Accuracy of intra-operative rapid diagnosis by Squash smear in CNS lesions – An early institutional experience.

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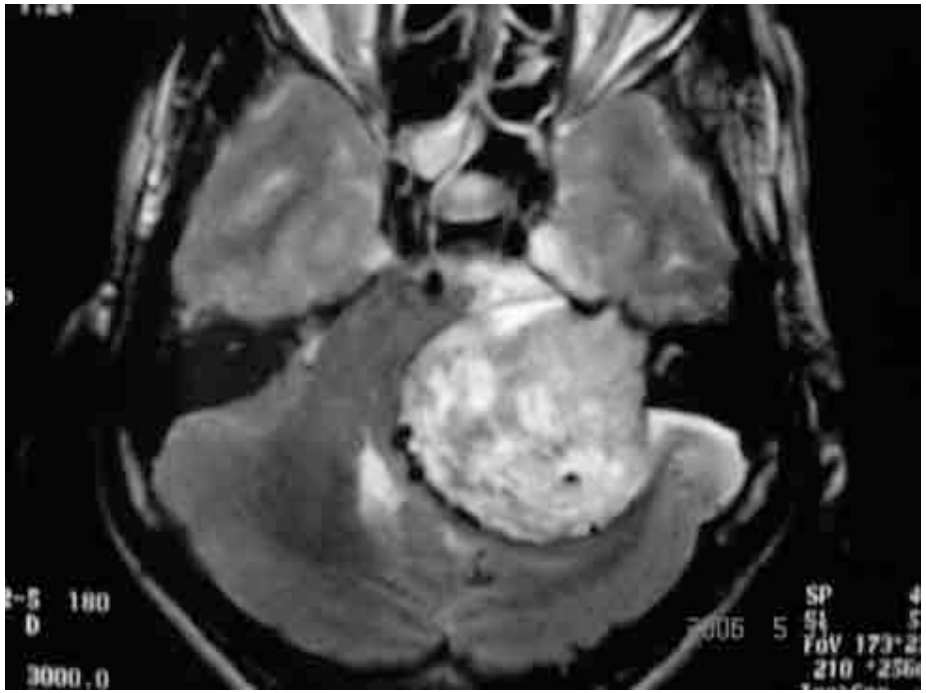
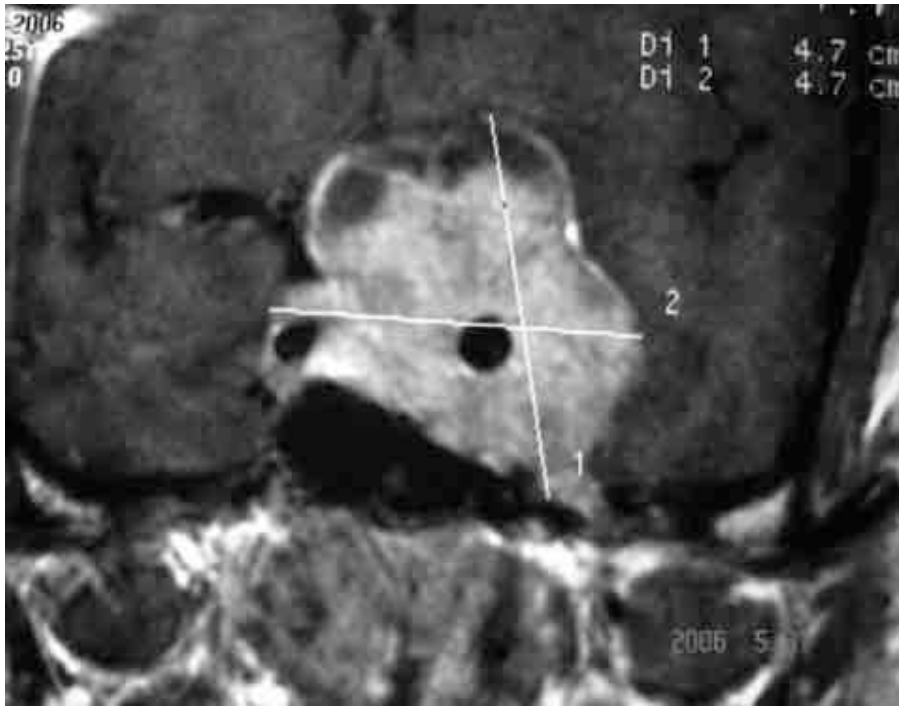
Introduction

- Squash smear preparation - fairly accurate, simple and reliable tool for rapid intra-operative diagnosis of central nervous system lesions.
- Based on two essential factors:
  - Availability of very small tissue fragments & good preservation of fine cellular details.
  - Not effected by edema, hemorrhage, necrosis & calcification.



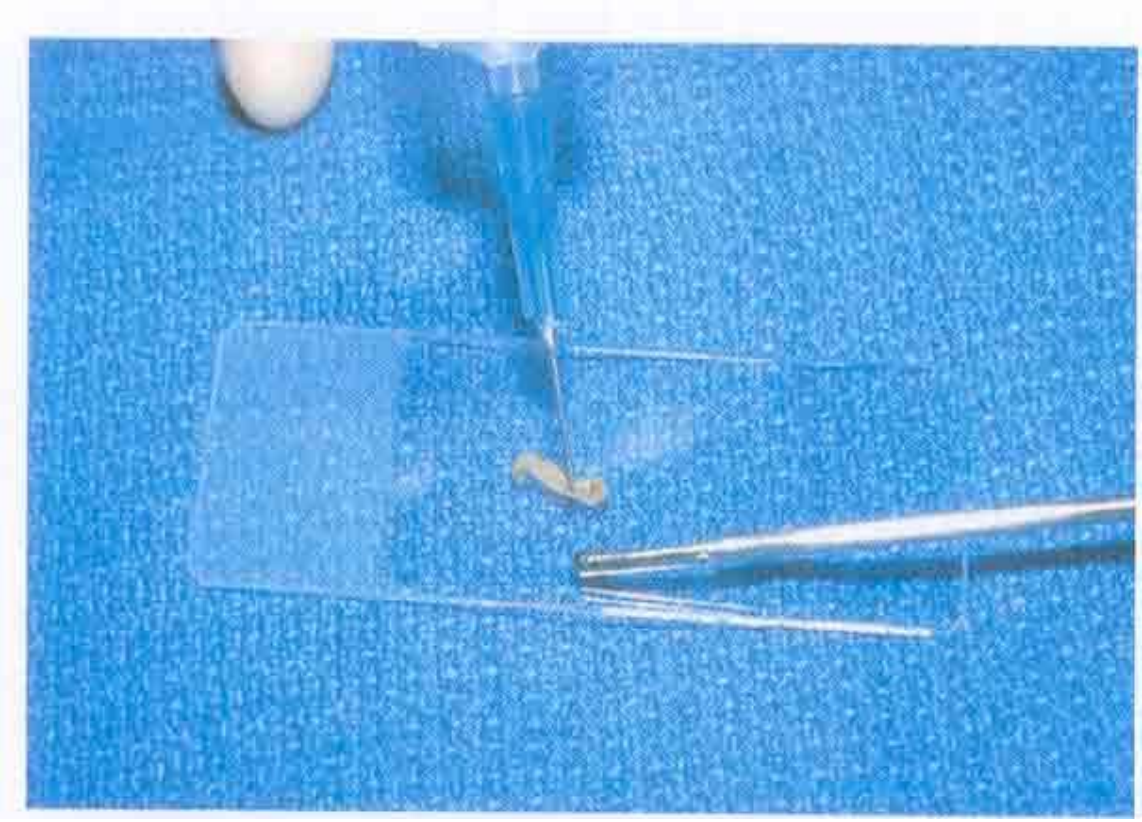
Surgery is easy in such cases ---------but



