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# Outcome and Prognosis of Metastatic Brain Tumour: A Study of 35 Cases

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**Abstract**

*Thirty five patients were selected to evaluate the outcome & prognosis of metastatic brain tumour in the department of Neurosurgery, Bangabandhu Sheikh Mujib Medical University, (BSMMU) Dhaka from February 2002 to December 2005.*

*A structured questionnaire was made. Data were collected after the patient admission. All patients were evaluated with detailed history and clinical examination. MRI of Brain of these patients revealed intracranial lesions highly suspicious of metastatic brain tumour. Investigations like USG of the whole abdomen and x-ray chest were done to locate any primary site. Some of the primary lesions were confirmed by FNAC and histological examinations. Solitary intracranial space occupaing lesion (ICSOL) and sizable lesion among the multiple lesions were treated by surgery, and then histopathological examination were done followed by radiotherapy and / or chemotherapy.*

*This was a prospective study.*

*This study showed the highest age of incidence of tumours were above 60 years. Male predominated than female (60.00%). Among the clinical features the most common sign was hemiparesis (34.28%). The commonest site of lesion was in frontal region (34.28%). Histopathological reports showed adenocarcinoma 40.00%, small cell carcinoma of lungs 28.57%, squamous cell carcinoma 22.85%, follicular carcinoma of thyroid 5.71%. Treatment options were surgery, radiotherapy and chemotherapy. Sixty percent patients were improved after treatment. Highest survival rate was 3 to 6 months with treatment (31.42%). This study revealed that commonest type of brain metastases was adenocarcinoma and primary site of lesion was lungs. Best option of treatment was surgery plus radiotherapy and longest survival rate of 1 year was in 20.00% cases.*

**Introduction:**

The incidence of brain metastases and the spectrum of metastasizing primary cancers vary with patient's age[1]. Brain metastases occur more frequently in adults than in children[2]. Among adults, the highest incidence is observed in the fifth to seventh decades of life[3]. The most common sources of brain metastases in this group of patients were cancers of the lungs, breasts, and skin in descending order. In children, the most common cause of brain

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metastases is leukaemia, followed by lymphoma[4].

The overall incidence of brain metastases is not affected by patient's gender, nor the incidence of brain metastases from a given primary cancer. The only apparent exception to this is melanoma, which is more likely to spread to the brain in male patients[5]. Lung cancer is the most common source of brain metastases in men where as breast cancer is the most common source in women[6].

The histological type of the primary tumour appears to be the major dictator of the frequency and pattern of intracranial spread. Lungs, breast cancer, melanoma, renal and colon cancers account for the majority of all brain metastases in order of decreasing relative frequency. Primary lung tumours account for 30 to 60% of all brain metastases cases[7]. Breast cancer ranks second contributing 10 to 30% of all brain metastases among women. Approximately 5 to 21% of patients with brain metastases have melanoma as the primary tumour. However, virtually any malignancy can metastasize to the brain. Patients with symptoms caused by a brain metastases varies[8].

Treatment modalities of brain metastases are: (i) radiation therapy a. Dose-fractionation schemes for whole brain radiation therapy b. altered fractionation schemes c. radiosensitizers d. prophylactic cranial irradiation for small cell lung cancer (ii) surgical resection (iii) postoperative whole brain radiation therapy (iv) stereotactic radiosurgery and (v) chemotherapy. Sometimes metastatic brain tumours are encountered where the primary scapes detection despite meticulous search by clinical and investigation method. Sometimes radiotherapy and chemotherapy are used in regulated combination[9].

**Materials and Methods:**

This was study a prospective study carried out from February 2002 to December 2005. A structured questionnaire was made. Data were collected after patient's admission. MRI of brain with contrast revealed intracranial tumour, whose radiological features were strongly suspicious of being metastatic tumour, histopathological diagnosis were made from material harvested at brain biopsy or by FNAC of obvious primaries.

**Results:**

**Table-I**

*Distribution of patients by age (n=35)*

| Age in years | Number | % |
|---|---|---|
| >20 | 01 | 2.86 |
| 20-39 | 02 | 5.71 |
| 40-59 | 11 | 31.43 |
| <60 | 21 | 60 |
| Total | 35 | 100 |

Table I shows that major proportion (60.00%) of the patients belonged to the age group of <60 years and the second height (31.43%) age group was 40-49 years. Only 5.7% was in the age of 20-39 years and 2.85% were in the age group of less than 20 years.

