American Journal of Medical Case Reports, 2018, Vol. 6, No. 7, 128-131
Available online at http://pubs.sciepub.com/ajmcr/6/7/2

DOI:10.12691/ajmcr-6-7-2

Brain and Spinal Tumors Incidence Annual Audit 2017 of Dept of Neurosurgery Khoula Hospital Muscat Oman: A Review

G P Mishra, Tariq Al Saadi, Neeraj Salhotra*, Samit Biniwale, Mohammad Hadad, Mohammad Hashim, Ali Al Mashani, Qassim Al Hinai, Sharad Samson Rajmani

Department of Neurosurgery Khoula Hospital Muscat Oman PO 90, PC 116
*Corresponding author: neersal@hotmail.com

Abstract Brain and spinal tumors contribute to the main bulk of neurosurgery work in any Neurosurgical center. Effective audit of the work of a neurosurgical center amounts to earmarking the areas needing improvement and hence an enhanced patient care. Our department also performed an annual audit of the cranial and spinal tumors dealt in one year and analyzed the results. Benign to malignant all varieties of cranial tumours were seen in a small population of a country like Oman, however state of art diagnostic facilities were used to diagnose, treat and follow up the patients. Careful eye was kept on the pseudoprogression of the tumours as repted in the radiological reports. Results revealed a standard distribution of the tumours seen in other centers reported in the literature. Extent of tumour excision was done in standard guidelines keeping patient useful outcome in mind. Resurgery in maligant tumours were offered in young patients if comes back with recurrence.

Keywords: *Brain and spinal tumors, incidence, pseudopogression of tumours*

Cite This Article: G P Mishra, Tariq Al Saadi, Neeraj Salhotra, Samit Biniwale, Mohammad Hadad, Mohammad Hashim, Ali Al Mashani, Qassim Al Hinai, and Sharad Samson Rajmani, "Brain and Spinal Tumors Incidence Annual Audit 2017 of Dept of Neurosurgery Khoula Hospital Muscat Oman: A Review." *American Journal of Medical Case Reports*, vol. 6, no. 7 (2018): 128-131. doi: 10.12691/ajmcr-6-7-2.

1. Introduction

Neurosurgery work in any center revolves mainly around the neoplasms benign or malignant excised with type of outcome seen. A scientific analysis of the same over a period gives the ways to improve upon the shortcomings encountered. An analysis of a period of 1 yr was done in Dept. of Neurosurgery Khoula Hospital Muscat Oman. Tumours ranged from astrocytomas to medulloblastomas and from pituitary adenomas to schwanomas. Outcome was carefully studied and rectification measures taken to improve upon the service.

2. Materials and Methods

All patient who were admitted in our department were carefully questioned for a detailed history, examined minutely, substantiated by the imaging and other studies to diagnose and then carefully after a detailed discussions with family regarding all possible risks and benefits surgical excision was planned and accomplished. Initial ICU care for 1 day post operatively, patients were transferred to the ward for continuation of nursing care and physiotherapy and 3 rd day discharged home if no unforeseen event occurred.

Careful follow up was done. Special emphasis was laid upon pseudoprogression identification by combining special arterial spin labeling to dynamic susceptibility contrast perfusion MR imaging.

3. Results

A total number of 1419 patients were admitted to the department in 2017. Out of that 136 patients were of cranial and spinal tumors. Out of that Omani patients were 127.Non-Omani patients were 9, Yemeni 3, Bangladeshi 2, Indian 2, Filipino 1, Tanzanian 1. Brain cases were 125. Spinal cases were 6. Scalp lesions were 5. Sex differentiation wise males were 67 (53.6%) and female were 58 (46.4%). New cases were 104. Recurrent or old cases were 21. Out of brain cases operated cases were 88. Non-operated cases were 37.

Meningioma formed the main bulk making 21 cases of total. 11caes of pituitary adenomas were seen. Metastasis were seen in 11 patients. 6 cases of schwannoma were seen. 6 cases of ependymomas were seen.

Glioblastoma multiforme was seen in another 5 patients. 5 cases were astryctomas were seen. Medulloblastomas cases were 4. Oligoastrocytomas made 3 of the bulk. Oligodendroglioma cases were 2. 2 cases of lymphoma were seen. 2 cases of ganglioglioma were seen. Craniopharyngioma cases also were 2. Chordoma also were 2. 1 case of oligoglioma, 1 case of neurofibroma, 1 case of atypical glioma, 1 case of epidermoidtumour, 1 case of gangliocytoma and one of other group territory were seen.

