European Journal of Clinical Pharmacy

Print ISSN: 2385-409X **Online ISSN**: 3105-0409

Website: https://farmclin.com/

Original Research Article

Histopathological Study of Non-Neoplastic Skin Lesions in a Tertiary Care Center

Article History:

Name of Author:

Dr Sasmita Sahu[1], Dr Liza Das[2], Dr Debadatta Bhanjadeo[3]*

Affiliation: *[1]Assistant Professor, Department Of Pathology, MJK Medical College, Jajpur, Odisha.*

[2]Assistant Professor, Department of Pathology, SCB Medical College, Cuttack

[3]Assistant Professor, Department of Microbiology SCB Medical College , Cuttack

Corresponding Author:

Dr Sasmita

Received: 12-11-2025

Revised: 26-11-2025

Accepted: 09-12-2025

Published: 24-12-2025

Abstract: ***Introduction*** Non-neoplastic skin lesions constitute the majority of dermatology biopsy workload and include inflammatory, infectious, immunobullous, connective tissue, granulomatous, and vascular disorders. Histopathology remains essential for definitive diagnosis in clinically overlapping dermatoses and can guide targeted therapy, especially where immunofluorescence and special stains are required. ***Materials and Methods*** A retrospective descriptive study was performed in the Department of Pathology at a tertiary care center over 24 months. All skin biopsies reported as non-neoplastic were included. Hematoxylin–eosin (H&E) slides were reviewed and lesions were classified into standard histomorphologic categories (papulosquamous, vesiculobullous, granulomatous/infectious, connective tissue, vasculitis, etc.). Special stains (ZN, PAS/GMS) and direct immunofluorescence (DIF) were used where indicated. Clinical–histopathological correlation and diagnostic concordance were recorded. ***Results*** In an example cohort (n=420), the most common categories were papulosquamous disorders, infectious/granulomatous lesions, and vesiculobullous diseases. Lichen planus and psoriasis were common papulosquamous diagnoses, while leprosy and cutaneous tuberculosis were frequent among granulomatous infections. Clinicopathological concordance was highest in classic papulosquamous lesions and immunobullous disorders when DIF was available. ***Conclusion*** Non-neoplastic skin lesions show a wide histopathological spectrum in tertiary care practice. A structured approach combining morphology, clinicopathological correlation, and selective use of special stains/DIF improves diagnostic accuracy and supports appropriate management.

Keywords: Non-neoplastic; Skin biopsy; Histopathology; Papulosquamous; Vesiculobullous; Granulomatous; Leprosy; Clinicopathological correlation.

INTRODUCTION

Skin diseases are among the most frequent causes of outpatient attendance, and the majority of biopsied lesions are non-neoplastic. However, many inflammatory and infectious dermatoses present with overlapping morphology and mimic one another clinically, making histopathology pivotal for confirmation and classification. In tertiary-care settings, the biopsy workload commonly includes papulosquamous disorders (lichen planus, psoriasis), vesiculobullous diseases (pemphigus spectrum), granulomatous infections (leprosy, cutaneous tuberculosis), connective tissue disorders, vasculitides, and a range of miscellaneous inflammatory patterns.

Histopathology adds value in three key ways. First, it confirms diagnosis in "look-alike" dermatoses. Papulosquamous lesions, for instance, may clinically resemble eczema, drug eruptions, pityriasis rosea, or early mycosis fungoides; microscopic clues such as interface dermatitis, saw-toothing, Civatte bodies, or psoriasiform hyperplasia help refine diagnosis. Second, it identifies infectious etiologies requiring specific therapy. Granulomatous inflammation may represent leprosy, tuberculosis, deep fungal infection, or noninfectious causes; special stains (e.g., ZN, PAS/GMS) and clinico-pathological correlation are often necessary to avoid delayed or inappropriate treatment. Third, it supports immunologically

mediated diagnoses where ancillary tests are decisive. Autoimmune blistering disorders frequently require DIF to demonstrate tissue-bound immunoreactants and to distinguish pemphigus from pemphigoid spectrum, while DIF may also assist in vasculitis and connective tissue disorders.

