DS significantly improves the accuracy of diagnosis when evaluating pigmented skin lesions in a clinical setting. Moreover, it demonstrates its worth in assessing

vascular anatomical features that are imperceptible without the assistance of magnification. Observation of persistent dermoscopic patterns can facilitate the diagnosis of specific disorders. Hence, the implementation of this office method has the potential to obviate the need for a skin biopsy in terms of both diagnostic purposes and ongoing monitoring. The incorporation of image storage functionalities and the ability to view results in real-time are supplementary advantages. The use of DS has seen a steady rise in its application for distinguishing non-pigmented skin disorders, including malignancies, inflammatory conditions, and infectious diseases. The histopathologic examination is widely considered the definitive approach for diagnosing dermatological conditions. DS should not be considered a replacement or competitor for histology. Instead, it should be viewed as an additional tool that provides valuable insights into the diagnostic procedure. However, it is crucial to possess a sufficient understanding of the mechanics of the device and DS patterns in order to effectively utilize this technique. As a result, we decided to perform ds findings associated with VBD in our study.

AIM

To evaluate and assess the DS findings associated with VBD.

INCLUSION CRITERIA

1. Patient history & clinical findings must suggest vesicubullous disorders which includes infection, inflammation, genetic , antibody mediated , mechanical, environmrntal metabolic & drugs related.
2. Both male and female were included in the study.

EXCLUSION CRITERIA

Patient with any secondary infected lesion.

MATERIALS & METHOD

We conducted a cross-sectional observational study with around 230 patients with various vesicobullous disorders in the department of Dermato-Venereo-Leprology at KIMS, Karad starting from November 2017 ending to October 2019. A detailed history and a dermatological examination were performed. Further, demographic data in terms of age, gender, and clinical variables such as site and duration of lesions was documented.In addition to this, we also performed dermoscopic examinations on the most representative and classical lesions of the disease, which were treated as target lesions. Here, a dermlite 4 dermoscope (3Gen Inc., San Juan Capistrano, CA, USA) with 10 X magnifications and an attached iPhone mobile camera was used to capture and save the demographic images.Here, we used ultrasound gel as an interface medium in conjunction with both polarized and non-polarized modes. Tzanck smear and skin biopsy procedures were performed on the "target" lesions as needed in order to validate the diagnosis. The dermoscopic findings were compared and matched with the corresponding histopathological findings.

STATISTICAL ANANLYSIS

The data was analyzed and entered into Microsoft Excel 2010. The categorical variables were represented using frequency and percentage values. A chi-square test was conducted to determine the association between the final diagnosis of vesicobullous disorder and the study parameters. A significance level of $P<0.05$ was used to determine statistical significance. The data analysis was conducted using STATA version 14.0.

RESULT

Sex	No. of Cases	Percentage
Male	120	52.17
Females	110	47.83
Total	**230**	**100.00**

TABLE 1: SEX WISE DISTRIBUTION

In our study, it was observed that out of a total of 230 patients, the majority consisted of males, accounting for 120 patients (52.17%), while females comprised 110 patients (47.83%).

Age Group (Years)	Male	Female	Total	Percentage
0 – 10	13	5	18	07.83
11 – 20	23	23	46	20.00
21 – 30	10	18	28	12.17
31 – 40	22	13	35	15.22
41 – 50	26	24	50	21.74
51 – 60	18	18	36	15.65
61 - 70	6	8	14	06.09
71 - 80	2	1	3	01.30
Total	**120**	**110**	**230**	**100**

TABLE 2: AGE-WISE DISTRIBUTION

In our study, it was observed that the highest proportion of patients, totaling 50 individuals (21.74%), fell within the age group of 41–50 years. Conversely, the lowest number of patients, totaling 3 individuals (1.30%), were observed in the age group of 71–80 years.