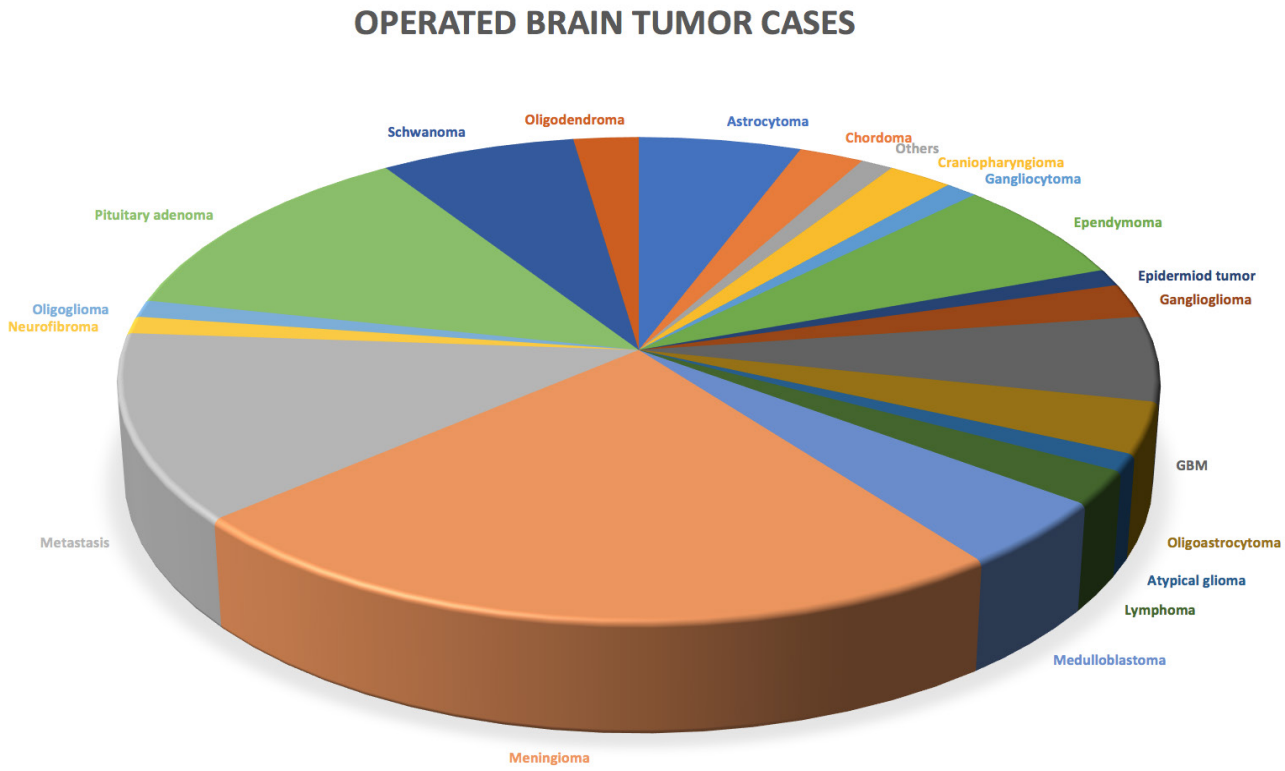


Figure 1 Overview of tumour sseen

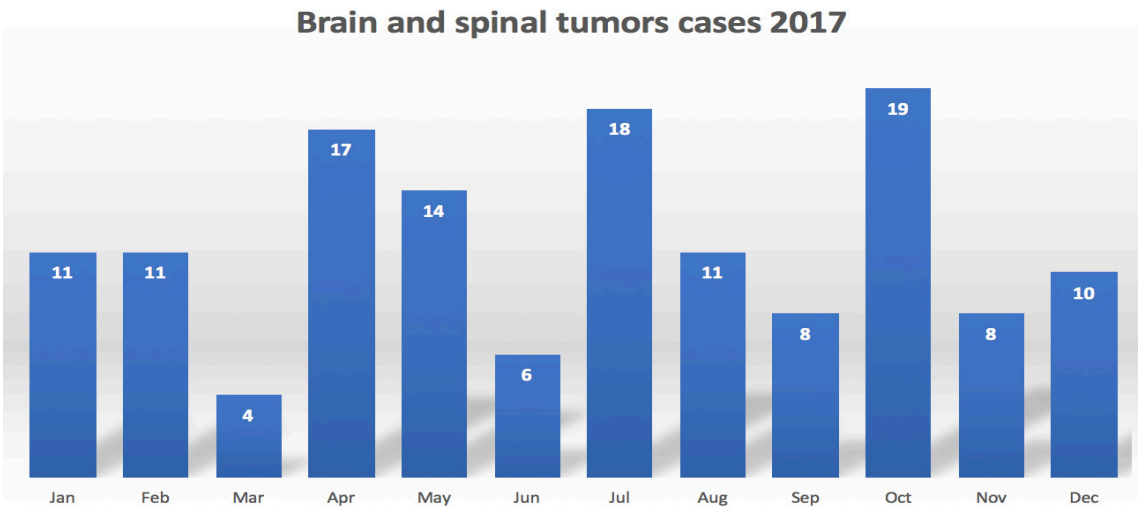