Here – where ICA encased & infiltrating tumor, Surgical challenge..

Material and Methods

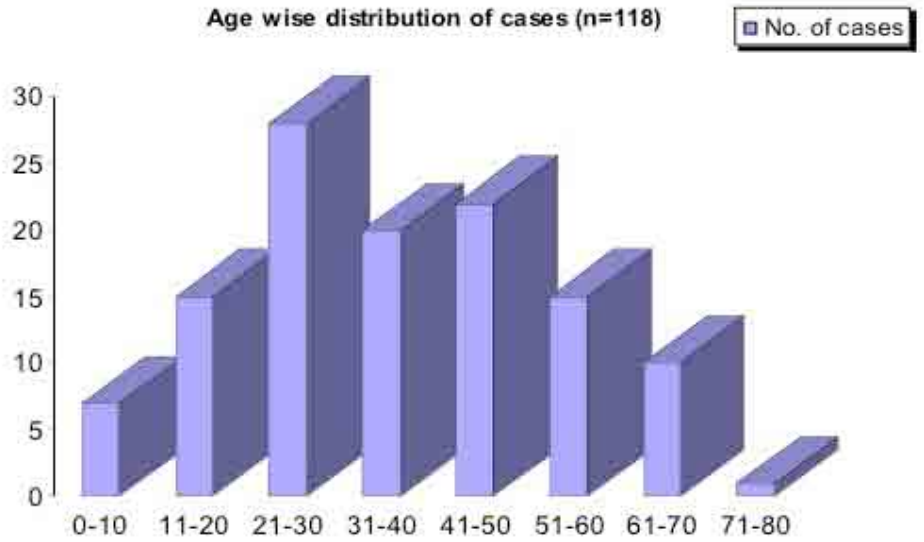
- Prospective study
- Included 118 patients
- Period of October 2004- October 2006.
- All patients operated for CNS mass lesions were included
- Squash cytology reported by pathologists
- All were subjected for routine histopathological processing.



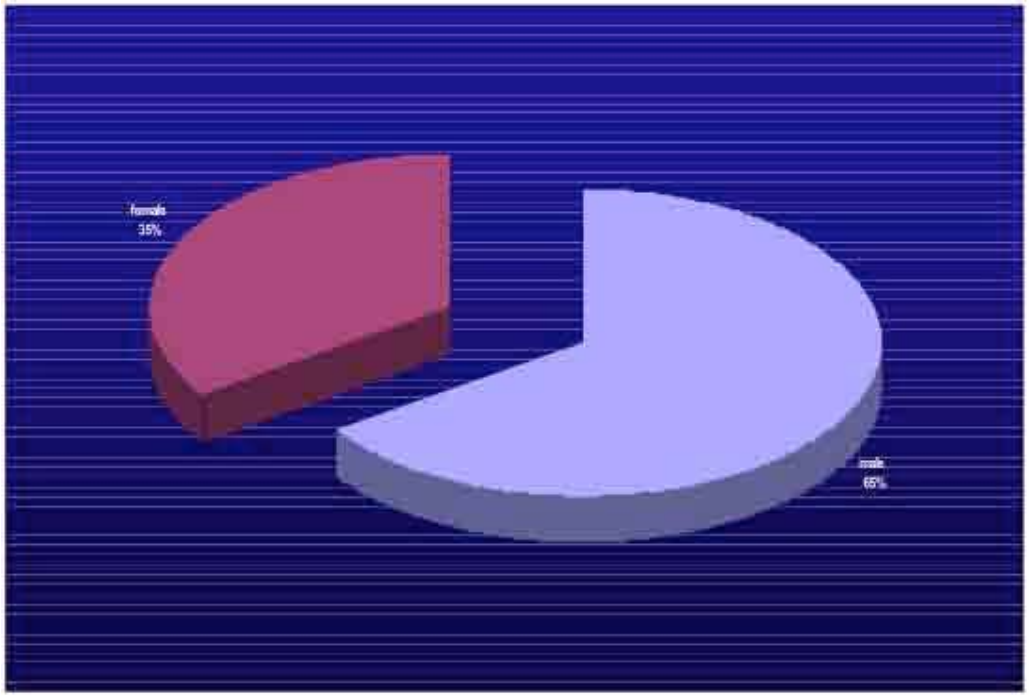
Squash smear technique

Minimum 2 air dried & 4 wet smear (MGG, H & E, PAP Stain).

Age wise distribution



Sex wise distribution



Site wise distribution of CNS lesions (n=118)

S.No.	Site	No. of Tumors	Percentage (%)
1.	**Cerebral Hemisphere**	**49**	**41.5**
	-Frontal	18	15.3
	-Parietal	04	3.4
	-Temporal	08	6.8
	-Overlapping lesions	19	16.1
2.	**Cerebellum**	**09**	**7.7**
3.	Pineal region	04	3.4
4.	Ventricles	11	9.3
5.	Suprasellar region	05	4.2
6	**Cerebellopontine angle**	**09**	**7.7**
7.	**Spinal cord**	**14**	**11.8**
8.	Non-Specific	14	11.8
	Total	**118**	**100**

Distribution of cases based on clinical diagnosis (n=118)

S. No.	Clinical / Provisional Diagnosis	No. of cases	Percentage
1	**Glioma**	**43**	**36.4**
2	Pituitary adenoma	04	3.4
3	Craniopharyngioma	04	3.4
4	**Meningioma**	**19**	**16.1**
5	Schwannoma	07	5.9
6	Neurofibroma	03	2.5
7	Metastatic	06	5.1
8	Epidermoid cysts	05	4.2
9	Arachnoid cysts	02	1.7
10	Vascular lesion	03	4.2
11	Tuberculosis	07	5.9
12	Seizure related lesion	05	4.2
13	Nonspecific diagnosis	06	5.1
14	Others	04	3.4
	Total	**118**	**100**

