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DIAGNOSTIC RELIABILITY AND PITFALLS OF TZANCK SMEARS IN CUTANEOUS LESIONS - RETROSPECTIVE STUDY IN A TERTIARY CARE CENTRE WITH CLINICAL AND HISTOPATHOLOGICAL CORRELATION

Pathology

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ABSTRACT

Introduction: Skin lesions can range from inflammatory and cutaneous dermatoses to neoplastic alterations in various skin tissue compartments. Tzanck smear is a simple, rapid and inexpensive test that is used to identify erosive vesiculobullous lesions, granulomatous lesions, cutaneous infections, genodermatoses and cutaneous tumors. **Aim:** The aim of this study is to examine the usefulness of tzanck smears for diagnosing cutaneous lesions and correlate tzanck smear findings with clinical and histopathological diagnosis. **Method:** This retrospective study was carried out on all Tzanck smears received for a period of nine months from February 2023 to October 2023. **Results:** A total of 32 tzanck smears were performed, out of which tzanck smear was diagnostically informative in 23 cases (72%) and not informative in 9 cases (28%). Tzanck smear findings confirmed the clinical diagnosis in 17 cases. Histopathology was available in 11 cases, out of which tzanck smear findings in 10 cases correlated with histopathological diagnosis. The commonest category for which tzanck smear was ordered was vesiculobullous lesions (16 cases - 50%), out of which 14 cases (44%) were diagnosed as pemphigus, and 2 cases (6%) were diagnosed as bullous pemphigoid. 4 cases (12%) suspected to have an infectious etiology were diagnosed as herpes infection. Out of 3 (9%) clinically diagnosed cases of ulcerative lesions, 2 cases (6%) had inflammatory pathology and 1 case (3%) was diagnosed as epithelial neoplasm. The cases which had unremarkable squamous epithelial cells with non-specific findings on tzanck smear were not helpful in any definite diagnosis. High concordance is seen between Tzanck smear diagnosis and clinical diagnosis as well as between Tzanck smear diagnosis and histopathological diagnosis. **Conclusion:** Tzanck smear is an excellent and very useful tool in establishing rapid diagnosis of cutaneous vesiculobullous and ulcerated lesions.

KEYWORDS

Tzanck, vesiculobullous, pemphigus, herpes, neoplasm.

INTRODUCTION

First introduced in 1947 by Frenchman, Arnault Tzanck, as a tool of diagnostic cytology for diagnosis of vesiculobullous conditions[1,2]. Nowadays, it is used for diagnosis of several dermatological conditions like vesiculobullous disorders, genodermatosis, cutaneous infections and cutaneous tumors[2,3]. It is a simple, fast, and inexpensive diagnostic test[2,4]. This study was undertaken to evaluate the efficacy of Tzanck smear cytology in the diagnosis of cutaneous lesions and to correlate it with clinical as well as histopathological diagnosis.

MATERIALS AND METHODS

It was a retrospective observational study of clinicopathological concordance, conducted at the Cytopathology Section in the Department of Pathology at a tertiary care center, Grant Government Medical College and Sir J.J. Group of Hospitals, Mumbai, Maharashtra, India from February 2023 to October 2023. All the tzanck smears received in the department of cytology between February 2023 to October 2023 were included in the study. Tzanck smears were prepared from the skin lesions according to the standard operating procedure. The smears were stained by Giemsa and Hematoxylin and Eosin stains. Available clinical details including particulars of the patient such as name, age, gender, site of involvement of the lesion and clinical diagnosis were noted. Slides of Tzanck smear were retrieved and reviewed and available histopathological diagnosis was documented. The clinical diagnosis was compared with Tzanck smear cytology diagnosis and the concordance was calculated. The Tzanck smear cytology diagnosis was compared with available histopathology diagnosis and concordance was calculated.

RESULTS

In the present study, 32 cases of Tzanck smears were analyzed. The age ranged from 8 years to 70 years. Maximum number of cases were observed in fourth decade (mean age=35.35 years). The lesions were seen predominantly in females {24 cases (75%)} with a M:F ratio of 0.33:1 [Figure 1].

Out of the 32 cases, the findings of tzanck smear were suggestive of vesiculobullous lesions in 16 cases (50%), cutaneous infections in 4 cases (13%), non-specific inflammatory lesions in 2 cases (6%), epithelial neoplasm in 1 case (3%) and non-representative in 9 cases (28%) [Table 1].

Out of the 16 cases of vesiculobullous lesions, 14 cases were of pemphigus group in which smears revealed multiple acantholytic cells (Tzanck cells) which are large round keratinocytes having perinuclear halo and deep basophilic cytoplasm [Figure 2.A]. 2 cases were diagnosed as bullous pemphigoid which showed presence of eosinophils in smears [Figure 2.B].

