

# The use of brain lab navigator in the management of small deep seated brain tumors.

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## Summary:

**Background:** A comparison study for management of deep seated small brain tumors less than 4 cm in the 3 diameters between cases managed by Brain lab navigator and those without it.

**Patients and methods:** We took 20 patients from the retrospective data before the use of Navigator in our country compared with the 20 patients managed after the use of navigator in our hospital (specialized surgical hospital) in the neuro-surgical. Unit since 2002 till now. From 1/8/2002 till 31/12/2007 the study included the type of tumor & surgery & the result of surgery & time & complications ((morbidity & mortality)).

**Results:** There was a significant increase of the safety of surgery by using the navigator including morbidity & mortality. But it was a time consuming procedure.

**Conclusion:** The brain lab navigator is very useful safe device in the surgical management of deep-seated small diameter less than 4mm. brain tumors.

**Keywords:** Brain Tumor, Navigator.

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## Introduction:

Deep seated brain tumors is a common problem, whether primary or secondary the difficulty of management of such cases is the localization during surgery & the avoidance of destruction of vital centers in the brain especially with the difficulty of localization & finding the tumors, and the other difficulty is to be sure of total removal with the difficulty of localization especially if the tumors is surrounded by extensive oedema. One of the new methods to use is the brain lab navigator for localization of the tumor to enable minimal brain parenchymal destruction & later ease the total removal of the tumor with minimal sequelae to the patient. The main work of the system is computerized for localization of the tumor by an MRI study with a net on the patient head to localize the tumor.

## Patients and methods:

We took 20 patients from the neurosurgical unit of the specialized surgical hospital from 1.8.2002 till 31.12.2003 fully analyzed & studied compared with 20 patients before 2002 i.e. before the use of navigator. In both places the patient were suffering from small less than 4 cm in 3 diameters deep seated brain tumors. We referred to the patients before 2002 by the group A, & the patients after 2002 i.e. with use of navigator group B.

**Table (1): Site of tumor**

	A	%	B	%
RT. Partical	7	35%	6	30%
Lt. partical	4	20%	6	30%
RT. Temporal	3	15%	2	8%
LT. temporal	1	5%	2	10%
RT. Fontal	2	10%	2	10%
Lt. fontal	2	10%	0	10%
Others	1	5%	2	10%

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**Table (2): Type of surgery:**

	A		B	
Craniotomy	20	100%	16	80%
Burrhole	0	%	4	20%

**Table (3): Time of preparation for surgery**

	A		B	
Less than 1 hour	20	100%		
1-2 hour	-		12	60%
More than 2 hours			8	40%

**Table (4): Time of surgery**

	A		B	
	No.	%	No.	%
Less than 3 hours	6	30%	-	-
3-4 hours	13	65%	4	20%
4-5 hours	1	5%	5	25%
5-6 hours	-	-	8	40%
More than 6 hours	-	-	3	15%

**Table (5): Complications of surgery**

Mortality (with in 1 week of surgery)				
A	B			
3	15%	0	0	0%
Rt. Parietal tumor	A		B	
Lt. hemiparesis	2	27%	0	0%
Lt. hemiplegia	1	13.5%	0	0%
Lt. parietal tumor	A		B	
Lt. hemiplegia	1	33%	0	0%
Lt. temporal	A		B	
Aphasia	1	100%	0	0%
Rt. Frontal tumor				
A	B			
O	0%	0%	0%	
Lt. frontal tumor	A		B	
Death	1	50%	0	0%
Aphasia	1	50%	1	50%

**N.B:** the above complications are news signs not related to the preoperative complaint.

**Table (6): Biopsy Results:**

	A		B	
Gliomas	16	80%	15	75%
Pine Loma	-	-	1	5%
Secondary	3	15%	4	20%
Not conclusive	1	5%	-	-

**Results:**

In both places the patients were suffering from small less than 4 cm in 3 diameters deep seated brain tumors.

We referred to patients before 2002 by the group A ,&the patients after 2002 i.e. with use of navigator group B.

**Discussion:**

There was in both cases almost a uniform distribution of deep brain tumors in different age group which goes with most studies .(3) with slight male predominance which goes with most studies (4,5). The patient selected show different sites of tumors group A ,the retrospective before 2002 35% Rt. parietal & 20% the left parietal which is more than 50% while group B the prospective group,60% cases were the Rt.&Lt. parietal ,we tried to pick the retrospective group as close as are can with the prospective group with limited choice.The symptoms &signs Headache & papilloedema were the most common clinical features which go witthe most studies(6,7) other symptoms depend mainly on the site of the tumor. The preparation of the patient: with navigator need longer preparation the new MRI & fixing of points or the scales of the patient &most patients needed more than 2 hours . The time of surgery it self the patients with navigator needed more time & 40% of the patients needed 5-6 hours & it will include the risk of prolonged anaesthesia ,although we noticed that the time of surgery was decreasing with the building of experience with type of surgery .

The most important points was the sequela of surgery we did not include the preoperative signs or symptoms & here there was a significant difference between the two ways of surgery when the patients with navigator ,show only 1 case of aphasia .i.e. 5% only ,while the patients without navigator 15% mortality in the 1<sup>st</sup> week of surgery & 6 cases 30% with different complications & this is explained by the extensive tissue manipulation without navigator Also with the use of navigator we could use minimal procedure (burrhole) 20% of cases of course with less morbidity & mortality .The biopsy 15% of cases of non-navigator patients was inconclusive due to difficulty of surgery.

**Conclusion:**

The use of brain lab navigator caries better prognosis, less complications more informative, less invasive but still time consuming which can be avoided with experience.

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