SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Dermatology

Practice of Tzanck Smear Cytodiagnosis at the Dermatology Hospital of Bamako

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DOI: https://doi.org/10.36347/sasjm.2026.v12i11.003 | **Received:** 06.09.2026 | **Accepted:** 01.11.2026 | **Published:** 03.11.2026

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Abstract **Original Research Article**

Introduction: Tzanck smear cytodiagnosis involves the morphological examination of cells obtained by scraping a lesion and spreading the material directly onto a glass slide. The technique has been used for decades. Although Tzanck smear cytodiagnosis can contribute to the diagnosis of several skin diseases, it remains a preliminary diagnostic test. ***Objective:*** The aim of this study was to describe the use of Tzanck smear cytodiagnosis in clinical practice at the Dermatology Hospital of Bamako. ***Methodology:*** This descriptive cross-sectional study was conducted in the dermatology department of the Dermatology Hospital of Bamako (HDB) from 1 May 2023 to 31 October 2023. All patients who attended during the study period and underwent Tzanck smear cytodiagnosis were included. Anonymity was guaranteed at enrolment. ***Results:*** Over a six-month period, Tzanck smear cytodiagnosis was performed in 67 patients. Male patients predominated (52%). The mean age was 27 years (range: 2–80 years). The principal indication for Tzanck smear examination was bullous eruptions (81.82%). Tzanck smear examination contributed to diagnostic orientation in 57 of 67 patients (85%). Bullous pemphigoid was the most frequent diagnosis (22.39%). ***Conclusion:*** In resource-limited countries, Tzanck smear cytodiagnosis, although an older technique, remains an alternative to histopathology, fungal cultures, and polymerase chain reaction testing.

Keywords: Tzanck smear cytodiagnosis; Dermatology Hospital of Bamako; Mali.

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INTRODUCTION

Tzanck smear cytodiagnosis involves the morphological examination of cells collected by scraping a lesion and spreading them directly onto a glass slide.

This test is named after Arnault Tzanck, a haematologist at Saint-Louis Hospital and a pioneer of blood transfusion, who developed a rapid cytological diagnostic method in 1947 based on the examination of smears obtained by scraping lesions [1].

The advantages of this technique are its speed and simplicity [1]. It requires fewer resources and can be implemented in poorly equipped facilities [1]. However, it is an orienting test and does not provide a definitive diagnosis [2].

Tzanck smear cytodiagnosis has been used for decades. Its use has gradually declined with advances in histopathology, fungal culture, and polymerase chain reaction (PCR) testing [1].

Disparities in access to these diagnostic tools persist between countries. Such investigations are routinely available in developed countries, whereas limited technical infrastructure and cost restrict access in resource-limited settings [3].

Tzanck smear cytodiagnosis can assist in the diagnosis of several skin diseases.

To our knowledge, no study on Tzanck smear cytodiagnosis has been conducted in sub-Saharan Africa.

The objectives of this study were to describe the practice of Tzanck smear cytodiagnosis and to identify its indications at the Dermatology Hospital of Bamako.

METHODOLOGY

The study was conducted in the dermatology department of the Dermatology Hospital of Bamako (HDB). It was a descriptive cross-sectional study lasting six months, from 1 May 2023 to 31 October 2023. All patients seen in consultation at HDB during the study period who consented and underwent Tzanck smear cytodiagnosis were included. Patients who did not consent, or whose samples were lost, were excluded. Non-participation in the study did not affect patient care.

Study procedure:

Patients recruited during consultations underwent dermatological and general examinations. Sampling sites were identified. Sociodemographic, medical-history, clinical, and paraclinical data were recorded on a data collection form.

Sampling technique

Tzanck smear cytodiagnosis can be performed on erosive or vesiculobullous skin or mucosal lesions. A recent lesion (less than 48 hours old) is preferable.