All the 4 cases of cutaneous infection were diagnosed as herpes infection. These smears revealed multinucleated cells with syncytial ground glass nuclei and nuclear molding [Figure 2.C]. Four cases were diagnosed as non-specific inflammatory lesion out of which two were diagnosed as acute on chronic inflammation and two were diagnosed as chronic inflammation.

One case diagnosed as epithelial neoplasm showed atypical squamous cells [Figure 2.D]

The concordance between clinical diagnosis and Tzanck smear diagnosis is high as tabulated in [Table 2]. The concordance between Tzanck smear diagnosis and histopathological diagnosis is also high as tabulated in [Table 3].

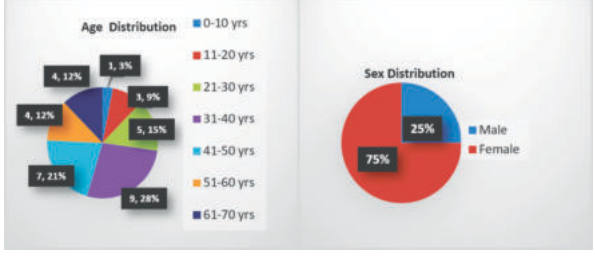


Figure 1: Age Distribution & Sex Distribution

Table 1: Details of Tzanck Smear Diagnosis

Tzanck smear diagnostic categories	No. of Cases
Vesiculobullous lesion	**16 (50%)**
Pemphigus group	14 (44%)
Bullous pemphigoid	2 (6%)
Cutaneous infection	**4 (13%)**

Herpes infection	4 (13%)
Nonspecific inflammatory lesions	**2 (6%)**
Acute on chronic inflammation	1 (3%)
Chronic inflammation	1 (3%)
Epithelial neoplasm	**1 (3%)**
Tzanck smear non-diagnostic categories	No. of Cases
Non representative	**9 (28%)**
Total	**32**

Table 2: Clinical diagnosis and Tzanck smear diagnosis concordance

Clinical Diagnosis	Tzanck Smear Diagnosis	Cases	Concordant	Discordant
Pemphigus group	Pemphigus Group	16	16(100%)	0
Herpes Infection	Herpes Infection	6	4(66.66%)	2(33.33%)
Bullous Pemphigoid	Bullous Pemphigoid	4	2(50%)	2(50%)
Genital Ulcer Disease	Non representative	2	0	2(100%)
Neoplastic Lesion	Epithelial Neoplasm	1	1(100%)	0
Varicella	Non representative	1	0	1(100%)
Insect Bite Reaction	Non representative	1	0	1(100%)
Bullous Impetigo	Non representative	1	0	1(100%)

Table 3: Tzanck smear diagnosis and Histopathological diagnosis concordance

Tzanck Smear Diagnosis	Histopathological Diagnosis	No. of Cases available for Histopathology (11)	Concordant	Discordant
Pemphigus group	Pemphigus group	8 (73%)	7(87.50%)	1(12.50%)
Bullous Pemphigoid	Bullous Pemphigoid	1 (9%)	1(100%)	0
Herpes Infection	Herpes Infection	1 (9%)	1(100%)	0
Epithelial neoplasm	Squamous Cell Carcinoma	1 (9%)	1(100%)	0

Pitfalls

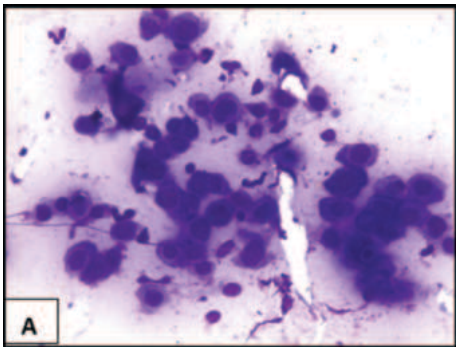
The present study was a restricted study of 9 months. Out of the total 32 cases, 9 cases (28.12%) were non representative. The limitations of Tzanck smear are that representative material may not be obtained if slides are improperly prepared from a crusted vesicle. This can also result if the base of the lesion is not adequately scraped. Poorly preserved cells can sometimes resemble neoplastic cells, leading to a wrong impression.

DISCUSSION

The lesions were seen predominantly in females {24 cases (75%)} with a M:F ratio of 0.33:1 which is similar to the study conducted by Singhal S. et al[4].

In the present study, clustering of cases was seen in the fourth decade with a mean age of 35.35 years which is similar to the study conducted by Virendra Khadse et al[7].

Singhal S. et al[4] and the present study documented most common diagnostic entity as vesiculobullous lesions {16 cases(50%)}, followed by cutaneous infections {4 cases (13%)}, non-specific inflammatory lesions {2 cases(06%)} and epithelial neoplasm {1 case (3%)}[Table 4].