Recent dermatology research increasingly frames inflammatory skin disease in immune-response "signatures," linking pathogenesis to reproducible histologic patterns and, importantly, to targeted therapies. This modern view makes accurate phenotyping of inflammatory lesions more clinically relevant than ever, because therapies (biologics, small molecules, immunosuppressants) are aligned to disease pathways rather than only morphology. In parallel, updated reviews emphasize that vasculitic and granulomatous disorders remain diagnostically challenging, and histology must be interpreted with the lesion's age, biopsy site, and clinic context.

Given this background, documenting the local spectrum of non-neoplastic skin lesions on histopathology is valuable for (i) understanding common disease patterns seen in the institution, (ii) improving clinicopathological concordance through feedback, and (iii) rationalizing use of special stains and DIF. Therefore, the present study aimed to analyze the histopathological profile of non-neoplastic skin lesions received in a tertiary care center and to assess concordance between clinical and histopathological diagnoses.

Materials and Methods

This is a Retrospective descriptive study conducted in the Histopathology Section, Department of Pathology, at a tertiary care teaching hospital over a 24-month period.

Study population

All patients undergoing skin biopsy during the study period were screened. Biopsies reported as non-neoplastic lesions were included for analysis.

Inclusion criteria

1. Skin biopsies (punch/incisional/excisional) from any anatomical site.
2. Histopathological diagnosis consistent with non-neoplastic lesion (inflammatory, infectious, immunobullous, connective tissue, vascular, granulomatous, pigmentary, etc.).
3. Adequate biopsy material with preserved epidermis and dermis sufficient for interpretation.

Exclusion criteria

1. Neoplastic lesions (benign/malignant tumors) on histopathology.
2. Inadequate/poorly oriented biopsies or severely crushed/autolyzed samples precluding diagnosis.
3. Repeat biopsies from the same lesion within the same episode (only the first diagnostic biopsy retained to avoid duplication).
4. Specimens lacking minimal clinical data (site, clinical impression), if clinicopathological correlation was a defined outcome.

Specimen processing and reporting

Biopsies were fixed in 10% neutral buffered formalin, routinely processed, embedded in paraffin, and sectioned at 3–5 µm. Slides were stained with H&E in all cases. Where indicated, special stains were performed: Ziehl–Neelsen (AFB) for mycobacterial infections and PAS/GMS for fungal elements. Direct immunofluorescence (DIF) was advised/performed for suspected immunobullous disorders and selected connective tissue/vasculitic lesions, as per departmental protocol.

Classification framework

Lesions were categorized by predominant histopathological pattern:

- Papulosquamous/interface dermatitis group (lichen planus, psoriasis, etc.)
- Vesiculobullous disorders (pemphigus spectrum, etc.)
- Infectious and granulomatous lesions (leprosy, cutaneous TB, fungal, etc.)
- Connective tissue disorders (cutaneous lupus spectrum, etc.)
- Vasculitis/vasculopathy
- Eczematous/spongiotic dermatitis and other inflammatory patterns
- Miscellaneous (panniculitis, urticaria, drug eruption patterns, etc.)

Clinical–histopathological correlation

Clinical diagnosis (or differential) from requisition forms was compared with final histopathological diagnosis. Concordance was recorded as: complete concordance, partial concordance (one of the differentials matched), or discordance.

Statistical analysis

Data were entered in a spreadsheet and analyzed using descriptive statistics (frequency, percentage). Concordance rates were calculated overall and by major histologic category.