- Unroof the vesicle and scrape its base using a sterile No. 15 scalpels blade.
- Spread the material onto a clean glass slide.
- Fix using gentle heat or allow to air-dry.
- Fix with methanol (MeOH).
- Stain with Giemsa, methylene blue, or Wright stain.
- Examine microscopically using an oil-immersion objective.
- First scan samples at low magnification (×4 and ×10), then examine them in detail using the high-power objective (×100).

Table 1: Interpretation of results

Conditions	Expected Tzanck smear findings
Pemphigus	Acantholytic cells
Bullous pemphigoid	Numerous eosinophils
Histoplasmosis	Birefringent cells
Sporotrichosis	Cigar-shaped cells
Bacterial infection	Cells arranged in chains
Leishmaniasis	Macrophages containing Leishman bodies
Drug eruption	Keratinocyte necrosis
Viral infections	Ballooning cells
Scabies	Presence of Sarcoptes mites

RESULTS

Over a six-month period, Tzanck smear cytodiagnosis was performed in 67 patients.

A skin biopsy was performed in five patients. Male patients predominated (52%). Mean age was 27 years, with ages ranging from 2 to 80 years. Most patients (86%) lived in urban areas.

Regarding indications for Tzanck smear examination, bullous eruptions accounted for 80.59% (Table 2).

Table 2: Distribution according to indications for Tzanck smear examination

INDICATION FOR TZANCK SMEAR	Frequency	Percentage
Oral erosions	2	2.98%
Postbullous erosions	2	2.98%
Bullous eruptions	54	80.59%
Skin eruption	8	11.94%
Oral ulceration	1	1.49%
Total	**67**	**100.00%**

Two slides per patient was the most frequent number (53.73%).

Table 3: Distribution by number of slides

NUMBER OF SLIDES	Frequency	Percentage
1	4	5.97%
2	36	53.73%
3	27	40.30%
Total	**67**	**100.00%**

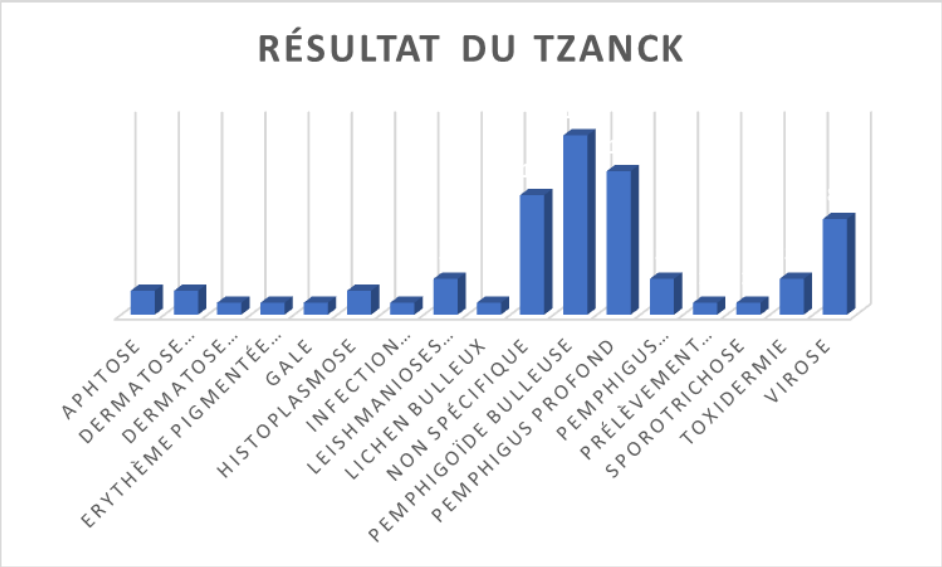
Biopsy was performed in five patients (Table 4).

Table 4: Distribution according to biopsy results

BIOPSY RESULTS	Frequency	Percentage
Superficial pemphigus	1	20.00%
Nonspecific dermatitis	1	20.00%
Histoplasmosis	1	20.00%
Bullous pemphigoid	1	20.00%
Deep pemphigus	1	20.00%
Total	5	100.00%

According to the Tzanck smear cytodiagnostic findings, bullous pemphigoid was the most frequent diagnosis (22.39%; Table 5).

