Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Neurosurgery

Clinical Features and Surgical Management of Intracranial Meningioma's in the Elderly

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DOI: 10.36347/sjams.2022.v10i07.011 | **Received:** 04.06.2022 | **Accepted:** 13.07.2022 | **Published:** 23.07.2022

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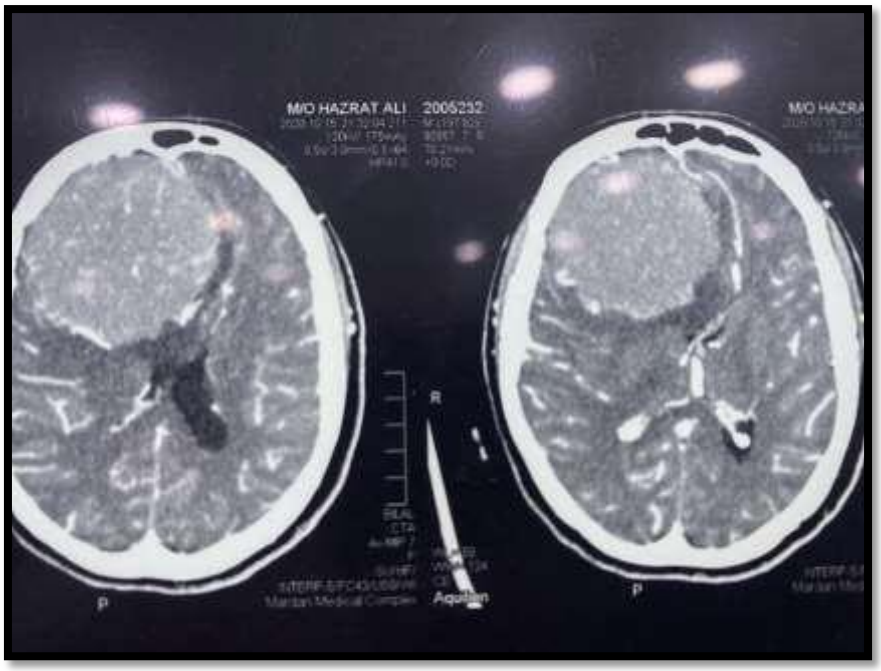
Abstract **Original Research Article**

Objective: Given the threat related with surgical intervention of intracranial meningiomas in the older population because of maturing physiology and numerous co morbidities, an endeavor was made to distinguish mediators impacting results and to characterize a category of individuals who ought not be surgically treated because of deprived prognosis. ***Study Setting: The study was conducted in neurosurgery unit mardan medical complex / bacha khan medical college Name of Hospital, Pakistan. Methods:*** The investigation of 58 individuals over the age of 70 years was conducted to determine short- and long-term results. Additionally, we derived scores for our patients using the previously reported CRGS, SKALE, and GSS grading systems. ***Result:*** As per the SKALE reviewing framework, neurological grimness was exclusively associated with a crucial site (P=0.02). Six people (10.3 percent) capitulated to their wounds. The Karnofsky score (KPS 60 versus KPS 70; P=0.0162), the American Society scale status (ASA 1 or 2 versus ASA 3; P=0.0022), and the evaluation of meningioma's were totally connected with mortality (P=0.012). The WHO grade (P=0.00048) and Simpson evaluation of resection (P=0.0437) were related with tumor repetition in six cases. Except for patients who died because of medical procedure or reoccurrence (15.5%), majority of subjects improved (50%) or remain unaltered (25.9%) in contrast with their karnofsky score before surgery. ***Conclusion:*** Neurological impairment following surgery was only observed in patients with a significant tumor placement (skull base, eloquent area, large vessels indulgence by the tumor). Because of the greatly increased threat of fatality, surgery should be carefully considered in individuals with a low functional state (KPS 60) or a bad bodily state (ASA 3 status). During routine visits, the majority of patients' neurological health enhanced or remains constant in comparison to their condition before operation.

Keywords: intracranial meningiomas, CRGS, neurological grimness, Karnofsky score, tumor, neurological health.

INTRODUCTION

Intracranial meningioma's had a consistent expansion in prevalence with age and is a pervasive tumor in the more established population in both genders. The recurrence is 3.5 occasions more noteworthy in those beyond 70 ones years old in more youthful ones [1]. With always expanding future and expanded utilization of analytic neuroimaging examinations, a significantly more prominent number of meningiomas found in this quiet population might be normal in the coming years. Careful surgical removal, and attentive hanging tight are generally alternatives for treatment. Medical procedure in more established patients may address a greater number of dangers than in more youthful patients, inferable from the physiology of maturing and the presence of different comorbidities. The necessity to find some kind of harmony between likely perils and advantages in the more seasoned age bunch entangles dynamic and methodology choice [2].



