

CRANIAL DERMOID AND EPIDERMOID TUMORS

Mumtaz Ali, Khalid Khanzada, Hamzullah Khan, Shahid Ayub,
Khalid Mehmood, Inayat Shah Roghani, Said Rehman

Departments of Neurosurgery, Medicine and Radiology
Postgraduate Medical Institute, Lady Reading Hospital and
Khyber Medical College Peshawar, Pakistan

ABSTRACT

Objectives: To assess the surgical outcome of patients with intracranial epidermoid / dermoid tumors.

Material and Methods: This descriptive observational study was conducted in department of Neurosurgery, Lady Reading Hospital Peshawar from May 2003 to March 2007. Patient with radiologically diagnosed epidermoid / dermoid tumors based on CT and MRI findings were selected. Detailed history and clinical features along with radiological findings were documented. Operative and histopathological details were noted.

Results: A total of 13 patients with dermoid / epidermoid tumor were analyzed. There were 8 males and 5 females with age ranged for 4 to 48 years with mean age of 30.2 ± 13 years. The clinical features like trigeminal neuralgia, dimness of vision and papilloedema were commonly noted. Four lesions were supratentorial and 09 were infra-tentorial. In supratentorial tumors, two were in sylvian fissure, one in temporal, and one in lateral ventricular area. Among infratentorial, 6 were in cerebello-pontine angle and 3 were in midline fourth ventricular area. Histological findings showed epidermoid in 10 and dermoid in 03 cases. Postoperative complications noted were CSF leakage in 2 (15.4%) cases, seizures and facial palsy in 1 patient (7.7%) each. Two patients died during the study period due to post operative complications.

Conclusion: Dermoid / epidermoid are tumors of 2nd and 3rd decade of life, midline are dermoid while laterally located are epidermoid tumors. Safe resection is the only treatment option available.

Key words: Dermoid/Epidermoid Tumors, Resection, Morbidity, Mortality.

INTRODUCTION

Epidermoid and dermoid tumors of brain are slow growing lesion. They present in 3rd and 4th decade of life with incidence of 0.04-1% of primary intra cranial tumors.¹ They usually present late due to its slow growing pattern and may attain considerable size before diagnosis². The mode of presentation depends upon the size and location of the tumor. They are more commonly identified in the pre-pontine, cerebellopontine angle and suprasellar cistern. Midline location and sylvian fissure location is rare. These tumors are irregular in shape and encircle vessels and nerves infiltrating in subarachnoid space of brain. They respond well to surgical excision. Complete excision of the tumor capsule is often not possible due to risk of damaging adherent neurovascular structures.³ Epidermoid and dermoid cysts are inclusion tumors of the central nervous system. They arise from the inclusion of embryonic

ectoderm into the neural tube during the 5th to 6th weeks of fetal life.⁴ These are rare tumor, usually benign, slow growing. Epidermoid constitute 0.5 to 1.5 percent of brain tumor while dermoid occurs less frequently up to 0.7%.⁵ Thus, number of lesions recur very slowly, can take years after the radical surgery.¹ Present study was designed as to assess the surgical outcome of patients with intracranial epidermoid / dermoid tumors.

MATERIAL AND METHODS

From May 2003 to March 2007, 13 cases with dermoid / epidermoid were surgically treated at the department of Neurosurgery Lady Reading Hospital Peshawar. These patients were selected out of all brain tumor admitted in the department. Detailed notes of clinical features radiological findings, operative notes and post operative complication were assessed individually. Histopathological findings were also recorded. The

SEX WISE DISTRIBUTION OF PATIENTS

Sex	Frequency	Percent
Male	8	61.5
Females	5	38.5
Total	13	100.0

Table 1

results were analyzed. Different parameters like age, sex, type and duration of symptoms, located of cyst, CT / MRI finding, operative features and post-operative complication were recorded. Follow up examination was done in OPD. Postoperative CT scan was advised in follow up visits.

RESULTS

A total of 13 patients with dermoid / epidermoid tumor, were included. There were 8 males and 5 females (table 1), with age ranged from 4 to 48 years with mean age of 30.2±13 years (table 2). Four lesions were supra tentorial and 09 were infra-tentorial. Among infratentorial, 6 were in cerebello-pontine (CP) angle and 3 were in midline fourth ventricular area while out of 4 supratentorial, one was in temporal, two were in sylvian fissure, and one was in lateral ventricular area (table 4).

