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Net Educational Video for Residents

Demonstration of Tzanck smear and its significance in dermatology

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ABSTRACT

Tzanck smear is a simple bedside technique that can play a crucial role in the diagnosis of various vesiculobullous, erosive, tumoral, and granulomatous cutaneous diseases. The procedure involves identifying an intact blister, deroofing it, scraping the erosion as well as the undersurface of the blister, transferring the material on a glass slide, staining the slide appropriately, and viewing under the microscope. The characteristic cells can be identified under the microscope that can aid the diagnosis.

Keywords: Tzanck smear, Acantholytic cell, Multinucleated giant cell

INTRODUCTION

Tzanck smear is a cytodiagnostic procedure, first introduced in 1947 by Tzanck, a French physician in herpetic infections and pemphigus.[1] Eventually, the technique has found wide applications in the diagnosis of various vesiculobullous, erosive, tumoral, and granulomatous diseases.

The test offers the advantage of being an unsophisticated, expeditious, economical, minimally invasive, and bedside diagnostic tool, though it requires certain amount of skill and experience for accurate interpretation.

INDICATIONS

Tzanck smear is indicated in the following conditions[2]

a. Autoimmune bullous disorders: Pemphigus vulgaris and its variants, bullous pemphigoid, linear IgA bullous dermatosis, and dermatitis herpetiformis
b. Viral infections: Herpes simplex infection, varicella and herpes zoster
c. Bacterial infections: Bullous impetigo
d. Genodermatoses: Hailey-Hailey disease and Darier's disease
e. Cutaneous tumors: Basal cell carcinoma, squamous cell carcinoma, Paget's disease, mastocytoma, and histiocytoma.

PROCEDURE

The procedure of Tzanck smear is as follows [Video 1]:[3]

Materials needed

Saline-soaked cotton swab, blunt scalpel, glass slide, Leishman stain, sterile water, and a pair of sterile gloves.

Collection of specimen

For blistering disorders, an intact new blister is selected, which is then opened along one side using a scalpel or iris scissors. The roof is then folded back and the floor as well as the undersurface of the roof are gently scraped using the blunt edge of the scalpel or a curette. The material collected is smeared onto a glass slide, allowed to air dry, and stained with Giemsa/Leishman stain.

For viral infections, one selects a fresh vesicle, rather than a crusted one.

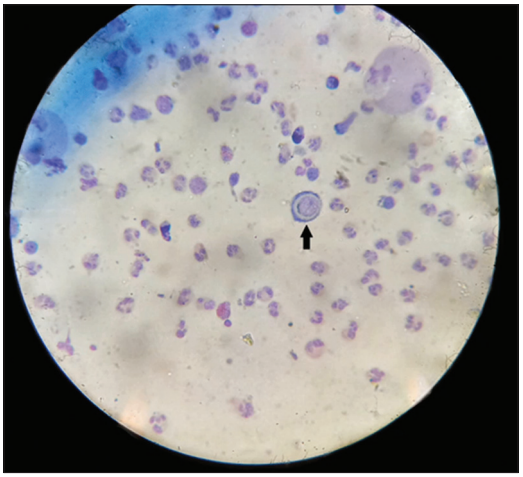
For the cytodiagnosis of suspected tumors, one should remove any overlying crust from ulcerated tumors, and non-ulcerated tumors should be incised carefully with a sharp and pointed scalpel without eliciting bleeding. A sample of tumor is then obtained with either a blunt scalpel or a small curette, and the tissue obtained is compressed between the two slides.

Staining of Tzanck smear

For this demonstration [Video 1], we have used Leishman stain. Other stains used are Giemsa, hematoxylin and eosin, Wright, Papanicolaou, methylene blue, and toluidine blue.[4]

Method

Air dry the smear so as to allow fixing. Add a few drops (drops to be counted) of Leishman stain enough to cover the smear and wait for 2 minutes before adding double the amount of sterile water. After another 7–8 minutes, wash the slide with sterile water. The slide is then air-dried and mounted on a microscope.[4]



Video 1: Video demonstrating the procedure of Tzanck smear.
Video available online at: https://doi.org/10.25259/JSSTD_33_2022

Microscopic examination

The slide is then examined under a light microscope (10×, and 40× and 100× with immersion oil).