Figure 2. The monthly tumor pattern

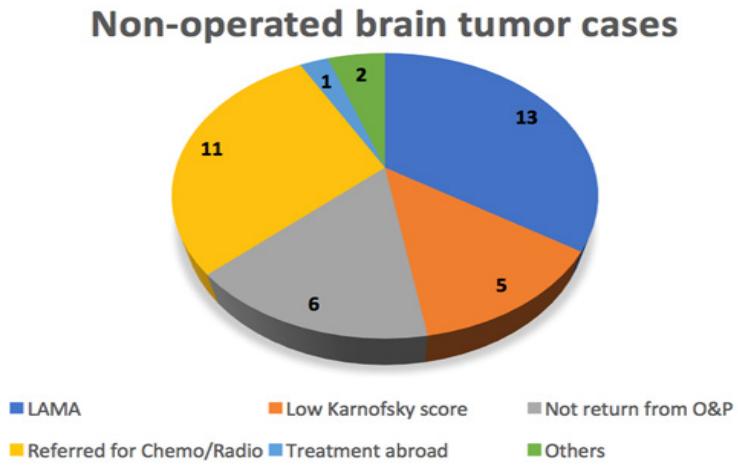
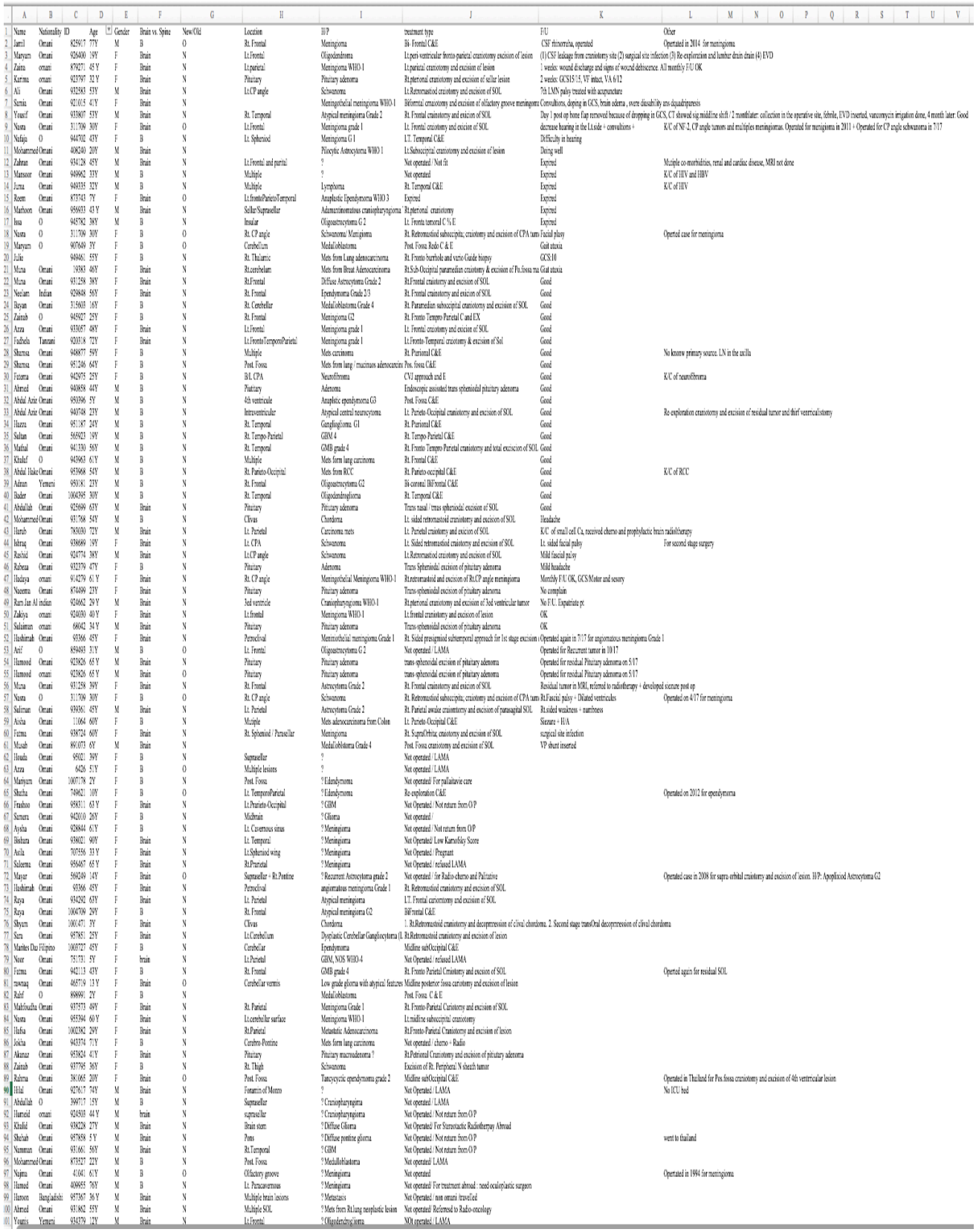