Histological findings showed epidermoid in 10 and dermoid in 03 cases (table 3). The clinical features like trigeminal neuralgia, dimness of vision and papilloedema were commonly noted (table 5). Mortality was seen in 02 patients. Complications noted were CSF leakage in 2 (15.4%) cases, seizures and facial palsy in 1 patient (7.7%) each (table 6).

DISCUSSION

(Depending on location of dermaoid and epidermoid tumors, there can be a long duration of symptoms before presentation. Tumors of fourth ventricle, pineal and in suprasellar cistern are diagnosed in pediatric age group. They contain an outer capsule of dense fibrous connective tissue lined by stratified squamous epithelium as well as

AGE DATA

Mean	30.23
Median	33.00
Mode	31.00
Std. Deviation	13.99
Range	44.00
Minimum	4.00
Maximum	48.00

Table 2

representing one or more constituents of dermis like hair, sebaceous and sweat gland, teeth and nails. Epidermoid tumors occur dominantly in the lateral location manifest in 2nd and 3rd decade of life and clinically present very late. They are frequently located in CP angle, sylvian fissure and temporal fossa). In this study we observed that four lesions were supra tentorial and 09 were infra-tentorial. Among 9 infratentorial, 6 were in CP angle and 3 were in midline fourth ventricular area while out of 4 supra tentorial, one was in temporal area, two in sylvian fissure and one was in lateral ventricular area.

(Both types are differentiated from each other by skin appendages and fat in the cyst lining. The presence of hair and teeth is diagnostic of dermoid cyst. Exact pathogenesis of these tumors is not known.⁶ Defect in the cleavage of the neural tissue from the cutaneous ectoderm, embryonic inclusion, trauma and epithelium remnants are factors of consideration on the origin of these tumor⁷). Epidermoid tumors are commonly located in the basal subarachnoid cisterns. They extend in all possible available space in its vicinity and have the potential to open the anatomical space in the region. Thus, they encase near vascular structure easily. In our series of 13 cases, 8 patients were

HISTOLOGICAL TYPES

Histological Types.	Frequency	Percent
Epidermoid	10	76.9
Dermoid	3	23.1
Total	13	100.0

Table 3

LOCATION OF TUMORS

Major Class	Location	Frequency (n=13)	Percentage
Supratentorial tumors	Temporal	1	7.7
	Sylvian fissure	2	15.4
	Lateral ventricular area	1	7.7
Infratentorial tumors	CP angle	6	46.2
	Midline 4th ventricular area	3	23.1

Table 4

CLINICAL FEATURES OF PATIENTS

Clinical Features	Frequency (n=13)	Percent
Trigeminal neuralgia	4	30.8
Headache/vomiting	2	15.4
Decrease vision	2	15.4
Papilloedema	2	15.4
Seizures	1	7.7
Facial weakness	1	7.7
Ataxia	1	7.7

Table 5

male showing male predominance, male preponderance has been reported by Desai K.D et al⁸ in a series of 24 cases of epidermoid tumors. The mean age was 30± 13 years. Dermoid cysts were recorded mainly in 1st and 2nd decade while all epidermoid cases were seen in 3rd and 4th decade group. Early age for dermoid, its midline location and early manifestation is due to CSF path way obstruction in these tumors. Dermoid cysts are 4-10 times less frequent than that of epidermoid and this ratio of frequency was seen in our cases. Laterally located tumors lead to focal symptomatology⁹. Right sided trigeminal neuralgia was noted in the 3 infratentorial epidermoid while in one patient left sided facial pain was the early symptoms. We observed 4 cases of supratentorial and 9 cases of infratentorial tumor. Dermoid cysts are commonly seen in midline posterior fossa. Out of the three dermoid cysts, 2 cases were in posterior fossa 4th ventricle. Symptoms related to Dermoid cyst were compression, obstructive hydrocephalous or both and the findings matches that of other study reported by Samii M et al¹⁰. One patient presented with rupture of cyst leading to raised intra cranial pressure and his MR picture was in favor of tumor. In such cases, due to low specific gravity of the contents they float on top of CSF with in the ventricle. This results in a lucent fat fluid level which can be scanned. A study has documented that ventricular cerebro-spinal fluid drainage shunt placement can give satisfactory results in other tumors that can raise intracranial pressure or those with malignant behaviour¹¹. One patient needed VP shunt after 2 weeks while two patients needed it after 6 weeks time. Post contrast MRI is more helpful in differential diagnosis of epidermoid and dermoid cysts from other disorder like arachnoid cyst, cystic glioma and Hemangioblastoma. CT scan demonstration of these lesions were homogeneous, with attenuation vahec similar to those of CSF.¹² Cases with infection of CSF needs VP shunt. Post surgical hydrocephalus needs examination of CSF and later VP shunt, when it is sterile.¹³

