

Intrasellar Meningiomas: Case Report and Systematic Review

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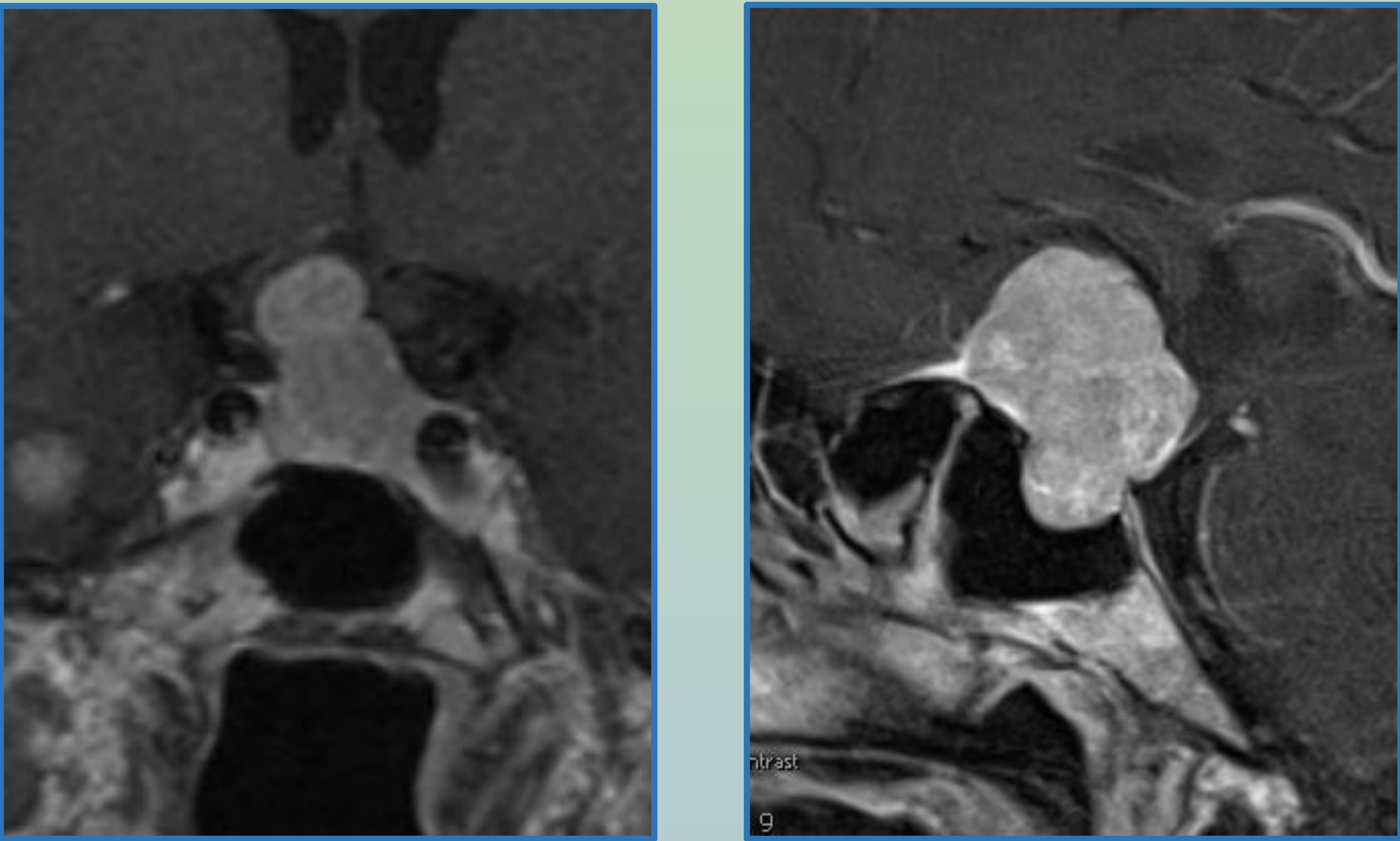
ABSTRACT

INTRODUCTION: Meningiomas constitute approximately 35% of all intracranial neoplasms. Intrasellar meningiomas represent an exceedingly rare subset, frequently misdiagnosed as pituitary adenomas due to overlapping clinical manifestations, hormonal assays, and radiological appearances. Definite diagnosis of intrasellar meningiomas typically necessitates magnetic resonance imaging (MRI) and visually demarcating the pituitary gland and the meningioma. However, histopathological evaluation remains essential for a conclusive diagnosis.