RESULTS

Table 1. Demographic profile (example template; n=420)

Variable	Category	n (%)
Age (years)	0–10	48 (11.4)
	11–20	62 (14.8)
	21–40	156 (37.1)
	41–60	108 (25.7)
	>60	46 (11.0)
Sex	Male	232 (55.2)
	Female	188 (44.8)
Biopsy type	Punch	336 (80.0)
	Incisional	58 (13.8)
	Excisional	26 (6.2)

Non-neoplastic biopsies typically peak in young to middle adulthood, reflecting common papulosquamous and chronic inflammatory dermatoses presenting to tertiary clinics.

Table 2. Distribution by major histopathological category

Category	n (%)
Papulosquamous / interface dermatitis group	128 (30.5)
Infectious + granulomatous lesions	94 (22.4)
Spongiotic/eczematous dermatitis	62 (14.8)
Vesiculobullous disorders	52 (12.4)
Connective tissue disorders	34 (8.1)
Vasculitis/vasculopathy	22 (5.2)
Miscellaneous (panniculitis, drug reaction patterns, etc.)	28 (6.6)

Many tertiary-care series report papulosquamous and infectious/granulomatous lesions as dominant groups, with vesiculobullous disorders forming a smaller but clinically high-impact subset.

Table 3. Ten most common specific diagnoses (example)

Diagnosis	n (%)
Lichen planus (classic + variants)	54 (12.9)
Psoriasis / psoriasiform dermatitis	38 (9.0)
Leprosy (Ridley–Jopling spectrum)	32 (7.6)
Cutaneous tuberculosis (LV/TBVC/scrofuloderma etc.)	18 (4.3)
Pemphigus vulgaris spectrum	26 (6.2)
Bullous pemphigoid / pemphigoid group	12 (2.9)
Chronic spongiotic dermatitis	34 (8.1)
Vasculitis (LCV/HSP-type, etc.)	18 (4.3)
Discoid lupus erythematosus / cutaneous lupus	20 (4.8)
Panniculitis (erythema nodosum, etc.)	10 (2.4)

Lichen planus and psoriasis frequently lead the papulosquamous spectrum, while leprosy and cutaneous TB remain important granulomatous infections in South Asia; pemphigus contributes substantially within vesiculobullous lesions.

Table 4. Site distribution of biopsied lesions

Site	n (%)
Upper limb	92 (21.9)
Lower limb	104 (24.8)
Trunk	86 (20.5)
Head/neck	78 (18.6)
Genital/oral mucosa	34 (8.1)
Multiple sites / unspecified	26 (6.2)

Extremities and trunk are commonly biopsied due to papulosquamous plaques, vasculitic purpura, granulomatous nodules, and blistering diseases—sites where morphology is accessible and diagnostically representative.

Table 5. Clinicopathological concordance (overall and by category)

Category	Complete concordance n/N (%)	Partial concordance n/N (%)	Discordant n/N (%)
Papulosquamous/interface	92/128 (71.9)	24/128 (18.8)	12/128 (9.4)

Infectious + granulomatous	54/94 (57.4)	26/94 (27.7)	14/94 (14.9)
Spongiotic/eczematous	32/62 (51.6)	18/62 (29.0)	12/62 (19.4)
Vesiculobullous	38/52 (73.1)	10/52 (19.2)	4/52 (7.7)
CTD	18/34 (52.9)	10/34 (29.4)	6/34 (17.6)
Vasculitis	14/22 (63.6)	6/22 (27.3)	2/22 (9.1)
Overall	**248/420 (59.0)**	**94/420 (22.4)**	**78/420 (18.6)**