Figure 3. The non operated category



	Name	Nationality	ID	Age	Gender	Brain vs. Spine	New/Old	Location	H/P	treatment type	F/U	Other
2	Jamil	Omani	825917	77Y	M	B	O	Rt. Frontal	Meningioma	Bi- Frontal C&E	CSF rhinorrhea, operated	Operated in 2014 for meningioma
3	Maryam	Omani	926400	19Y	F	Brain	N	Lt.Frontal	Oligodendroma	Lt.peri-ventricular fronto-parietal craniotomy excision of lesion	(1) CSF leakage from craniotomy site (2) surgical site infection (3) Re-exploration and lumbar drain drain (4) EVD	
4	Zaitra	omani	879271	45 Y	F	Brain	N	Lt.parietal	Meningioma WHO-1	Lt.parietal craniotomy and excision of lesion	1 weeks: wound discharge and signs of wound dehiscence. All monthly F/U OK	
5	Karima	omani	923797	32 Y	F	Brain	N	Pituitary	Pituitary adenoma	Rt.pterional craniotomy and excision of sellar lesion	2 weeks: GCS15/15, VF intact, VA 6/12	
6	Ali	Omani	932583	53Y	M	Brain	N	Lt.CP angle	Schwanoma	Lt.Retromastoid craiotomy and excision of SOL	7th LMN palsy treated with acupuncture	
7	Samia	Omani	921015	41Y	F	Brain	N		Meningothelial meningioma WHO-1	Bifrontal craniotomy and excision of olfactory groove meningioma	Convulsions, doping in GCS, brain edema , severe disability ans dquadriparesis	
8	Yousif	Omani	933807	53Y	M	Brain	N	Rt. Temporal	Atypical meningioma Grade 2	Rt. Frontal craniotomy and exicon of SOL	Day 1 post op bone flap removed because of dropping in GCS, CT showed sig.midline shift / 2 monthlater: collection in the operative site, febrile, EVD inserted, vancomycin irrigation done, 4 month later: Good	
9	Nasra	Omani	311709	30Y	F	Brain	O	Lt.Frontal	Meningioma grade I	Lt. Frontal craiotomy and excicin of SOL	decrease hearing in the Lt.side + convulsions +	K/C of NF-2, CP angle tumors and multiples meningiomas. Operated for meniginoma in 2011 + Operated for CP angle schwannoma in 7/17
10	Nafaja	O	944702	43Y	F	B	N	Lt. Sphenoid	Meningioma G I	LT. Temporal C&E	Difficulty in hearing	
11	Mohammed	Omani	408240	20Y	M	Brain	N		Pilocytic Astrocytoma WHO 1	Lt.Subcocipital craniotomy and excision of lesion	Doing well	
12	Zahran	Omani	934128	45Y	M	Brain	N	Lt.Frontal and partial	?	Not operated / Not fit	Expired	Mutiple co-morbidities, renal and cardiac disease, MRI not done
13	Mansoor	Omani	940962	33Y	M	B	N	Multiple	?	Not operated	Expired	K/C of HBV and HBV
14	Jurna	Omani	940335	32Y	M	B	N	Multiple	Lymphoma	Rt. Temporal C&E	Expired	K/C of HIV
15	Reem	Omani	873743	7Y	F	Brain	O	Lt.frontoParietoTemporal	Anaplastic Ependymoma WHO 3	Expired	Expired	
16	Marhoon	Omani	956033	43 Y	M	Brain	N	Seller/Supraseller	Adamantinomatous craniopharyngioma	Rt.pterional craniotomy	Expired	
17	Issa	O	945702	38Y	M	B	N	Insular	Oligoastrocytoma G 2	Lt. Fronta temoral C % E	Expired	
18	Nasra	O	311709	30Y	F	B	O	Rt. CP angle	Schwanoma/ Meningioma	Rt. Retromastoid subocipita; craiotomy and excision of CPA tum	Facial plasy	Operted case for meningioma
19	Maryam	O	907649	3Y	F	B	O	Cerebellum	Medulloblastoma	Post. Fossa Redo C & E	Gait ataxia	
20	Julie		946461	55Y	F	B	N	Rt. Thalamic	Mets from Lung adenocarcinoma	Rt. Fronto burrhole and vario Guide biopsy	GCS:10	
21	Muna	Omani	19383	46Y	F	Brain	N	Rt.cerebelum	Mets from Breat Adenocarcinoma	Rt.Sub-Occipital paramedian craiotomy & excision of Pn.fossa ma	Gait ataxia	