Table 5: Distribution according to Tzanck smear cytodiagnostic findings



Tzanck smear cytodiagnosis contributed to diagnostic orientation in 57 of 67 patients (85%; Table 6).

Table 6: Contribution of Tzanck smear cytodiagnosis to diagnostic orientation

Tzanck smear findings	Frequency	Percentage
Contributory examination	57	85%
Noncontributory examination	10	15%
Total	**67**	**100**

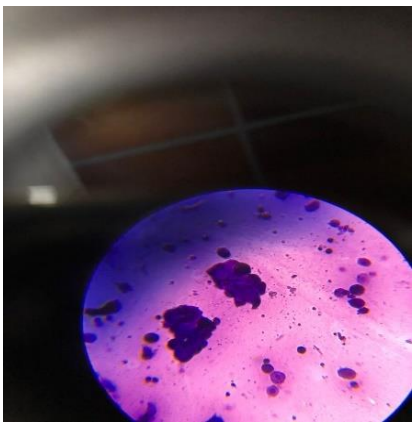


Image 1: Ballooning cells (Dr Lamissa Cissé)



Image 2: Umbilicated vesicles (Dr Alimata Keïta)

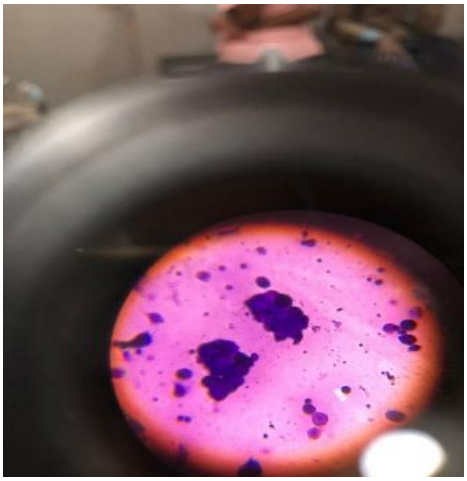


Image 3: Ballooning cells (Dr Lamissa Cissé)



Image 4: Umbilicated vesicles (Dr Binta Guindo)

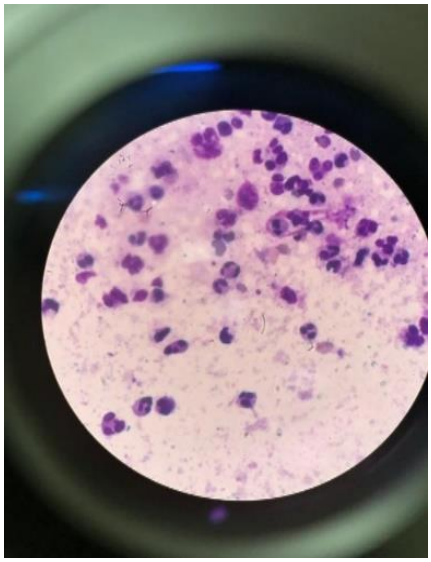


Image 4: Cigar-shaped cells with neutrophils (Dr Lamissa Cissé)



Image 5: Nodules arranged in a chain (Dr Lamissa Cissé)



Image 6: Postbullous erosions (Dr Binta Guindo)

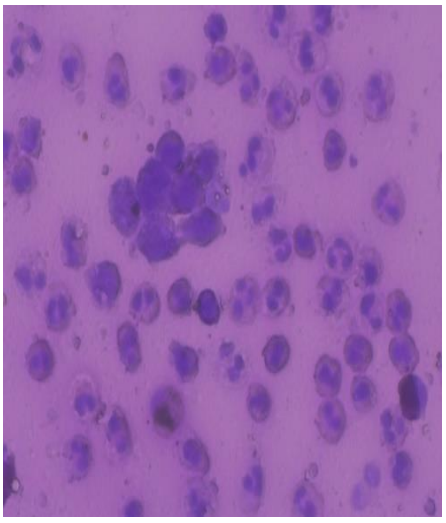


Image 7: Numerous neutrophils and eosinophils (Dr Lamissa Cissé)



