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**IDENTIFICATION OF ARTEFACT CONTAMINATION
MORPHOLOGICAL CHARACTERISTICS IN MINIMIZING
PITFALLS IN CYTOLOGY**

By

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DECLARATION

I hereby declare that this thesis is based on my original work. I also declared that this thesis has no previously or currently submitted by any other degree student at UiTM or other institutions.

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ABSTRACT

IDENTIFICATION OF ARTEFACT CONTAMINATION MORPHOLOGICAL CHARACTERISTICS IN MINIMIZING PITFALLS IN CYTOLOGY

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INTRODUCTION : Pitfall in cytomorphological diagnostic can be defined as misdiagnosis or misinterpretation of result which may lead to false positive or negative thus affected treatment and caused possible morbidity. The occurrence error during the cytomorphological diagnosis is an artifact contaminant. The possible artifact contaminants interference in the cytological slides might derived from patients, medical laboratory technologist and laboratory environment. The sources of artifact contaminant are lipsticks, pubic hairs, cotton fibers, KY Gel lubricant, compact powder, dust particles, gloves powder, pencil carbon and mascara. The general objective of this study is to determine the morphological characteristics of artefacts contaminant in cytological sample that can cause pitfalls in diagnostic.

METHODS : The selected artefact contaminants were collected and put in the sterile container, containing normal human sputum as an adherence medium. Prepared slides were then stained using Papanicolaou (Pap) and May-Grunwald Giemsa (MGG), screened and the result were recorded by capturing the image using Leica DM750 Microscope equipped with an ICC 50 HD camera. Finally, the findings were compared to the normal, malignant and microorganisms cells via an establish cytology atlas and confirmed by qualified cytoscientists.

RESULTS : The lipstick contaminant resemble tumor diathesis in present of malignancy background. Meanwhile, the pubic hairs resemble *Wuchereria bancrofti* parasite. The cotton cloth were resemble the *Leptothrix* bacteria. The KY Gel lubricant resemble to the mucus appearance. The compact powder has similar appearances to the cornflaking artefacts. The dust particles resemble the keratotic cell. The gloves powder resemble with the cells in atrophic menopausal smear. The pencil carbon and mascara characteristics similar with the anthracotic pigment in black lung disease smears.

CONCLUSION : The some morphological characteristics of artifact contaminants can mimic cytomorphological of human cells and these findings can be used as a reference in cytomorphological diagnostic to minimize a pitfall.

Keywords : Artifact, contaminant, pitfall, mimic, resemble

CHAPTER 1

INTRODUCTION

1.1 Background of the study

In general, pitfall is a hidden, unsuspected danger or difficulty during interpreting result. In cytology diagnosis, pitfalls can cause misdiagnosis which may lead false positive or false negative result (Idowu & Powers, 2010). The cytoscreener or cytopathologist should be aware of the pitfalls during evaluation of slide and interpreting of the result (Anshul Singh, Deborah J. Carroll, 2013). Based on Idowu & Powers (2010), pitfalls in cytology could lead to unnecessary treatment, increasing the operating cost and also can be fatal. Regarding to the Berner & Graber (2008), unveiled misdiagnosis rate in gynae and non-gynaecological diagnosis cases which are 2-9% and 5-12% respectively. One of the causes of pitfalls are from contamination (Gary W.Gill et. al, 2013). Artefact is one of the contaminant that can be interrupt during the sample collection or sample processing and may lead to cause a pitfall. Artefact in scientific investigation is something that observed in experiment that is not naturally present. Based on previous study, example of artefacts are dust, cotton fibers, glove powder, human hair and camel brush air (Sahay K. et. al, 2013).

The significant of this study to identify the potential artefacts contaminant from patient, medical laboratory technologist and laboratory environment that can cause pitfall in cytological diagnosis. Artefacts contaminant can interfere in various specimens either from gynaecological specimen or non-gynaecological specimen. Example of gynaecological specimen are conventional pap smear or thin prep specimen while the example for non-gynaecological specimen are