Distribution of cases based on intraoperative squash smear cytologic diagnosis (n=118)

S. No.	Cytopathological Diagnosis	No. of cases	Percentage
1	**Glioma**	**36**	**30.5**
	-Astrocytoma	30	25.4
	-Glioblastoma Multiforme	02	1.7
	-Oligodendroglioma	01	0.84
	-Ependymoma	03	2.5
2	Pituitary adenoma	04	3.4
3	Craniopharyngioma	03	2.5
4	**Meningioma**	**17**	**14.4**
5	Schwannoma	08	6.8
6	Neurofibroma	03	2.5
7	Metastatic tumors	10	8.5
8	Tuberculosis	05	4.2
9	Aspergillosis	02	1.7
10	Others	20	16.9
	Total	**118**	**100**

Distribution of cases based on Histopathologic diagnosis (n=118)

S. No.	Histopathological Diagnosis	No. of cases	Percentage
1	**Glioma**	**34**	**28.8**
	-Astrocytoma	20	16.9
	-Glioblastoma Multiforme	07	5.9
	-Oligodendroglioma	01	0.84
	-Ependymoma	04	3.4
	-Gliosarcoma	02	1.7
2	Ganglioglioma	03	2.5
3	Pituitary adenoma	06	5.08
4	Craniopharyngioma	03	2.5
5	**Meningioma**	**18**	**15.3**
6	Schwannoma	09	7.7
7	Neurofibroma	02	1.7
8	**Metastatic**	**09**	**7.7**
9	Tuberculosis	06	5.08
10	Aspergillosis	02	1.7
11	Seizure related lesion	05	4.2
12	Other	21	17.8
	Total	**118**	**100**

Cyto-histological correlation of CNS lesions (n=118)

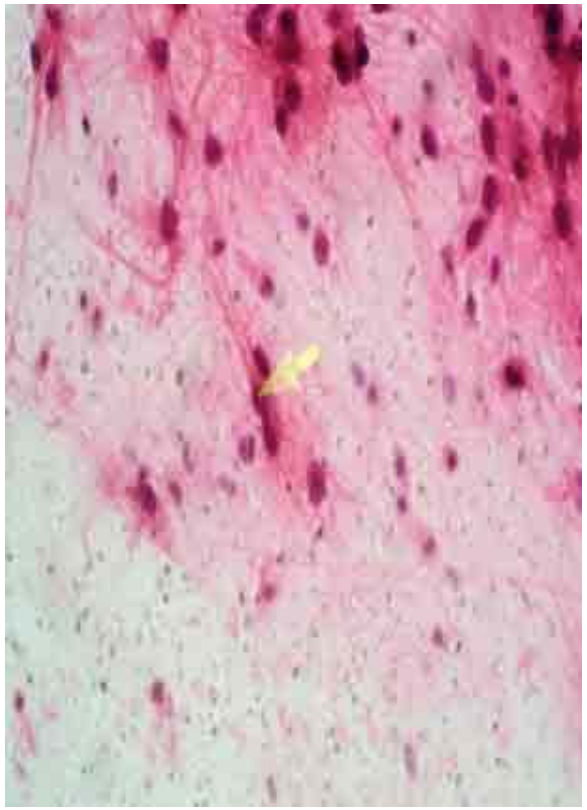
S. No	Cytological Diagnosis	No. of Cases	Histological Diagnosis	No. of Cases	Percentage
1	**Glioma / Astrocytoma**	**30**	**Astrocytoma**	**20**	**66.6**
			Glioblastoma	06	20.0
			Oligodendroglioma	01	
			Ependymoma	01	
			Ganglioglioma	02	
2	Glioblastoma Multiformae	02	Glioblastoma	01	50
			Gliosarcoma	01	
3	Ependymoma	03	Ependymoma	02	66.6
			Ganglioglioma	01	
4	Pituitary Adenoma	04	Pituitary Adenoma	04	100
5	Craniopharyngioma	03	Craniopharyngioma	03	100
6	**Meningioma**	**17**	**Meningioma**	**15**	**88.2**
			Ependymoma	01	
			Gliosarcoma	01	
7	**Schwannoma**	**08**	**Schwannoma**	**07**	**87.5**
			Meningioma	01	
8	Neurofibroma	03	Neurofibroma	02	66.6
			Meningioma	01	
9	**Metastatic**	**10**	**Metastatic**	**09**	**90**
			Meningioma	01	
10	**Tuberculoma**	**05**	**Tuberculoma**	**05**	**100**
11	**Aspergillosis**	**02**	**Aspergillosis**	**02**	**100**
12	Others	31		31	
	Total	**118**		**118**	

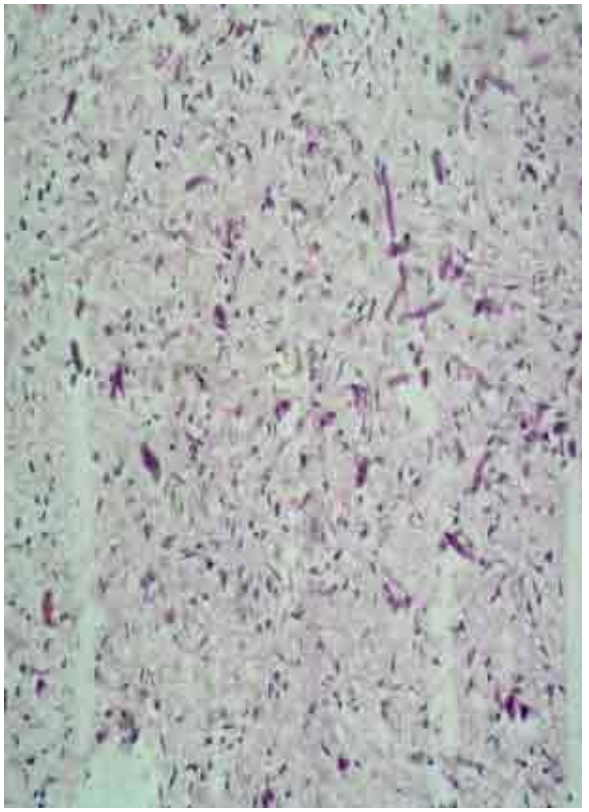
Conclusion

- The cytohistological correlation of all 118 lesions diagnosed on cytology was 89.7%.
- Common reasons for no opinion on cytology were fibrosis, inflammation, calcification, necrosis and lack of definite cytologic criteria.

