

## A STUDY OF THE METASTATIC TUMOURS OF THE CNS

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### ABSTRACT

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#### BACKGROUND

The Metastatic tumours are the tumours that originate outside the CNS and spread secondarily to the CNS via the haematogenous route [metastasis] or by direct invasion from adjacent tissue. Metastatic tumours are the most common CNS neoplasms. Due to under diagnosis and inaccurate reporting, the incidence rates found in the literature for brain metastases [up to 11 per 100,000 population per year] probably underestimate the true incidence. The aim of the study is to study the metastatic tumours of the CNS.

#### METHODS

The sample size included 100 cases of intra-cranial neoplasms that turned in the Department of Medicine in KVJ Medical College, Sullia and different local private hospitals of Sullia and Mangalore.

#### RESULTS

In this study Metastatic tumours constitutes 3 (3%) of intracranial tumours. Among these 2 are adenocarcinomas and 1 case is a neurofibrosarcoma. All 3 cases occurred in a >14-year-old patients. All were men. 2 cases were cerebral and one case was in cerebellum in location.

#### CONCLUSION

Due to under diagnosis and inaccurate reporting, the incidence rates found in the literature for brain metastases [up to 11 per 100,000 population per year] probably underestimate the true incidence.

#### KEYWORDS

Metastatic, Tumours, Central nervous system, Haematogenous.

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**INTRODUCTION:** The Metastatic tumours are the tumours that originate outside the CNS and spread secondarily to the CNS via the haematogenous route [metastasis] or by direct invasion from adjacent tissue. Metastatic tumours are the most common CNS neoplasms. Due to under diagnosis and inaccurate reporting, the incidence rates found in the literature for brain metastases [up to 11 per 100,000 population per year] probably underestimate the true incidence.<sup>1</sup> Autopsy studies revealed that CNS metastases occur in about 25% of patients who die of cancer. Leptomeningeal metastases occur in 4-15% of patients with solid tumours<sup>2</sup> and dural metastases in 8-9% of cancer patients with advanced cancer.<sup>3</sup> Spinal epidural metastases are found in 5-10% of all patients with cancer and are much more frequent than spinal leptomeningeal or intramedullary metastases<sup>4</sup> Direct intracranial extension from local primary tumours is rare.<sup>5</sup> Metastatic cancer of the unknown primary is one of the top ten most frequent cancer diagnosis comprising approximately 30% of all malignancies.

According to Strictland –Marmol L.B, among 38 cases of metastatic adenocarcinomas 22 pulmonary, 10 breast, 6 gastro intestinal.<sup>6</sup> In one of the study average age was 46.5 years.<sup>7</sup> The incidence of CNS metastases increases from less than one per 100 000 below 25 years of age to greater than 30 per 100000 at age 60 years<sup>1</sup> Up to 30% and adults and 6-10% of children with cancer will develop brain metastasis.<sup>8</sup> The relative proportions of various primary tumours are different for the two sexes, but for most tumours gender lacks a significant independent effect on the occurrence of CNS metastasis.<sup>9,1</sup> According to Verma R N et al among 11 cases of Metastatic tumours 9 were males and 2 were females.<sup>7</sup> More than 80% of brain metastases are located in the cerebral hemispheres, especially in arterial border zones and at the junction of cerebral cortex and white matter. Approximately 15% are found in the cerebellum. Of the brain metastases, less than half are single [i.e. the only metastasis in the brain], and very few are solitary [i.e. the only metastasis detected in the body].<sup>10</sup> Others intracranial sites include the dura and leptomeninges in these sites, extension from or to other compartments is common.<sup>11,12</sup> The vast majority of metastases affecting the spinal cord paravertebral tissues into the epidural space.<sup>13</sup> Occasionally metastatic CNS tumours seed along the walls of the ventricles or are located in the pituitary gland, choroid plexus, or a pre-existing lesion like a meningioma. The

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posterior fossa is relatively frequently involved in patients with colorectal and renal carcinoma and tumours of the pelvic organs. Dural metastases are relatively common in cancer of the prostate, breast lung and in haematologic malignancies.<sup>12</sup> Leptomeningeal metastases in patients with lung and breast cancer melanoma, and haematopoietic tumours.<sup>1,2</sup> Spinal epidural metastasis in cancer of prostate breast, lung, kidney, non-Hodgkin lymphoma and multiple myeloma and intramedullary spinal cord metastasis in small cell lung carcinoma.<sup>4</sup>

**AIMS AND OBJECTIVES:** To study the metastatic tumours of the CNS.

**MATERIALS AND METHODS:** The sample size included 100 cases of intra-cranial neoplasms that turned in the Department of Medicine in KVJ Medical College, Sullia and different local private hospitals of Sullia and Mangalore.