Image 8: Umbilicated nodules (Dr Binta Guindo)



Image 9: Ulcerated nodules (Dr Binta Guindo)

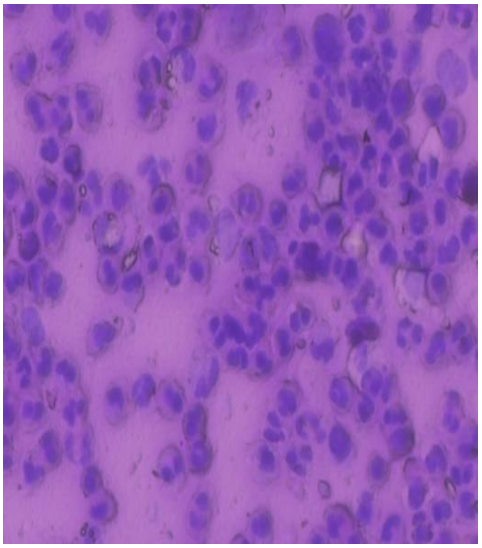


Image 10: Numerous neutrophils and eosinophils (Dr Lamissa Cissé)

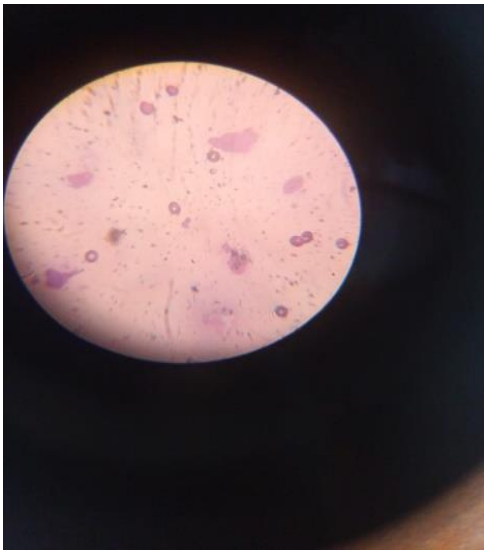


Image 11: Birefringent cells (Dr Lamissa Cissé)

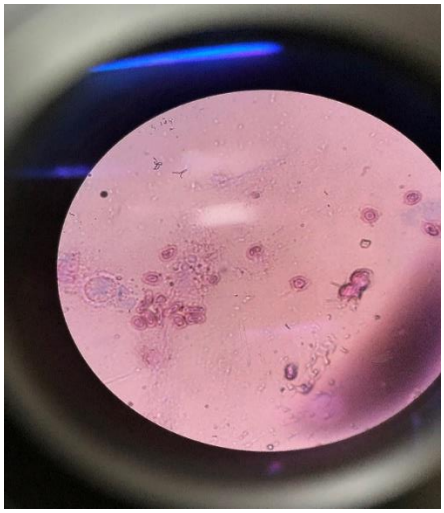


Image 12: Birefringent cells with a macrophage (Dr Lamissa Cissé)

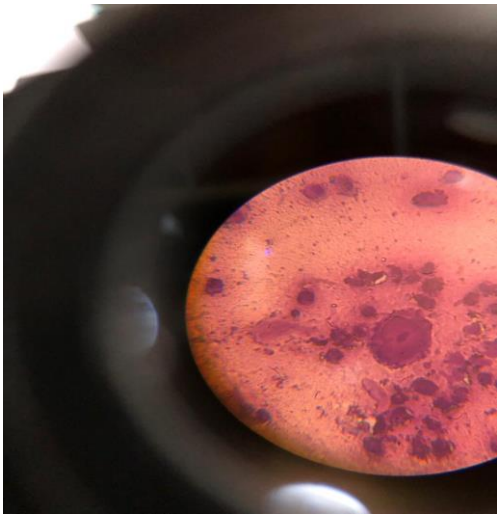


Image 13: Acantholytic cells (Dr Lamissa Cissé)