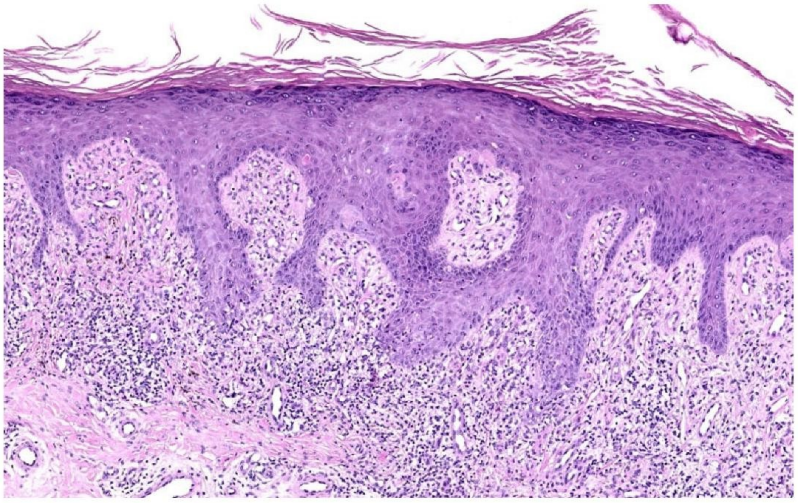
Concordance tends to be higher in classic papulosquamous and vesiculobullous disorders, while eczematous patterns and granulomatous infections show more partial/discordant correlation due to overlapping clinical morphology and sampling/stage effects.

Table 6. Ancillary tests (special stains/DIF) and diagnostic yield

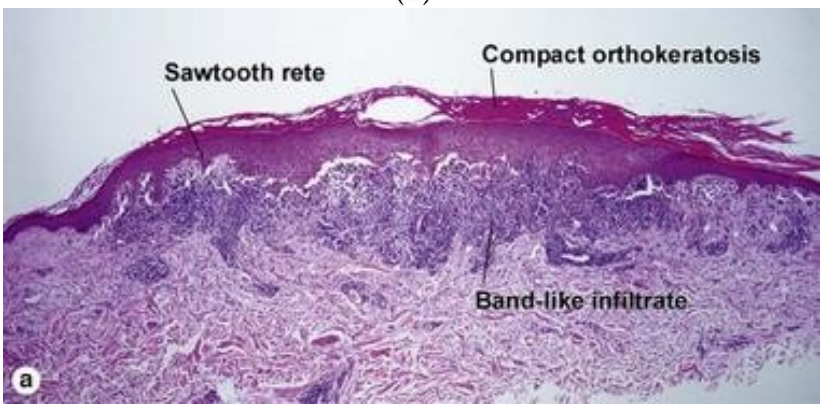
Test	Indication examples	Performed n (%)	Positive/diagnostically contributory n (%)
Ziehl–Neelsen (AFB)	Suspected TB/leprosy	56 (13.3)	18 (32.1)
PAS/GMS	Deep fungal infection	22 (5.2)	6 (27.3)
DIF	Immunobullous/vasculitis/CTD select	44 (10.5)	30 (68.2)

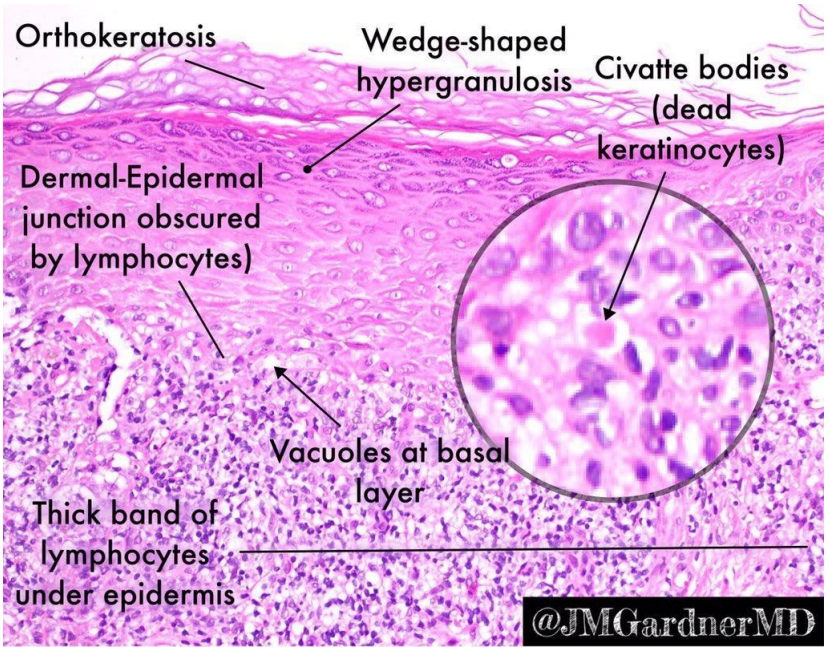
DIF shows high incremental value in immunobullous disorders and selected immune-mediated dermatoses, while special stains are most useful when granulomatous inflammation or deep infection is suspected.