Medical procedure results are basic for therapy planning, especially the ID of patient subgroups that would profit with a medical procedure choice as far as in general endurance and personal satisfaction. Since choices about the ideal helpful methodology ought to be made with the most extreme consideration, I decide to portray our experience treating intracranial meningioma's in the senior population beyond 70 years old [3].

MATERIAL AND METHODS

The measures of intracranial meningioma surgical interventions were considerably analyzed in 58 patients aged 70 years who underwent surgery between 2016 and 2019. The study was conducted in neurosurgery unit mardan medical complex / bacha khan medical college mardan, Pakistan.

Preoperative physical status was determined using the scale of American Society [4]. The functional status was assessed using the Panofsky Performance Status (KPS) scale8. Preoperative magnetic resonance imaging (MRI) exams were used to evaluate the tumor's location, greatest dimension, and volume. The volume of tumors was determined using the formula V=4/3x x 12A x 12B x 12C, where A, B, and C denote the tumor's biggest dimension in three planes. The Simpson classification was used to determine the amount of tumor excision. Simpson resection score was determined based on the surgical observations and validated by CT scans and magnetic resonance imaging (MRI) after the operation [5]. In a series of follow-up MRI tests, a repetition was characterized as the return of the tumor in instances of complete meningioma extraction or the development of the tumor leftover in circumstances of deficient meningioma expulsion. The main postoperative MRI assessments were ordinarily performed a large portion of a year following a medical procedure with additional tests occurring about annual afterward. Additionally to the above-mentioned approach, MRI exams were performed whenever neurological impairments manifested or worsened. Neurological assessments were performed during admission, during the postoperative period, after discharge, and at each visit in our medical facility [7].

Also, three proposed evaluating frameworks for surgical signs in older patients with intracranial meningioma's were resolved for every persistent, to be specific CRGS, SKALE, and GSS. The Clinical-Radiological Grading System (CRGS) depends on six models: tumor size and area, neurological status, KPS score, presence of peritumoral edema, and presence of

simultaneous issues. Meningioma's are delegated basic on the off chance that they are situated close to major cerebral vessels, cranial nerves, or the brainstem and persuasive regions. Serious edema is portrayed as that which is related with a shift of midline structures, while mild edema is depicted as that which is just peritumoral or missing [8].

STATISTICAL ANALYSIS

Statistical programming, adaptation 12.0, was utilized to assess the collected information (Statsoft Inc., Tulsa, OK, USA). Fundamental clear measurements, the nonparametric Mann–Whitney U–test and the Kruskal–Wallis test, just as possibility tables with the Pearson chi-squared and Fisher's definite tests, were utilized in the investigations. Statistical importance was characterized as a P-value of 0.05 [9].

RESULT

Our individuals were between the age from 70 to 85 years, with a mean of 75.1 years; somewhat the greater part were female (55.2 percent). Prior to medical procedure [10], the normal term of side effects was 9.2 months (range: five days to four years). Motor impedances (34.5 percent), seizures (31%), migraine (24.1 percent), aphasia (22.4 percent), and cerebellar side effects were the most every now and again revealed manifestations (8.6 percent). Tumors were appended to the dural in 24 patients (41.4%), on the convexity in 22 patients (37.9%), and in the parasagittal region or to the falx cerebri in 12 patients (20.7 percent). In our partner, the mean measurement of the tumor was 45.6 mm (range: 19–89 mm), and the mean volume of the tumor was 38.7 cm3 [12], (territory: 2.5–164 cm3). Serious peritumoral edema resulted in 15.5 percent of cases; moderate edema resulted in 58.6 percent of cases, and no edema occured in 25.9 percent of individuals. Practically all patients, 53 altogether, had comorbidities (middle 2, territory 0–9), as shown in Table 1. 13.8 percent, 70.7 percent, 15.5 percent, and 0% of patients, separately, had ASA grades 1 to 4. The KPS scale demonstrates that 12 patients (20.6 percent) were reliant (KPS 60), while 46 patients (79.4 percent) were free (KPS 70). The middle CRGS score was 13 (territory: 9–17), with 1.7 percent of patients scoring ten, 39.7 percent scoring ten to twelve, and 58.6 percent scoring more prominent than twelve. The middle SKALE score was 12 (territory: 6–14), with 8.6 percent of patients scoring under 8, 12.1 percent scoring equivalent to 8, and 79.3 percent scoring more prominent than 8; the middle GSS score was 19 (territory: 13–23), with 86.2 percent scoring more noteworthy than 16.

