

**Assessment of stability of vitiligo with help of dermoscopy- A cross sectional study**

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**Citation this Article:** Dr. Jagruti Maheriya, Dr. Brijesh Parmar , Dr. Yogesh Parmar, “Assessment of stability of vitiligo with help of dermoscopy- A cross sectional study”, IJMSIR- February - 2023, Vol – 8, Issue - 1, P. No. 252 – 258.

**Type of Publication:** Original Research Article

**Conflicts of Interest:** Nil

**Abstract**

Vitiligo is an acquired autoimmune disorder of pigmentation characterized by loss of functional melanocytes and melanin in epidermis. Stability in vitiligo is an important factor for choosing an appropriate treatment approach for patient. This study was done to observe the dermoscopic findings of vitiligo and to correlate with stability of vitiligo.

This was a descriptive cross-sectional study conducted in tertiary care hospital from June 2022-november 2022.

Total 90 adult ( $\geq 18$  year) patients having vitiligo vulgaris for  $\geq 1$  year duration, irrespective of treatment status were enrolled in this study. Out of 90 patients, 30 patients each in

(1) unstable (progressive) (2) stable (3) repigmenting group were enrolled on clinical ground. History and clinical findings were noted. Contact type of dermoscopy was carried out using handheld Dermoscope Dermlite DL4 with polarized mode and photographs were analyzed.

Out of 90 patients, maximum number (25.5%) of cases were from 25–34-year-old age group. Total 56.6% cases were female while 43.4% cases were male in present study. Total 51 (56.6%) were already receiving treatment for vitiligo.

Among unstable group, commonly observed findings were perifollicular depigmentation (70%), starburst appearance (16.7%), comet tail appearance (20%), tapioca sago (“Sabu dana”) appearance (40%), trichrome pattern (70%), and altered pigment network (81%).

Among stable group, commonly observed findings were marginal hyperpigmentation (76.6%), intralesional/marginal reticular hyperpigmentation (30%), and perifollicular pigmentation (60%). Among repigmenting group, commonly observed findings were marginal hyperpigmentation (80%), and intralesional/perilesional erythema with telangiectasia (46.7%).

## Summary

Dermoscopic features like perifollicular pigmentation and perilesional/marginal hyperpigmentation suggest stability, while starburst pattern, comet tail sign, tapioca sago appearance suggest instability. Stability of vitiligo is important for deciding treatment approach for patients. Dermoscopy can be an effective, reliable, non-invasive, reproducible, and simple procedure for staging the vitiligo lesion.

**Keywords:** Dermoscopy, Unstable Vitiligo, Stable Vitiligo.

## Introduction

Vitiligo is an autoimmune disorder of pigmentation in which there is loss of functional melanocytes and melanin in the epidermis. Incidence rate is estimated to be 3-4% in India, and almost up to 8.8 % in Gujrat and Rajasthan.<sup>1</sup> There is no gender, racial or ethnic predilection.<sup>2-4</sup>

A Dermoscope is a noninvasive, diagnostic tool which magnifies subtle clinical surface features of skin lesions as well as unveils some subsurface skin structures not normally visible naked eye or with a magnifying lens, with several add-on features of an inbuilt specialized illuminating system (visible light, polarized light, and ultraviolet sources), adjustable magnification, the ability to assess structures as deep as in the reticular dermis, and the ability to record digital images for future analysis and comparison.<sup>5</sup>

This office procedure may sometimes obviate the need for a skin biopsy for diagnosis and for follow-up. The facility of storage of images and the results being immediately available are added advantages of this diagnostic tool.<sup>6</sup>

Dermoscopy is useful tool for identification and differentiation of various pigmentary disorders such as melasma, exogenous ochronosis, lichen planus, rieh1's

melanosis, post inflammatory hyperpigmentation, ashy dermatosis, idiopathic guttate hypomelanosis, pityriasis versicolor.<sup>7</sup>

Dermoscopy has certain advantages over wood's lamp such as (1) no false positive result due to topical products application (2) no interobserver variation in interpretation of results (3) ability to visualize subsurface structure such as papillary dermis as well.

