Study of clinico-radiological and clinico-pathological correlation of intracranial space occupying lesion at rural center

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Citation

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Abstract

Objective: To study the clinico-radiological and clinico-pathological correlation of intracranial space occupying lesions at AVBRHMethods: The primary method of case ascertainment was detailed neurological examination and review of all CT with contrast of the head performed on the patients between 1st July 2004 to 31st December 2006 at rural centre after suspecision of intracranial space occupying lesions on clinical presentation.Result: In our study of 52 cases the clinicoradiological and clinicopathological correlation of intracranial space occupying was founded in 61.5% Amongst all the ICSOL the maximum number of cases was of neoplastic tumors i.e. 63% next to this was infective group i.e. 21% & rest of the cases were of traumatic group i.e. 15%.Conclusion: CT scan is the diagnostic and the most accurate investigation in localization of ICSOL. CT guided biopsy is helpful in diagnosing the histopathology of various ICSOLs. X ray skull studies are not of much value as a diagnostic tool in ICSOL. The overall incidence of correct clinical localization of the lesion to the final diagnosis after investigations and surgery was seen to be 61.5% cases.

INTRODUCTION

Space occupying lesions in the cranial cavity is known to mankind since 1774, when Louis first reported fungus tumour of the dura mater. Three decades ago and earlier, medical teachers in India [1] frequently stated that brain tumours were uncommon in Indians. With the development of recent investigative techniques in India during the past 2 decades, it has become obvious that brain tumours are as common in this country as elsewhere.

The most of the patients with neoplasm has fairly characteristic presentation However; many patients with intracranial masses present a greater diagnostic challenge because of atypical presentation secondary to intratumoural hemorrhage, arterial occlusion and cerebral infarction or tumour involvement of silent areas. In such cases it is important to utilize modern neuroradiological proce¬dures in order to detect the lesion to localize it and thus predict the histological tumour type. To detect the presence of potentially life threatening complications such as cere¬bral herniation or ventricular entrapment and to provide appropriate pre-therapeutic neuro-anotomic data to prevent an untoward complications.

METHODS AND MATERIAL

This study of ICSOL was carried out at Acharya Vinoba Bhave Rural Hospital, Sawangi, Meghe, Wardha during the six academic terms from April 2004 to October 2006. Total 52 cases were studied and the primary method of case ascertain was detailed neurological examination and review of all CT with contrast of the brain performed on the patients after suspicion of intracranial space occupying lesions on clinical presentation.

OBSERVATIONS

From our study it is observed that the maximum numbers of patients were between age group 20 to 50 years i.e. 33 patients (63%) while 3 patients (6%) were below 10 years of age and 7 patients (13%) were above 60 years of age. The sex distribution of patients was 30 male (58%) and 22 female (42%). The ratio of male to female was 1.3:1. The maximum number of patients of ICSOL belonged to malignant etiology of 19 (37%) while 14 patients (27%) belongs to benign nature, 11 patients (21%) were belonged to infective etiology and 8 patients were of traumatic etiology (15%).

The incidence of various ICSOL (Figure 1) out of the 52

patients was 13 astrocytoma, 2 oligodendroglioma, 1 medulloblastomas, 3 secondaries in brain. Out of all malignant ICSOL compromising total 19 cases, 1 colloid cyst, 5 meningioma, 1 acoustic Neuroma, 1 pineal tumor, 2 pituitary adenoma, 2 porencephalic cyst, 2 epidermoid cyst. Among the all benign tumors of 14 the distribution was 9 tuberculoma, 1 hydatid cyst, 1 abscess and 11 infective etiology. The 8 patients were of chronic subdural haematoma with history of traumatic etiology. The patients presented with various symptoms like headache, vomiting, convulsions, neurodeficit, fever, diminished or loss of vision and history of trauma. (Figure 2) In the study 20 patients (38%) had complaints of neurodeficit; out of that there distribution was 11 (55%) hemiplegia, 5 (25%) cerebellar symptoms, 2 (10%) monoplegia and 2 (10%) decerebrate rigidity. The 12 (23%) patients had altered higher functions, 9 of these were from malignant, 2 from infective and 1 from traumatic group.

