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Original Research Article

Histopathological spectrum of hyperpigmented skin lesions- A study in a tertiary hospital from western Uttar Pradesh

Avani[1], Kamna Gupta[1], Medha Jain[1], Amit Jaiswal[2,*], R.K. Thakral[1], Alok Mohan[1]

[1]*Dept. of Pathology, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India*
[2]*Dept. of Dermatology and Venereology, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India*

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ABSTRACT

Background: Hyperpigmented skin lesions are the cause of concern for general people and are commonest reason for dermatology consultation. An accurate histopathological diagnosis helps a dermatologist in appropriate management of such lesions**.**
Materials and Methods: A retroprospective study of 100 cases of skin biopsies in hyperpigmented lesions was conducted from January 2020 to July 2021 at our institute. Inadequate skin biopsies, lesions of neoplastic or congenital etiology were excluded from the study. A clinico-histopathological correlation was also done.
Results: Out of 100 skin biopsies studied, most cases (50%) were in the age group of 21-40 years. Females were more affected than males; F:M ::1.27:1 and the most common histopathological diagnosis was Lichen planus and its variants (38%).
Conclusion: Hyperpigmented skin lesions can be the only presentation of wide variety of the skin lesions. To make the diagnosis;proper and detailed history, clinical examination and microscopic examination of the biopsies is must which helps the doctor to treat the patients effectively.

1. Introduction

Great variation in the human skin color is seen across the world, ranging from very fair to very dark skin color. Pigmentary disorders are one of the major concern for which the patients seek the dermatologist attention.[1] Color of the human skin is primarily due to the melanin pigment which is produced by the melanocytes present in the lower epidermis.[2] It is the amount of melanin pigment which determines the various shades of skin and can result in hypopigmentary disorders or hyperpigmentary disorders.[3]

Basically the hyperpigmentation means darkening of the skin, attributed by increase in melanin.[4] It may be because of increased melanin production, or increase in the number of melanocytes or because of the deposition of the other substances in the skin that impart color to the skin.[5] Hyperpigmentation can be diffuse as well as focal. Some people like Asians are more prone to develop pigmentation.[2] Few aggravating factors like UV radiation, hormones and certain medication have role in development of hyperpigmentation.[6]

There are many disorders whose clinical presentation is only the hyperpigmentation.[7] That's why for accurate diagnosis and treatment, skin biopsy having three components i.e. epidermis, dermis and subcutis is must. Proper histopathological examination of the biopsies reveals the most correct diagnosis.

As the hyperpigmentation causes social stigma and affect the mental health especially in Asian females that's why, the aim of this study was to evaluate all hyperpigmented lesions

* *Corresponding author*.
E-mail address: drjaiswalatcutis@gmail.com (A. Jaiswal).

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histopathologically in this particular region of western Uttar Pradesh of India.

2. Materials and Methods

It was a hospital based retro-prospective study, conducted at Department of Pathology, Muzzafarnagar Medical College in collaboration with Department of Dermatology over a period from January 2020 to July 2021.

Study was started after the Institutional Ethical Committee approval (ECR/1318/Inst/UP/2019).

A total 100 patients with hyperpigmented skin lesions of any age and sex were taken into consideration. Inadequate skin biopsies or hyperpigmented lesions of neoplastic or congenital etiology were excluded from the study.

Written informed consent was taken from all patients. Punch skin biopsy was done and sent for histopathological examination. Tissue was fixed in 10% buffered formalin solution. Sections of 3 to 4 micrometer thickness were prepared and stained using routine Haematoxylin & Eosin stain. Special stains like PAS, Fontana Masson, Metachromatic stain and Masson Trichrome were used wherever required.

Detailed microscopic examination of all skin biopsies were done and correlated with clinical data. All the collected data was entered in Microsoft Excel sheet and statistically analysed using SPSS software.

3. Results

Total 100 skin biopsies from hyperpigmented lesions were analysed during the defined time period. Majority of the cases (50%) were in age group of 21–40 years followed by 33% in the 41–60 years of the age group. The Youngest case was of 6 years age and oldest was of 75 years. Out of these cases, 56 were females and 44 were males thus, females were more affected than males (Table 1). Most common clinical symptom apart from hyperpigmentation was itching (86%).