22	Muna	Omani	931258	38Y	F	Brain	N	Rt.Frontal	Diffuse Astrocytoma Grade 2	Rt.Frontal craiotomy and excision of SOL	Good	
23	Neelam	Indian	929848	56Y	F	Brain	N	Rt. Frontal	Ependymoma Grade 2/3	Rt. Frontal craiotomy and exicon of SOL	Good	
24	Bayan	Omani	315603	16Y	F	B	N	Rt. Cerebellar	Medulloblastoma Grade 4	Rt. Paramedian subocipital craniotomy and excision of SOL	Good	
25	Zainab	O	945927	25Y	F	B	N	Rt. Frontal	Meningioma G2	Rt. Fronto Tempro Parietal C and EX	Good	
26	Azza	Omani	933057	48Y	F	Brain	N	Lt.Frontal	Meningioma grade I	Lt. Frontal craiotomy and excision of SOL	Good	
27	Fadhela	Tanzani	920318	72Y	F	Brain	N	Lt.FrontoTemporoParietal	Meningioma grade I	Lt.Fronto-Temporal craiotomy & excision of Sol	Good	
28	Shamsa	Omani	946877	59Y	F	B	N	Multiple	Mets carcinoma	Rt. Pturional C&E	Good	No known primary source. LN in the axilla
29	Shamsa	Omani	951246	64Y	F	B	N	Post. Fossa	Mets from lung / mucinous adenocarcin	Pos. fossa C&E	Good	
30	Fatema	Omani	942975	25Y	F	B	N	B/L CPA	Neurofibroma	CVJ approach and E	Good	K/C of neurofibroma
31	Ahmed	Omani	940858	44Y	M	B	N	Puttitary	Adenoma	Endoscopic assisted trans sphenoidal pituitary adenoma	Good	
32	Abdul Aziz	Omani	950396	5Y	M	B	N	4th ventricule	Anaplstic ependymoma G3	Post. Fossa C&E	Good	
33	Abdul Aziz	Omani	940748	23Y	M	B	N	Intraventricular	Atypical central neurocytoma	Lt. Pureto-Occipital craniotomy and excision of SOL	Good	Re-exploration craniotomy and excision of residual tumor and thirf ventriculostomy
34	Huzra	Omani	951387	24Y	M	B	N	Rt. Temporal	Ganglioglioma G1	Rt. Pturional C&E	Good	
35	Sultan	Omani	566923	19Y	M	B	N	Rt. Tempo-Parietal	GBM 4	Rt. Tempo-Parietal C&E	Good	
36	Marhal	Omani	941330	56Y	M	B	N	Rt. Temporal	GMB grade 4	Rt. Fronto Tempro Parietal craniotomy and total excision of SOL	Good	
37	Khalef	O	943963	61Y	M	B	N	Multiple	Mets form lung carcinoma	Rt. Frontal C&E	Good	
38	Abdul Hake	Omani	953968	54Y	M	B	N	Rt. Parieto-Occipital	Mets from RCC	Rt. Parieto occipital C&E	Good	K/C of RCC
39	Adnan	Yemeni	950181	23Y	M	B	N	Rt. Frontal	Oligoastrocytoma G2	Bi-coronal BiFrontal C&E	Good	
40	Bader	Omani	1004395	30Y	M	B	N	Rt. Temporal	Oligodendroglioma	Rt. Temporal C&E	Good	
41	Abdullah	Omani	925699	63Y	M	Brain	N	Pituitary	Pituitary adenoma	Trans nasal / trnas sphenoidal excision of SOL	Good	
42	Mohammed	Omani	931768	54Y	M	B	N	Clivus	Chordoma	Lt. sided retromastoid craniotomy and excision of SOL	Headache	
43	Harub	Omani	783030	72Y	M	Brain	N	Lt. Parietal	Carcinoma mets	Lt. Parietal craiotomy and excicon of SOL	K/C of small cell Ca, received chemo and prophylactic brain radiotherapy	
44	Ishraq	Omani	936889	19Y	F	Brain	N	Lt. CPA	Schwanoma	Lt. Sided retromastoid craiotomy and excision of SOL	Lt. sided facial palsy	For second stage surgery
45	Rashid	Omani	924774	38Y	M	Brain	N	Lt.CP angle	Schwanoma	Lt.Retromastoid craiotomy and excision of SOL	Mild fascial palsy	
46	Rabeea	Omani	932379	47Y	F	B	N	Pituitary	Adetoma	Trans Sphenoidal excision of pituitary adenoma	Mild headache	
47	Hadaya	omani	914279	61 Y	F	Brain	N	Rt. CP angle	Meningothelial Meningioma WHO-1	Rt.retromastoid and excision of Rt.CP angle meningioma	Monthly F/U OK, GCS:Motor and sesory	
48	Naeema	Omani	874489	23Y	F	Brain	N	Pituitary	Pituitary adenoma	Trans-sphenoidal excision of pituitary adenoma	No complain	