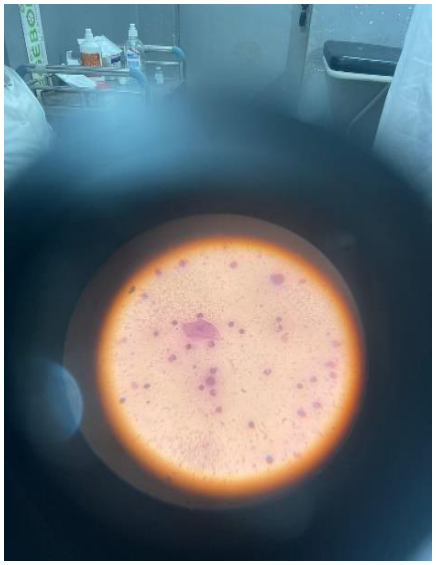


Image 13: Normal keratinocytes (Dr Lamissa Cissé)



Image 14: Rosette-like blisters (Dr Sissoko Madou)



Image 15: Postbullous erosions (Dr Binta Guindo)

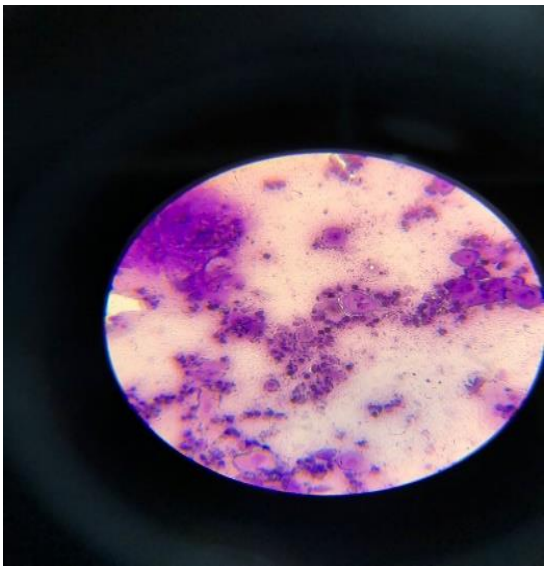


Image 16: Normal keratinocytes (Dr Lamissa Cissé)

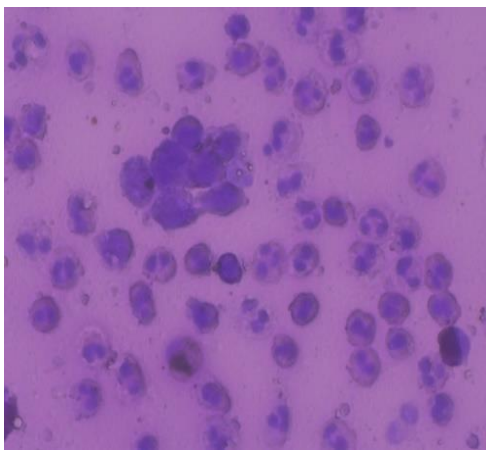


Image 17: Numerous neutrophils and eosinophils (Dr Lamissa Cissé)

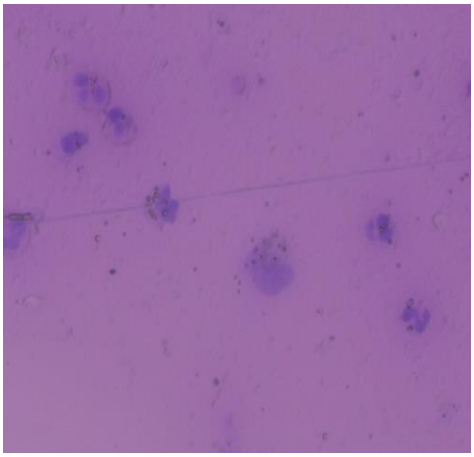


Image 18: Macrophage (Dr Lamissa Cissé)