INTERPRETATION OF RESULTS

The results can be interpreted as follows[5]

a. Autoimmune bullous disorders
   i. Pemphigus vulgaris: It reveals multiple acantholytic cells (Tzanck cells). A typical Tzanck cell [Figure 1] is a large round keratinocyte with a hypertrophic nucleus and abundant basophilic cytoplasm. The basophilic staining is deeper peripherally on the cell membrane ("mourning edged" cells) due to the cytoplasm's tendency to get condensed at the periphery, leading to a perinuclear halo
   ii. Pemphigus vegetans: Acantholytic cells along with more inflammatory cells, predominantly eosinophils
   iii. Pemphigus foliaceus and pemphigus erythematosus: Acantholytic cells and dyskeratotic cells that often have a hyalinized cytoplasm
   iv. Bullous Pemphigoid: Inflammatory cells, predominantly eosinophils
   v. Linear IgA bullous dermatosis: Inflammatory cells, predominantly neutrophils
   vi. Dermatitis herpetiformis: Inflammatory cells, particularly neutrophils.

b. Viral infections
   i. Herpes simplex infection, varicella, and herpes zoster: Multinucleated, syncytial giant cells [Figure 2] and acantholytic cells.

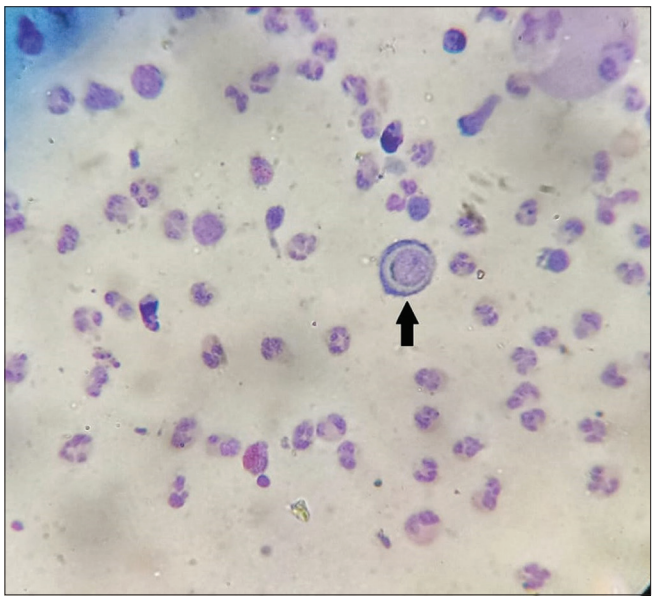


Figure 1: Black arrow denotes large round acantholytic cell (keratinocyte with a hypertrophic nucleus, abundant basophilic cytoplasm and perinuclear halo) in pemphigus vulgaris (Leishman stain, ×1000).

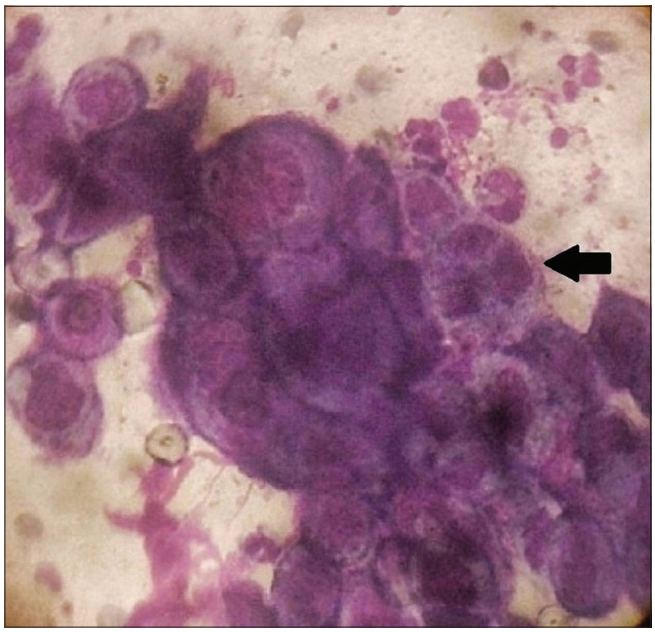


Figure 2: Black arrow denotes multinucleated, syncytial giant cells in herpes simplex infection.

c. Bacterial infections
   i. Bullous impetigo: Dyskeratotic acantholytic cells, neutrophils, and gram-positive cocci in clusters.

d. Genodermatoses
   (i) Hailey-Hailey disease: Plenty of acantholytic cells
   (ii) Darier's disease: Corps ronds, grains, and a few acantholytic cells.

e. Cutaneous tumors
   i. Basal cell carcinoma: Clusters of basaloid cells
   ii. Squamous cell carcinoma: Isolated, atypical squamous cells
   iii. Paget's disease: Paget's cells

CONCLUSION

In spite of being an archaic technique, Tzanck smear continues to be a robust tool for corroboration or exclusion of a clinically suspected diagnosis, especially in vesiculobullous dermatoses and therefore needs to be mastered by the dermatology residents.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

Dr. Smitha Ancy Varghese is on the editorial board of the Journal.

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