'Stability of vitiligo' is an important concept guiding direction in patient management. Unstable vitiligo may show worsening with some therapeutic options like phototherapy and photochemotherapy. Moreover, unstable vitiligo patients are not suitable for surgical approach as there is higher chance of graft/transplant failure and depigmentation at donor site. Thus, stability is an important factor before choosing appropriate treatment.

The aim of this study is to understand the various dermoscopic pattern present in vitiligo and its correlation with stability of the disease.

## Materials & Methods

Total 90 adult patients having vitiligo vulgaris irrespective of treatment modality, coming to dermatology OPD were enrolled in this cross-sectional observational study. Study was conducted at tertiary care hospital in Surat, Gujrat from study period of June 2022- November 2022. Out of these 90 patients 30 patients each in (1) unstable (progressive) (2) stable (3) repigmenting group were enrolled based on clinical ground.

**Sampling technique:** convenience purposive sampling

## Inclusion criteria

1. Patient willing to give informed valid consent
2. Age  $\geq$  18 year
3. Patient having clinically diagnosed vitiligo vulgaris for  $\geq$  1 year duration; irrespective of treatment statu

### Exclusion criteria

1. Patient having hypo/depigmented disorders other than vitiligo
2. Informed written consent was taken. Detailed history was inquired and clinical examination was done. Contact type of Dermoscopic examination was done using handheld Dermoscope Dermlite DL4 (10x magnification) with polarised mode. Vitiliginous lesions having recent most onset were examined to look for dermoscopic features. Photographs were captured using Samsung galaxy A71 and analysed using SPSS software.

### Result

Out of 90 cases, highest number (23, 25.5%) of cases were from 25–34-year-old age group. Total 51 (56.6%) were female while 39 (43.4%) were male [chart 1]. History of one or other form of treatment taken was present in 12 cases of stable group, 13 cases of unstable group and 24 cases of repigmenting group [chart 2].

### Dermoscopic findings observed are as follows: [table 1]

**Perifollicular pigmentation** [figure 5] was seen in 60% (18) cases of stable, 40% (12) cases of unstable and 50% (15) cases of repigmenting vitiligo [chart 3A].

**Intralesional/perilesional erythema with telangiectasia** [figure 6] was seen in 30% (9) cases of stable, 20% (6) cases of unstable and 46.7% (14) cases of repigmenting vitiligo [chart 3A].

**Perifollicular depigmentation** was seen in 20% (6) cases of stable, 70% (21) cases of unstable and 10% (3) cases of repigmenting vitiligo [chart 3A].

**Trichrome pattern** [figure 1] was seen in 30% (9) cases of stable, 70% (21) cases of unstable and 20% (6) cases of repigmenting vitiligo [chart 3A].

**Tapioca sago appearance** [figure 2] was seen in 10% (3) cases of stable, 40% (12) cases of unstable and 10% (3) cases of repigmenting vitiligo [chart 3B].

**Comet tail sign** [figure 3] was seen in 3.3% (1) case of stable, 20% (6) cases of unstable vitiligo [chart 3B].

**Marginal hyperpigmentation** [figure 6] was seen in 76.7% (23) cases of stable, 40% (12) cases of unstable and 80% (24) cases of repigmenting vitiligo [chart 3B].

**Leukotrichia** [figure 2] was seen in 33.3% (10) cases of stable, 46.7% (14) cases of unstable and 23% (7) cases of repigmenting vitiligo [chart 3B].

**Starburst pattern** [figure 4] was seen in 16.7% (5) cases of unstable vitiligo [chart 3B].

### Pigment network

**Reticular pigment network** [figure 5] was seen in 66.7% (20) cases of stable, 36.7% (11) cases of unstable and 80% (24) cases of repigmenting vitiligo [chart 4].

**Reduced pigment network** was seen in 60% (18) cases of stable, 66.7% (20) cases of unstable and 46.7% (14) cases of repigmenting vitiligo [chart 4].

**Reversed pigment network** [figure 4] was seen in 26.7% (8) cases of stable, 83.3% (25) cases of unstable and 20% (6) cases of repigmenting vitiligo [chart 4].