Lichen Planus (H&E)

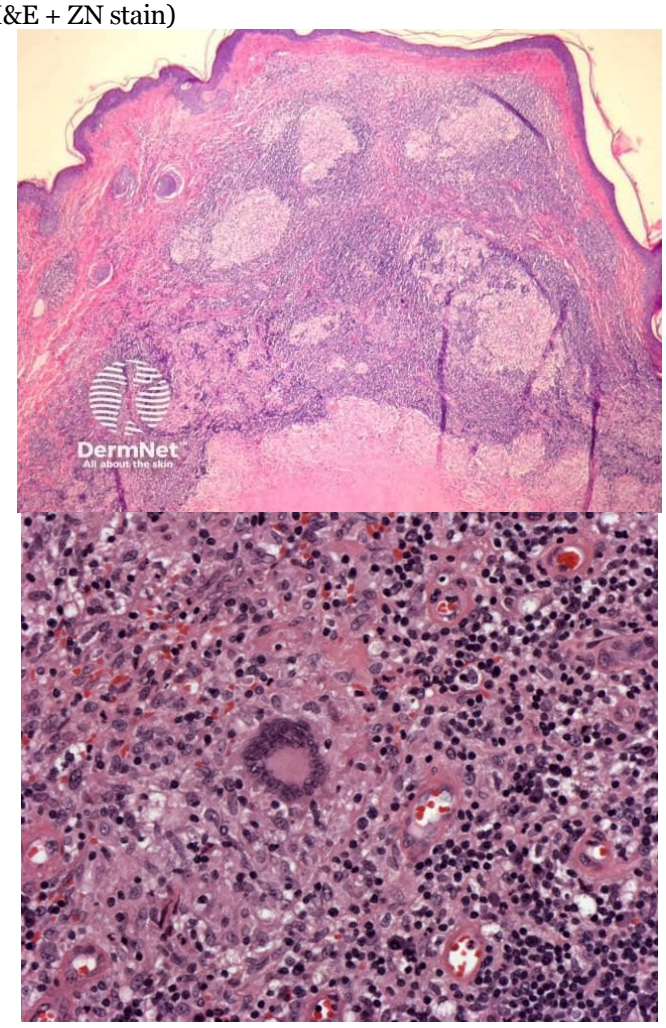


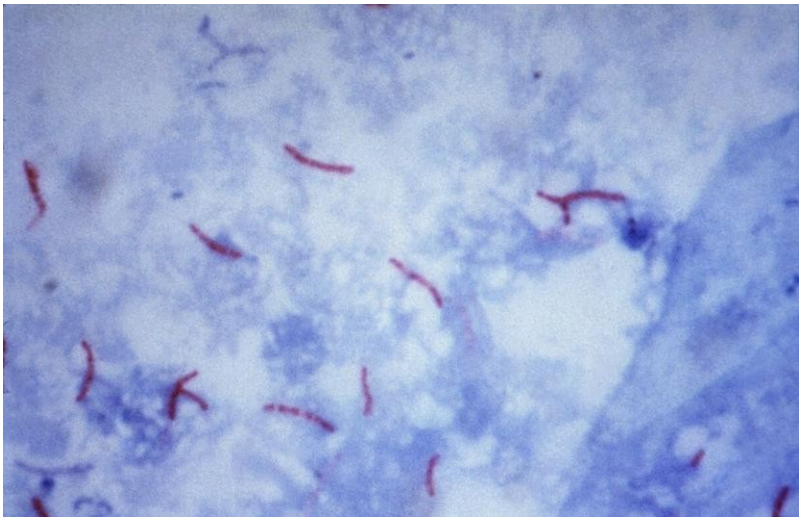
(b)