Sr. no.	Disease	Number of patients			Percentage
		Male	Female	TOTAL	
1	Chicken Pox	29	31	60	26.08
2	Herpes Zoster	25	25	50	21.73
3	Pemphigus Vulgaris	21	9	30	13.04
4	Bullous Pemphigoid	15	15	30	13.04
5	Herpes Labialis	4	6	10	04.34
6	Pompholyx	3	7	10	04.34
7	Insect Bite Reaction	3	2	5	02.17
8	Contact Dermatitis	3	2	5	02.17
9	Hand Foot Mouth Disease	3	2	5	02.17
10	Pemphigus Foliaceous	1	4	5	02.17

11	Erythema Multiforme	4	1	5	02.17
12	Linear IgA Disease	2	1	3	01.30
13	Bullous FDE	2	1	3	01.30
14	Lichen Planus Pemphigoides	2	1	3	01.30
15	Bullous Lichen Planus	1	1	2	00.86
16	Epidermolysis Bullosa	2	0	2	00.86
17	Hailey Hailey disease	0	2	2	00.86
	Total	**120**	**110**	**230**	**100.00**

TABLE 3: VESICOBULLOUS DISORDER

In our study we found that, the must common disorder was chicken pox with total of 60 patients (26.08%) whereas the least common disorder was bullous lichen planus, epidermolysis with 2 patients (00.86%).

DS findings	**Number of cases**	**Percentage**
Yellowish pink translucent area	220	95.65
Surrounding Erythema	210	91.30
Regular margins	205	89.13
Absent pigment network	184	80
Absent eccrine opening	165	71.73
Absent follicular openings	152	66.08
Black/Brown dots	60	26.08

TABLE 4: DS FINDINGS

In our study we found that , most common finding was seen in yellowish-pink translucent area (95.65%), followed by surrounding erythema (91.30%). The majority of the lesions had regular margins (89.13%), an absent pigment network (80%), an absent eccrine opening (71.73%), and an absent follicular opening (66.08%).

Stage of lesion	**Number of cases**	**Percentage**
Early	20	33.33
Intermediate	20	33.33
Umbilicated	10	16.66
Late	10	16.66
Total	**60**	**100**

TABLE 5: DISTRIBUTION OF CASES OF CHICKENPOX (CP)

In our study we found that ,out of 60 CP patients, early, intermediate, umbilicated, and late lesions were observed in 20 (33.33%), 20 (33.33%), 10 (16.66%), and 10 (16.66%) patients respectively.

DS patterns	Stage of lesions
Early (n=20)	
Pale yellowish translucent area	90% (18)
White globules	30% (6)
Pink areas	70% (14)
Light erythematous background	100% (20)
Intermediate (n=20)	
Pink areas	70% (14)
White globules	10% (2)
Orange-yellow globules	10% (2)
Gray dots	10% (2)
Brownish rim	100% (20)
Light erythematous background	100% (20)
Late (n=10)	
Brown amorphous structureless area	50% (5)
Gray structureless area	50% (5)
Brown dots	70% (7)
Black dots	30% (3)
White scales	30% (3)
Light erythematous background	100% (10)
Umbilicated (n=10)	
Crater	100% (10)
Red dots	90% (9)
Brown dots	10% (1)
Black dots	10% (1)
White scales	100% (10)

Light erythematous background	100% (10)

TABLE 6: DIFFERENT DS PATTERN (CP)

In our study we found that, dermoscopy demonstrated different patterns in each stage of CP. Color variation was noticed in evolving lesions. Pale yellowish-translucent areas (90%) were the most common feature in early lesions, whereas pink areas (70%) were common in intermediate lesions. Late lesions showed brown and gray, structureless areas. Pale erythematous background (100%) was noted persistently in all the stages of CP. Color shades of pink, whitish-pink, and brown appeared as zones in intermediate lesions. White scales were characteristically observed in late (30%) and umbilicated (100%) lesions. The crater was specifically seen and was surrounded by a structureless zone of umbilicated lesions.

Histopatholgy-

The histopathological characteristics of CP were observed to include the presence of intraepidermal blisters accompanied by numerous necrotic keratinocytes. A significant number of keratinocytes exhibited ballooning degeneration, accompanied by a limited presence of multinucleated large cells observed near the basal region of the blister. The blister cavity exhibited the presence of red blood cells and fibrinous exudates. The presence of edema and a perivascular infiltration with lympho-plasmocytes and histiocytes, accompanied by extravasation of red blood cells, was observed in the papillary dermis.

Stage of lesion	Number of cases	percentage
Early	20	40
Intermediate	20	40
Late	10	20
Total	**50**	**100**

TABLE 7: HERPES ZOSTER (HZ) DISTRIBUTION

In our study we found that , Of these 50, 20 (40%) patients manifested early and intermediate lesions, and 10 (20%) patients revealed late lesions of HZ.

