



## DIAGNOSTIC ACCURACY OF SQUASH CYTOLOGY OF ASTROCYTOMA

<b>Dr. M. S. Lalitha</b>	M.D, Assistant Professor, Department Of Pathology, Government Sivagangai Medical College Hospital, Sivagangai, Tamilnadu.
<b>Dr. A. G. Krishnaveni</b>	M.D, Associate Professor, Department Of Pathology, Government Sivagangai Medical College Hospital , Sivagangai , Tamilnadu.
<b>Dr. A. Vijayalakshmi*</b>	M.D, Assistant Professor, Department Of Pathology, Government Sivagangai Medical College Hospital, Sivagangai, Tamilnadu. *Corresponding Author

**ABSTRACT** **BACKGROUND:** Primary Central nervous system tumours occupies less than 2% of overall human cancers in adults. The accurate diagnosis of intracranial tumour is necessary for therapeutic and prognostic purpose. Intraoperative smear cytology provides a rapid diagnosis which helps the neurosurgeon for immediate decision regarding the extent of surgery. **Objectives:** To determine the accuracy of squash preparation, by comparing it with histopathological sections and analysing the cytomorphological features of astrocytoma **Methods:** This was both retrospective and prospective study. We received nineteen radiologically and clinically suspected Astrocytoma in saline with fixatives. Crush smear were made and stained with rapid Haematoxylin and Eosin. The corresponding biopsy materials were fixed in 10% neutral buffered formalin and submitted for tissue processing. Staining was done with routine Haematoxylin and Eosin stain. The cytomorphological features of these tumours were correlated with histopathological sections. **Results:** In our study, we received nineteen radiologically and clinically suspected Astrocytoma , tissue of all the tumours were soft and easy to smear . Glioblastomamultiforme was the most commonly encountered tumor amongneuroepithelial tumor constituting about 42.1% followed by diffuse astrocytoma (36.8%), WHO grade II and IV tumors of astrocytoma were commonly encountered in our study. Astrocytoma was common in males than females with majority of them fall in 5 th decade. we got 94.7% correlation between squash cytology and histopathology. **Conclusion:** Squash cytology is simple, rapid, accurate and cost effective diagnostic tool for Astrocytoma

**KEYWORDS :** Astrocytoma, Squash Cytology.

**INTRODUCTION:**

Primary central nervous system tumours constitutes less than 2% in adults but second most common tumours in children after leukemia. Squash sme technique provides a rapid intraoperative diagnosis and guidance to the neuro surgeon during surgical resection and lesion targeting. High water content and inherent soft nature make frozen sections interpretations difficult. Squash cytology act as an alternative method to frozen section for intraoperative consultation. It is fairly accurate, relatively safe, rapid, simple, easily reproducible and cost effective technique. The role of squash cytology has increased with the development of CT and MR guided stereotactic biopsies which yield a small quantity of tissue. The present study is to determine the accuracy of squash cytology for rapid intraoperative diagnosis of astrocytoma and its correlation with histopathological diagnosis.

**MATERIALS AND METHODS:**

The study was carried out in the Department Of Pathology, Madurai Medical College, Madurai, for the period of two years. During this period, 19 specimens of radiologically and clinically suspected Astrocytoma were received in saline without any fixative. Squash smear were made and stained with rapid Haematoxylin and Eosin. The corresponding biopsy materials were fixed in 10% neutral buffered formalin and submitted for tissue processing. Staining was done with routine Haematoxylin and Eosin stain. The cases were classified based on WHO classification, 2007. The diagnostic accuracy of squash cytology of Astrocytoma was compared with histopathological diagnosis. The observations were compared with other studies and inferences drawn.