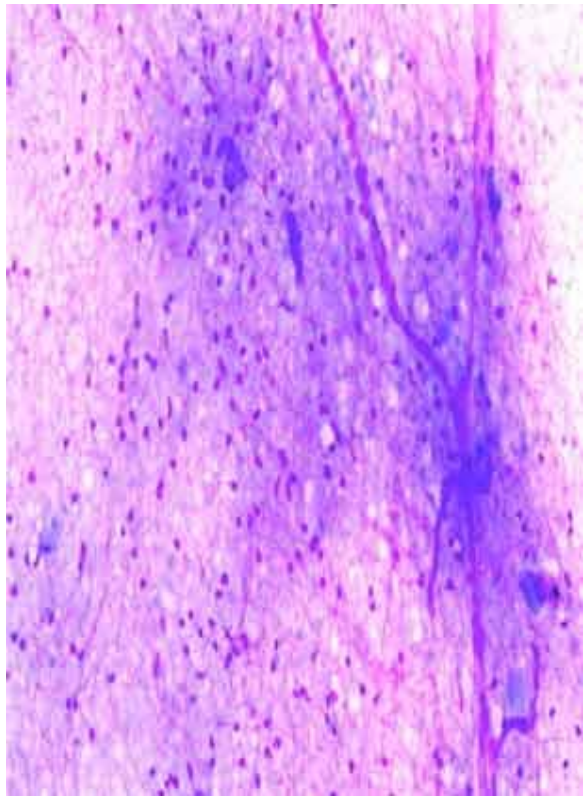
Common causes for erroneous diagnosis on cytology were

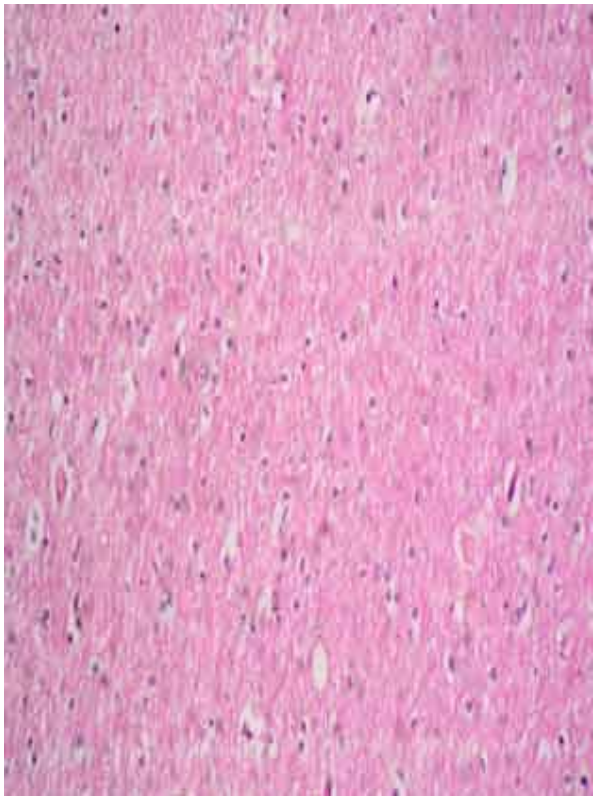
- increased fibrous component,
- biopsy from cyst wall,
- increased and morphology obscuring inflammation and necrosis,
- lack of architecture on cytology,
- reactive changes,
- resistance to desegregation.