In majority of the cases (44%), there was bilateral involvement of all four limbs followed by only upper limb involvement in 25% cases and whole body involvement in 20% cases (Table 2). Most common presentation was papules (46%) followed by plaques (40% cases). Least number of cases were of patches and macules (< 6%).

Table 1: Age and sex wise distribution

Age (in years)	Male (No.)	Female (No.)	Total (No.)	Percentage (%)
Birth-20	7	5	12	12.0
21-40	22	28	50	50.0
41-60	11	22	33	33.0
61-80	4	1	5	5 .0
Total	44	56	100	100.0

Table 2: Site wise distribution

Site	Cases (No.)	Percentage (%)
Upper limbs	25	25.0
Lower limbs	9	9.0
Both upper and lower limbs	44	44.0
Whole body(Chest, abdomen, back, limbs)	20	20.0
Head, face and neck	2	2.0

Table 3: Histopathological spectrum of hyperpigmented skin lesions

S.No .	Histopathological diagnosis	Cases (No.)	Percentage (%)
1.	Classical Lichen Planus	18	18.0
2.	Eczematous Dermatitis	11	11.0
3.	Polymorphous Light Eruption	8	8.0
4.	Discoid Lupus Erythematosus	7	7.0
5.	Lichen Planus Hypertrophicus	7	7.0
6.	Lichenoid like keratosis and reaction	7	7.0
7.	Lichen Planus Pigmentosus	6	6.0
8.	Lichen Simplex Chronicus	6	6.0
9.	Post Inflammatory Hyperpigmentation	6	6.0
10.	Prurigo Nodularis	6	6.0
11.	Lichen Amyloidosis	4	4.0
12.	Morphea	4	4.0
13.	Melasma	4	4.0
14.	Pityriasis Versicolor	3	3.0
15.	Rhiel's Melanosis	2	2.0
16.	Erythema Dyschromicum Perstans	1	1.0
	Total	100	100

Histopathological examination revealed that maximum cases (38%) were of Lichen planus and its variants(Lichen planus hypertrophicus, Lichen planus pigmentosus, Lichenoid like keratosis or reaction). Other cases were of Eczematous dermatitis (11%), Polymorphous light eruptions (8%), Discoid lupus erythematosus (7%), Prurigo nodularis and Post inflammatory hyperpigmentation (6% each). Few cases of Lichenoid amyloidosis, Morphea, Melasma (4% each), Pityriasis versicolor (3%) and Riehl's melanosis (2%) and single case of Erythema dyschromicum perstans were also observed (Table 3) (Figure 1). Diagnosis of Lichen amyloidosis and Pityriasis versicolor was confirmed by the special stains (Crystal Violet & PAS)(Figure 2). Special stain Fontana Masson

