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INTRAOPERATIVE SQUASH SMEAR CYTOLOGY AND HISTOPATHOLOGICAL CORRELATION-A TWO YEAR STUDY IN GMKMCH SALEM.

Pathology

Dr.S.Ramesh   Associate Professor of Pathology , Govt Mohan Kumaramangalam Medical College, Salem

ABSTRACT

AIM: To prepare and compare the squash smear technique with the histopathological examination in the diagnosis of Central Nervous System(CNS) lesions.To assess the utility of the squash smear technique for the rapid diagnosis in the neurosurgical biopsies for providing intraoperative consultation. MATERIALS AND METHODS: This was a prospective study conducted in the Department of pathology for a period of 2 years from 2017to 2018. 47 cases were enrolled in the study .Squash and Histopathology smear was made, studied and their results were compared. RESULTS: 41 cases of the 47 cases selected for the study show complete correlation of squash cytology with histopathology . 6 cases showed discordance..CONCLUSION: Intraoperative Squash smear cytology is fairly accurate, safe, simple, reliable and cost effective tool for rapid diagnosis of CNS lesions.

KEYWORDS

Squash smear cytology -Central nervous system lesions- Histopathological examinations.

INTRODUCTION:

Squash cytology is simple ,rapid and inexpensive ,fairly accurate .It overcomes freezing artifacts observed with frozen sections.(1) The soft consistency of CNS tissue is best suited for squash cytology.Role of squash cytology has increased with the advent of stereotactic biopsies which provide only minimal amount of tissue The current study was undertaken to assess the utility of squash smear cytology for intraoperative diagnosis.Squash cytology has been replaced frozen section study as a diagnostic tool as Stereotactic surgeries done nowadays produce less tissue quantity inadequate for cryostat.The soft and friable tissues in the CNS tumors are easy to smear and thus provide good cellular details .

AIM:

To prepare and compare the squash smear technique with the histopathological examination in the diagnosis of CNS lesions.To assess the utility of the squash smear technique for the rapid diagnosis in the neurosurgical biopsies for providing intraoperative consultation.

Materials and Methods:

Patients with clinical diagnosis of CNS tumours were enrolled in the study. We received about 47 neurological specimen. Necrotic tissue-like material and blood clots were avoided. 1 to 2 mm of tissue at the area of interest as visualized by naked eye was taken. Bits were selected at different areas for better results. Applying minimal pressure tissue was squashed between two glass slides into a thin smear. Smears are immediately fixed with 95 % isopropyl alcohol and stained with Eosin and haematoxylin stains.Simultaneously with remaining tissue routine Histopathological examination was done and both smears were analysed and compared.Clinical history like presenting symptom , location of lesion, radiological findings were noted .Squash cytology diagnosis were compared with histopathological findings.The tumors were classified according to the World Health Organization classification of CNS Neoplasms.(3) IHC was done on required cases.

Observation And Results:
Table - 1: Age and sex distribution of patients

AGE	NO OF CASES	%	MALE	FEMALE
11-20	2	4.2	1	1
21-30	3	6.3	1	2
31-40	10	21.2	4	5
41-50	13	27.6	7	5
51-60	7	14.8	3	3
61-70	12	25.5	7	5

Peak incidence of brain tumors were observed in middle age and they comprised 13 cases(27.65%) of tumors examined. 26 male patients and 21 female patients were seen in our study. Age of youngest patient was 12 years and age of oldest patient was 70 years.
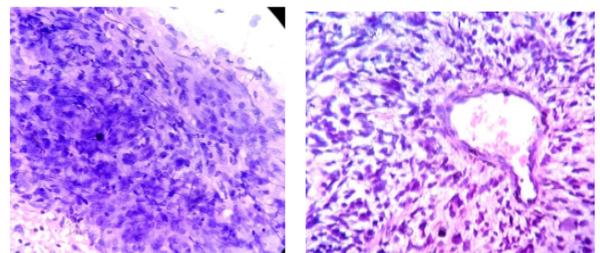
Fig 1 Squash cyto of GBM   **Fig 2 HPE of GBM**

Table:2 Squash smear evaluation

DIAGNOSIS OF SQUASH SMEARS	NO OF CASES	PERCENTAGE
Low grade astrocytoma	6	12.7
Malignant astrocytoma	9	19.1
Glioblastoma multiforme	4	8.5
Schwannoma	8	17.0
Meningioma	8	17.0
Epidermoid cyst	1	2.1
Meduloblastoma	1	2.1
Pituatary Adenoma	2	4.2
Craniopharyngioma	1	2.1
Metastasis	2	4.2
Small round blue cell tumours	3	6.3
Inconclusive	2	4.2

