

CASE REPORT

Case Report of a Classic Case of Cervical SCC on Pap Smear

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ABSTRACT

Cervical cancer continues to be a significant global health burden, particularly in low and middle-income countries, despite being largely preventable through effective screening and early intervention strategies. Among the various screening modalities, the Papanicolaou (PAP) smear has been pivotal in reducing both the incidence and mortality associated with cervical carcinoma. This article comprehensively reviews the Pap smear's history, clinical utility, methodologies, and evolving significance in modern gynecological practice. Additionally, it presents a case study involving a 56-year-old woman diagnosed with cervical carcinoma, detected via Pap smear, thus emphasizing the test's critical role in routine gynecological assessments. The review further explores the integration of newer screening modalities such as HPV DNA testing and liquid-based cytology (LBC), which have augmented the sensitivity and specificity of cervical cancer screening. The article highlights the need for continued public health efforts to enhance awareness, improve access to screening, and incorporate advanced diagnostic techniques for effective cervical cancer control.

KEYWORDS

• Pap Smear • Cervical Cancer Screening • Cytology • HPV DNA Testing
• Bethesda System • Public Health

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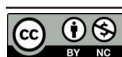
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INTRODUCTION

Cervical cancer ranks as the fourth most frequently diagnosed cancer and the fourth leading cause of cancer deaths among women worldwide. Early detection through cytological screening has been crucial in mitigating this public health challenge.¹ The introduction of the Papanicolaou test by Dr. George Papanicolaou in the 1940s marked a significant advancement in preventive oncology. By facilitating the early identification of cervical intraepithelial neoplasia (CIN) and invasive carcinomas, the Pap smear has revolutionized gynecological care. The effectiveness of the Pap smear is well-documented, with studies demonstrating a reduction in cervical cancer

mortality by up to 70% in populations with regular screening. This test remains the cornerstone of cervical cancer prevention despite the development of more advanced diagnostic methods.² However, the Pap smear is not without limitations, including variability in sampling and interpretation, necessitating complementary strategies such as HPV DNA testing and LBC. This article aims to delineate the historical evolution, clinical methodology, diagnostic accuracy, and modern relevance of the Pap smear. It also presents a clinical case that illustrates the practical utility of cytology in diagnosing cervical carcinoma and discusses emerging trends in cervical cancer screening and prevention.