**Table: II**

*Distribution of patients by sex (n=35)*

| Sex | Number | Percentage |
|---|---|---|
| Male | 21 | 60.00 |
| Female | 14 | 40.00 |
| Total | 35 | 100.00 |

Table II shows that among the 35 patients 60% were males & 40% were females.

**Table-III**

*Distribution of patients by occupations (n=35)*

| Occupations | Number | Percentage |
|---|---|---|
| Day labourer | 11 | 31.43 |
| Service holder | 08 | 22.86 |
| Farmer | 07 | 20.00 |
| Professional | 04 | 11.43 |
| Others | 05 | 14.28 |
| Total | 35 | 100.00 |

Table III shows that the highest occupational group were day laborers (31.43%) followed by service-holders (22.85%) and farmers (20%).

**Table-IV**

*Distribution of patients by presenting symptoms (n=35)*

| Presenting Symptoms | Number | Percentage |
|---|---|---|
| Headache | 21 | 60.00 |
| Vomiting | 14 | 40.00 |
| Convulsion | 7 | 20.00 |
| Altered Consciousness | 5 | 14.29 |
| Blurring of Vision | 5 | 14.29 |

Table III shows that the commonest symptoms were headache (60%) followed by vomiting (40%) and convulsion (20%).

**Table-V**

*Distribution of patients by clinical features (n=35)*

| Clinical features | Number | Percentage |
|---|---|---|
| Hemiplegia & hemiparesis | 27 | 77.14 |
| monoparesis | 08 | 22.86 |
| cranial nerve palsy | 05 | 14.29 |
| Impaired heigher psychic function | 06 | 17.14 |

Table V shows that highest group of clinical presentation was one sided weakness (71.19%) followed by monoparesis (22.86%).

**Table-VI**

*Distribution of patients by site of lesion (n=35)*

| Site | Number | Percentage |
|---|---|---|
| frontal lobe | 12 | 34.28 |
| Parietal lobe | 10 | 28.57 |
| Fronto-parietal | 05 | 14.28 |
| Temporal lobe | 01 | 2.85 |
| Occipital lobe | 01 | 2.85 |
| Cerebellum | 04 | 11.42 |
| Total | 35 | 100 |

Table-VI shows that the commonest site of lesion was in frontal to be followed by parietal lobe (28.57%) and frontoparietal lobe (14.28%).

**Table-VII**

*Distribution of patients by histological types of the tumour (n=35)*

| Histological types of the tumuors | Number | Percentage |
|---|---|---|
| Adenocarcinoma | 14 | 40.00 |
| Small cell carcinoma of lungs | 10 | 28.57 |
| Squamous cell carcinoma | 08 | 22.86 |
| Follicular carcinoma of thyroid | 03 | 8.57 |
| Total | 35 | 100.00 |

Table – VII shows that the heighest group of patients had adenocarcinoma (40.00%) followed by small cell carcinoma of lungs (28.57%) and squamous cell carcinoma (22.86%)

**Table-VIII**

*Distribution of patients by primary site of lesions.*

| Site | Number | Percentage |
|---|---|---|
| Lungs | 21 | 60.00 |
| GIT | 03 | 8.57 |
| Breasts | 02 | 5.71 |
| Thyroid | 02 | 5.71 |
| Kidneys | 01 | 2.86 |
| Scalp | 01 | 2.86 |
| Prostate | 01 | 2.86 |
| Unknown | 04 | 11.42 |
| Total | 35 | 100.00 |

Table VIII shows that highest incidence of primary site was lungs (60%) followed by GIT (8.57%), breasts (57%) & thyroid (5.7%) respectively.

**Table-IX**

*Distribution of patients by options of treatment (n=35)*

| Treatment options of patients | Number | Percentage |
|---|---|---|
| Surgery + Radiotherapy | 15 | 42.86 |
| Surgery+Chemotherapy+ Radiotherapy | 14 | 40.00 |
| Radiotherapy | 05 | 14.29 |
| Radioiodine ablation | 01 | 2.85 |
| Total | 35 | 100 |

Table IX shows that highest group of patients (42.86%) were treated by surgery+ radiotherapy followed by surgery + chemotherapy + Radiotherapy (40%) and Radiotherapy (14.29%) alone.