Comorbidities	Number of Patients n (%)
Hypertension	46 (79.3)
Thyroid disease	17 (29.3)
Ischemic heart disease	15 (25.9)
Diabetes	13 (22.4)
Arrhythmia	8 (13.8)
Chronic obstructive pulmonary disease	6 (10.3)
Chronic heart failure	3 (5.2)
Chronic renal failure	3 (5.2)
Artificial heart valves	2 (3.45)
Liver disease	1 (1.7)

Preoperative KPS Status	Number of Patients n (%)
40	1 (1.7)
50	5 (8.6)
60	6 (10.3)
70	4 (6.9)
80	11 (19)
90	27 (46.6)
100	4 (6.9)

SURGICAL PROCEDURES

All patients where operated. Simpson grades I or II resection were cultivated in 81% of cases, Simpson grades III and IV were accomplished in 5.2 percent and 13.8 percent of medical procedures, separately. Over half (56.9 percent) of patients had WHO grade I meningioma's, albeit 37.9 percent had WHO grade II meningioma's, and 5.2 percent had WHO grade III meningioma's. Simpson evaluation of resection (I+II versus III versus IV) was essentially impacted by area as indicated by dural connection (P=0.0027), basic situation of meningioma's as per the CRGS and GSS reviewing frameworks (P=0.003 and P=0.027, separately), and generally CRGS score (P=0.0213). Different factors, like KPS status (P=0.12), ASA status (P=0.46), the presence and seriousness of peritumoral edema (P=0.69), tumor volume (P=0.47), and the meningioma's most prominent measurement (P=0.71), had no impact [13, 18, 20]. The figures 1–3 represent illustrative models.