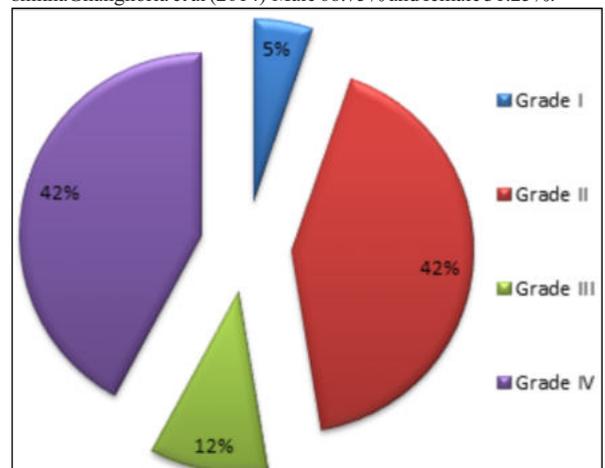
**OBSERVATIONS AND RESULTS:**

In our study, we received nineteen case of radiologically and clinically suspected astrocytoma, tissue of all the tumours were soft and easy to smear. Glioblastomamultiforme was the most commonly encountered tumor amongneuroepithelial tumor constituting about 33.3% followed by diffuse astrocytoma (29.2%), Squash cytology of Astrocytoma was compared with histopathology and 94.7% correlation were achieved in this study.

**DISCUSSION:**

In early '30s, squash technique was introduced as intraoperative neurosurgical diagnosis and the advent of stereotactic neurosurgical technique produces very small specimen which are difficult to get a section on cryostat and increased the popularity of squash cytology in

rapid diagnosis.. This present study was done to evaluate the diagnostic accuracy of squash cytology of Astrocytoma and their level of correlation with histopathological diagnosis. It demonstrated 94.7% diagnostic accuracy on squash smears of Astrocytoma Glioblastomamultiforme was the most commonly encountered tumor amongneuroepithelial tumor constituting about 42.1% followed by diffuse astrocytoma (36.8%) Astrocytoma was common in males than females with majority of them fall in 5 th decade. Males (78.9%) outnumbered females (21.1%) in astrocytoma in our study which was comparable with the findings of Chi JG et al<sup>2</sup> (M:F - 1.48:1) and shikhaGhanghoria et al (2014)<sup>3</sup> Male 68.75% and female 31.25%.

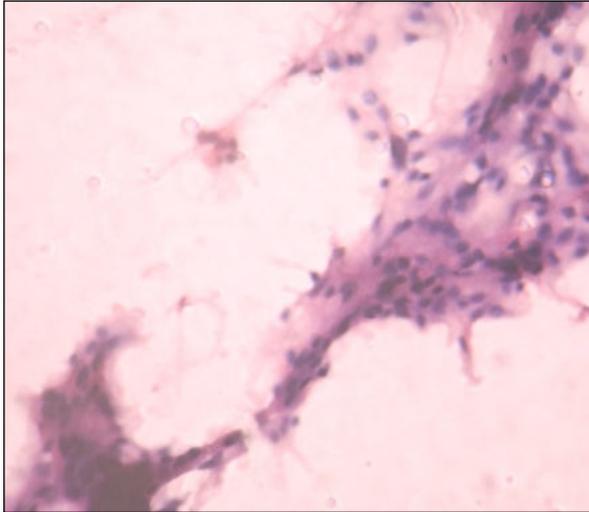


**Figure No 1 :** Distribution Of Astrocytoma According To WHO grading

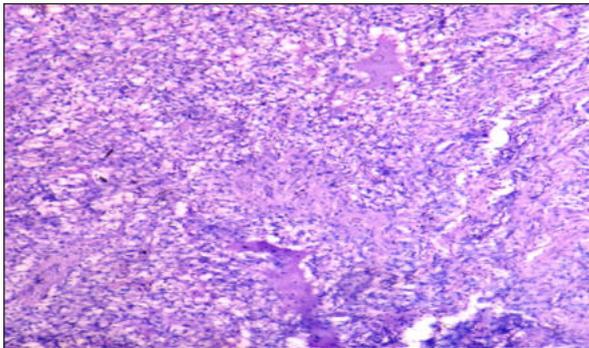
WHO grade II and IV tumors were commonly encountered in our study.

A case of 59 year old male presented with right hemiparesis for 1 month. MRI showed findings possibility of vasculitis. Squash smears showed a moderate cellularity with an irregular clusters arranged around blood vessels. There was no endothelial hyperplasia. The provisional diagnosis of low grade astrocytoma was made. The histopathological sections revealed glioblastomamultiforme. From the above observation, it has been showed that the grading of astrocytoma