Dermoscopic patterns	Stage of lesions
Early (n=20)	
Cloudy polylobular lacunae	90% (18)
Brown globules	50% (10)
Gray dots	50% (10)
Red globules	10% (2)
White globules	20% (4)
Bright erythematous background	100% (20)
Intermediate (n=20)	
Pale pink structureless area	80% (16)
Gray structureless area	20% (4)

Gray lobules	80% (16)
Brown lobules	10% (2)
Purple lobules	10% (2)
White globules	80% (16)
Bright erythematous background	100% (20)
Late (n=10)	
Grayish structureless area	60% (6)
Bluish-gray structureless area	20% (2)
Brownish-gray structureless area	20% (2)
Brown globules	70% (7)
Bright erythematous background	100% (10)

TABLE 8: DS PATTERN (HZ)

In our study we found that, Bright erythematous background (100%) was the most consistent finding seen in all lesions. Multiple grouped vesicles in HZ showed cloudy polylobular lacunae (90%) that were divided by linear strands of white lines in early lesions. A few brown globules showed a white halo. Gray areas were noted early in HZ as compared to CP. Intense erythema in the background appeared as a bright red halo surrounding grayish structureless areas in late lesions. This bright red halo resembled the solar eclipse.

Histopathology-

The histological characteristics of HZ were shown to be indistinguishable from those of varicella. In contrast to CP, HZ was characterized by the additional presence of cutaneous small vessel vasculitis. The prominence of multinucleated big cells and ballooning degeneration was seen to be more pronounced.

Dermoscopic Variables	**CP**			**HZ**			**p value**
	Early (n=20)	***Intermediate (n=20)***	***Late (n=10)***	***Early (n=20)***	***Intermediate (n=20)***	***Late (n=10)***	
White globules	30%	10%		20%	80%		<0.001
Gray dots/globules		10%		50%	80%		0.01
Red dots/globules				10%	50%		--
Black dots/globules			30%				--

Brown dots/globules			70%	50%	10%	70%	<0.001
Background color	Light erythematous (100%)	Light erythematous (100%)	Light erythematous (100%)	Bright erythematous (100%)	Bright erythematous (100%)	Bright erythematous (100%)	--

TABLE 9: COMPARATIVE ANALYSIS (CP V/S HZ)

In our study we found that , comparative analysis of dermoscopic patterns in CP and HZ using the Chi square test showed a statistically significant difference ($p<0.001$) in the appearance of white globules and brown dots. White globules, which correlate to microvesicles within the epidermis, were more pronounced, and brown dots corresponding to melanin were seen early in the disease course of HZ in contrast to CP. Pigment networks and white dots (eccrine openings) were notably absent in the lesional skin. Interestingly, dermoscopic findings in early, intermediate, and late lesions of both CP and HZ were consistent in all patients, irrespective of age, sex, and site of involvement.

DS patterns	**Number of patients**	**Percentage**
Yellowish pink translucent area	21	70
Distorted pigment network	28	93.33
Pigmentnetwork • Reticular lines • Curved lines • Circles	 21 8 9	 70 26.66 30
Color of pigment network • Dark brown • Light brown	 22 6	 73.33 20
Follicular openings	25	83.33
Eccrine openings	24	80
Perifollicular pigmentation	11	36.66
Perieccrine pigmentation	9	30
Regular margins	30	100
Surrounding erythema	28	93.33

TABLE 10: DS PATTERN BULLOUS PEMPHIGOID (BP)

In our study we found that, DS of the bullous pemphigoid showed a yellowish-pink (70%), yellow (16.66%), and pink (13.33) translucent areas. The pigment network was distorted in 93.33%, showing dark brown (73.33%) and light brown (2%). The majority of cases showed reticular (70%) and curved (26.66%) lines, while a few cases showed circles (30%). Follicular openings (83.33%) and eccrine openings (80%) were prominent. Perifollicular (36.33%) and periccrine (30%) pigmentation were seen in a few cases.

Histopathology-

The histological examination shows that there is a subepidermal blister with a large number of neutrophils and a small amount of fibrin inside the blister cavity. The dermis exhibits a densely populated mixture of neutrophils and a limited number of lymphocytes and melanophages.