**Table-X**

*Distribution of patients by outcome after treatment (n=35)*

| Outcome | Number | Percentage |
|---|---|---|
| Improved | 21 | 60.00 |
| Same as before | 08 | 22.86 |
| Deteriorated | 03 | 8.57 |
| Others | 03 | 8.57 |
| Total | 35 | 100 |

Table-X shows that highest group (60%) of patients were improved after treatment and 22.85% of patients remained same as before & 8.578% patients deteriorated.

**Table: XI**

*Distribution of patients survival rate after treatment (n=35).*

| Months | Number | Percentage |
|---|---|---|
| > 3 months | 04 | 11.42 |
| 3 to 6 months | 11 | 31.42 |
| > 6 to 9 months | 10 | 28.57 |
| > 9 to12 months | 07 | 20.00 |
| 12 months and more | 03 | 8.57 |

Table – XI shows that heighest survival rate was 3 to 6 months (31.42%) followed by 6-9 months (28.57) and 9-12 months (20.00%).

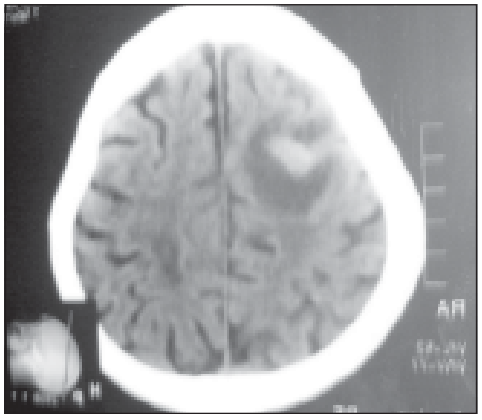

**Fig.-1:** *Small cell carcinoma metastases from lungs.*

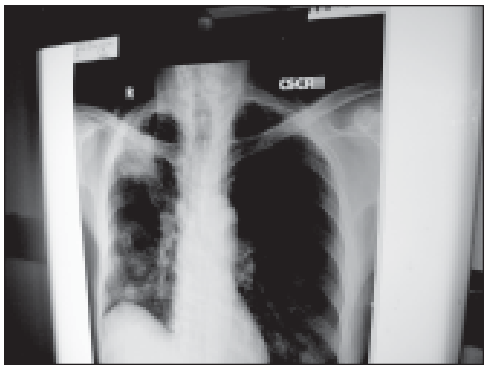

**Fig.-2:** *Small cell carcinoma of lungs of same patient.*

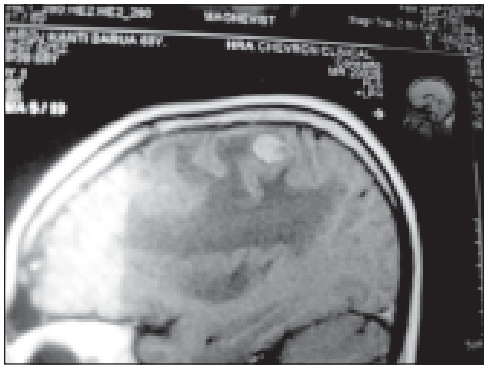

**Fig.-3:** *Adenocarcinoma metastases from lungs.*

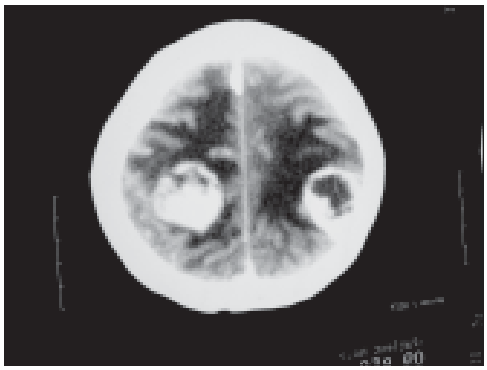

**Fig.-4:** *Squamous cell carcinoma metastases from lungs.*

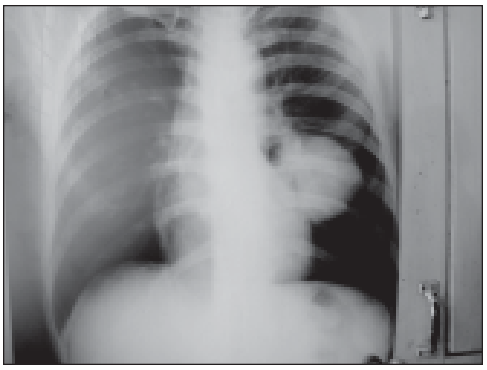

**Fig.-5:** *Squamous cell carcinoma of lungs of the same patient.*

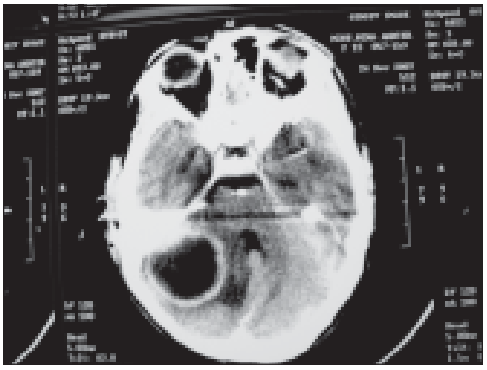

**Fig.-6:** *Adenocarcinoma metastases from Kidney.*

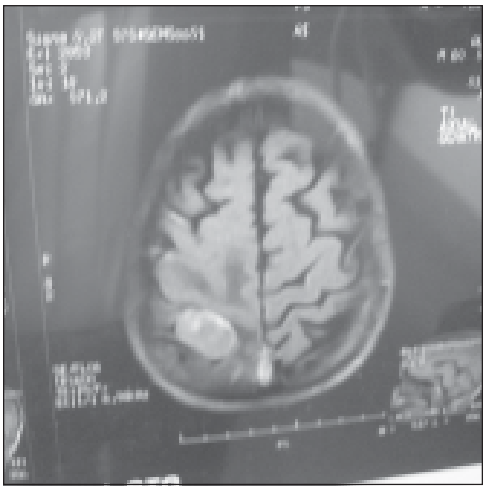

**Fig.-7:** *Follicullar carcinoma metastases from thyroid.*

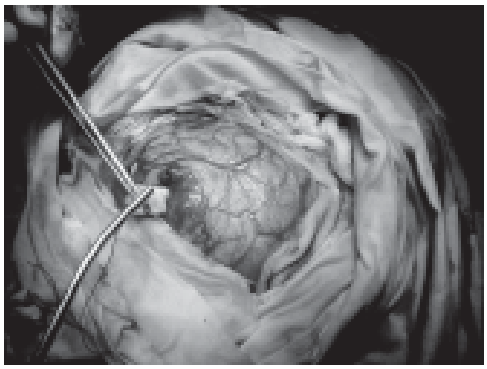