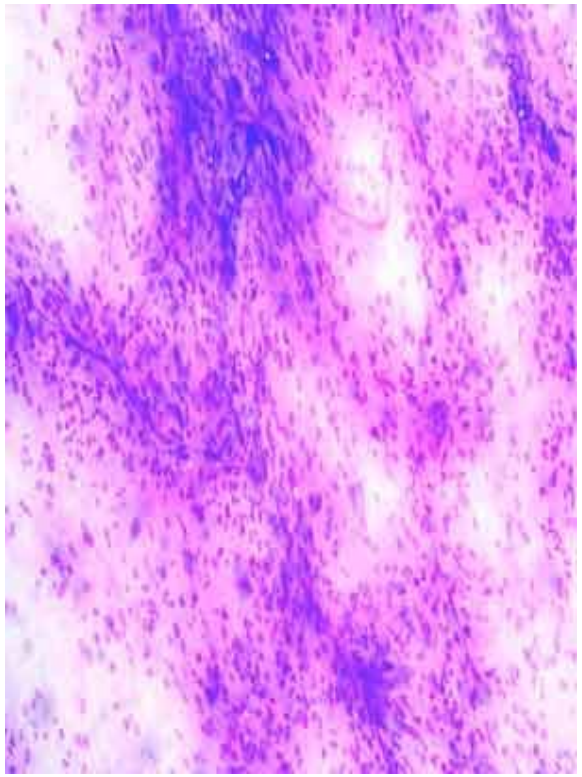


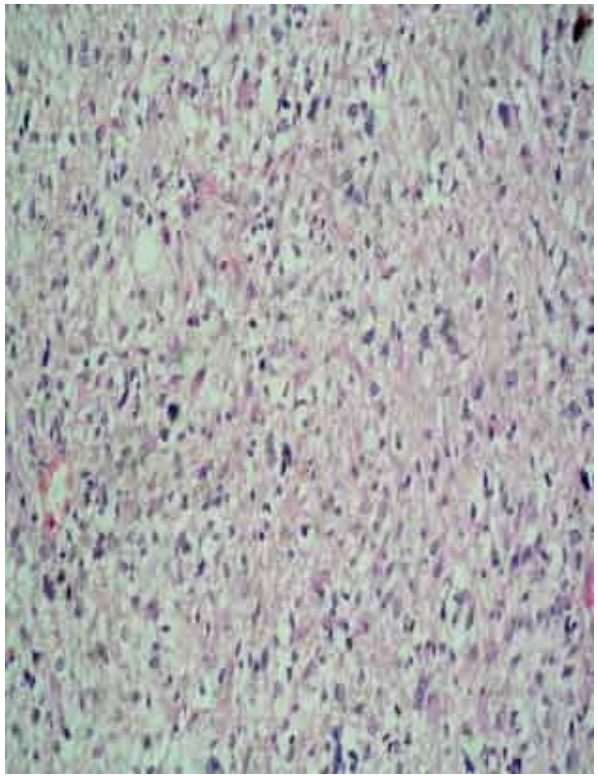
Pilocytic Astrocytoma



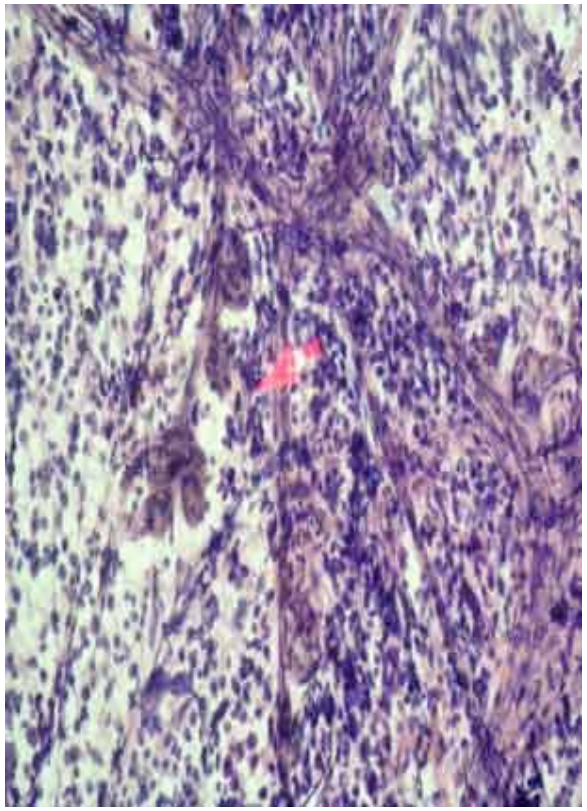


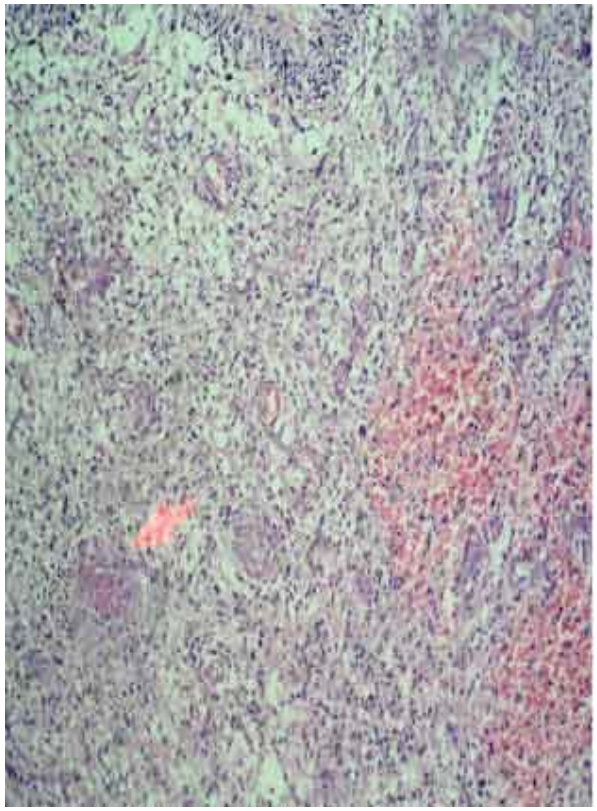
Astrocytoma grade 2



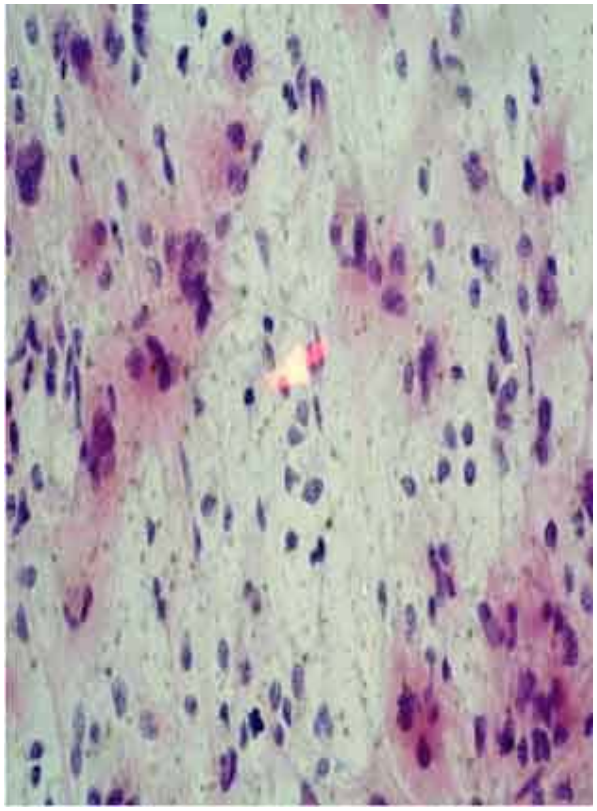