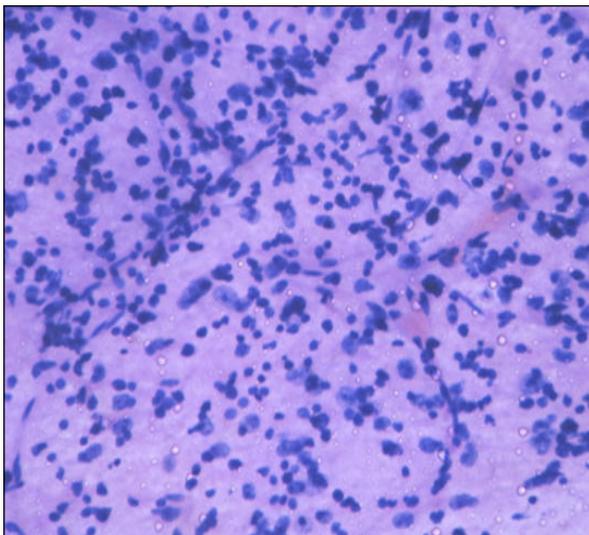
was difficult. These improper grading was due to the sampling error and had variation in grade from one area to another area within a single tumor. Deshpande et al reported similar difficulties in their study<sup>4</sup> Histopathological sections revealed both the less and more aggressive areas of astrocytoma but squash smear on small biopsies showed only the particular area. It might have failed to show the aggressive area within that tumor. It correlated with the reports of Asha et al,<sup>5</sup> four cases were diagnosed as low grade glioma and anaplastic astrocytoma on cytology which on paraffin sections were diagnosed as anaplastic astrocytoma and glioblastomamultiformerespectively. So small biopsies may not be adequate to grade the astrocytic tumors.



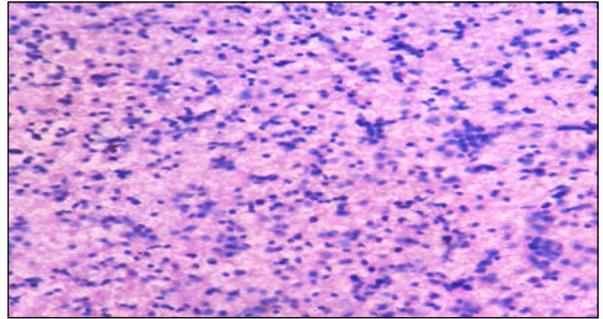
**Figure No 2:** Pilocytic Astrocytoma. Tumor Cells Have Elongated Nuclei With The Coarse Bipolar Process. (H&Ex400)



**Figure No 3:** Pilocytic Astrocytoma. Tumor Composed Of Biphasic Pattern With Pilocytic Areas And Intermingled With Microcystic Areas. (H&Ex100). Case 1953/14.



**Figure No 4:** Grade II, Astrocytoma. Moderate Cellularity With A Heterogeneous Population Of Cells. (H&Ex100).



**Figure No 5** Grade II Astrocytoma. Tumor Cells Have Scant Cytoplasm With Irregular Hyperchromatic Nuclei. (H&Ex100).

**CONCLUSION:**

We had observed a 94.7% correlation between squash cytology and its histopathology in Astrocytoma .So Intraoperative squash cytology are rapid and reliable diagnostic tool for Astrocytoma. Inadequate tumoural sampling with undergrading of some astrocytoma may occur, especially when diagnoses are based on tissues obtained from smaller biopsies.

**REFERENCES:**

1. JaiswalS, Vijm,JaiswalAK, BehariS. Intraoperative squash cytology of central nervous system lesions: a single center study of 326 cases. *DiagnCytopathol.* 2012 Feb ;40(2):104-12.doi:10.1002/dc.21506.
2. Chi JG, Khang SK. Central Nervous System Tumors among Koreans – A Statistical study on 697 cases. *J of Korean Sci* Vol 4, No 2, pp 77-90, June 1989
3. Ghangoria S, Mehar R, KulkaraniCV,Mittal M, Yadav A, Patidar H. Retrospective histological analysis of CNS tumors – A 5 year study. *Int J Med Sci Public ealth* 2014;3:1205-1207
4. Deshpande K, Surase S, Shedge R, D'costa G, Bharambe B. Accuracy and Diagnostic Yield of Intraoperative Squash Smear Technique in the Rapid Diagnosis of CNS lesions. *Bombay Hospital J* Vol :52, No.2, 2010.
5. Asha T, Shankar SK, Rao TV, Das S. Role of Squash smear technique for rapid diagnosis of Neurosurgical Biopsies – A cytomorphological evaluation. *Indian J PatholMicrobiol* 1989;32:152-60.