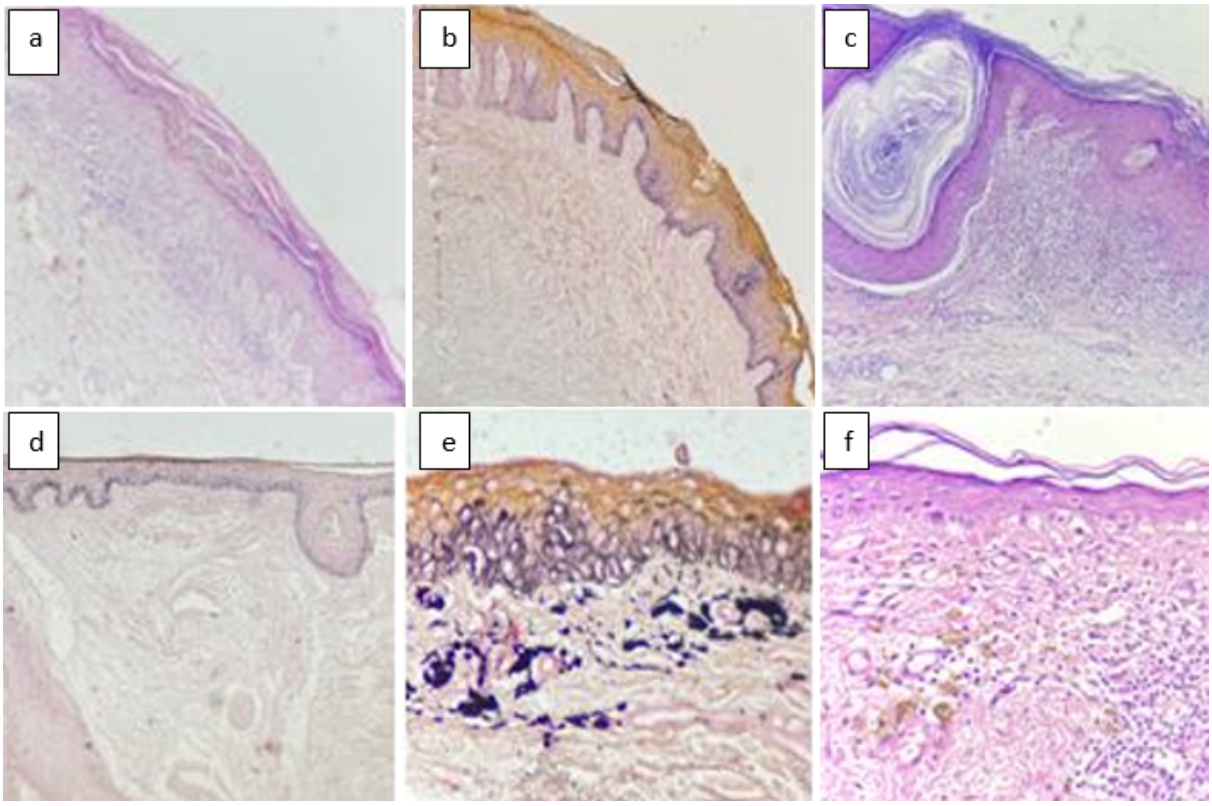

Fig. 1: a: Classical lichenplanus: Hyperkeratosis, saw tooth rete ridges and band like inflammatory infiltrate (H&E stain 100X), **b:** Basal hyperpigmentation (Fontana Masson stain, 100X). **c:** Discoid lupus erythematosus: Hyperkeratosis with follicular plugging, bydropis, basal cell degeneration, and lymphocytic inflammatory infilterate(H&E stain 100X). **d:** Post inflammatory hyperpigmentation: Epidermal hyperpigmentation (Fontana Masson stain,100X). **e:** Erythema dsvchromicum perstans: pigment incontinence in dermis (Fontana Masson stain 400X). **f:** Riehl's melanosis: thinning of epidermis, loss of rete ridges. Pigment incontinence and few melanophages in dermis. (H&E stain 400X).