49	Ram Jar Al	indian	924662	29 Y	M	Brain	N	3ed ventricle	Craniopharyngioma WHO-1	Rt.pterional craniotomy and excision of 3ed ventricular tumor	No F/U. Expatriate pt	
50	Zakiya	omani	924030	40 Y	F	Brain	N	Lt.frontal	Meningioma WHO-1	Lt.frontal craiotomy and excicon of lesion	OK	
51	Sulaiman	omani	68042	34 Y	M	Brain	N	Pituitary	Pituitary adenoma	Trans-sphenoidal excision of pituitary adenoma	OK	
52	Hashimah	Omani	93366	45Y	F	Brain	N	Petroclival	Meninothelial/ meningioma Grade 1	Rt. Sided prasigmoid subtemporal approach for 1st stage excision	Operated again in 7/17 for angiomatous meningioma Grade 1	
53	Arif	O	859493	31Y	M	B	O	Lt. Frontal	Oligoastrocytoma G 2	Not operated / LAMA	Operated for Recurrent tumor in 10/17	
54	Hamood	Omani	923826	65 Y	M	Brain	N	Pituitary	Pituitary adenoma	trans-sphenoidal excision of pituitary adenoma	Operated for residual Pituitary adenoma on 5/17	
55	Hamood	omani	923826	65 Y	M	Brain	O	Pituitary	Pituitary adenoma	trans-sphenoidal excision of pituitary adenoma	Operated for residual Pituitary adenoma on 5/17	
56	Muna	Omani	931258	39Y	F	Brain	N	Rt. Frontal	Astrocytoma Grade 2	Rt. Frontal craiotomy and exicon of SOL	Residual tumor in MRI, referred to radiotherapy + developed seizure post op	
57	Nasra	O	311709	30Y	F	B	O	Rt. CP angle	Schwanoma	Rt. Retromastoid subocipita; craiotomy and excision of CPA tum	Rt.Fascial palsy + Dilated ventricules	Operated on 4/17 for meningioma
58	Suliman	Omani	939361	45Y	M	Brain	N	Lt. Parietal	Astrocytoma Grade 2	Rt. Parietal awake craiotomy and excision of parasagital SOL	Rt.sided weakness + numbness	
59	Aisha	Omani	11064	60Y	F	B	N	Muciple	Mets adenocarcinoma from Colon	Lt. Pureto-Occipital C&E	Siezure + H/A	
60	Fatma	Omani	938724	60Y	F	Brain	N	Rt. Sphenoid / Parasellar	Meningioma	Rt. SupraOrbita; craiotomy and excision of SOL	surgical site infection	
61	Musab	Omani	891073	6Y	M	Brain	N		Medulloblastoma Grade 4	Post. Fossa craniotomy and excision of SOL	VP shunt inserted	
62	Houda	Omani	99021	39Y	F	B	N	Supraseller	?	Not operated / LAMA		
63	Azza	Omani	6426	51Y	F	B	O	Multiple lesions	?	Not operated / LAMA		
64	Mariyam	Omani	1009178	2Y	F	B	N	Post. Fossa	? Edandymoma	Not operated/ For palliatavie care		
65	Shatha	Omani	749621	10Y	F	B	O	Lt. TemporoParietal	? Edandymoma	Re-exploration C&E	Operated on 2012 for ependymoma	
66	Fauhno	Omani	958311	63 Y	F	Brain	N	Lt.Prarieto-Occipital	? GBM	Not Operated / Not return from O/P		
67	Samera	Omani	942010	26Y	F	B	N	Midbrain	? Glioma	Not operated /		
68	Aysha	Omani	928844	61Y	F	B	N	Lt. Cavernous sinus	? Meningioma	Not operated / Not return from O/P		
69	Bishara	Omani	936021	90Y	F	Brain	N	Lt. Temporal	? Meningioma	Not Operated/ Low Karnofsky Score		
70	Asila	Omani	707556	33 Y	F	Brain	N	Lt.Sphenoid wing	? Meningioma	Not Operated / Pregnant		
71	Saleema	Omani	956667	65 Y	F	Brain	N	Rt.Prarietal	? Meningioma	Not Operated / refused LAMA		
72	Mayur	Omani	569249	14Y	F	Brain	O	Supraseller + Rt.Pontine	? Recurrent Astrocytoma grade 2	Not operated / for Radio-chemo and Palitative		Operated case in 2008 for supra orbital craiotomy and excision of lesion. H/P: Apophicod Astrocytoma G2
73	Hashimah	Omani	93366	45Y	F	Brain	N	Petroclival	angiomatous meningioma Grade 1	Rt. Retromastoid craniotomy and excision of SOL		