Figure 1

Figure 1: Incidence of various ICSOL

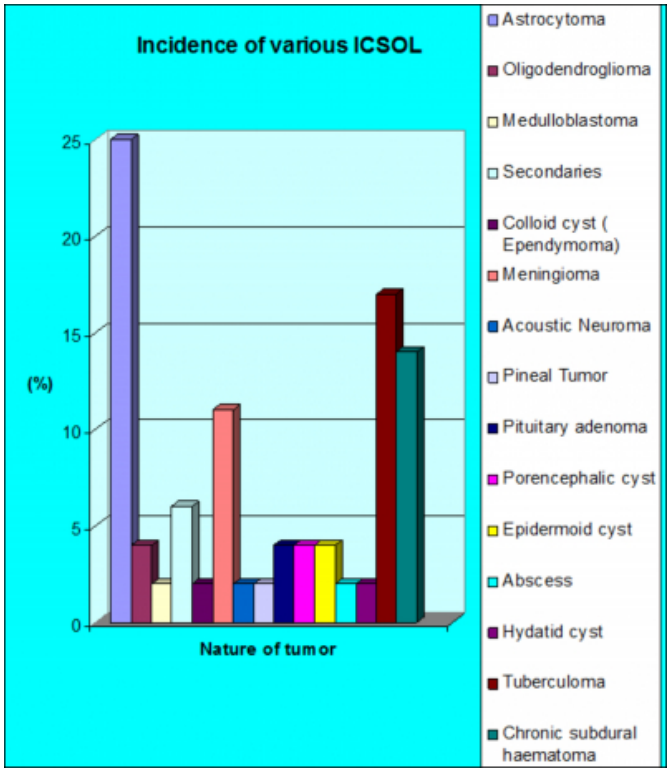
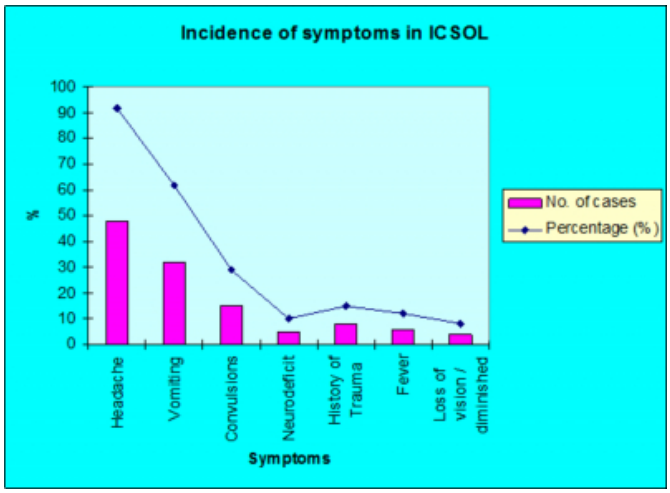


Figure 2

Figure 2: Incidence of symptoms in ICSOL



The 17 (33%) patients found to have papilloedema, in that 12 of malignant and 5 of benign origin. The 11 (21%) patients with abnormal reflexes, there distribution was 6 from malignant and 5 from infective group. In malignant group 2 patient had exaggerated, 3 had sluggish and 1 had absent reflex, while in traumatic group 3 patients were of exaggerated reflexes and 1 of sluggish and absent reflex each. The 4 patients (8%) had sensory deficit. The 7 patients (13%) had cranial nerve involvement, out of these, 4 were from malignant ICSOL, 2 cases from benign ICSOL & 1 case from traumatic ICSOL.

All of the 52 patients were subjected to various lines of treatment in the form of anticonvulsants, antiedema, antibiotics, steroids & physiotherapy. The 37 patients (71%) had underwent surgical intervention, in that complete resection and debulking was done in 13 patients each, partial excision was done in 2 patients, only biopsy was taken in 3 patients while ventriculo-peritoneal shunt was done in 6 patients. All the cases of malignant ICSOL were subjected to radiotherapy, and 9 patients of tuberculoma had received complete anti tubercular therapy.

