

Original article

A study of supratentorial glioma

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Abstract

Introduction:-Gliomas account for the great majority of primary tumors that arise within the brain parenchyma. The term "glioma" refers to tumors that have histologic features similar to normal glial cells (ie, astrocytes, oligodendrocytes, and ependymal cells).

Material and Methods: This study consists of analysis of 100 cases of Supratentorial Glioma treated at Department of Neurosurgery, VS and SVP Hospital, Ahmedabad from January 2017 to December 2021. All the patients studied were operated at the institute itself.

Results: Supratentorial Gliomas are more common in middle aged individuals in our study with median age being 44 years and this data has been compared with other western studies. New onset convulsions followed by headache are most common presenting symptoms. In our study most of the lesions were localized to frontal lobe (36%) followed by temporal lobe (31%), parietal lobe (24%) and 9% included other sites such as perisylvian, occipital cortex or insular lobe. Other study also comprised of frontal lobe as predominant site of presentation.

Conclusion:- The management of a patient with glioma begins with careful evaluation of the history and clinical findings. The physician needs to have a clear understanding of the symptoms and how they are affecting the patient's life. The potential impact of other medical problems is also assessed.

Keywords : Gliomas, Classification, Percival Bailey, Etiology.

Introduction:

For each of these types of gliomas, there are neoplasms that span a broad spectrum of biologic aggressiveness. The strategy and tactics used to remove them may change from one to another, but the aim is to remove tumor radically without mortality and with minimal morbidity. The surgeon should be familiar with the microsurgical anatomy of the area involved and this helps him to plan the surgery and foresee the problems likely to encounter. The uses of microsurgical technique have, without doubt improves the result of surgery of these lesions. The treatment options of surgery, radiation therapy or a combination of two, or observation with periodic clinical and MRI evaluation is

considered. The surgeon must understand what the patient’s expectations are from the treatment program and to consider carefully the short and long term benefits and risks. However in some patients the management decision can be difficult because of minimal or non progressive symptoms, risk involved with treatment or an incidental asymptomatic tumor. Gliomas accounted for 42% of the 2,000 brain tumours operated upon by Harvey Cushing and the proportion remains the same today. The difference since Cushing’s times is the 20-fold drop in the peri-operative mortality of gliomas^[2] Gliomas constitute 35–50% of all intracranial neoplasms. The incidence of central nervous system (CNS) tumors in India ranges from 5 to 10 per 100,000 population with an increasing trend and accounts for 2% of malignancies. Nearly two-thirds of all cases of supratentorial gliomas occur in the third to fifth decade. The relative risk of brain cancer is 3.18 for elderly persons as compared with young adult.

Material and methods:

This study consists of a analysis of 100 cases of Supratentorial Glioma treated at Department of Neurosurgery, VS & SVP Hospital, Ahmedabad from January 2017 to December 2021. All the patients studied were operated at the institute itself. Patient data were documented in case record form and were followed up till the end of the study. A retrospective observational study was planned.

The results observed in the study are discussed and compared with few similar studies done elsewhere.

Results:-

Supratentorial Gliomas are more common in middle aged individuals in our study with median age being 44 years and this data has been compared with other western studies. New onset convulsions followed by headache are most common presenting symptoms with which patient presented to out tertiary care center which further lead to imaging and diagnosis of space occupying lesions. In our study most of the lesions were localized to frontal lobe(36%) followed by temporal lobe (31%), parietal lobe (24%) and 9% included other sites such as perisylvian, occipital cortex or insular lobe. Other study also comprised of frontal lobe as predominant site of presentation.

Table 1: Age Incidence (Age of Presentation)

	Our Study	Ian R. Whittle et.al	Haihui. Jiang et. al	Julien Spitaels et. al
Median Age	44 Years	63 Years	37 Years	50 Years

Table 2:- Sex Incidence

Sex	No. of patients (N=100)	Percentage (%)	Edward G. Shaw et.al (%)	Ian R. Whittle. Et. al (%)	Jianfeng Liang et. al (%)	Julien Spitel et. al (%)
Male	56	56	63	66	56	57
Female	44	44	37	34	44	43

Table 3:- Symptoms (At time of Presentation)

Symptoms	No. of Patients (N=100)	Percentage (%)	Julien Spitaels (%)	Ian R. Whittle et. al (%)	J.P. Posti et. al (%)	Margriet IJzerman-Korevaar et. al(%)
Headache	32	32	8.5	59	19.7	35
Confusion	33	33	2.8	62	N/A	27
Seizures	68	68	85	14	52	37
Dysphagia	2	2	32.6	44	28	30
Neurocognitive Impairment	10	10	4.6	23	57	36
Hemiparesis	4	4	2.8	84	22	21
Aphasia	3	3	12.6	12	25	24
Visual field Defects	26	26	N/A	25	8.5	13
Drowsiness	8	8	N/A	8	8.5	35
fatigue	12	12	12	6	-	20
Unconsciousness	1	1	2	-	-	-