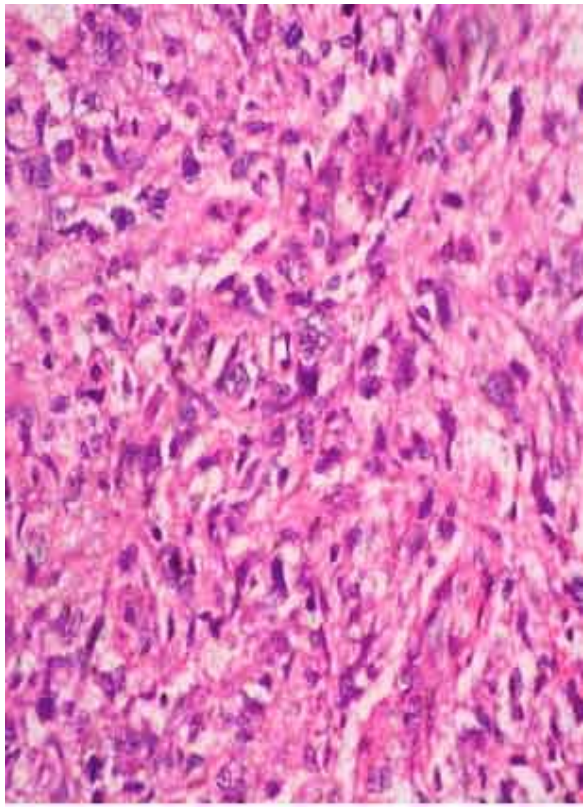
Astrocytoma grade 3



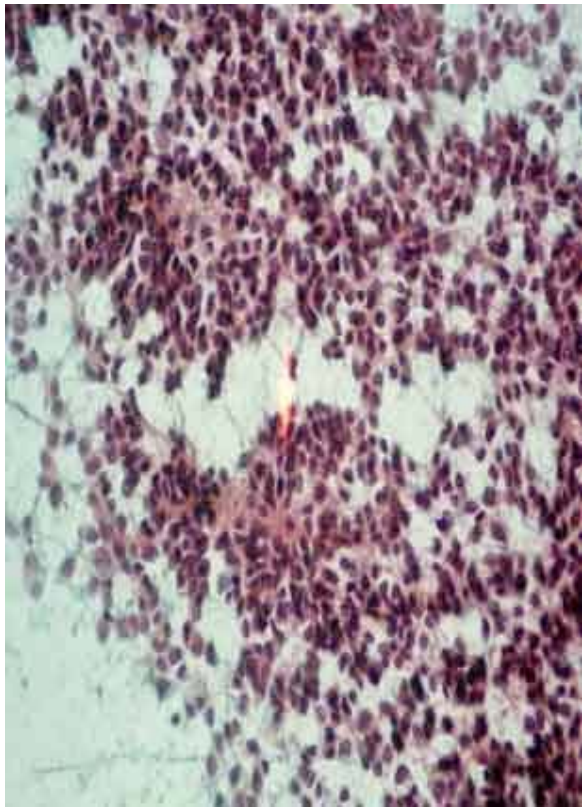


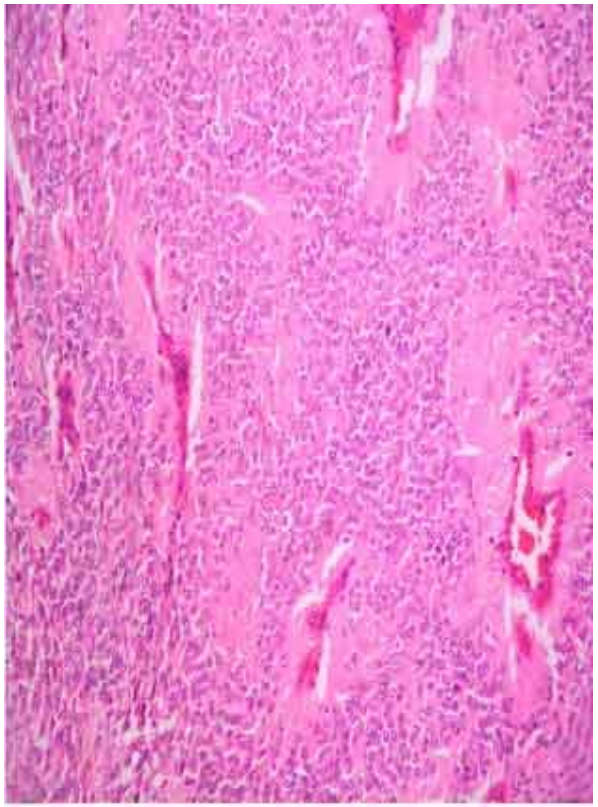
Astrocytoma grade 4



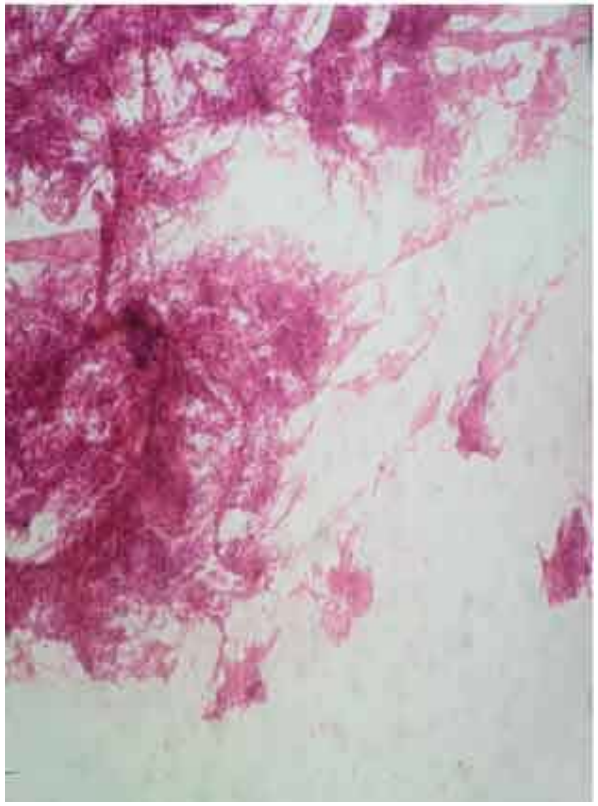


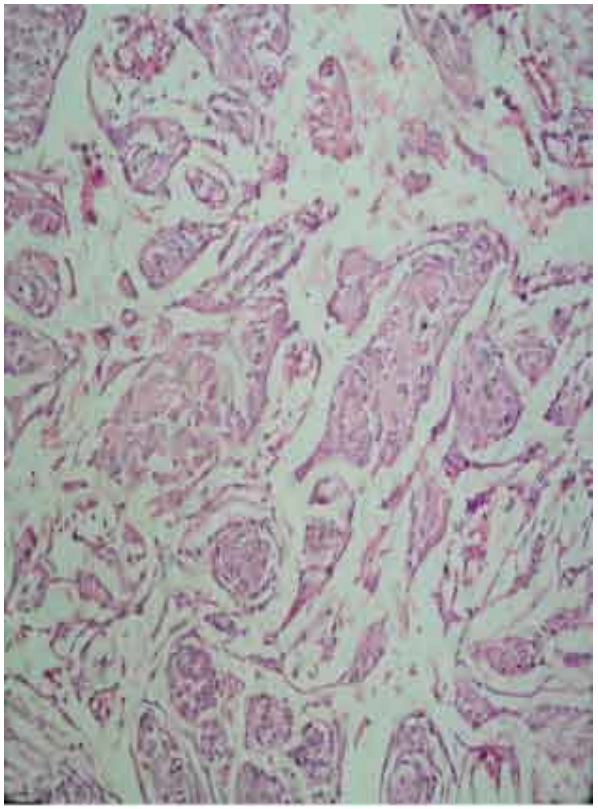