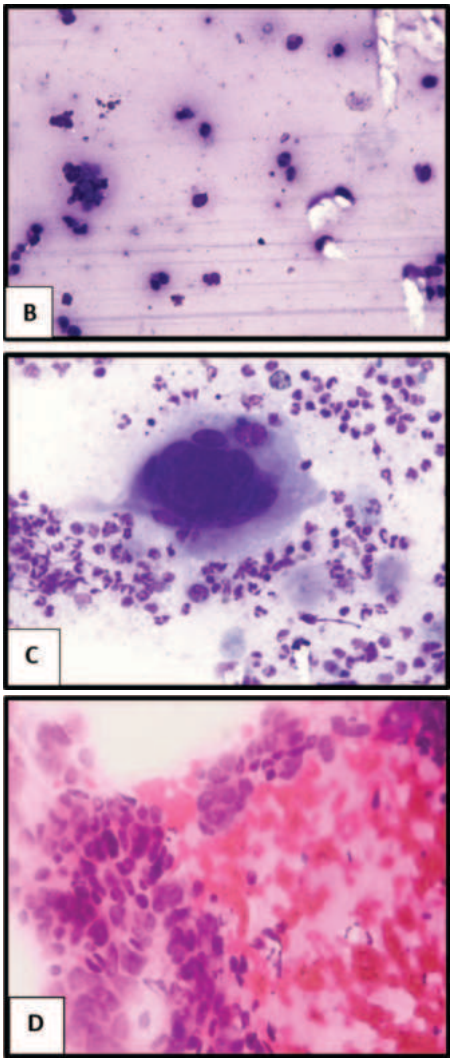


Figure 2: A- Acantholytic Cells of Pemphigus; B- Eosinophils in Bullous Pemphigoid; C- Multinucleated Giant Cell of Herpes; D- Atypical Squamous Cells in Epithelial Neoplasm

In the present study, tzanck smear diagnosis were correlated with clinical diagnosis and available histopathology diagnosis. When clinical diagnosis was compared with Tzanck smear diagnosis (Tzanck smear-clinical concordance), the present study showed higher concordance than study conducted by Kumar AKKT et al, HN Shruthi et al. However, concordance was lower than study conducted by Singhal S et al[2,4,5]. When Tzanck smear diagnosis was compared with histopathology diagnosis (Tzanck smear-histopathology concordance), the present study showed higher concordance than study conducted by Kumar AKKT et al, HN Shruthi et al and Singhal S et al. However, concordance was lower than study conducted by Khadse V et al[2,4,5,7] [Table 5].

Table 4: Comparison Of Pattern Of Distribution Of Cytological Diagnosis On Tzanck Smear In Various Studies

Authors	N	Cutaneous Infections	Non-specific inflammation	Vesiculo-bullous lesion	Tumours	Spongiotic Dermatitis	Other Conditions	Non representative
Eryilmaz A et al., (Turkey, 2014	500	193 (38.6 %)	0 (0%)	11 (2.2%)	190 (38%)	54 (10.8%)	47 (9.4%)	0 (0%)
Kumar AKKT et al., (India, 2018)	70	11 (15.71 %)	0 (0%)	22 (31.43 %)	0 (0%)	0 (0%)	28 (40.0 6%)	12 (12.8 %)

Khadse V et al., (India, 2018)	102	36 (35.29 %)	18 (17.65 %)	45 (44.12 %)	0 (0%)	1 (0.98%)	2 (0.98 %)	0 (0%)
Singhal S et al., (India, 2020)	62	26 (41.94 %)	0 (0%)	23 (37.10 %)	0 (0%)	0 (0%)	0 (0%)	13 (20.97 %)
Present study	32	4 (12.5 %)	2 (6.25%)	16 (50%)	1 (3.12 %)	0 (0%)	0 (0%)	9 (28.12 %)

Table 5: Comparison of concordance of Tzanck smear cytology in various studies

Authors	Tzanck smear-Clinical concordance	Tzanck smear-Histopathology concordance
Kumar AKKT et al., [5] (India, 2018)	61.11%	68.42%
HN Shruthi	60%	83.33%
Khadse V et al., [14] (India, 2018)	-	100%
Singhal S et al., [13] (India, 2020)	77.4%	64.86%
Present Study (India, 2023)	71.87%	90.90%

CONCLUSIONS

As per our observations we can conclude that Tzanck smear is a rapid, easy and reliable tool for evaluating and diagnosing vesiculobullous lesions of the skin, cutaneous infections especially herpetic infections and cutaneous malignancy. Tzanck smear causes minimal trauma or discomfort to the patient allowing it to be easily performed. Tzanck smear cytology by showing parallel cytomorphological characters with skin biopsy can reduce the need of the skin biopsy in most of the vesiculobullous skin lesions. This study may be taken as reinforcement to other studies that have already established the utility of Tzanck smear as a cytodiagnostic technique in the field of dermatology. Tzanck smear is a prudent diagnostic tool for cytological evaluation of cutaneous lesions. It serves as a complimentary investigative modality to histopathology. Smears taken from the fresh lesions and from the representative areas may minimize the discordance rate and thereby improve the concordance.

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