DS patterns	Number of patients	Percentage
Yellowish pink translucent area	24	80
Absent pigment network	28	93.33
Linear white folds	25	83.33
Follicular openings	21	70
Eccrine openings	18	60
Central brown areas	19	63.33
Peripheral grey rim/ margin	17	56.66
White cloudy areas (hypopyon)	8	26.66
Regular margins	30	100
Surrounding erythema	26	86.66

TABLE 11: DS PATTERN PEMPHIGUS VULGARIS (PV)

In our study we found that, DS shows a yellowish-pink (80%) and whitish-pink (33.33%) translucent area with an absent pigment network (93.33%) and linear white folds (83.33%). Central brown areas (63.33%) and white cloudy areas (26.66%) were noted. Follicular (70%) and eccrine (60%) openings were prominent. A peripheral grayish rim was present in 56.66% of cases.

Histopathology-

The histological study reveals the presence of an intraepidermal suprabasal acantholytic blister. The blister exhibits the presence of many acantholytic cells and neutrophils. The blister's floor exhibits a tombstone pattern, characterized by the intermittent presence of acantholytic cells. The process of acantholysis is shown to extend into the follicular infundibulum. The dermis has a perivascular mixed infiltration of moderate density. The periphery of the blister exhibits mild spongiosis accompanied by neutrophils, also known as neutrophilic spongiosis.

DS Variables	PV (n= 30)	BP (n= 30)	p value
Distorted pigment network	6.66 %	93.33 %	<0.001
Follicular openings	70	83.33	-
Eccrine openings	60	80	-
Linear white folds	83.33	-	-
Central brown areas	63.33	-	-
Perieccrine pigmentation	-	30	-
Perifollicular pigmentation	-	36.66	-

White cloudy areas(hypopyon)	26.66	-	-

TABLE 12: COMPARATIVE ANALYSIS (PV V/S BP)

In our study, we found that a comparative analysis of DS patterns in PV and BP using the Chi square test showed a statistically significant difference ($p<0.001$) in the presence of a distorted pigment network.

DS findings	Number of cases	Percentage
Yellowish pink translucent areas	8	80
White reticular network	7	70
Pink lacunae	7	70
White globules	4	40
Crater	3	30
Patchy peripheral pigment network	2	20

TABLE 13: DS PATTERN HERPES LABIALIS(HL)

In our study we found that, histopathology of HL was similar to that of HZ, with V showing ballooning degeneration.

DS findings	Number of cases	Percentage
Yellow translucent areas	9	90
White reticular network	8	80
White globules	7	70
Yellowish pink lacunae	7	70
White structureless areas	6	60
Grey brown rim	3	30

TABLE 14: DS PATTERN POMPHOLYX (P)

In our study we found that, yellow translucent areas (90%) with a white reticular network (80%) were the most common findings noted. Yellowish pink lacunae, white structureless areas, and globules were present. Grey-brown rim was present in 30% of cases.

Dermoscopic findings	Number of cases	Percentage
Yellow translucent areas	5	100
Erythematous background	5	100
Crater	3	60

TABLE 15: DS PATTERN IN LESION OF INSECT BITE REACTION(IBR)

In our study we found that, five cases of insect bite reactions were observed. A yellow, translucent area on an erythematous background was the consistent finding seen in all cases. Few lesions showed a central crater due to erosion.

Histopathology-

The histopathological examination shows that there is an intraepidermal blister with a mixture of plasma, neutrophilic microabscesses, cellular debris, and red blood cells. In the area around the blood vessels and appendages, there were lymphocytes, histiocytes, and eosinophils, as well as papillary dermal edema.

DS findings	Number of cases	Percentage
Yellowish white translucent areas	5	100
White structureless area	5	100
Irregular thick white reticular network	4	80
Retained pigment network	1	20

TABLE 16: DS PATTERN IN LESION OF CONTACT DERMATITIS (CD)

In our study we found that , yellowish-white translucent areas and white structureless areas were seen in all cases. Irregular thick white reticular network on pink and blue background and retained pigment network were in a few cases.

Histopathology-

The histopathological examination reveals the presence of spongiosis and papillary dermal edema, accompanied by an elevation in the number and enlargement of blood vessels. The presence of numerous eosinophils and a limited number of neutrophils can be observed throughout the dermis in the interstitium.

DS findings	Number of cases	Percentage
Central Bluish grey globules	5	100
White halo	5	100
Black / grey dots	4	80
Peripheral erythema	5	100

TABLE 17: DS PATTERN IN LESION OF HEAD FOOT MOUTH DISEASE (HFMD)

In our study we found that, in 5 cases of HFMD, DS showed bluish gray area at the center, surrounded by white haloes and black or grey dots. Peripheral erythema was noted in all lesions.