Fig 3 IHC GFAP of GBM
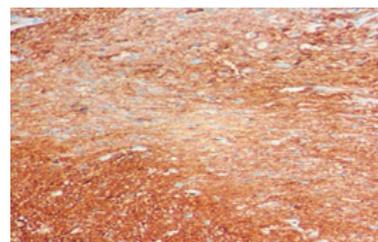
Table – 3: Histopathological evaluation of lesions

Histopathological diagnosis	No of cases	Percentage
Low grade astrocytoma	6	12.7
Malignant astrocytoma	8	17.0
Glioblastoma multiforme	6	12.7
Schwannoma	9	12.7
Meningioma	7	21.2
Epidermoid cyst	1	2.1

Medulloblastoma	3	2.1
Pituatary Adenoma	3	4.2
Craniopharyngioma	1	2.1
Metastasis	2	4.2
Small round blue cell tumour	1	8.5

Of these 47 cases,6 cases reports in Squash smear were inconcurrent with histopathology.One case of Malignant astrocytoma was actually reported as a mixed Glioma.One case was reported as Tubercular lesion in Histopathology.one cases of Meningioma was diagnosed as Schwannoma.Two cases which was diagnosed as small round blue cell tumour in cytology, was confirmed as Medulloblastoma.Two cases which were previously designated as Inconclusive was reported as Glioblastoma multiforme.

Table – 4: Comparative analysis of cytological and histopathological diagnosis.

Diagnosis	Squash smear diagnosis	Histological diagnosis	% Accuracy
Low grade astrocytoma	6 (12.76%)	6 (12.76%)	100
Malignant astrocytoma	9(19.14%)	8 (17.02%)	88.8
Glioblastoma multiforme	4(8.51%)	6 (12.76%)	66.6
Schwannoma	8(17.02%)	9 (19.14%)	88.8
Meningioma	8(17.02%)	7 (14.89%)	87.5
Epidermoid cyst	1(2.12%)	1 (2.12%)	100
Medulloblastoma	1(2.12%)	3 (6.38%)	33.3
Pituatary Adenoma	2(4.25%)	3 (6.38%)	66.6
Craniopharyngioma	1(2.12%)	1 (2.12%)	100
Metastasis	2 (4.25%)	2 (4.25%)	100
Small blue round cell	3 (6.38%)	1 (2.12%)	33.3
Inconclusive	2 (4.25%)	-	Nil

Discussion:

Primary tumours of central nervous system constitute less than 2% of overall human cancers and 20-30% of all childhood cancer.The location of tumour,radiological findings and clinical presentation of the patients helps the pathologist in making the cytological diagnosis with accuracy .. Diagnosis intraoperatively helps the surgeon in deciding the adequacy and accuracy of site as well as in modification of surgical method in clinically discrepant diagnosis. As the prognostic factors and patient adjuvant theraphies are important and based on Grade and type of tumours this is important . This can be achieved from an open biopsy or by a radiologically guided, stereotactic procedure.(4) Tissue from unrepresentative area led to erroneous diagnosis in discrepant cases Squash smear cytology is also helpful to identify non-neoplastic space occupying lesions and radiation induced necrosis versus recurrent tumours. A study by Ramana et al the peak age of CNS tumours wa middle age as seen in our Studies of Padma et al, Bromeland et al and Mertinez et al showed diagnostic accuracy of squash cytology as 81%,91% and 95% respectively (7,8,9) . In our study the diagnostic accuracy was 87 %. Grade 3 astrocytoma had diagnostic accuracy of 100% followed by grade 2 which had diagnostic accuracy of 80% in a study by Venaktesh raju et al . Our study however had a 100% correlation in Low grade astrocytoma followed equally in high grade and GBM.(10)

Conclusion:

We are presenting this study as Squash cytology has emerged as an important intraoperative diagnostic aid guiding the neurosurgeon and helps in better management of patients. Cytology provides good cellular details in easily smearable tumours. With clinicoradiological correlation, Squash smear cytology could be the preferred method for intraoperative diagnosis. The accuracy of this study of about 85.1% matched with other studies done in the past on the squash smear technique.

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