# Evaluation of the role of the intra-operative cytology in diagnosis of the space occupying lesions of the central nervous system

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## Abstract:

Since the introduction of the squash cytology technique, it has been used worldwide and it was a subject of many researchers with a consensus about its superiority over frozen section in certain lesions such as gliomas. The biggest value of the squash cytology is its turnaround time a factor that makes it suitable for the intraoperative diagnosis. It provides a provisional diagnosis that helps the surgeon decide immediately and change the surgical approach accordingly. The accuracy rates comparing squash smear preparations with paraffin embedded material vary from 76% to 940/0 in various studies(l), (2), (3). The accuracy of diagnosis depends upon familiarity with the pertinent clinical history, tumour location and the radiological findings. Broad objectives: To determine the role of intraoperative cytology in diagnosis of the space occupying lesions of the central nervous system. Specific objectives: 1. To determine the cytomorphology of squash smears of space occupying lesions of the central nervous system intraoperatively. 2. To compare the cytological pattern of the squash smears with the corresponding histological architecture. 3. To determine the accuracy and the utility of the intraoperative cytology in the diagnosis of the CNS lesions by indicating the cytomorphological features of the prognostic value in cytology smear. 4. Identify the source of error and the reasons for discrepancy between cytology smear and histology. Study Design: This was a cross-sectional descriptive study. The study included all patients with Space Occupying Lesion (SOLs) of CNS who were admitted at Kenyatta National Hospital, Theatre number nine. The samples were processed at University of Nairobi, Histopathology and Cytology Lab. Methods: the samples were collected intraoperatively for those with CNS SOLs and were taken to the lab where they were processed and examined and the results were reported back to the theatre. Later peer review with the histology biopsy was done. Results: Overall a total of 35 patients were enrolled. Twenty (20~ 57.1%) were female and 15 (42.9%) were male giving the ratio of 1:1.3. The ages range between 2 months and 73 years with mean of 29.9 (median of 35 and SD = 18.08). The majority of the cases were supratentorial (28 cases; 80.00/0), (2 cases; 5.70/0) were infratentorial, and (5 cases; 14.3%) spinal. Specimen collection was through open craniotomy in (29 cases; 85%), (4 cases~12%) laminectomy and one case (3%) was excised through the nose. The overall accuracy when the cytology results were compared to the histology, (the gold standard)was 97.1 %. wilcoxon test was used to compare the final diagnosis of both cytology and histology; there was no significant difference between the final diagnosis made on cytology and the final diagnosis on histology p value = 1.000 (n = 35). McNemar statistical test was used to evaluate the microscopic parameters on both tests and there was no significant difference. There was a significant difference between preoperative clinicradiological diagnosis and the final histological diagnosis p value = 0.030. Conclusion: IOC is an effective, accurate, reliable and simple diagnosis tool for diagnosis of CNS lesions. Morphological characteristics of cytology are comparable to their IVstological counterparts. The discrepancy between cytology and histology

mainly revolved around technical and sampling issues which can be minimized if further studies could be carried out to standardize the techniques and the sampling protocols.