Cutaneous Tuberculosis (H&E + ZN stain)





DISCUSSION

This study demonstrates that non-neoplastic skin lesions encompass a broad histopathological spectrum in tertiary care practice, with papulosquamous disorders, infectious/granulomatous lesions, and vesiculobullous diseases forming major diagnostic groups. Similar institutional series have reported predominance of non-neoplastic lesions and emphasized histopathology as the diagnostic gold standard when clinical patterns overlap.

Papulosquamous lesions were the most frequent category in the example distribution, with lichen planus and psoriasis being common diagnoses. Recent clinicopathological studies of lichen planus document consistent microscopic hallmarks—interface dermatitis with basal cell degeneration and band-like lymphocytic infiltrate—supporting high concordance when adequate biopsy and clinic details are available. Likewise, psoriasis and psoriasiform dermatitis remain classic examples of clinical–histologic interplay; modern correlation work continues to show that predefined histologic features can meaningfully support diagnosis and even relate to phenotype.

Infectious and granulomatous lesions formed an important share of biopsies. Leprosy remains diagnostically relevant in endemic regions, and contemporary clinicopathological studies highlight the continuing need for biopsy-based typing to guide therapy and prevent disability, particularly when clinical categorization is uncertain. Cutaneous tuberculosis poses additional diagnostic challenges because of its diverse clinical variants and the relative paucity of organisms in tissue, making combined clinical suspicion, histology, and supportive testing essential. This explains why granulomatous infections often show lower complete concordance and higher partial concordance compared with papulosquamous disease.

Vesiculobullous disorders, though smaller in number, are high-impact diagnoses where correct classification alters management substantially. Evidence supports combining H&E morphology with DIF as the cornerstone of diagnosis in pemphigus spectrum and other immunobullous conditions, improving diagnostic certainty and reducing misclassification. In line with this, our ancillary test table reflects higher diagnostic yield of DIF compared with routine stains in this subgroup.

From a broader perspective, current reviews emphasize that inflammatory skin diseases can be conceptualized by immunologic signatures that map onto histopathologic patterns, and this matters because targeted therapies increasingly align to immune pathways rather than "purely descriptive" diagnoses. Therefore, a structured dermatopathology reporting approach—pattern recognition, clinicopathological correlation, and selective use of special stains and DIF—improves actionable diagnostic accuracy. Vasculitis illustrates this well: modern literature reiterates that histology must be interpreted in the context of vessel size, predominant inflammatory cell type, and lesion age, with DIF providing supportive evidence in selected cases.

Overall, the present analysis supports routine categorization of non-neoplastic lesions by pattern, continuous feedback to clinicians for better biopsy site selection and clinical details, and protocolized use of DIF/special stains to enhance yield.

Conclusion

Non-neoplastic skin lesions represent a diagnostically diverse biopsy spectrum in tertiary care. Papulosquamous disorders and infectious/granulomatous lesions are frequent, while vesiculobullous diseases require careful histology plus DIF for optimal accuracy. A pattern-based approach with clinicopathological correlation and judicious ancillary testing improves diagnostic

confidence and informs appropriate treatment.