**Absent pigment network** was seen in 40% (12) cases of stable, 93.3% (28) cases of unstable and 30% (9) cases of repigmenting vitiligo [chart 4].

### Discussion

Normal skin has a typical reticulate pigmentation, corresponds to pigmentation along with rete ridges and pale area signifying papillary dermis on dermoscopic examination<sup>8</sup>.

The reticulate pigment network is seen altered in the lesions of vitiligo. Absent pigment network and Reversed pigment network; characterised by white line segregating hyperpigmented areas in net like fashion, are seen in progressing stage of vitiligo. As there is gradual loss of

melanin and melanocytes in dermis, light directly passes through it and reflect upon by dermal collagen which will produce white glow and area of relative hyperpigmentation is produced by pale area corresponding to dermal papilla. This appearance is perceived as a reversed pigment network<sup>9</sup>.

Dermoscopic patterns observed in Purnima et al study<sup>10</sup> in clinically unstable patients were Trichrome in 41%, Starburst, Comet tail, Polka-dot in 9% each, Marginal hyperpigmentation in 12% cases. In Thatte SS et al study<sup>11</sup>, reduced pigmentary network, absent pigmentary network, reversed pigmentary network and perifollicular pigmentation were present in evolving vitiligo lesions. Similar findings were also observed in the present study. Marginal hyperpigmentation (100 %), reticular pigmentation (81.25%) and perifollicular pigmentation (87.5%) were more observed in stable vitiligo in Purnima et al<sup>10</sup> study. Marginal and perifollicular hyperpigmentation, reticular pigmentation were commonly associated with stable vitiligo in Thatte et al study<sup>11</sup>. Similar findings were also observed in the present study.

Meng et al<sup>12</sup> observed residual perifollicular pigmentation to be associated more with unstable or progressive vitiligo. This could be due to involvement of follicular melanocytes reservoirs in late stage of disease process. Thus, perifollicular pigmentation persists for longer period than interfollicular region.

Marginal hyperpigmentation (46.1%), intralesional/perilesional erythema with telangiectasia (15.3%) were observed in repigmenting group in Awal G et al study.<sup>13</sup>

**Findings suggesting disease activity**

TRICHROME PATTERN; three different color zone of hyperpigmentation, hypopigmentation and

depigmentation are seen. It indicates active disease process.

TAPIOCA SAGO APPEARANCE; multiple depigmented globules are seen.

LEUKOTRICHIA; achromic hair shaft with depigmented perifollicular region. It is associated with poor prognosis as melanocyte reservoir within hair follicles are also destroyed.

COMET TAIL SIGN; linear extension of lesion into surrounding normal skin, indicates micro koebnerization.

STARBURST PATTERN; radial spoke like extension into surrounding normal skin is seen.

REVERSED RETICULAR PIGMENTATION; hyperpigmented areas segregated by white lace like pattern is seen. It is seen in early progressive stage of vitiligo.

- Findings suggesting stability:
  - MARGINAL PIGMENTATION
  - PERIFOLLICULAR PIGMENTATION
  - RETICULAR PIGMENT PATTERN
- Findings seen exclusively in patients receiving topical treatment:
  - INTRA/PERILESIONAL ERYTHEMA
  - TELENGIECTASIA

Table 1: Dermoscopic Findings Of Vitiligo (n=30 each group):

Dermoscopic features	Stable group	Unstablegroup	Repigmentinggroup
Perifollicular pigmentation	18 (60%)	12(40%)	15(50%)
Intra/perilesional erythema & telangiectasia	9(30%)	6(20%)	14(46.7%)
Perifollicular depigmentation	6(20%)	21(70%)	3(10%)
Trichrome pattern	9(30%)	21(70%)	6(20%)
Tapioca sago appearance	3(10%)	12(40%)	3(10%)
Comet tail sign	1(3.3%)	6(20%)	-
Marginal hyperpigmentation	23(76.7%)	12(40%)	24(80%)
Leukotrichia	10 (33.3%)	14(46.6%)	7(23%)
Starburst pattern	-	5(16.7%)	-
Reticular pigment pattern	20(66.7%)	11(36.7%)	24(80%)
Reduced pigment pattern	18(60%)	20(66.7%)	14(46.7%)
Reversed pigment pattern	8(26.7%)	25(83.3%)	6(20%)
Absent pigment pattern	12(40%)	28(93.3%)	9(30%)