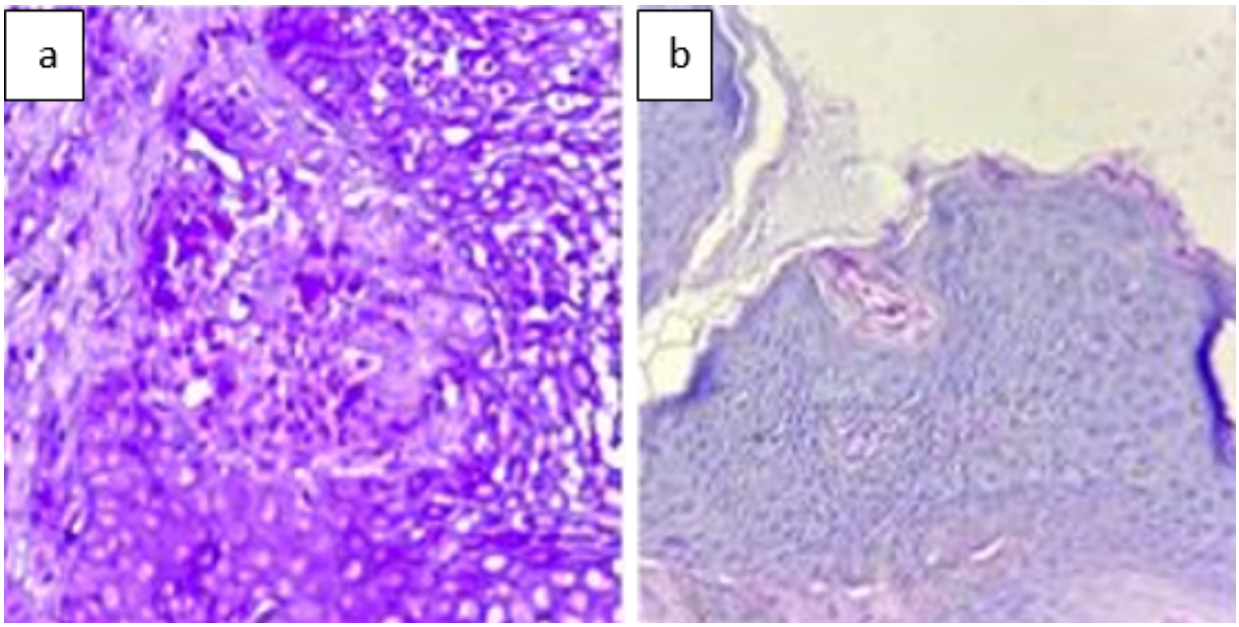

Fig. 2: a: Lichen amyloidosis: Amorphous magenta material of amyloid (Crystal violet stain 400X), **b:** Pityriasis versicolor: fungal byphae and spores (PAS stain, 400X).

was also done to visualize the melanin pigment (Figure 1). Clinico- histopathological correlation was found in 92% cases. Only 8% cases had final diagnosis on histopathology.

4. Discussion

There are various factors influencing the hyperpigmentation such as type of skin, working conditions, stress, sun exposure and autoimmunity. These disorders cause socio-economic burden by creating social stigma among the individuals.

In the present study, most of the patients (50%) were in age group of 21–40 years, followed by 33% cases in 40-60 years age group. These findings were in concordance with findings of VS Veldurthy et al which reported that out of 92 cases, 31.5% patients were in the 21-30 years age group.[8] Similarly, in the study of Laishram R et al, most cases (32.2%) were in the age group of 21-30 years and 14.7% cases belonged to 31-40 years age group.[9] In the study by Younas M et al, 25% cases were in 21 to 30 years age group.[10] Goyal KK et al showed maximum cases (28%) in the age group of 21-30 years followed by 26% cases in 31-40 years age group, thus constituting 54% cases in 21-40 years age group.[11]

In this study, most patients were females (56%) while males were 44%, thus creating male female ratio of 1:1.3. This result was similar to the study done by Kumar MU et al in which, out of 90 patients, 38 were males and 52 were females forming a male : female ratio was 1: 1.4.[12] Similar findings were also observed in the study done by Goyal KK et al with 48% males and 52% females, thus creating male female ratio of 1:1.1.[11] Same female predominance was also seen in the study of Singh A et al, forming male to female ratio of 1:1.4.[13] However, Veldurthy VS et al in their study showed male predominance with M : F ratio of 3:2.[8]

Involvement of four limbs was seen in present study in majority of the cases (44%), followed by only upper limbs involvement (25%). Whole body (chest, abdomen, back and limbs) was involved in 20% cases. The result of the present study was remarkably comparable to the study done by Smitha M et al and Adhikari RC et al which showed upper and lower extremities as the most common affected sites in cases of hyperpigmented skin lesions.[14,15]

Most of the lesions in this study presented as papules (46% of the total cases) followed by plaques (40% cases). These findings were similar to the study done by Smitha M et al which revealed papules and plaques as the most common clinical presentation (in more than 50% cases).[14] In the study of Veldurthy VS et al, hyperpigmented plaques were the most common clinical presentation in 36.9% cases.[8]

Most common histopathological finding was hyperkeratosis (88%) followed by changes in the rete ridges (70%). Other findings included acanthosis (50%), chronic inflammatory infiltrate (50%), degeneration of the basal cell layer (48%) and hypergranulosis (45%). These findings are comparable to the study done by Smitha M et al in which hyperkeratosis, acanthosis, basal cell degenation and hypergranulosis were the common findings. Inflammatory infiltrate was also seen in more than 50% of the cases.[14] However, these were in discordance of the study done by Goyal KK et al which showed perivascular inflammatory infiltrate (72%) and pigment incontinence (62%) as the common histological findings.[11]

In the present study, histopathological examination was done on 100 cases. Out of which, 38 cases were of Classical lichen planus and its variants, 11 cases of Eczematous dermatitis, 8 cases of Polymorphous light eruption (PMLE), 7 cases of Discoid lupus erythematosus (DLE), 6 cases each of Lichen simplex chronicus, Post inflammatory hyperpigmentation and Prurigo nodularis. Other histopathological diagnosis were Melasma (4 cases), Morphea (4 cases), Lichen amyloidosis (4 cases), Pityriasis versicolor (3 cases) and Riehl's melanosis (2 cases). Only single case of Erythema dyschromicum perstans was seen.