74	Raya	Omani	934292	63Y	F	Brain	N	Lt. Parietal	Atypical meningioma	LT. Frontal cariocmony and excision of SOL		
75	Raya	Omani	1004709	29Y	F	B	N	Rt. Frontal	Atypical meningioma G2	BiFrontal C&E		
76	Shyam	Omani	1001471	3Y	F	Brain	N	Clivus	Chordoma	1. Rt.Retromastoid craniotomy and decompression of clival chordoma. 2. Second stage transOral decopression of clival chordoma		
77	Sara	Omani	957851	25Y	F	Brain	N	Lt.Cerebellum	Dysplastic Cerebellar Ganglocytoma (L	Rt.Retromastoid craniotomy and excision of lesion		
78	Marites Dia	Filipino	1003727	45Y	F	B	N	Cerebellar	Ependymoma	Midline subOccipital C&E		
79	Noor	Omani	751731	5Y	F	brain	N	Lt.Parietal	GBM, NOS WHO-4	Not Operated / refused LAMA		
80	Fatma	Omani	942113	43Y	F	B	N	Rt. Frontal	GMB grade 4	Rt. Fronto Parietal Craiotomy and excion of SOL	Operted again for residual SOL	
81	rawnaq	Omani	468719	13 Y	F	Brain	O	Cerebellar vermis	Low grade glioma with atypical features	Midline posterior fossa curiotomy and excision of lesion		
82	Rahf	O	898991	2Y	F	B	N		Medulloblastoma	Post. Fossa C & E		
83	Mahloudha	Omani	937573	49Y	F	Brain	N	Rt. Parietal	Meningioma Grade 1	Rt. Fronto-Parietal Cariotomy and excision of SOL		
84	Nasra	Omani	955394	60 Y	F	Brain	N	Lt.cerebellar surface	Meningioma WHO-1	Lt.midline subocipital craniotomy		
85	Hafsa	Omani	1002382	29Y	F	Brain	N	Rt.Parietal	Metastatic Adenocarcinoma	Rt.Fronto-Parietal Craniotomy and excision of lesion		
86	Jokha	Omani	943374	71Y	F	B	N	Cerebro-Pontine	Mets form lung carcinoma	Not operated / chemo + Radio		
87	Akanaz	Omani	953824	41Y	F	Brain	N	Pituitary	Pituitary macroadenoma ?	Rt.Pturional Craniotomy and excision of pituitary adenoma		
88	Zainab	Omani	937795	36Y	F	B	N	Rt. Thigh	Schwanoma	Excision of Rt. Peripheral N sheath tumor		
89	Rahma	Omani	381065	20Y	F	Brain	O	Post. Fossa	Tanycycric ependymoma grade 2	Midline subOccipital C&E		Operated in Thailand for Pos.fossa craniotomy and excision of 4th ventricular lesion
90	Hilal	Omani	927617	74Y	M	Brain	N	Foramin of Monro	?	Not Operated / LAMA		No ICU bed
91	Abdullah	O	399717	15Y	M	B	N	Supraseller	? Craniopharyngima	Not operated / LAMA		
92	Hamoid	omani	924503	44 Y	M	brain	N	supraseller	? Craniopharyngioma	Not Operated / Not return from O/P		
93	Khalid	Omani	938228	27Y	M	Brain	N	Brain stem	? Diffuse Glioma	Not Operated/ For Stereotactic Radiotherpay Abroad		
94	Shehab	Omani	957858	5 Y	M	Brain	N	Pons	? Diffuse pontine glioma	Not Operated / Not return from O/P		went to thailand
95	Nasman	Omani	931661	58Y	M	Brain	N	Rt.Temporal	? GBM	Not Operated / Not return from O/P		
96	Mohammed	Omani	873527	22Y	M	B	N	Post. Fossa	? Medulloblastoma	Not operated/ LAMA		
97	Najma	Omani	41041	61Y	M	B	O	Olfactory groove	? Meningioma	Not operated		Operated in 1994 for meningioma
98	Hamed	Omani	409655	76Y	M	B	N	Lt. Parscavernous	? Meningioma	Not operated/ For treatment abroad : need oculoplastic surgeon		
99	Hamon	Bangladeshi	957367	36 Y	M	Brain	N	Multiple brain lesions	? Metastasis	Not Operated / non omani travelled		
100	Ahmed	Omani	931862	55Y	M	Brain	N	Multiple SOL	? Mets from Rt.lung neoplastic lesion	Not operated/ Referred to Radio-oncology		
101	Younis	Yemeni	934379	12Y	M	Brain	N	Lt.Frontal	? Oligodendroglioma	NOt operated / LAMA		