Management of dermoid /epidermoid is

SURGICAL COMPLICATIONS

Surgical Complications	Frequency	Percent
CSF leak	2	15.4
Siezures	1	7.7
Facial palsy	1	7.7
No complications	9	69.2
Total	13	100.0

Table 6

linked and currently the only treatment option is safe surgical excision.¹⁴ Total capsule removal is not mandatory. The most popular view is to resect as much of the capsule as possible because it can be densely adherent to vital neuro-vascular structures and an aggressive approach is required in such cases.¹⁵ But once removed radically, recurrence rate is very low. Lunardi P et al⁵ reported complete long term freedom from tumor recurrence (17.3 years) therefore, substitute resection have a good prognosis in terms of gradual tumor remnant. The post operative complications were not specific in dermoid / epidermoid as those are expected in any patient with brain tumors. Meningitis was not scanned in any case in our services. Some observations have been reported by Desai K et al⁸ in his pineal epidermoids case series study.

CONCLUSION

Dermoid /epidermoid are rare slow growing brain tumors. Dermoid cysts are centrally located while epidermoid are laterally located tumor in brain. Outcome after radical excision is good.

REFERENCES

1. Kurosaki K, Hayashi N, Hamada H, Hori E, Kurimoto M, Endo S. Multiple epidermoid cysts located in the pineal and extracranial regions treated by neuroendoscopy. *Neurol Med Chir* 2005;45:216-9.
2. Konovalov AN, Spallone A, Pitzkhelauri DL. Pineal epidermoid cysts: Diagnosis and management. *J Neurosurg* 1999;91:370-4.
3. Akhaddar A, Jiddane M, Chakir N, El-Hassani R, Moustarchid B, Bellakhdar F. Cerebellar abscesses secondary to occipital dermoid cyst with dermal sinus. *Surg Neurol* 2002;58:266-70.
4. Cirak B, Kiyamaz N, Kerman M Cerebellar dermoid cyst with hydrocephalus. *Pediatr Neurol* 2004;163-6.
5. Lunardi P, Missori P, Galiardi FM, Fortuna A. Dermoid cyst of the posterior fossa in children: Report of nine cases. *Surg Neurol*

- 1990;34:39-42.
6. Hinojosa M, Tatagiba M, Harada K, Samii M. Dermoid cyst in the posterior fossa accompanied by klippel-Feil syndrome. Childs Nerve Syst 2001;17:97.
 7. Higashi S, Takinami K, Yamashita J. Occipital dermal sinus associated with dermoid cyst in the fourth ventricle. Am J m Neurodiol 1995;945-8.
 8. Desai K, Nadkarni T, Fattepurkar S, Goel A. Pineal epidermoid cysts: A study of 24 cases. Surgical Neurology, 65: 124-9.
 9. Stendel R, Pietila TA, Lehmann K, Kurth R, Suess O, Brock M. Ruptured intracranial dermoid cysts. Surg Neurol 2002;57:391-8.
 10. Samii M, Tatagiba Male Piquer J, Carvalho GA, Surgical treatment of epidermoid cysts of the cerebellopontine angle. J Nrutoduth 1996:14-9.
 11. Schroeder H W, Oertel J, Gaab M R, Endoscope assisted microsurgical resection of epidermoid tumors of the cerebellopontine angle, J Neurosurg 2004;101:227-232.
 12. Das CJ, Tahir M, Debnath J, Pangtey GS. Neurological picture. Ruptured intracranial dermoid. J Neurol Neurosurg Psychiatry 2007;78: 624-5.
 13. Komolafe EO, Adeolu AA, Komolafe MA. Treatment of cerebrospinal fluid shunting complications in a Nigerian neurosurgery programme. Pediatr Neurosurg 2008;44:36-42.
 14. Hanikeri M, Waterhouse N, Kirkpatrick N, Peterson D, Macleod I. The management of midline transcranial nasal dermoid sinus cysts. Br J Plast Surg 2005;58: 1043-50.
 15. Posnick JC, Costello BJ. Dermoid cysts, gliomas, and encephaloceles: Evaluation and treatment. Atlas Oral Maxillofac Surg Clin North Am 2002 ;10: 85-99.

Address for Correspondence:**Dr Mumtaz Ali**

Assistant Professor
Neuro Surgery Department
Lady Reading Hospital,
Peshawar – Pakistan.