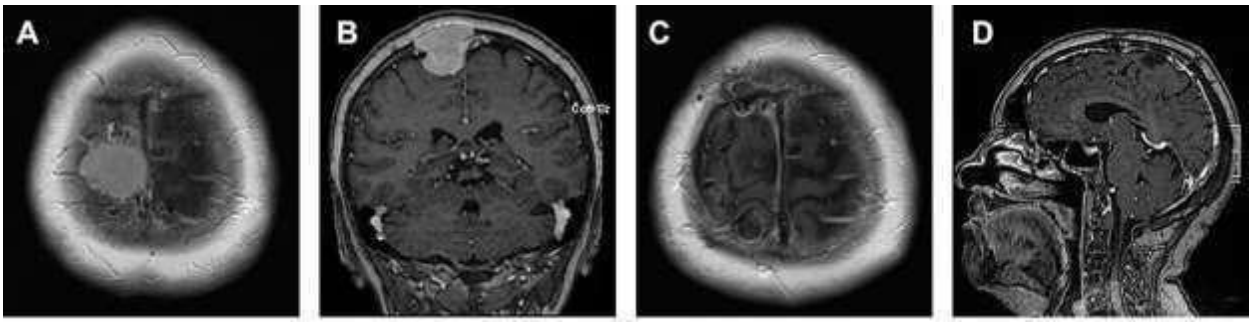


Fig-1

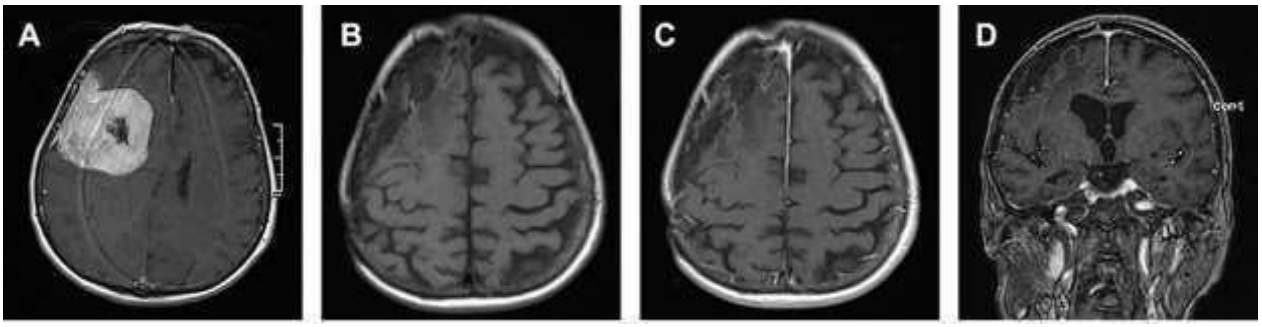


Fig 2

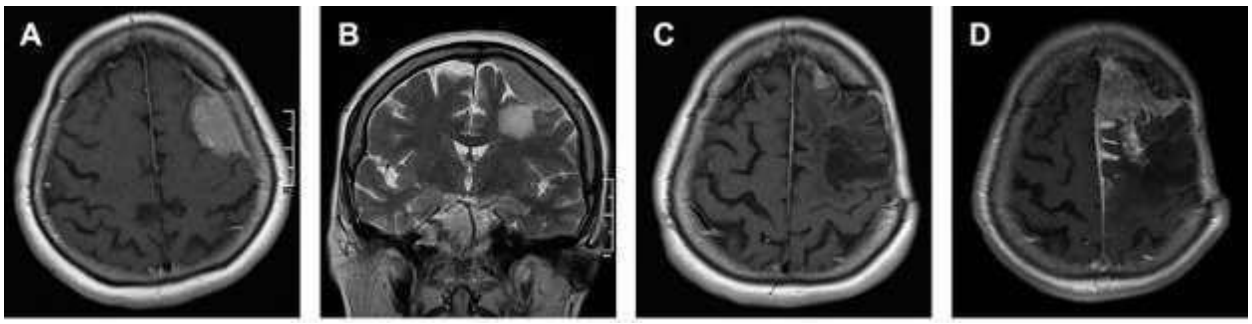


Fig 3

MORBIDITY

Before medical procedure, 40 of 58 patients had neurological disabilities, which decayed in seven cases postoperatively [11]. Furthermore, five patients fostered extra neurological irregularities postoperatively, bringing about an aggregate of 12 cases (20.7 percent) of neurological crumbling. In any case, among the 40 patients with preoperative neurological anomalies, 14 patients improved (i.e, 35% of patients with preoperative weaknesses improved), including six patients who got back to ordinary neurological condition (15%). Internal issues resulted in 12 patients (20.7%), including six instances of pneumonic issues and two instances of cardiovascular issues [12]. In 18 patients, generally morbidity was characterized as postoperative neurological deteriorating or potentially huge internal entanglement (31%).

Extent of Removal (Simpson Grade)	Neurological Morbidity n (%)	Overall Morbidity n (%)	Mortality n (%)
I + II n=47	9 (19.15)	13 (27.7)	3 (6.4)
III n=3	0	1 (33.3)	1 (33.3)
IV n=8	3 (37.5)	4 (50)	2 (25)

MORTALITY

In the postoperative term, six people (10.3 percent) died. Men (23.1%) had a more prominent passing rate than ladies (0%) (P=0.015). Three patients passed on as an immediate consequence of medical procedure, while the excess three passed away because of extra postoperative issues. Individual cases brought about the following: Massive venous stroke because of postoperative venous apoplexy, ischemic stroke of the brainstem because of hindrance of tumor- encased veins during a medical procedure, meningitis, sepsis, pneumonia, and myocardial dead tissue [13].

The CRGS, SKALE, and GSS scores had no impact on neurological morbidity, a variable impact on morbidity, and a considerable impact on mortality (Table 4).

Grading Scale	Neurological Morbidity	Overall Morbidity	Mortality
CRGS score	*P*=0.108	*P*=0.0171[a]	*P*=0.017[a]
SKALE score	*P*=0.56	*P*=0.067	*P*<0.005[a]
GSS score	*P*=0.35	*P*=0.152	*P*=0.0494[a]

Note: [a]Significant relationships.

FOLLOW UP

522 of 52 survivors were checked for a middle of 48.25 months (mean: 75.6 months; range: 5.5–110 months). Two patients remained unfollowed. Six cases (12%) of repeat were seen after, and 97 months, separately. Four people had WHO grade II meningiomas and two had WHO grade III meningioma's [15]. Among the four patients with WHO grade II meningioma's, postoperative irradiation was conducted in two patients with incomplete extraction (Simpson IV) and no illumination was planned for two patients with absolute tumor expulsion (Simpson I). Postoperative radiation was planned for the two patients with WHO grade III malignancies; anyway one of them rejected further therapy. Table 5 sums up the course of illness in patients who have had tumor repeats. Three patients (6%) expired because of tumor repeats, and ten additional patients (20%) passed away during follow-up for irrelevant reasons [14].