Chart 1: Sex according distribution of cases (n=90)

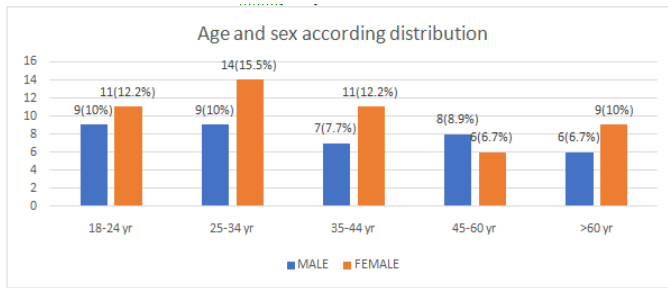


Chart 4: Pigment network pattern observed in vitiligo cases(n=30 each group)

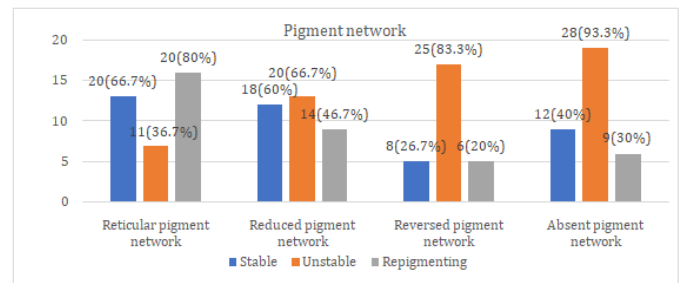


Chart 2: Distribution of stability of vitiligo based on treatment history (n=90)

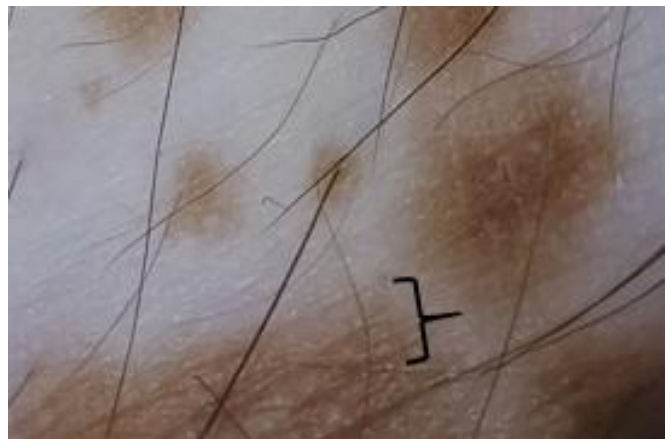
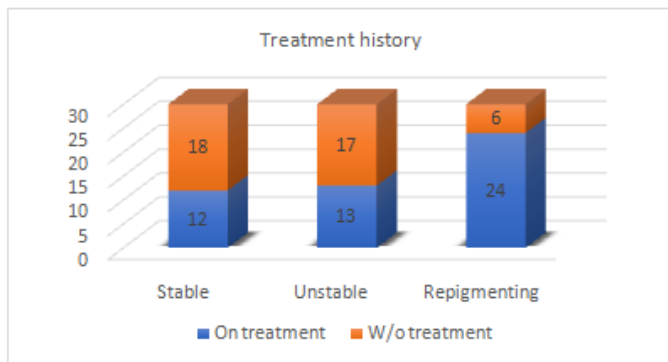


Figure 1: Trichrome Vitiligo

Chart 3(A): Dermoscopic pattern observed in vitiligo cases(n=30 each group)