DISCUSSION

The average age of tumour to be 38.19 years while in present study the maximum number of patient were the seen in age group of 20-50 years, the average age being 35 years which correlates to the findings of Ramamurthi.[2] The sex distribution ratio of 1.3:1 of our study simulates with analysis of Ramamurthi [2] of males to be 62.44% and females to be 37.56%, while Sanatan Rath [3] found the incidence to be 65.9% in males and 34.1% in females of the 1164 of his

patients.

Ramamurthi [2] in his study of 1676 patients found the incidence of gliomas was 46.19% and tuberculomas 39.10%. meningioma was found in 1.57%. Sana than Rath [3] in his study found gliomas in 44.9%, tuberculomas in 8.4% meningioma was encountered in 12.2% of his patients. Rest of the rare tumours accounted for 19.6% of patients which included 5% secondaries in the brain, 5.4% pituitary tumour and other rare lesions. In his study of 1711 patients he noted traumatic haematomas in 3.4% of patients, abscess in 2.2%, tuberculomas in 8.4%, cysticercosis 1.4%, hydatid cyst 0.2% and non tubercular granulomas 0.2% while inadequately verified tumours accounted for 12.8%.

The incidence of neoplastic and tubercular lesions in different studies was compaired in Table 1. The overall incidence of tuberculoma in present study is 17% and the values are in well correlation with the other studies. Dastur [4] have reported the incidence of neoplastic tumours amongst ICSOL to be 24.6%; Ramamurthi [5] quotes it to be 21.69%, while the other series shows it to be 21.83%. Kestura [6] by 20.93% and Tandon [7] noted the incidence of neoplastic tumours to be 21.60%. In our study we observed the incidence to be 63% which is higher than the above mentioned studies.

Figure 3

Table 1: incidence of the various lesions in different studies (In percentage)

Lesions	Dastur [8]	Ramamurthi [5]	Tandon [7]	Cushing [10]	Kastura [6]	Zulch [11]	Zimmerman [12]	Present Study
Neoplastic Tumors	24.6	21.6	21.83	23.93	20.76	23.08	17.03	63
Tuberculoma	18.36	21.4	4.8	1.98	2.72	0.52	6.42	17

In the series of Dastur [8] the overall incidence of benign tumour was 36.33%, in that of Ramamurthi [9] it was 33.92%, in Tandon's study it was 33.9% in Cushing's [10] series it accounted for 36.77% while Kastura [6] observed it to be 46.06%, Zu1chl [11] 35.55%, Zimmerman [12] 28.85%, Sanatan Rath [3] noted it in 36% of his patients. In the present study we observed overall incidence benign tumours to be 27% which is correlated with above mentioned studies. The incidence of acoustic neuroma was 8.12% in Destur [4] series, 10.09% in Ramamurthi [5] series, 7.96 in Tandon [9] series 8.39 % in Cushing's [10], 12.97% in Kestura's [6], 7.52% in Zulch's [11] series, 1.52% in Zimmerman's [12] study and in the present study we observed the incidence to be 2% which is lower than the above mentioned studies.

The incidence of meningioma is 11% in our study which correlates with above mentioned study. The incidence of ependymoma is 2% which is lower than the above mentioned study. The reason being that probably our study is small study comprising of 52 patients. It is observed from above table that Dastur [8] found the incidence of astrocytomas and glioblastoma to be 63.83%, Rammurthi [5] found it to be 79.23%, Kastura [10] 52.9%, Russel [13] 75.5%, Zulch [11] 59.2%, Zimmerman [12] 74.62%, Sanatan Rath [3] 25.87%, while in our study we found it to be 31% which is comparable with above mentioned studies.

In our study incidence of medulloblastoma is 2% while Dastur [8] found it to be 12.69%, Ramamurthi [5] 5.74%, Kestura [6] 10.6%, Russel [13] 6%, Zulch [11] 9.9%, Zimmerman [12] 4.9% and Sanatan Rath [3] noted it 4.08%. All these were well in correlation with the present study.