CASE REPORT

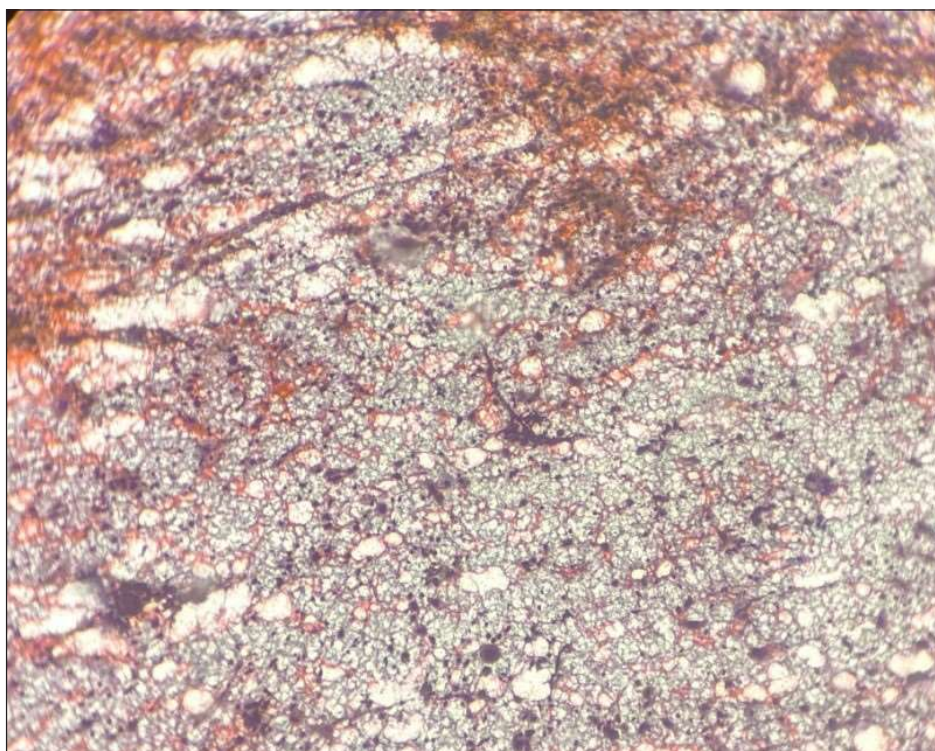


Figure 1: Showed high cellularity with tumor diathesis 4x, Pap stain

A 56-year-old postmenopausal woman presented to the Obstetrics and Gynecology (OBGY) department with complaints of persistent lower abdominal pain and occasional vaginal discharge lasting over a month. Her medical history was unremarkable, with no known comorbidities. She reported having irregular gynecological checkups and had never undergone a Pap smear. On general physical examination, the patient was found to be hemodynamically stable. Abdominal

examination revealed mild tenderness in the lower quadrants, but no palpable masses. Pelvic examination showed healthy external genitalia, and on per speculum inspection, the cervix appeared grossly normal without any visible lesions or ulcerations. Given the patient's age and symptoms, a Pap smear was performed using standard aseptic techniques. Endocervical and ectocervical samples were collected using an Ayre's spatula and cytobrush, smeared onto clean glass slides,

fixed immediately in 95% ethyl alcohol, and later stained using the Papanicolaou staining technique. The slides were then examined under light microscopy by experienced cytopathologists. The cytological analysis revealed a highly cellular smear comprising both single and clustered tumor cells. The cells exhibited marked nuclear pleomorphism, hyperchromasia, irregular nuclear contours, and a high nuclear-to-cytoplasmic ratio. The cytoplasm appeared dense, eosinophilic, and occasionally keratinized. Notably, the presence

of tadpole cells and spindle-shaped cells was observed. The background showed extensive tumor diathesis, including necrotic debris, proteinaceous material, and hemorrhage. Based on these cytomorphological features, the smear was categorized as squamous cell carcinoma (SCC) according to the Bethesda System for Reporting Cervical Cytology. Figure 1-3 A biopsy and histopathological confirmation was advised for verification of the diagnosis of SCC of the cervix.

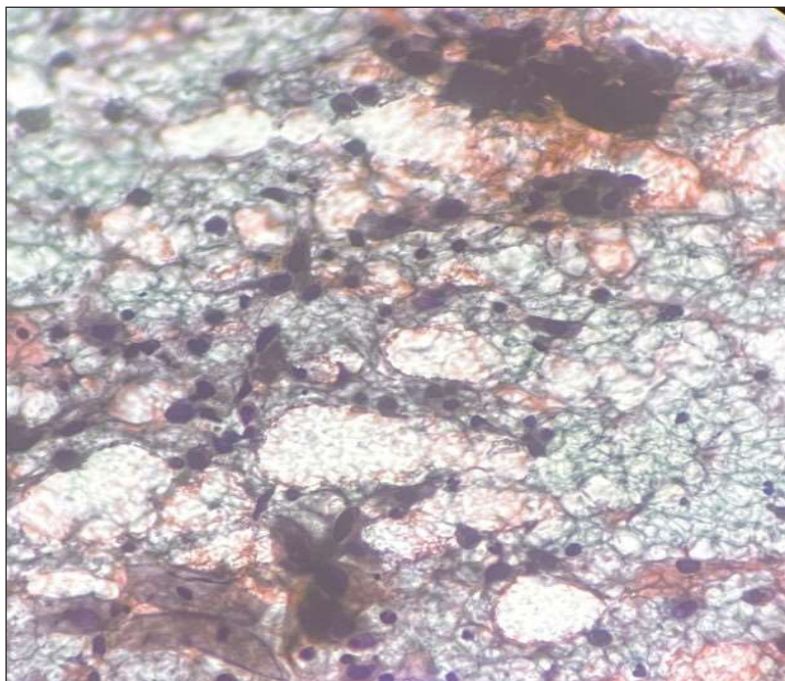


Figure 2: Showed single and small clusters of highly pleomorphic malignant squamous cells 40x, Pap stain