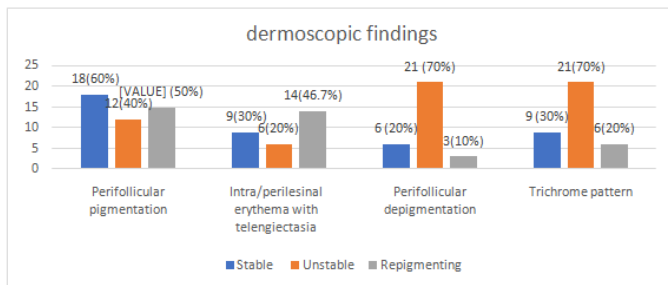


Figure 2: Tapioca sago appearance; leukotrichia

Chart 3(B): Dermoscopic pattern observed in vitiligo cases(n=30 each group)

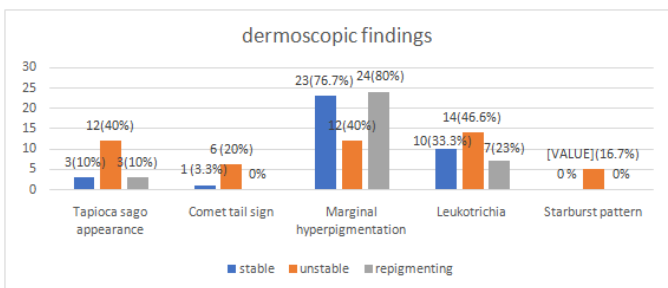




Figure 3: Comet Tail Sign

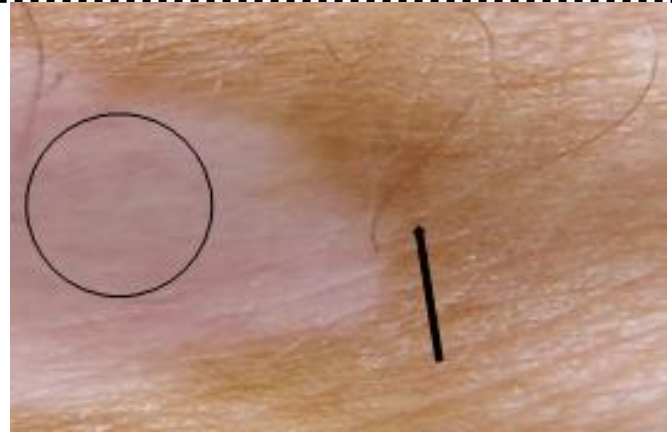


Figure 6: Marginal Hyperpigmentation(Black Arrow), Erythema And Telangiectasia(Black Circle)



Figure 4: Starburst Pattern & Reversed Reticular Pigmentation(Black Circle)

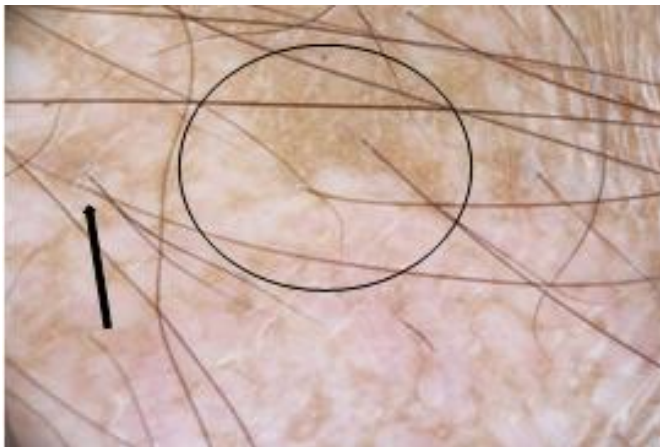


Figure 5: Reticular Pigmentation (Black Circle) and Perifollicular Pigmentation (Black Arrow)

### Conclusion

Marginal hyperpigmentation, intralesional/marginal reticular hyperpigmentation, and perifollicular pigmentation suggest stability. Intra/perilesional erythema with telangiectasia is seen exclusively in patients on topical treatment.

Perifollicular depigmentation, starburst appearance, comet tail appearance, tapioca sago (“Sabu dana”) appearance, trichrome pattern, altered pigment network features suggest instability.

Dermoscopy is an effective, non-invasive, reliable, reproducible, cost-effective, and simple tool for assessment of stability of vitiligo and for prediction and evaluation of treatment response.

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