The incidence of tuberculoma observed by Dastur [14] was 36.14%, of all ICSOL while it was 14.3% observed by Chandnani [15]. In our patients the incidence was 17%. In our study all patients of tuberculoma were adults. The incidence of tuberculoma in pediatric age group was higher as observed by Chandnani [15] 70% and Dastur [14] 56%. This is possibly because the over all incidence of tumour in their series were in pediatric age group. Raised ICT was the commonest presentation resent in all the cases of Chandnani's [15] study while it accounted for 80% of Dastur [14] and 84% in present study. Papilloedema is the next common clinical presentation observed in 66% of Chandnani [15], 60% of Dastur [14] and 22% of the present study. Altered consciousness, cranial nerve palsy and epilepsy was not observed by Dastur [14] and Chandnani [15] while we have observed epilepsy in 33% of cases. Neurodeficit was not noted by Chandnani [15] while Dastur [14] noted it in 20% and in the present study it accounted for 11% of the cases. Antitubercular chemotherapy is mandatory in the all patient presenting as tuberculomas. Surgery is required only in cases not responding to anti tubercular treatment or if there are signs of progressive neurological deficit. As all patients had responded well to anti tubercular treatment, surgical intervention was not required in our patients while Dastur [14] did it in 36.14% and Chandnani [15] in 50% of their cases. We had no mortality in our cases of tuberculoma while it was 16.66 % as observed by Chandnani [15] while Dastur [14] observed relatively low incidence of mortality of 3.1%.

In the present study of the total 52 cases, 8 were of the traumatic haematomas of chronic subdural haematomas. Wylie McKissock [16] studied 389 cases of subdural haematoma of which 48.32% were of chronic subdural haematoma. Motor deficit was observed in 37% of our cases while it was 40.87% as observed by Wylie McKissock [16] and 63% by Kalyanraman.[17] Incidence of epilepsy was not found in our cases while the same was 17% as observed by Kalyanraman [17] and 7.19% by Wylie McKissock.[16] Headache was noted in 74 % cases by Kalyanraman [17] while it was 59.38% as observed by Wylie McKissock [16]. In the present study we observed headache in 75% cases haematomas. Incidence of vomiting in our study was 13% while it was 29.64% in Wylie McKissock [16] and 37% as noted by Kalyanraman.[17] Altered higher functions were noted in 50% of our cases while Wylie McKissock [16] has noted them in 33.16% cases. Kalyanraman [17] noted altered higher functions in 19% of his cases.

All the patients in our study were operated. Burr holes with or without craniotomy was done in all patients. Wylie McKissock [16] did burrhole in 94% of the cases and burr hole with craniotomy in 5.4% of cases. Morbidity from subdural haematoma as observed by Wylie McKissock [16] was 81% while mortality in his study amounted 12.9%. Kalyanraman [16] observed only 7% mortality and 60% morbidity in their study. In the present study mortality rated to 12.5% and morbidity to 50%.

Amongst the various clinical features headache, vomiting, visual disturbances and papilloedema were the commonest in all the series including present study. Headache was present in 72% of the patients in present study while Rameshchandra [18] found it in 50%, Jacob [19] in 77% and Balasubramanian [20] in 52.04%. Diminished vision was present in 62% of Rameshchandra's patient, 60% of Jacobs's patient, 52% of Balasubramanian cases. While in present study it was 13%. Vomiting was present in 48% of Rameshchandra's patient, 54% of Jacobs patients, 51.02% of Balsubramanian and 70% patients of present study. Papilloedema was present in 67% of Rameshchandra, 85% of Jacobs, 84.69% of Balasubramanian and 57% of patients of present study. Thus it is evident that the common features of ICSOL have the similar incidence in all the study mentioned above. Convulsions were accounted in 48% of Rameshchandra, 53% of Jacobs, 13.26% of Balasubramanian while it was present in 25% cases of our study. Motor deficit was present in 27% cases of our study. Motor deficit was present more or less in similar percent of patients in all the studies in consideration i.e. 50% in Rameshchandra's. 43% of Jacob's and 54.08% of Balsubramanian's patients.