This was in concordance with the study done by Smitha M et al in which 200 cases were studied. They diagnosed 115 cases of Classical lichen planus and its variants. Rest of the cases included Post inflammatory hyperpigmentation (18 cases), Lichen simplex chronicus (15 cases), Prurigo nodularis (15 cases), Polymorphous light eruption (15 cases) and Morphea (12 cases). Less common cases in their study included 3 cases each of Lichen amyloidosis and Discoid lupus erythematosus, 2 cases of Prurigo simplex and 2 cases of Freckles.[14] Our study findings were also comparable to the findings of Jayker SS et al where out of 85 cases, 11 cases were of Classical lichen planus, 6 cases of Lichen planus pigmentosus, 5 cases each of Prurigo nodularis and Psoriasis, 4 cases of Morphea, 4 cases of Lichen simplex chronicus. Others were Lichen striatus and Verruca plana (3 cases each), Macular amyloidosis (2 cases), Post inflammatory hyper pigmentation (1 cases). No case of Lichen amyloidosis was observed.[16]

Saha R et al in their study showed similar findings where Lichen planus and its variants constituting 20 cases out of 52 cases. This was followed by 14 cases of Post inflammatory hyperpigmentation, 5 cases of Macular amyloidosis, 4 cases of Lichen simplex chronicus, 3 cases of Morphea, 2 cases each of Lichen amyloidosis and Prurigo nodularis and 1 case each of DLE and Dawling Degos.[17]

Ravindran S et al in their study on 100 cases of hyperpigmented skin lesions found that the maximum number of cases (45 cases) were those of Classical Lichen planus and its variants, followed by 12 cases of Eczematous dermatitis, 8 cases of PMLE, 7 cases of DLE, 6 cases of Lichen simplex chronicus, 7 cases of Post inflammatory hyperpigmentation.[18]

Veldurthy VS et al did a study on non-neoplastic skin lesions by punch biopsy and found that Lichenoid lesions

(26%) were the most common histopathological diagnosis reported followed by Hansen's disease (23.9%). Lichen planus (58.3%) was the most common histopathological sub type of lichenoid lesions. [8]

All these findings indicate that there is appreciable similarity between present study and the above mentioned studies. In our study, clinicpathological correlation was done on all cases of pigmentary skin lesions, confirming the clinical findings. An analysis of the clinical diagnosis with the histopathological diagnosis revealed a positive correlation in 92% of cases and negative correlation in 8% of cases thus emphasizing the importance and utility of histopathology in arriving at a conclusive diagnosis.

A higher percentage of clinical concordance can be attributed to many differential diagnosis provided by the dermatologist. It also emphasizes the need for a proper clinical diagnosis.

5. Conclusion

Hyperpigmentation is common skin problem faced by most of the patients. Clinical history with differential diagnosis given by the dermatologist / clinician provides aid in histopathological analysis. Histopathological examination is the gold standard technique for confirmation of the diagnosis and help in the further follow up of the patients.

In this study, vast diversity in skin lesions was noticed, commonest being the Lichen planus and its variants.

Hyperpigmentary skin disorders especially of face and exposed body parts affect patients psychologically, lower their self-confidence and have social impact so proper diagnosis and treatment by dermatologist using various modalities including psychotherapy can play a very vital role in enhancing their quality of life. [19]

6. Conflict of Interest

None.

7. Source of Funding

None.