Astrocytoma grade 4



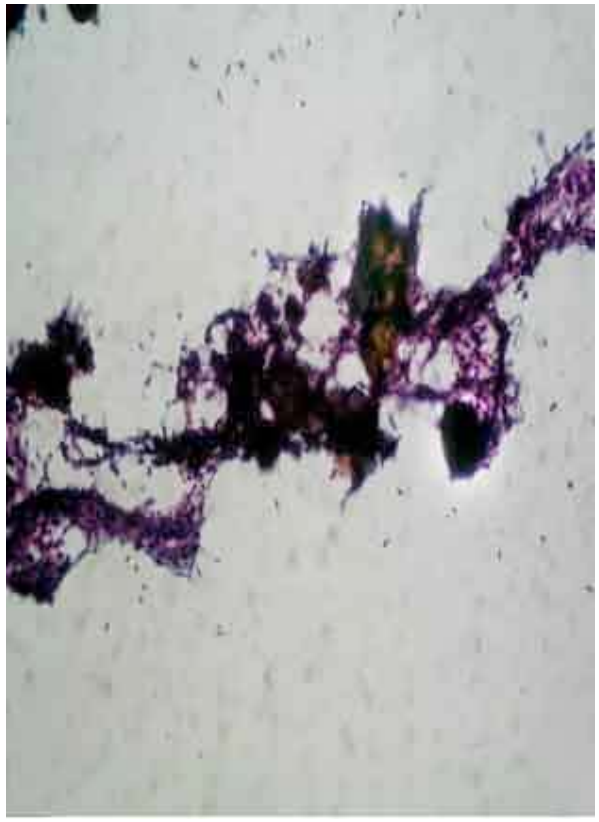


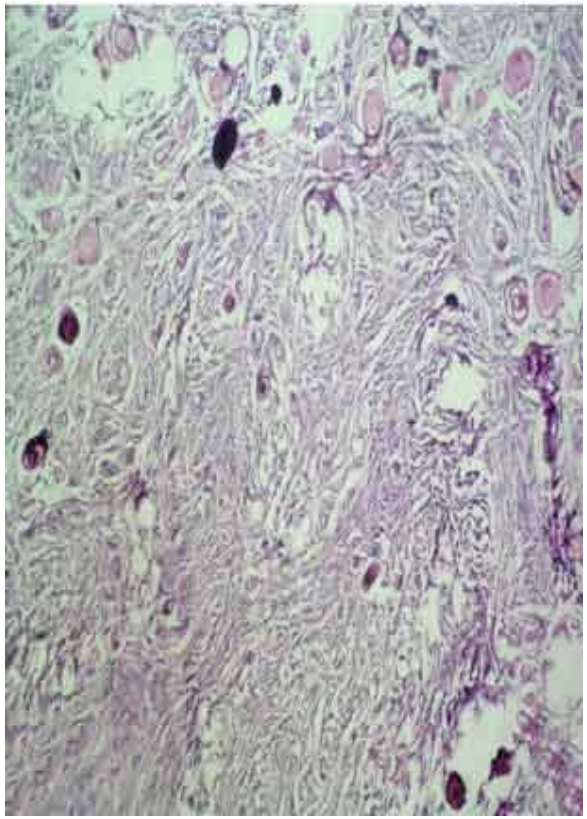
Ependymoma



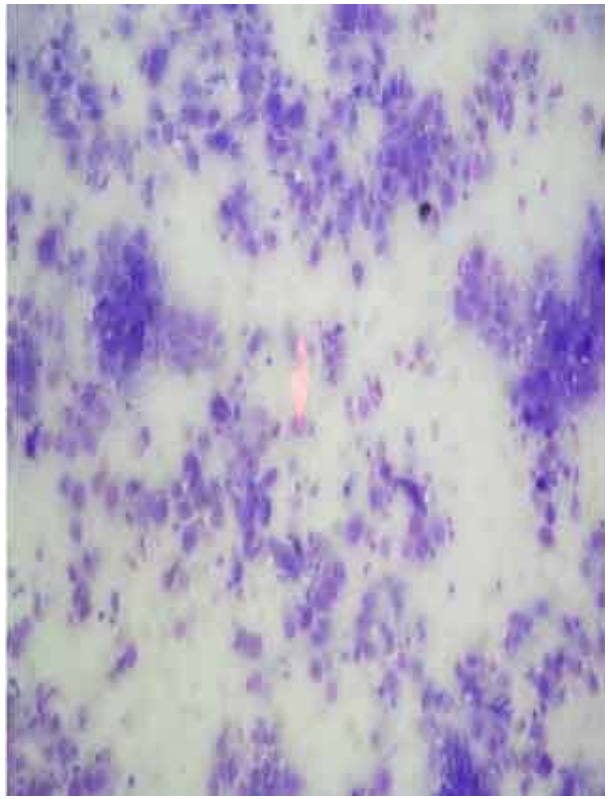


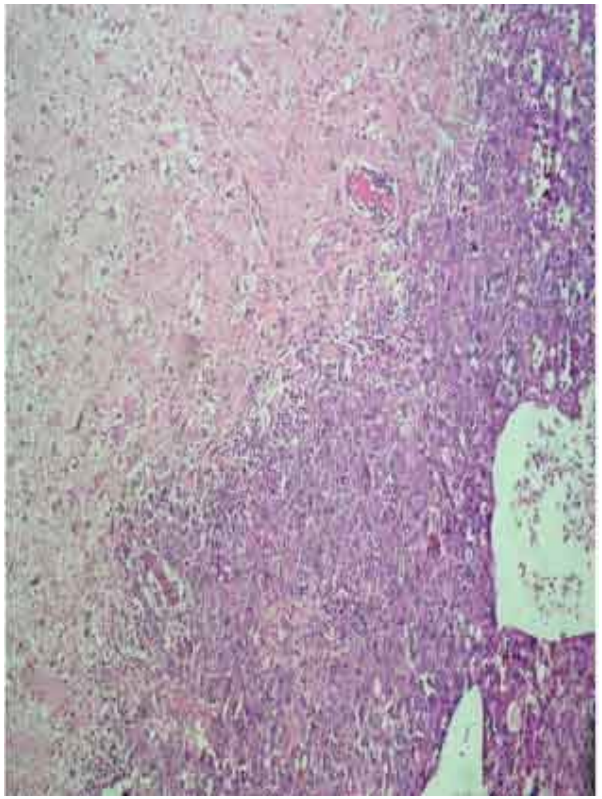
Meningioma



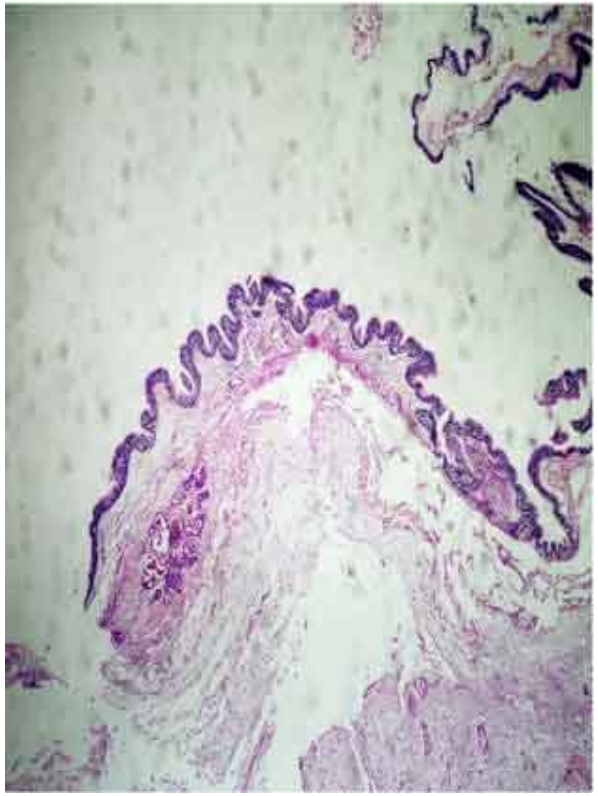


