

ORIGINAL

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Brain Stem Tumours – Surgical Management

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ABSTRACT

OBJECTIVE: Our main objective was to assess the outcome of surgery in selected group of Brain Stem tumours. **PURPOSE OF STUDY:** This paper specifically looked at the role of definitive surgical procedures, total or near total excision of cystic or focal Brain stem lesions and their outcome as compared to minimal invasive surgery like stereo tactic biopsy for diffuse tumours. **MATERIAL & METHODS:** The study comprises of forty patients of brain stem tumours which were admitted and operated at the Neurosurgery Department of Allied Hospital, Punjab Medical College, Faisalabad. **PERIOD:** Jan 1991 to Dec 1998. **RESULTS:** The age of these patients were between five to forty two years, with peak incidence between eleven and fifteen years. There were thirty four children and four adults. The male to female ratio was 24/16 (1.5:1). Most of these patients had computerized tomography(70%) or Magnetic Resonance Imaging (30%). The predominant histological type was astrocytomas Grade III (60%) and Grade II (30%). **CONCLUSION:** All cystic and focal tumours showed better results with radical surgery, compared to more diffuse tumours that had stereo tactic biopsy.

KEY WORDS: Brain stem tumours, Computerized tomography, Magnetic resonance imaging, Stereo tactic surgery.

INTRODUCTION

With the availability of more sophisticated neuro diagnostic modalities such as CT, and nuclear magnetic resonance imaging, it has become obvious that brain stem tumours are relatively heterogeneous and may be classified according to location within the brain stem and gross anatomic appearance and probable pathologic diagnosis.^{1, 2}

It is also becoming evident that the decision of whether or not to recommend surgery may be based on the

integration of the neuro-diagnostic evaluation with the clinical course and neurological examination.^{1, 2, 3, 4}

MATERIAL & METHODS

From January 1991 to December 1998, we operated on 500 brain tumours of these 40 (8%) were brain stem tumours, (Figure-1) and all of the material presented in this paper is derived from this surgical experience. All these patients were admitted at the neuro-surgical department of Allied Hospital, Punjab Medical College Faisalabad.

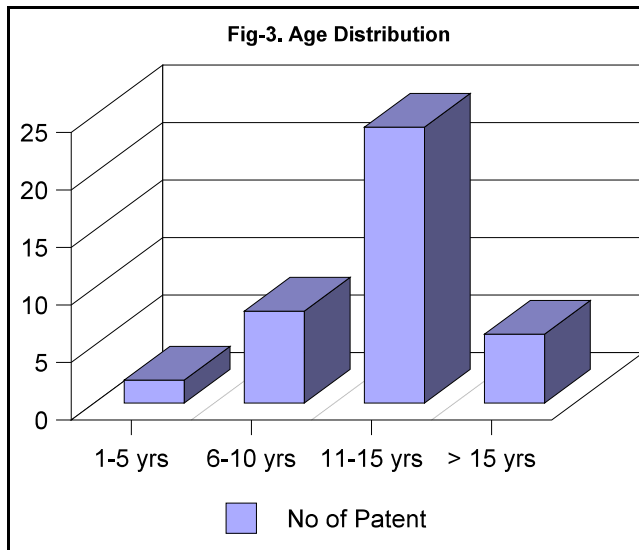
SURGICAL TECHNIQUE

All these patients were managed surgically. Stereo tactic biopsies were carried out on 16 (40%) patients and total or near total excision of the lesions were carried out in 24 (60%). Ventriculoperitoneal shunts were performed in 25 (62%) of these patients. Komai stereo tactic system was used in patients with diffuse tumours. More definitive surgery was performed in patients with focal or cystic lesions. Standard sub-occipital mid line craniectomy in prone position was used for midline lesions and lateral park bench position with retro mastoid craniectomy was performed for lateral and exophytic lesions of the brain stem. Cervico medullary lesions were approached through sub occipital midline craniectomy with upper cervical laminectomy.