References

1. Shenoi SD, Prabhu S. Role of cultural factors in the biopsychological model of psychosomatic skin diseases: An Indian perspective. *Clin Dermatol*. 2013;31(1):62–5.
2. Nouveau S, Agrawal D, Kohli M, Bernerd F, Misra N, Nayak CS, et al. Skin Hyperpigmentation in Indian Population: Insights and Best Practice. *Indian J Dermatol*. 2016;61(5):487–95.
3. Ortonne JP, Bissett DL. Latest insights into skin hyperpigmentation. *J Investig Dermatol Symp Proc*. 2008;13(1):10–4.
4. Jablonski NG. The Evolution of Human Skin and Skin Color. *Annu Rev Anthropol*. 2004;33(1):585–623.
5. Stulberg DL, Clark N, Tovey D. Common hyperpigmentation disorders in adults: Part I. Diagnostic approach, cafe au lait macules, diffuse hyperpigmentation, sun exposure, and phototoxic reactions. American family physician. *Am Fam Physician*. 2003;15(10):1955–60.
6. Dhar S, Dutta P, Malakar R. IADVL Textbook of dermatology. In: Valia R, Valia A, editors. Pigmentary disorders. Mumbai: Bhalani Publishing House; 2008. p. 736–98.
7. Mosher DB. Disorders of pigmentation. Dermatology in general medicine. New York: McGraw-Hill; 1993. p. 903–5.
8. Veldurthy VS, Shanmugam C, Sudhir N, Sirisha O, Motupalli CP, Rao N, et al. Pathological study of non-neoplastic skin lesions by punch biopsy. *Int J Res Med Sci*. 2015;3(8):1985–8.
9. Laishram R, Myrthong B, Laishram S, Shimray R, Kumar A, Sharma DC, et al. Pigmented skin lesions: Are they all of melanocytic origin? A histopathological prospective. *J Pak Assoc Dermatologists*. 2013;23(3):284–8.
10. Younas M, Haque A. Spectrum of histopathological features in non-infectious erythematous and papulosquamous diseases. *Int J Pathol*. 2004;2(1):24–30.
11. Goyal KK, Chahal KS. To Study the Clinicopathological Correlation of Common Pigmentary Disorders of Skin. *Int J Sci Res*. 2018;7(9):1448–52.
12. Kumar MU, Yelikar BR, Inamdar AC, Umesh S, Singhal A, Kushtagi AV, et al. A Clinico-pathological study of Lichenoid tissue reaction-A tertiary care experience. *J Clin Diagn Res*. 2013;7(2):312–6.
13. Singh A, Sharma P, Kashyap A, Sen A, Dabas R, Pal R, et al. A Clinicopathological Study of Spectrum of Pigmented Skin Lesions in Southern India: A Three Year Experience at a Tertiary Care Centre with Review of Literature. *Saudi J Pathol Microbiol*. 2020;5(10):437–45. doi:10.36348/sjpm.2020.v05i10.005.
14. Mruthyunjayappa S, Mahantappa H, Gopal MG, Venugopal SB. A study of spectrum of histopathological features in patients presenting with hyperpigmented skin lesions. *Arch Med Health Sci*. 2016;4(2):189–95.
15. Adhikari RC, Shah M, Jha AK. Histopathological spectrum of skin diseases in a tertiary skin health and referral centre. *J Pathol Nepal*. 2019;3(1):1434–40.
16. Jayker SS, Anantharaj J, Surhonne SP, Ramachandra R, Gurumurthy RY. Histopathological spectrum of hyperpigmented lesions of skin. *J Evol Med Dent Sci*. 2016;5(34):1913–7.
17. Saha R, Bandyopadhyay U, Halder B. Clinicopathological correlation of hyperpigmented skin lesions with special emphasis on alkaline Congo red stain for amyloid detection. *Int J Health Clin Res*. 2021;4(1):104–9.
18. Ravindran S, Teja KR, Arnold J, Kumar SA, Balaji S. Histopathological and Clinical Correlation of Hyperpigmented Skin Lesions. *Sch J App Med Sci*. 2020;8(11):2472–7.
19. Chaturvedi SK. Stigma experience in skin disorders: An Indian perspective. *Dermatol Clin*. 2005;23(4):635–42.

Author biography

Avani, Resident

Kamna Gupta, Professor https://orcid.org/0000-0001-8144-767X

Medha Jain, Associate Professor

Amit Jaiswal, Professor

R.K. Thakral, Professor

Alok Mohan, Professor

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