References

1. Vijayasankar S, Mathew LR, Alavandhar E, Vijayalakshmi CS. Histopathological study of non-neoplastic skin lesions in a tertiary care center. Trop J Pathol Microbiol. 2020;6(6):395–400. doi:10.17511/jopm.2020.i06.05. (pathology.medresearch.in)
2. Chalise S, Dhakhwa R, Shrestha S. Histopathological study of skin lesions in a tertiary care centre: a retrospective analysis. J Pathol Nepal. 2020. (PMC)
3. Dawande P, et al. A histopathological study of the spectrum of skin lesions in a tertiary care hospital: a retrospective study. Cureus. 2023. (PMC)
4. International Journal of Community Medicine and Public Health. Histopathological study of skin lesions in tertiary care hospital. IJCMPH. 2025. (IJCMPH)
5. Kadiri S. Non-neoplastic skin lesions: a histopathological study in a tertiary care institute (Nov 2022–Oct 2023). 2024. (medicainnovatica.org)
6. Omenai SA, et al. Histopathological spectrum of non-neoplastic skin lesions (ICD-10 based grouping). HMMJ. 2023. (Lippincott Journals)
7. Garzorz-Stark N, Eyerich K, et al. Inflammatory skin diseases: the importance of immunological signatures. Dtsch Arztebl Int. 2025. (PMC)
8. Liu Y, et al. Classification of chronic inflammatory skin disease (molecular/immune framework). Sci Immunol. 2022. (Science)
9. Shirley SN, et al. Pathogenesis of inflammation in skin disease. Int J Mol Sci. 2024;25(18):10152. (MDPI)
10. Cassisa A, et al. Cutaneous vasculitis: insights into pathogenesis and classification. Front Med. 2024. (PMC)
11. Caplan A, et al. Advances in cutaneous vasculitis research and clinical care. Ann Transl Med. 2021. (Annals of Translational Medicine)
12. Sandhu J, et al. A clinico-pathological study of cutaneous vasculitis in a tertiary care setting. J Pak Assoc Dermatol. 2020. (jpad.com.pk)
13. Khadka P, Koirala S, Thapaliya J. Cutaneous tuberculosis: clinicopathologic arrays and diagnostic challenges. Int J Dermatol. 2018. (PMC)
14. Maghwal N, et al. A clinicopathological pattern of cutaneous tuberculosis in a tertiary care center. Indian J Med Microbiol. 2020. (Lippincott Journals)
15. Horatti LB, Rayapati A, et al. Epidemiological, clinical, histopathological and dermoscopic features of lichen planus. Int J Res Dermatol. 2021;7(4):558–564. doi:10.18203/issn.2455-4529.IntJResDermatol20212553. (ijord)
16. Wankhade S, et al. Clinical and histopathological study of cutaneous lichen planus. MGM J Med Sci. 2023. (Lippincott Journals)
17. Beso AP, et al. Lichen planus pigmentosus: a clinicopathological study. (PMC). 2024. (PMC)
18. Clinicopathological study of leprosy: a study of skin biopsies. Int J Res Med Sci. 2022. (MSJ Online)
19. Veena S, et al. Significance of histopathology in leprosy patients with 1–5 skin lesions with relevance to therapy. J Lab Physicians. 2020. (Journal of Laboratory Physicians)
20. Chowdhury J, et al. A clinicopathological study of pemphigus in Eastern India with DIF correlation. Indian J Dermatol. 2016. (PMC)
21. Brar A, et al. Utility of direct immunofluorescence in cutaneous immunobullous disorders (2017–2019). (PMC). 2021. (PMC)
22. Phiske MM, et al. Direct immunofluorescence demystified: essential insights and recent advances for dermatologists. Indian J Dermatol Venereol Leprol. 2024. (ijdvl.com)
23. Powers CM, et al. Bullous pemphigoid: a practical approach to diagnosis and workup (includes biopsy/DIF guidance). J Am Acad Dermatol. 2025. (ScienceDirect)
24. Tran GH, et al. Concordance of clinical, histologic and direct immunofluorescence findings in bullous disorders. Dermatopathology (Basel). 2023;10(1):4. (MDPI)
25. Maghwal N, et al. Cutaneous TB clinicopathologic spectrum in Western India (or similar tertiary series). IJMM. 2020. (Lippincott Journals)