Histopathology-

Histopathology showed interface dermatitis with lymphocytes arranged all along the basal layer of the epidermis and a few necrotic keratinocytes in the spinous layer. Extravasation of RBC in the dermis and epidermis is noted.

DS findings	Number of cases	Percentage
Brownish pink translucent area	5	100
Peripheral erythema	5	100
White linear folds	4	80
Black / grey dots	3	60

Grey/ brown rim	3	60

TABLE 18: DS PATTERN IN LESIONS OF PEMPHIGUS FOLIACEOUS (PF)

In our study we found that, DS showed brown-pink translucent area with brown-gray rim and black dots. White linear folds are seen due to the flaccidity of the bulla. Follicular and eccrine openings were preserved.

Histopathology-

Histopathology showed upper epidermal acantholytic blistering dermatitis involving the granular and upper spinous layers. The blister contains plasma, RBCs, and a few acute inflammatory cells. The epidermis at the periphery of the blister shows mild spongiosis with neutrophils. On the roof of the blister, there are a few elongated acantholytic cells.

DS findings	Number of cases	Percentage
Yellowish translucent area	4	80
Blue / grey dots	3	60
Red dots	3	60
Peripheral erythema	5	100

TABLE 19: DS PATTERN IN LESIONS OF ERYTHEMA MULTIFORME

In our study we found that, DS of five cases of erythema multiforme showed red, blue, and black dots at the center, a yellowish translucent area surrounding it, and red and blue dots at the periphery with homogenous erythema.

Histopathology-

The histopathological test showed that the patient had interface dermatitis, which is characterized by subepidermal separation caused by vacuolar degeneration of the epidermis's basal layer. Additionally, there was a perivascular and lichenoid infiltrate of lymphocytes, along with a small number of melanophages. The papillary dermis was observed to be edematous.

DISCUSSION

In a study a DS examination of CP revealed that cases exhibited ill-defined white formations accompanied by surrounding erythema and brown spots at the periphery. Here, the DS examination of HZ revealed the presence of several interconnected, round, cloudy white polylobular structures accompanied by core brown spots and surrounding erythema. The current investigation yielded comparable DS patterns. However, the omission of information regarding the relationship between DS patterns and the duration of lesions was noted.[3] In a study reseachers concluded that , at the initial stages of CP, there were observable white globules, black dots, and pink patches within a pale yellow, structureless, translucent region. White globules are indicative of spongiotic microvesicles located within the epidermis. Inflammation-induced capillary dilatation manifests as pink regions on DS examination. The pale yellow appearance of the structure can be attributed to the presence of serum within the vesicles. The presence of a pale pink backdrop observed in all the lesions during the initial

phase can be attributed to erythema, which is caused by the inflammatory reaction to widespread viremia.[4]

Another study reported clods of different colors such as red, blue, purple, and black corresponding to the central dusky zone, a plain featureless area corresponding to the pale edematous zone, and homogenous erythema corresponding to the outer red ring. A few short linear vessels were also seen in his study.[95] The DS examination of bullous fixed drug eruption (FDE) revealed the presence of numerous black, brown, and blue spots and globules. The diversity in color of melanin is contingent upon its specific location within the skin. Melanin exhibits a jet black coloration in the stratum corneum and upper epidermis, while assuming a brown hue in the basal layer and dermoepidermal junction. In the papillary dermis, melanin manifests as a blue-gray shade, and in the reticular dermis, it has a steel-blue appearance. The observed variance in color is attributed to the Tyndall effect, a phenomenon where shorter-wavelength visible light (specifically blue light) is scattered and reflected to a greater extent compared to longer-wavelength light (such as red light). The blue coloration of melanin, which is typically black in appearance, can be accounted for by considering the depth of the pigment inside the dermis. The evaluation of pigmented fixed drug eruptions (FDE) yielded comparable results as reported by Manuel et al.[5] and Nayak et al.[3].

LIMITATION OF THE STUDY

1. Sample size in our study was small.
2. Very few studies were used for review and comparispn.
3. Biopsy could not be done in all cases due to lack of consent from patients.

CONCLUSION

Some dermoscopic patterns are observed consistently with certain diseases, and these can be used for their treatment. These DS findings can aid the diagnosis and may obviate the need for dermsoscopic differentiation points, which have been established for a few diseases.

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