DISCUSSION

Discussion of the methodology:

We conducted a cross-sectional study of Tzanck smear cytodiagnosis at HDB over six months. Cases were recruited during consultations. The main indications were erosive, bullous, and nodular lesions. Samples were obtained from glabrous skin and mucous membranes. The limitations of this study were the lack of histological examination in some cases and the absence of specific cultures and PCR testing for samples from suspected infections. These tests would have allowed the sensitivity and specificity of the Tzanck smear to be evaluated. Nevertheless, this study enabled us to describe the use of Tzanck smear cytodiagnosis at HDB.

Discussion of the findings:

Tzanck smear cytodiagnosis was performed in 67 patients. This number may be considered relatively low given the total volume of consultations at HDB. Turkish investigators (Eryılmaz *et al.,*) reported 500 cases over 18 months (3). In the United States, Durdu and colleagues recruited 400 patients over two years (4). In India, Tzanck smear cytodiagnosis was performed in 57 patients over 12 months (Panwar *et al.,*) [2]. Differences between these studies may be explained by the longer study period in Turkey and by the indications for testing. In dermatological practice, Tzanck smears are commonly used to diagnose bullous dermatoses, viral infections, and leprosy. However, this test can also help diagnose several neoplastic, granulomatous, and inflammatory dermatoses (Kelly) [5]. In our study, the principal indications were erosive bullous dermatoses.

On average, samples were collected from two lesions per patient. However, the number sampled varied according to the clinical presentation.

The diagnostic hypotheses prompting Tzanck smear examination were mainly autoimmune bullous dermatoses, followed by infectious dermatoses of viral, fungal, and parasitic origin. The Tzanck smear was performed to support or rule out a suspected diagnosis, as described by other authors (Panwar *et al.,*) [2]. In particular, the absence of ballooning cells in a sample from a blister or erosion may help exclude a viral dermatosis. The presence of acantholytic cells suggests pemphigus.

However, the Tzanck smear cannot establish a definitive diagnosis in some cases. Nevertheless, it is a simple, low-cost, minimally invasive test.

Tzanck smear cytodiagnosis was helpful in more than 85% of our cases. In 15%, findings were nonspecific. Comparable findings have been reported by Panwar *et al.,* [2]. In India, the proportion of nonspecific diagnoses was higher, at approximately 35%. Some authors consider that the result depends on the operator, sampling technique, staining, and interpretation (Kelly) [5].

The sensitivity of the test has been reported to exceed 95% when performed by an experienced operator (Kelly) [5].

Sensitivity and specificity also depend on the disease under investigation. Viral dermatoses are easier to recognise because of the characteristic multinucleated giant cells. By contrast, autoimmune bullous dermatoses are more difficult to distinguish, except for pemphigus vulgaris and, to some extent, bullous pemphigoid (Panwar *et al.,*; Kelly; Gayatri) [6].

In particular, linear IgA dermatosis cannot be distinguished from dermatitis herpetiformis. These limitations, however, are shared by Tzanck smear cytology and histology (Durdu) [7]. In general, a definitive diagnosis of autoimmune bullous dermatoses relies on immunofluorescence.

Infectious dermatoses such as histoplasmosis are easier to identify because of their characteristic birefringent cells. Leishmaniasis may be identified by Leishman bodies. We confirmed these diagnoses by histology.

Autoimmune bullous dermatoses, followed by viral dermatoses, were the most frequent findings, similar to the observations reported by Panwar *et al.,* in India (2).

CONCLUSION

Tzanck smear cytodiagnosis remains a useful investigation for diagnosing several dermatological conditions, particularly autoimmune bullous dermatoses and viral skin diseases. It is relatively easy to perform and especially valuable in resource-limited countries where PCR and culture are not always available.

Further studies are needed to compare Tzanck smear findings with modern methods such as PCR, immunofluorescence, and histology to better characterise the sensitivity and specificity of Tzanck smear cytodiagnosis.

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