Figure 4. Master chart of the study

In non operated category 13 patients refused surgery here and travelled to other centersabroad. 11 cases were sent for radio/chemo without surgical intervention. 5 cases were not operated in view of poor general condition. 1 case was referred abroad in view of lack of technical expertise here. 5 cases went out on pass for social reasons but did not return back. 2 cases were in miscellaneous category.

We had 6 mortalities in the group. 2 patients were of HIV and they finally succumbed. 1 patient of oligoastrocytoma expired in postoperative period. 1 case of anaplastic ependymoma was also lost. 1 case of craniopharyngioma was lost due to uncontrolled metabolic anomalies. One case expired which was not operated in view of poor general condition.

Pseudoprogression of tumours in follow up studies is an important factor to be kept in mind and studies like arterial spin labeling to dynamic susceptibility contrast perfusion MR imagingtobe made use of.

Patients were subjected to standard management by investigating modalities of CT and MRI and followed by craniotomies or laminectomies with excision or decompression of the tumor wherever needed. Outcome is of international standard. As per histopathology radiation or chemotherapy was given as per the case.

4. Discussion

In review of literature as per Chang-Hyun Lee in 2010 in Korea the incidence of meningioma amounted to 31.2% of all brain tumors. Glioblastoma amounted to be 30.7% of all gliiomas. In children under 19 years germ cell tumors and medulloblastomas were the common tumor seen. [1]

Vastrad B in 2017 studied the underlying genetic mechanism of the pathogenesis of gliomas and glioblastomas and found the DEGs, such as MYC, FGFR1, CDKN2A, HOXA10 and MET, may be used for targeted diagnosis and treatment of gliomas and glioblastoma. [2]

Lijuan Bo in 2017 further studied the genetic mechanism of gliobalstoma. [3]

Sandberg CJ in 2013 studied comparison of glioma stem cells to neural stem cells from the adult human brain identifies dysregulatedWnt- signaling and a fingerprint associated with clinical outcome. [4]

Aghayanglkashaniin 2015 studied tumors of the central nervous system over a 18-year retrospective review in a Tertiary Pediatric Referral Center in Iran and concluded 53 % of brain tumours to be superatentorial. [5]

Chu TPC in 2018 studied how Do Biological Characteristics of Primary Intracranial Tumors Affect Their Clinical Presentation in Children and Young Adults. [6]

Chu TP in 2016 also studies where are the opportunities for an earlier diagnosis of primary intracranial tumours in children and young adults? [7]

ThustSc in 2018 studied the pseudoprogression of brain tumors, as shown in radiological investigations. [8]

Liu ZC in 2017 further studied combination of IVIM-DWI and 3D-ASL for differentiating true progression from pseudoprogression of Glioblastomamultiforme after concurrent chemoradiotherapy: study protocol of a prospective diagnostic trial. [9]

Choi YJ in 2013 further emphasized on pseudoprogression in patients with glioblastoma: added value of arterial spin labeling to dynamic susceptibility contrast perfusion MR imaging [10]

5. Conclusion

Our study further emphasises the incidence of brain tumours in a sector of population comparable to the data revealed by the other studies. Meningiomas making the bulk of it and medulloblastomas remaining the common paediatric tumour. Pseudoprogression of tumours also an important factor to be considered and to be avoided by making use of studies like arterial spin labeling to dynamic susceptibility contrast perfusion MR imaging [10].

References

[1] Chang-Hyun Lee, M.D., Kyu-Won Jung, M.S., Heon Yoo, M.D., Ph.D., Sohee Park, Ph.D., and Seung Hoon Lee, M.D. Epidemiology of Primary Brain and Central Nervous System Tumors in Korea. Korean Neurosurg Soc. 2010 Aug; 48(2): 145-152. Published online 2010 Aug 31.

[2] Vastrad B, Vastrad C, Godavarthi A, Chandrashekar R. Molecular mechanisms underlying gliomas and glioblastoma pathogenesis revealed by bioinformatics analysis of microarray data. Med Oncol. 2017 Sep 26; 34(11): 182.

[3] Lijuan Bo, Bo Wei, Chaohui Li, Zhan feng Wang, Zheng Gao, and Zhuang Miao. Identification of potential key genes associated with glioblastoma based on the gene expression profile. OncolLett. 2017 Aug; 14(2): 2045-2052.

[4] CJ, Altschuler G, Jeong J, Strømme KK, Stangeland B, Murrell W, Grasmo-Wendler UH, Myklebost O, Helseth E, Vik-Mo EO, Hide W, Langmoen IA. Comparison of glioma stem cells to neural stem cells from the adult human brain identifies dysregulated Wnt-signaling and a fingerprint associated with clinical outcomeSandberg. Exp Cell Res. 2013 Aug 15; 319(14): 2230-43.

[5] AGHAYAN GOLKASHANI, MD, Hossein HATAMI, MD, MPH , Abdonaser FARZAN, MD, Hassan Reza MOHAMMADI, MD, Yalda NILIPOUR, MD, Maliheh KHODDAMI, MDandFarzaneh JADALI, MD. Tumors of the Central Nervous System: An 18-Year Retrospective Review in a Tertiary Pediatric Referral CenterHosein. Iran J Child Neurol. 2015 Summer; 9(3): 24-33.

[6] Chu TPC, Shah A, Walker D, Coleman MP. How Do Biological Characteristics of Primary Intracranial Tumors Affect Their Clinical Presentation in Children and Young Adults? J Child Neurol. 2018 Jan 1:883073818767562.

[7] Chu TP, Shah A, Walker D, Coleman MP. Where are the opportunities for an earlier diagnosis of primary intracranial tumours in children and young adults? Eur J Paediatr Neurol. 2017 Mar; 21(2): 388-395.

[8] Thust SC, van den Bent MJ, Smits M. Pseudoprogression of brain tumors. J Magn Reson Imaging. 2018 May 7.

[9] Liu ZC, Yan LF, Hu YC, Sun YZ, Tian Q, Nan HY, Yu Y, Sun Q, Wang W, Cui GB. Combination of IVIM-DWI and 3D-ASL for differentiating true progression from pseudoprogression of Glioblastomamultiforme after concurrent chemoradiotherapy: study protocol of a prospective diagnostic trial. BMC Med Imaging. 2017 Feb 1; 17(1): 10.

[10] Choi YJ, Kim HS, Jahng GH, Kim SJ, Suh DC. Pseudoprogression in patients with glioblastoma: added value of arterial spin labeling to dynamic susceptibility contrast perfusion MR imaging. Acta Radiol. 2013 May; 54(4): 448-54.