Table 4:- Location of Tumour

Location of Tumour (Lobe/Region)	Our Study N=100 (%)	Jianfeng Liang et. al. (%)	Rasmussen et.al (%)	Haihui Jiang et. al (%)
Frontal	36	47	36	26
Temporal	31	42	29	30
Parietal	24	4	17	10
Others (Occipital Insular,Perisylvian Cortex	9	7	19	34

Table 5: Histology of Tumour

Histology of Tumour	Our Study (N=100)	Julian Spitaels et al (N=35)	Edgar Shaw et. al (N=514)	Jianfeng et. al (N=335)
Pilocytic Astrocytoma	16	7	131	23
Anaplastic Astrocytoma	6	-	230	21
Low grade OligoAstrocytoma	9	6	71	32
Anaplastic Oligodendroglioma	14	22	82	16
Glioblastoma Multiforme	45	-	-	134
Others (Including Gemistocytic Astrocytoma, Piloxyoid Astrocytoma, Subependymal Giant Cell Astrocytoma, ganglioglioma)	10	-	-	109

Table 6:- Post Operative Imaging

Post Operative Imaging	No. of Patients (N=100) %	Ciric et. al (N=42)	Ammirati et. al (N=31)
Subtotal Resection (STR)	32 (32%)	15 (35.71%)	19(61.29%)
Gross Total Resection (GTR)	68 (68%)	27 (64.28%)	21 (67.74%)
Edema	10 (10%)	9 (0.21%)	3 (0.96%)

Table 7:- Radiotherapy

Radiotherapy	Our Study (N=100)	Isabelle Rydan et.al (n=381)	Ian R Whittle (N=80)
Yes	52	157	26
No	48	224	54

Most of tumours had a average size of less than 4 cm (40%) and presented with new focal neurological deficit and seizure. While 31% had average size of in range 4-6cm and 29% patient has tumour of average size more than 6 cm, proper precautions were taken while operating included bipolar therny, CUSA (if required) and Blood products (if required). Majority of patients 75% were fully active (Grade 0) while 12% patients could possibly do light Work (Grade 1),10% could care for self but cannot work (Grade 2), 2% were limited self care (Grade 3), And 1 % were

Disabled and confined to Chair (Grade 4).^[3] All patient in study underwent operative intervention after thorough work up included by medical , cardiologist, pulmologist and anaesthetist. Majority of patients were diagnosed with Glioblastoma Multiforme (45%) and were of age group 41-50 years of age. While Pilocytic Astrocytoma was second most common Histological Diagnosis (16%). Anaplastic Oligodendroglioma comprises of 14%and Low Grade OligoAstrocytoma comprise of 9% of cases and Anaplastic Astrocytoma comprised of 6% of cases this data was compared with other western studies. Majority of patients (68%) underwent gross total reection of tumour while 325 patient underwent a subtotal Resection (STR). Post operative complications such as Post operative haematoma , CSF Leak,hydrocephalus, seizure, new focal neurological deficit.^[4]

Discussion:-

WHO CNS5 2021 has taken a new approach to classify the Gliomas, Glioneuronal Tumors, and Neuronal Tumors, Gliomas are a diverse family of tumors with varying prognoses depending on grade and age. Fourteen newly recognized types have been added to the classification of Gliomas, Glioneuronal Tumors, and Neuronal Tumor. — Importantly, WHO CNS5 recognizes the clinical and molecular distinctions between those diffuse gliomas that primarily occur in adults (termed “adult-type”) and those that occur primarily in children (termed “pediatric-type”).^[5] Note the use of the word “primarily” in the last sentence, since pediatric-type tumors may sometimes occur in adults, particularly young adults, and adult-type tumors may more rarely occur in children. The management of a patient with glioma begins with careful evaluation of the history and clinical findings. The physician needs to have a clear understanding of the symptoms and how they are affecting the patient's life. The potential impact of other medical problems is also assessed. These survival data suggest that both low-grade and high-grade supratentorial gliomas have outcomes which are highly dependent upon histologic type.^[6] Therapeutic strategies may need to be individualized based upon tumor grade and histologic type.

Traditionally, CNS WHO tumor grades were written as Roman numerals. However, the fifth-edition WHO Blue Books have emphasized more uniform approaches to tumor classification and grading and have favored the use of Arabic numerals for grading, as is currently done for all the other organ systems. Furthermore, a danger of using Roman numerals in a within-tumor grading system is that a “II” and a “III” or a “III” and a “IV” can be mistaken for one another and an uncaught typographical error could have clinical consequences.^[7] This was less likely when each tumor type had a different name, eg, “anaplastic” was present in addition to grade “III.” Given these considerations, WHO CNS5 has changed all CNS WHO tumor grades to Arabic numerals.

Conclusion:-

The factors that were independently associated with decreased functional independence were: older age at the time of surgery, coexistent Cardiovascular disease and incurring a new postoperative motor deficit.^[8] A decline in functional status was independently associated with tumor recurrence.

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