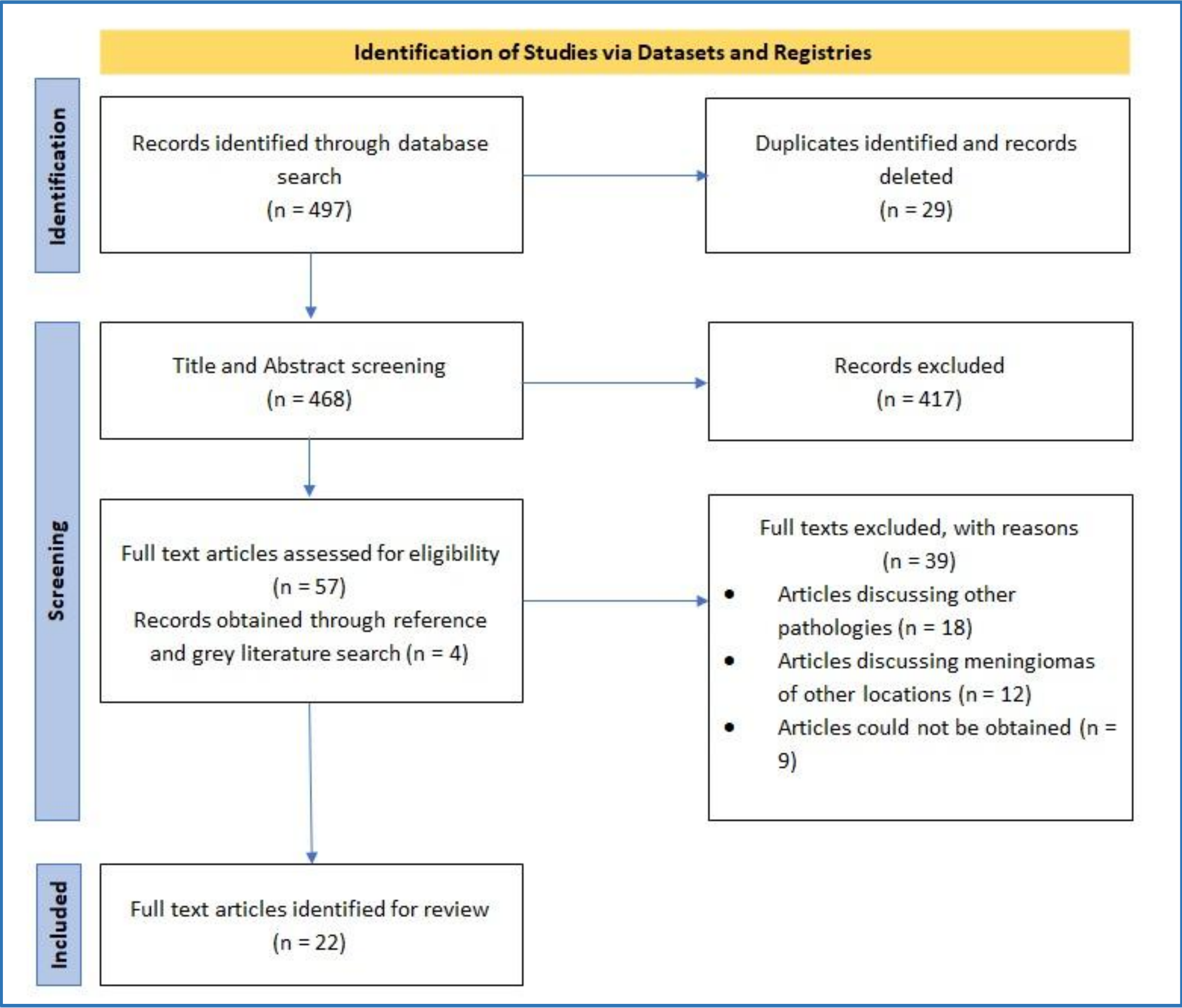
METHODOLOGY: A retrospective review was conducted for all patients diagnosed with intracranial meningiomas between 2006 – 2020 at Massachusetts General Hospital and Brigham and Women’s Hospital, Boston, was performed to identify the patients of intrasellar meningioma. Additionally, a systematic review of literature from inception to the present was conducted using the search terms “intrasellar”, “meningioma” and “sellar meningioma” aiming to compile the previously documented intrasellar meningiomas in literature.