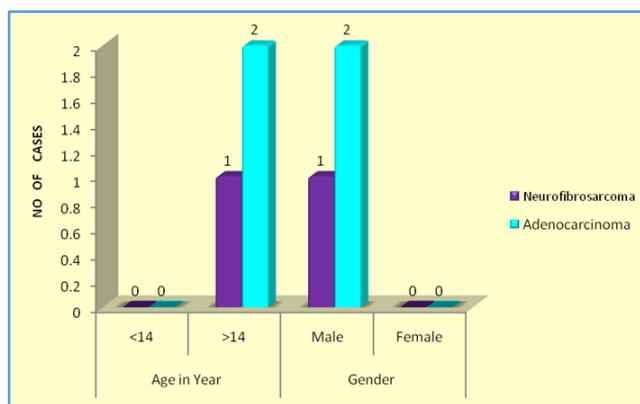
The cases were studied in an inter Department co-ordination. Most of the cases were diagnosed by clinical approach and confirmed by the Department of Radiology and The Department of Pathology.

**RESULTS:**

**METASTATIC TUMOURS:**

Type of tumour	Age in years		Gender	
	<14	>14	Male	Female
Neurofibrosarcoma	0	1	1	0
Adenocarcinoma	0	2	2	0
<b>Total</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>

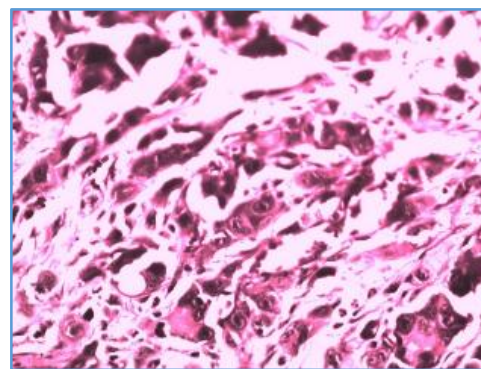
**Table 1: Showing age and gender distribution of metastatic tumours**



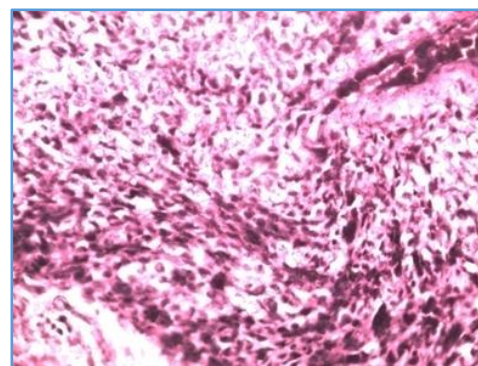
**Fig. 1: Age and gender incidence of metastatic tumours**

In this study Metastatic tumours constitutes 3 (3%) of intracranial tumours. Among these 2 are adenocarcinomas and 1 case is a neurofibrosarcoma. All 3 cases occurred in a >14-year-old patients. All were men. 2 cases were cerebral and one case was in cerebellum in location.

**DISCUSSION:**



**Fig. 2: Microphotograph of Metastasis from adenocarcinoma stomach. Glandular pattern lined by columnar cells with hyperchromatic pleomorphic nuclei**



**Fig. 3: Microphotograph of Metastasis from Neurofibrosarcoma. Wavy spindle shaped cells with hyperchromatic pleomorphic nuclei arranged in interlacing bundles**

The metastatic tumours accounts for 3% of all intracranial tumours. This incidence is higher than the incidence seen in study conducted by Banerjee et al<sup>14</sup> (1.7%). Average age being 59.3 years in this study.

Metastatic tumours	% of Intracranial tumours	Avg. age in years.
Banerjee et al <sup>15</sup>	1.7%	42.3
Verma RN et al <sup>7</sup>	3.9%	46.5
Demaster's K et al <sup>5</sup>	10.7%	75.5
Present study	3%	59.3

**Table 2: Comparison of percentage incidence and average age of Metastatic tumours**

All above mentioned studies show male predominance including present study in which the M:F ratio was 3:0.

Name of the study	M:F ratio
Banerjee et al <sup>15</sup>	2:1
Percy et al <sup>16</sup>	92:79
Demaster's K et al <sup>5</sup>	3:3
Verma RN et al <sup>7</sup>	9:2
Present study	3:0

**Table 3: Comparison of sex incidence of metastatic tumours**

**CONCLUSION:** Due to under diagnosis and inaccurate reporting, the incidence rates found in the literature for brain metastases [up to 11 per 100,000 population per year] probably underestimate the true incidence.

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