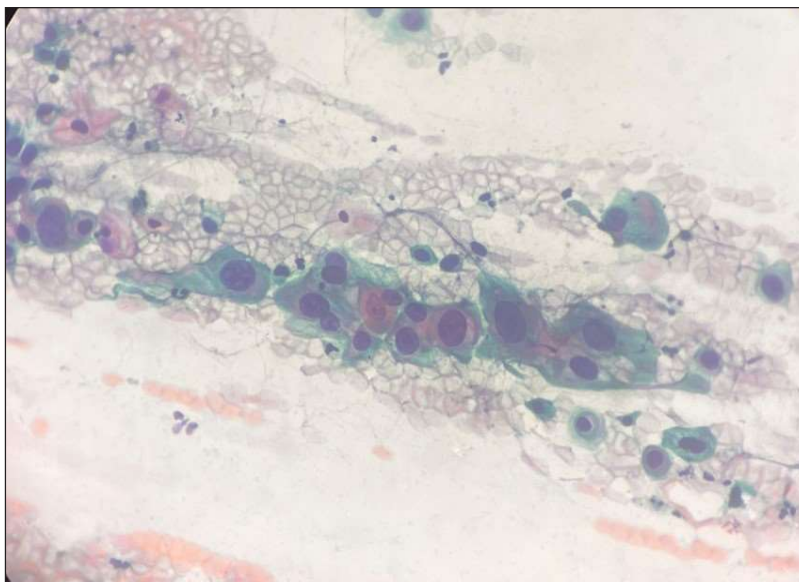


Figure 3: Showed malignant squamous cells with tumor necrosis in the back ground 40x, Pap stain

DISCUSSION

The Pap smear remains an invaluable tool in cervical cancer screening and early detection. Its role in identifying precancerous lesions such as CIN and early invasive carcinomas has been instrumental in significantly lowering mortality rates where regular screening is practiced. The success of cytology-based screening lies in its ability to detect cellular abnormalities before clinical symptoms arise, thus allowing for timely intervention.³ In the reported case, despite the absence of gross cervical lesions on speculum examination, cytological assessment revealed malignant features, underscoring the importance of routine Pap smear testing, especially in asymptomatic or minimally symptomatic women. The sensitivity of conventional Pap smears for detecting high-grade lesions ranges between 50-75%, while the specificity remains high at approximately 96%. This disparity highlights the need for repeated screening at appropriate intervals and the potential for false-negative results due to sampling or interpretative errors.⁴ To address these limitations, the incorporation of adjunctive methods has been advocated. High-risk HPV DNA testing has emerged as a more sensitive alternative, detecting persistent infections with oncogenic HPV strains that are implicated in the pathogenesis of cervical cancer. Co-testing, which involves concurrent Pap smear and HPV testing, enhances diagnostic accuracy and is now recommended in many guidelines for women aged 30 and above.^{5,6} Moreover, the advent of LBC has improved sample adequacy, reduced unsatisfactory smears, and facilitated reflex testing for HPV. LBC uses liquid fixatives to preserve cells before processing, offering better cell preservation and distribution. Studies comparing conventional smears with LBC have reported higher sensitivity and specificity with the latter, making it a preferred choice in many modern laboratories.

Despite these technological advancements, several barriers continue to impede effective cervical cancer screening in resource-constrained settings.^{7,8} These include limited access to healthcare, inadequate laboratory infrastructure, lack of trained personnel, cultural stigmas, and poor health literacy. In such contexts, alternatives like visual inspection with acetic acid (VIA) offer a low-cost, immediate result screening method, albeit with lower specificity.^{9,10} Globally, public

health initiatives such as the WHO's Global Strategy to Eliminate Cervical Cancer aim to scale up screening and vaccination efforts. The goal is to achieve 90% HPV vaccination coverage, 70% screening coverage, and 90% access to treatment for cervical disease by 2030. Implementation of such strategies requires coordinated efforts involving government agencies, healthcare providers, and community stakeholders.

CONCLUSION

The Pap smear continues to be a cornerstone in the early detection and prevention of cervical cancer. While newer techniques like HPV DNA testing and LBC have enhanced the diagnostic landscape, cytological screening remains vital, particularly in resource-limited settings. The reported case highlights the critical role of Pap smear in detecting asymptomatic cervical malignancies and underscores the importance of routine gynecological evaluation. Efforts to improve screening uptake, address infrastructural limitations, and integrate modern diagnostic tools are essential to reduce the global burden of cervical cancer. Future strategies should emphasize universal access to screening, health education, and HPV vaccination to move toward the elimination of cervical cancer as a public health problem.

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