Altered higher function were common in the present study of 28% while they were is little less, seen in the others for example 19% of Rameshchandra's patient 16% of Jacob's and 5.10% of Balasubramanian's patients. Exaggerated reflexes were seen in 19% patients of the present and 18% of Rameshchandra's patient while Jacob Abraham's and Balasubramanian did not noticed them. Cranial nerve involvement was noted in 18% of the patients in present study and that noted by Jacob Abraham was 17% while Balasubramanian and Rameshchandra did not observed it. It is evident from the above discussion that the various clinical features are more or less similar in the incidence in the series under consideration.

The X- ray skull was not done in our study as it was not much avail in the diagnosis. In the present study apart from all the investigations done in other series we had done CT scan in all patients. We could achieve the correct localization by this new diagnostic tool in 92% of the patients which is by far more reliable and accurate diagnostic aid. After the investigation was made the patients were posted for suitable surgical procedures, according to the probable suspected diagnosis. In the present study all the patients could not be operated. Out of all the patients we operated 76%. Ramesh¬Chandra [18] could operate the entire patients while Jacob [19] operated 92% and Balasubramanian [20] 87.75% of the total patients.

Out of the various surgical procedures, Balasubramanian [20] exercised total excision of growth in 51.03%, partial excision in 59.42% and only biopsy in 5.39%. He did shunt in 0.62%. Jacob Abraham [19] did total excision in 57% partial in 35% & biopsy in 6%. Balasubramanian [20] did total excision in 21.42% partial excision in 10.2%, biopsy in 31.63% of his patients. In the present study total excision could be achieved in 12.2%, partial excision in 6.6%, shunt in 12% and biopsy in 9% of cases, while debulking of malignant tumor was done in 40% of cases. Radiotherapy postoperatively was given to all the patients (100 per cent), of Balasubramanian's study, while it was given to 20.5% of Jacob's [19] patients and in the present study we subjected 48.48% of the total patients to radiotherapy.

About 2 - 5% of persons suffering from hydatid disease have

a lesion in the brain. [21, 22] Incidence of hydatid cyst brain found to be 1 % in New Zealand [22] Balasubramaniam and Ramamurthi [23] recorded only 6 cases amongst 3000 suspected ICSOL at the Madras institute of Neurology over 20 years. Raja Reddy [24] reported only 4 cases out of 1000 SOL at Hyderabad. In our study we found the incidence of hydatid cyst brain to be 2%.

In the follow up the overall mortality recorded is approximately the same in all the studies under consideration. We noted 18.18% mortality in our study while Rameshchandra [18] had 70.1% incidence of overall mortality. Jacob Abraham [19] noted it to be 46% while V. Balasubramanian [20] observed the lowest inconsideration i.e. 21.42%. (Table 2) The overall morbidity in the patients in various studies varies from 35-70%. The overall morbidity is 28% in our study (out of the surviving patients), 70% in Rameshchandra's study [18], 62% in Jacob's [19] and 36% in Balasubramanian's study.[20] It is quite evident that bearing a very few aspects of the present study pattern, the findings of the various studies published and our own study have a close relationship.

Figure 4

Table 2: The Morbidity & Mortality of various neoplastic tumors

Series	Rameshchandra [18]	Jacob Abharam [19]	Balasubramanian [20]	Present study
Morbidity	70	62	36	28
Mortality	70.01	46	21.42	18.18

CONCLUSION

The overall incidence of correct clinical localization of the lesion to the final diagnosis after investigations and surgery was seen to be signifincant in 2/3rd cases. X ray skull is not of much value as a diagnostic tool in ICSOL. CT scan is the diagnostic and the most accurate investigation in localization of ICSOL. CT guided biopsy is helpful in diagnosing the histopathology of various ICSOLs. Surgical intervention is the treatment of choice in ICSOL in the form of debulking, complete or partial excision and biopsy followed by radiotherapy and chemotherapy. Combination of surgical excision followed by radiotherapy and chemotherapy (anti malignant drugs) should be the method of choice for malignant ICSOL.

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