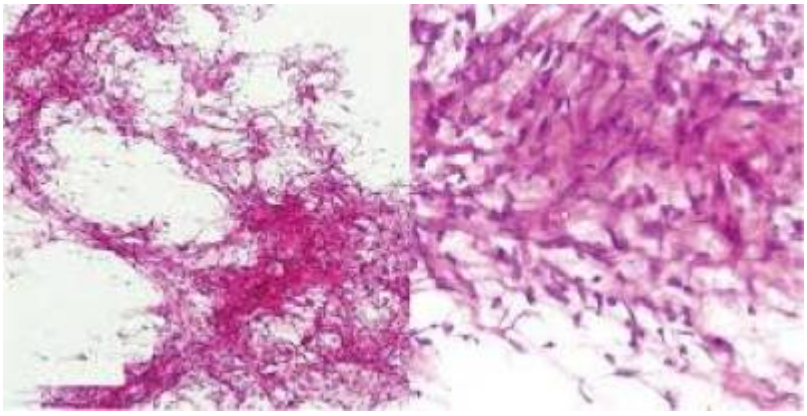
Squash cytology



Squash cytology is of significant importance in intraoperative consultation of central nervous system (CNS) pathology. There are several studies on squash cytology of CNS lesions, and only a few of them deal with spinal lesions alone.

(1) To evaluate intraoperative squash cytology of spinal lesions. (2) To correlate cytological diagnosis with histopathological diagnosis and assess the diagnostic accuracy. (3) To study Ki67 expression on squash smears and determine whether it can assist in grading spinal tumours on cytology.

A prospective study was conducted on 68 patients with clinico-radiologically diagnosed lesions of the spine. Intraoperative squash smears were stained with Hematoxylin and eosin stain, Papanicolaou (Pap) stain, and May-Grünwald-Giemsa (MGG) stain. Subsequently, histological diagnosis was made. Ki67 immunostaining was performed on squash smears and histology sections.

The sensitivity, specificity, positive predictive value, negative predictive value, and diagnostic accuracy of squash cytology in spinal lesions were 84.6, 100, 100, 23.1, and 80.88%, respectively. On immunocytochemistry, the mean Ki67 labelling indices for grade I, II, and III tumours were 0, 0.33 and 9%, respectively.

Squash smear cytology is a rapid intraoperative technique for diagnosing spinal lesions, with high specificity and high positive predictive value. It is more effective in diagnosing neoplasms than non-neoplastic lesions. Ki67 immunostaining can be done on cytology smears to effectively differentiate between WHO grade I and grade II spinal tumors [1].

One hundred and fifty cases of CNS lesions in pediatric patients were studied over a period of 2 years. Intraoperative squash smears were prepared, stained with hematoxylin and eosin, and examined. Remaining sample was subjected to histopathological examination.

Medulloblastoma (24.0%) was the most frequently encountered tumor followed by pilocystic astrocytoma (21.33%) and ependymoma (13.33%). Diagnostic accuracy of squash smear technique was 94.67% when compared with histological diagnosis.

Smear cytology is a fairly accurate tool for intraoperative CNS consultations [2].

Fifty prospectively registered patients with clinical diagnosis of CNS tumors were enrolled in the study. All the patients were subjected to magnetic resonance imaging (MRI). Intraoperative CSC was performed and smears were stained with Leishman and rapid Hematoxylin and Eosin (H and E) stain. The diagnosis of CSC was compared with MRI diagnosis and histopathological diagnosis. The CNS tumors were categorized based on clinical and therapeutic implications. Diagnostic accuracy, sensitivity, specificity, and positive and negative predictive value of MRI and CSC were calculated by using appropriate formulae.

The age range of the CNS tumors included in the study was 2 to 68 years. There was a slight female preponderance. Sensitivity, specificity, positive predictive value, and negative predictive value of preoperative MRI were 90.47%, 82.76%, 79.17%, and 92.31% respectively. These values of utility parameters for CSC were 100% for each of the clinical and therapeutic implications. It helped neurosurgeons in optimizing surgical procedure in 12 cases of meningioma. It influenced surgical management in 1 case of infratentorial pilocytic astrocytoma, and helped in the diagnosis and management of 9 unexpected tumors missed on MRI [3].

A prospective study of 114 patients with CNS tumors was conducted over a period of 18 months (September 2004 to February 2006). The cytological preparations were stained by the quick Papanicolaou method. The squash interpretation and FS diagnosis were later compared with the paraffin section diagnosis.

Of the 114 patients, cytological diagnosis was offered in 96 cases. Eighteen nonneoplastic or noncontributory cases were excluded. Using hematoxylin and eosin-stained histopathology sections as the gold standard, the diagnostic accuracy of cytology was 88.5% (85/96) and the accuracy on FS diagnosis was 90.6% (87/96). Among these cases, gliomas formed the largest category of tumors (55.2%). The cytological accuracy in this group was 84.9% (45/53) and the comparative FS figure was 86.8% (46/53). In cases where the smear and the FS diagnosis did not match, the latter opinion was offered.

Squash preparation is a reliable, rapid and easy method and can be used as a complement to FS in the intraoperative diagnosis of CNS tumors [4].

References

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