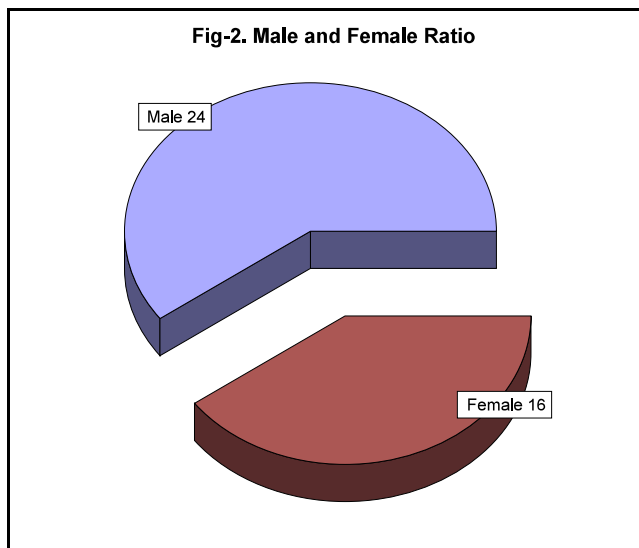
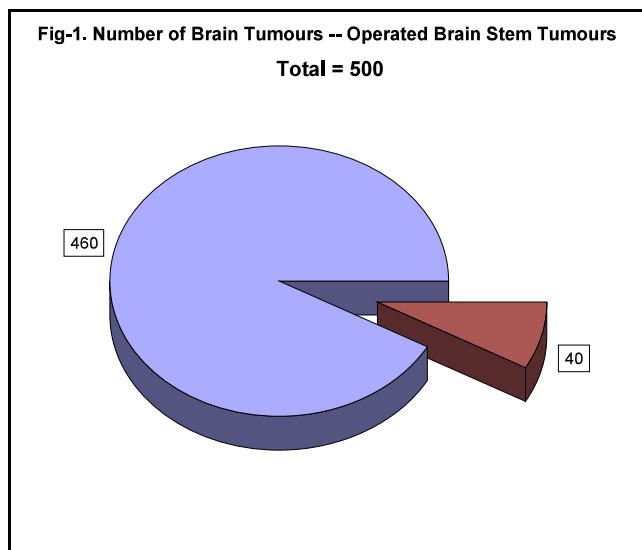
RESULTS

There were 24 males and 16 females aged 5 to 42 years. (Figure 2, 3). All were viewed as presenting surgical difficulties because of brain stem lesions depending upon their location, size or associated hydrocephalus. The commonest clinical presentation among these patients were multiple cranial nerve deficit 25 (62%), ataxia 28 (70%) and long track signs 25 (62%). Signs

Tinnitus, hearing loss and hiccups were also the presenting complaints in some of these patients. Only 5 (12%) of these patients presented with grand mal seizure. (Table-I)



Vertical Nystagmus was present in only 1/3rd of these patients. All these patients had computerized tomography 28 (70%) or magnetic resonance imaging 12 (30%) (Table-II).



and symptoms of raised intra cranial pressure were present in only half of these patients.

Table-I. Clinical features

	No. of Pts.	%age
Ataxia	28	70%
Cranial nerve deficit	25	62%
Personality problem	12	30%
Corticospinal tract signs	25	62%
Headaches & vomiting	20	50%
Tinnitus	10	25%
Hearing loss	2	5%
Hiccoughs	8	20%
Ac. hemiplegia	4	10%
Generalized seizures	5	12%

Table-II. Investigations

Investigations	No. of Pts.	%age
CT Scanning	28	70%
M R I	12	30%

Table-III. Surgical procedures

	No. of Pts.	%age
Stereo tactic biopsies	16	40%
Total/ near total excision	24	60%
VP shunt	25	60%

Table-IV. Outcome (morbidity & mortality)

	Total/near total 24(60%)	Biopsy 16(40%)
Unchanged neurology	2 (5%)	14 (35%)
Clinical improvement	15 (37.5%)	-
Morbidity	5 (12.5%)	2 (5%)
Mortality	2 (5%)	-

Table-V. Histopathology

	No. of Pts.	%age
Astrocytoma Grade I,II	12	30%
Glioblastoma Multiform grade III	24	60%
Tuberculomas	2	5%
Cavernomas	1	2.5%
Epidermoid cyst	1	2.5%

DISCUSSION

Intrinsic brain stem tumours have traditionally been treated with radiation therapy and adjunctive chemotherapy, with relatively little success. We have carried out this retrospective study on 40 consecutive patients (34 children and 6 adults) with a histologically verified brain stem gliomas. This study specifically looked at the clinical outcome of patients following stereotactic and open surgery. Stereotactic biopsy was performed in 16(40%) patients and open surgery (total or near total excision) in 24 (60%) patients. Histopathological examination showed that the majority of gliomas were diagnosed grade III astrocytomas in both children and adults. Survival was significantly short in children when compared to adults. Determination of the grade of a brain stem glioma may be of prognostic significance. With the availability of more sophisticated neuro diagnostic modalities such as co axial tomography and nuclear magnetic imaging, it has become obvious that brain stem tumours are relatively heterogenous and may be classified according to location within the brain stem and gross anatomic appearance and probable pathologic diagnosis. MRI not only allows precise analysis of their growth pattern but also can lead to a correct pre operative diagnosis in the majority of cases.

CONCLUSION

We conclude that there is a place for open surgery (total / near total excision) for all cystic, and focal lesions. Stereotactic biopsy should be performed in all diffuse brain stem lesions in order to achieve a definitive histological diagnosis.

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A great man is always willing to be little.

Ralph Waldo Emerson