Psammomatous Meningioma

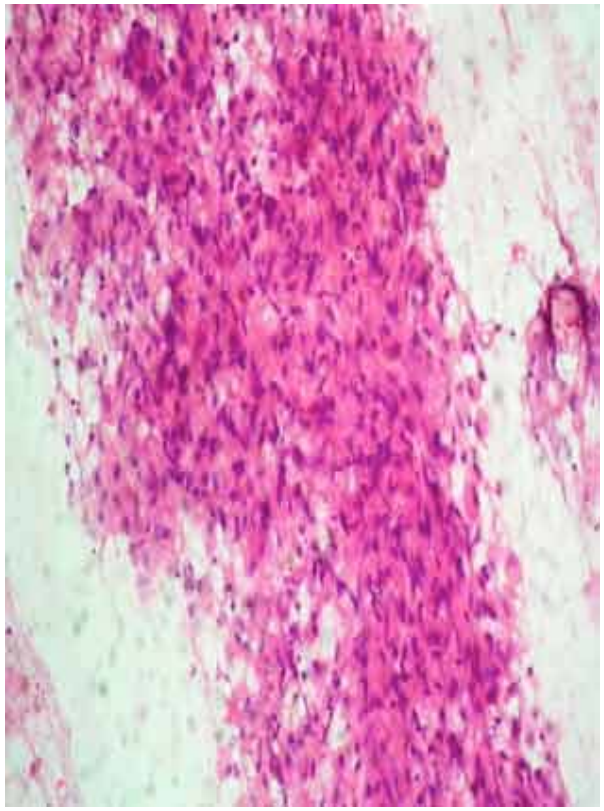


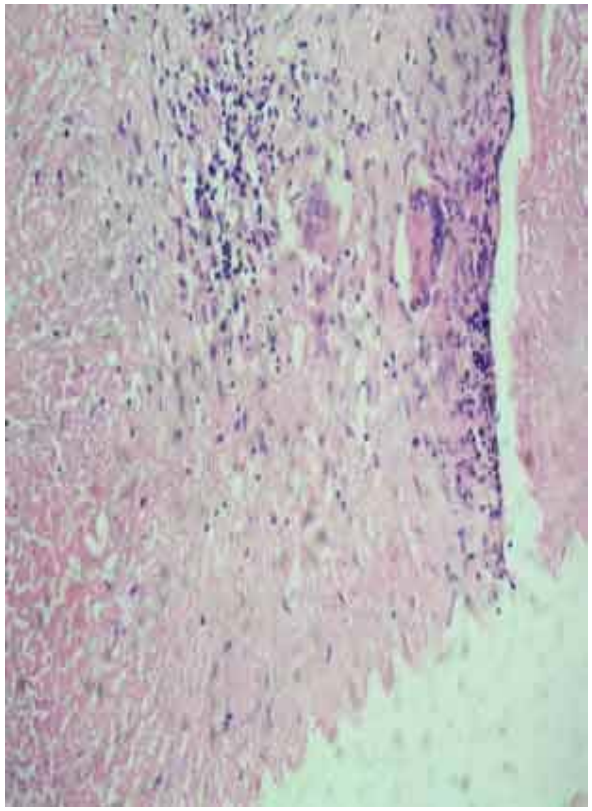


Metastatic lesion

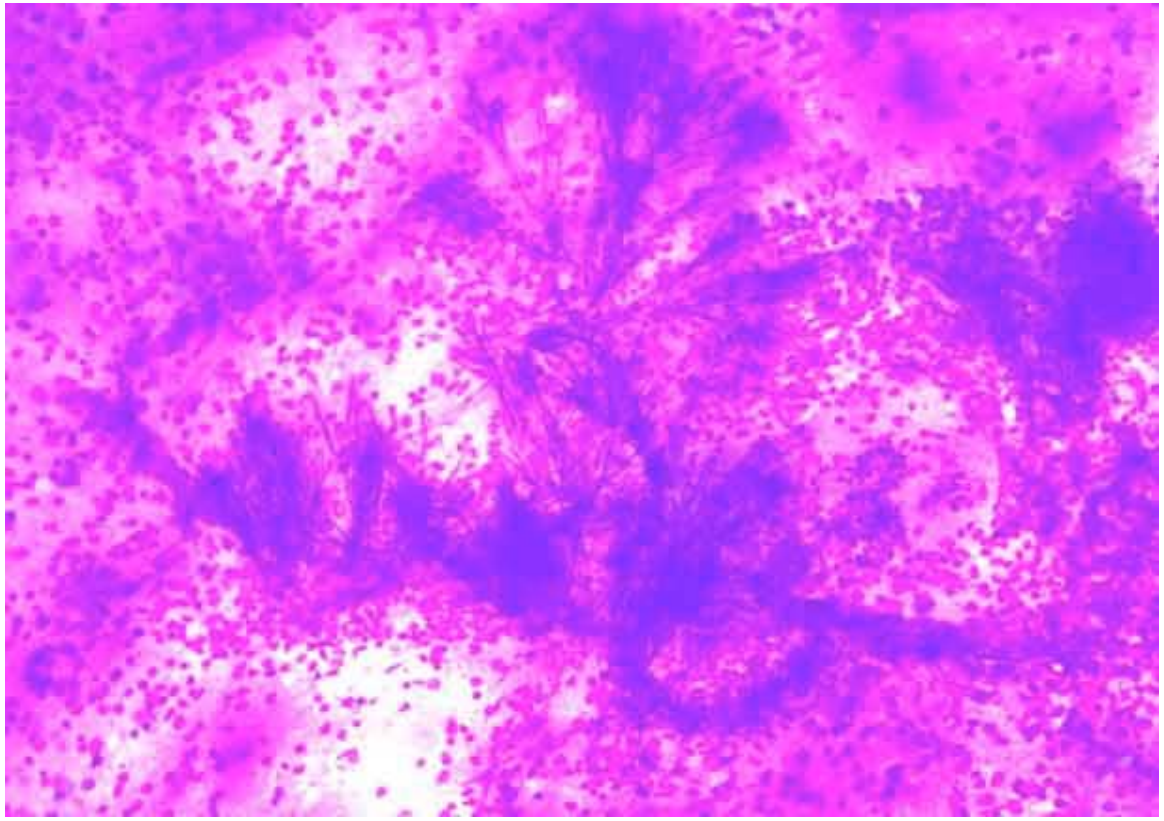


Bronchogenic cyst





Granulomatous lesion



Aspergilloma

THANK YOU