**Fig.-8:** *Per-operative picture of a metastatic brain tumor.*

**Fig.-9:** *Post-operative picture of a metastatic brain tumor patient.*

**Discussion:**

This was a prospective study. In this study the heighest age group was <60 years. In a previous study the heighest age groups were from fifth to seventh decade[10]. Among the clinical features most common was one sided weakness. Most of the primary sites were from lungs (60%). In a previous study the most common sources of brain metastases were cancers of the lung, breast and skin, in descending order[10]. In our study the commonest site of metastasis was frontal lobe (34.28%) and the most common histopathological type was adenocarcinoma (40.00%). Of patients with lung cancer, 18 to 65% developed brain metastasis and more than 40% of the patients had adenocarcinoma in a previous study[11]. In this study, treatment options were surgery, radiotherapy, chemotherapy, radioiodine-ablation etc. Sixty percent of the patients improve after treatment and survival rate was 3 to 6 months in 31.42% cases, 6 to 9 months in 28.57% cases, 9 to 12 months in 20.00% cases and more than 12 months were 8.57% cases. In a previous study median survival time of 1 year was in 30% of patients[12].

**Conclusion:**

This study showed that commonest type of brain metastases was adenocarcinoma and primary site of lesion was lungs. Best option of treatment was surgery plus radiotherapy and median survival rate of 1 year was in 20.00% of cases.

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