Case	WHO Grade	Simpson Grade	Postop Rth	Time to Recurrence	Additional Treatment	Last Patient Status (Length of Follow-up)
78-year-old man	II	IV	Yes	41 months	Reoperation, GKS, reoperation	Deceased (75 months)
74-year-old man	II	IV	Yes	97 months	No; watchful observation	Alive (110 months)
74-year-old woman	II	I	No	88 months	No; watchful observation	Alive (106 months)
72-year-old woman	II	I	No	18 months	2 × Cyberknife	Alive (50 months)
76-year-old man	III	I	Yes	23 months	Chemotherapy	Deceased (26 months)
85-year-old man	III	III	Refused	3 months	No	Deceased (5.5 months)

DISCUSSION

Expanded future expectancy and use of symptomatic neuroimaging examinations currently have brought about an increment in the quantity of recognized meningioma cases, especially among the old. Neurosurgeons are every day gone up against with

the choice whether to operate on meningioma's in patients in this age bunch. Due to the physiology of maturing and different comorbidities, medical procedure in the old population might be accomplished with a risk of hazardous postoperative outcomes [15]. Nonetheless, it is significant that intraoperative and postoperative consideration of intracranial injuries have improved considerably in late many years and careful treatment of intracranial meningioma's has become a feasible restorative alternative for the older. Momentary death rates have been accounted in the range of 0% and 13.5 percent, while all out intricacy rates have been accounted in the range of 3% and 30%. Referencing that an immediate examination of bleakness between considers are tricky in light of the fact that inconveniences are once in a while characterized exhaustively. Our gathering had a 10.3 percent death rate, a 20.7 percent neurological dismalness rate, and a 31% absolute morbidity rate, which included neurological crumbling just as dangerous inward issues [16].

The level of meningioma resection in the old is similar to that in more youthful patients, 21–23 with complete resection happening in most of cases (around 72–89 percent). Our resection rate was similar to these data. The degree to which the tumor is resected is basic, as the more extremist the medical procedure, the lower the risk of repetition. Complete expulsion is most habitually practical in convexity meningioma's, trailed by parasagittal and fascine meningioma's, and is least regularly conceivable in skull base meningioma's, steady with our discoveries. On account of skull base meningioma's, the most unfortunate results as far as activity radically are connected with vascular and cranial nerve inclusion, tumor adherence to the mind stem, huge sinus contribution, and the presence of visually impaired regions during surgical methodologies [17].

Various specialists have endeavored to characterize preoperative indicators of hazardous in the old population, with a few authors showing the prescient worth of patient age, male sex, tumor size, tumor location, presence and seriousness of edema,11,14 and general wellbeing pointers, for example, ASA and KPS scores; nonetheless, a few investigators have scrutinized the prescient worth of it [18].

Surgical expulsion risks should be weighed against the accessibility of elective treatment procedures, for example, stereotactic radiosurgery. Regularly, deciding the proper administration technique for an individual patient is testing. Stereotactic radiosurgery (SRS) might be utilized to treat oligosymptomatic, especially minuscule meningioma's, to achieve a drawn out tumor control rate similar to medical procedure. Meningiomas have a one-year repeat pace of 5.4 percent to 11.5 percent, and a five-year repeat pace of 8% to 24.1 percent. Recurrence happened in 13% of patients in our example, with a one-year repeat pace of 2% and a five-year repeat pace of 8%. The examination recognized meningioma's' histopathological WHO grade and the degree of their resection as the essential danger factors for tumor repetition [19, 20].

CONCLUSION

Old people are turning into an expanding focal point of neurosurgical practice. An exhaustive assessment of patients with intracranial meningioma should consider their clinical and neurological status preceding a medical procedure, just as their intellectual condition and level of dependence. Fortunately, the before surgery KPS score is the essential indicator of clinical results and technique costs. The patient's age can't be utilized as motivation to keep away from the surgical intervention. Preoperative arranging has a huge effect in postoperative results and personal satisfaction. Joining surgical and adjuvant radiosurgical medicines empowers decreases in surgical time, postoperative issues, and emergency clinic stay [21].

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