RESULTS: Two female patients aged 58 and 71 years at the time of surgery, were identified at the participating institutions. An extensive literature review identified 26 patients (median age = 54.50 ± 25 years; female:male = 9:4) across 22 studies from an initial pool of 497 abstracts and 61 full texts. Visual field defects were the most prevalent symptoms, observed in twenty-one patients (75.0%), followed by headaches in 7 patients (25.0%). Hormonal assessments revealed panhypopituitarism in 14 patients (50.0%). Conversely, hyperprolactinemia was documented in a total of 10 patients (35.7%). Computed tomography (CT) scan and Magnetic Resonance Imaging (MRI) were used for preoperative radiological assessment, identifying 5 cases (12.8%) of pure intrasellar meningiomas and the rest exhibiting suprasellar extension. The maximum tumor diameter ranged from 1.1 – 6 cm. Transsphenoidal surgery was the predominant surgical approach, with four patients requiring revision surgeries and one patient undergoing a tumor biopsy. Histopathological assessment confirmed the diagnosis of intrasellar meningioma, categorizing twelve tumors WHO Grade I and two each for WHO Grade II and Grade III. Amongst the Grade I tumors, meningothelial meningiomas were the most frequently observed, followed by fibrous and psammomatous type. Additionally, a significant association was observed between the pathological grade of tumor and tumor recurrence, with higher risk of recurrence observed in WHO Grade II meningiomas (p = 0.044).

CONCLUSION: Intrasellar meningiomas are infrequently reported and often underdiagnosed during initial clinical evaluation. To highlight the importance of radiological diagnosis in identifying intrasellar meningiomas, it is essential to emphasize the role of imaging in the diagnostic process for cases at the participating hospitals. Neurosurgeons and neurologists should consider intrasellar meningiomas as a differential diagnosis when assessing a sellar or intrasellar lesion to ensure appropriate management and improve clinical outcomes.



Intrasellar meningiomas identified by conducting a retrospective assessment of institutional Intrasellar meningiomas



PRISMA Flowchart Entailing The Inclusion Of The Articles Discussing Intrasellar Meningiomas

CASE DESCRIPTIONS

CASE 1:
A 58-year-old woman, with bilateral vision loss presents with a large intrasellar lesion with a maximum diameter of 9.8 cm, with suprasellar extension. The patient underwent gross total resection of the tumor via transsphenoidal approach. Histopathological diagnosis revealed WHO grade I tumor with insignificant postoperative course.

CASE 2:
A 72-year-old woman presented with visual field defects and imbalance and is diagnosed with multiple intracranial aneurysms on imaging analysis. The intrasellar meningioma has a maximum diameter of 1.1 cm. Preoperative hormonal levels indicate mild hypothyroidism. The patient underwent transsphenoidal resection of a WHO grade II tumor. The patient had recurrence of the tumor and underwent a repeat transsphenoidal surgery and skull base and sellar radiotherapy.

INCLUDED CASES

Characteristic	Total	Recurrence	No Recurrence	P-Value
Included Patients	28	5	23	
Age (Median ± SD), in years	54.5 ± 25	55 ± 11	54 ± 25.5	0.610
Sex				1.000
Female	18 (64.3%)	3 (10.7%)	15 (53.6%)	
Male	10 (35.7%)	2 (7.1%)	8 (28.6%)	
Headache				0.574
No	21 (75.0%)	3 (10.7%)	18 (64.3%)	
Yes	7 (25.0%)	2 (7.1%)	5 (17.9%)	
Endocrinological Symptoms				0.574
No	21 (75.0%)	3 (10.7%)	18 (64.3%)	
Yes	7 (25.0%)	2 (7.1%)	5 (17.9%)	
Visual Symptoms				0.290
No	7 (25.0%)	0 (0.0%)	7 (25.0%)	
Yes	21 (75.0%)	5 (17.9%)	16 (57.1%)	
High Prolactin Levels				0.626
No	18 (64.3%)	4 (14.3%)	14 (50.0%)	
Yes	10 (35.7%)	1 (3.6%)	9 (32.1%)	
Panhypopituitarism				0.326
No	14 (50.0%)	4 (14.3%)	10 (35.7%)	
Yes	14 (50.0%)	1 (3.6%)	13 (46.4%)	
Maximum Diameter (range), in cm	1.1-6			
Resection				0.452
Gross Total Resection	13 (46.4%)	4 (14.3%)	9 (32.1%)	
Sub Total Resection	12 (42.9%)	1 (3.6%)	11 (39.3%)	
Biopsy	1 (3.6%)	0 (0.0%)	1 (3.6%)	
Unavailable	2 (7.1%)	0 (0.0%)	2 (7.1%)	
WHO Grade				0.044*
I	13 (46.4%)	1 (3.6%)	12 (42.8%)	
II	2 (7.1%)	2 (7.1%)	0 (0.0%)	
III	2 (7.1%)	0 (0.0%)	2 (7.1%)	
Unavailable	11 (39.2%)	2 (7.1%)	9 (32.1%)	
Post-operative Radiation				1.000
No	27 (96.4%)	5 (17.8%)	22 (78.6%)	
Yes	1 (3.6%)	0 (0.0%)	1 (3.6%)	