Benign Spindle Cell Tumors of the Pituitary: Diagnostic Features and Outcomes

Bryan Iorgulescu; Saksham Gupta BA; Hasan A Zaidi MD; Rory Crotty; Edward R. Laws MD, FACS; Timothy R. Smith MD, PhD, MPH

Harvard Medical School, Boston, MA; Department of Pathology, Department of Neurosurgery, Cushing Neurosurgery Outcomes Center, Brigham and Women's Hospital

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Background

Benign spindle cell neoplasms, notably granular cell tumors, spindle cell oncocytomas, and pituicytomas, comprise a rare subset of intrinsic pituitary lesions (1,2). They arise from similar lineages of pituicytes in the posterior pituitary, though debate exists as to their histological origins and classification. Analysis of their presentation and optimal management has been limited by their rare nature, though they may require different operative approaches (2). These malignancies also appear similarly to pituitary adenomas on imaging, making pre-operative diagnosis difficult to achieve. We analyzed clinical presentation, management, and outcomes of a series of 27 patients with benign spindle cell tumors of the pituitary to better characterize these lesions. Furthermore, we highlight radiographic presentations of the most common benign spindle cell neoplasm variants.

Methods

Patients diagnosed with a benign spindle cell tumor of the pituitary gland at Partners Healthcare hospitals from 1982 2015 were retrospectively reviewed for patient characteristics, presenting symptoms, radiographic and pathologic features, treatment, and outcomes; as approved by PHS IRB.

Conclusions

Benign spindle cell tumors are histologically heterogeneous neoplasms that present with neurological symptoms and pituitary dysfunction. They present with similar radiographic features. Surgery is curative in most patients, though a minority of patients experience recurrence.

Table 1. Tumor Subtypes

Age	**Median**	**Range**
Presentation (yr)	61.1	22-80
Sex	**n**	**(%)**
Male	14	51.9
Tumor Type	**n**	**(%)**
Granular Cell Tumor	8/27	29.6
Spindle Cell Oncocytoma	7/27	25.9
Pituicytoma	6/27	22.2
Smooth Muscle Tumor	2/27	7.4
Fibromyoma	1/28	3.6
Nerve Sheath Tumor	1/28	3.6
Neuroepithelial Neoplasm	1/28	3.6
Solitary Fibrous Tumor	1/28	3.6

Table 2. Presenting Characteristics

Presenting symptoms	**n**	**(%)**
Visual field deficit	10/18	55.6
Headaches	5/18	27.8
Hypothyroidism	4/18	22.2
Dizziness	2/18	11.1
Pituitary Function Labs	**n**	**(%)**
Prolactin (high)	4/9	44.4
TSH (low)	4/9	44.4
LH (low)	3/7	42.9
FSH (low)	3/8	38.5

Table 3. Histological Staining

Positive Reactivity	**n**	**(%)**
S100	20/23	87.0
Epithelial Membrane Antigen	7/10	70.0
Glial Fibrillary Acidic Protein	6/13	46.2
Galectin-3	5/8	62.5
Vimentin	3/6	50.0
CD68	3/8	37.5
Negative Reactivity	**N**	**(%)**
Synaptophysin	8/8	100.0
Melanosome-Specific Antigen	5/5	100.0

References

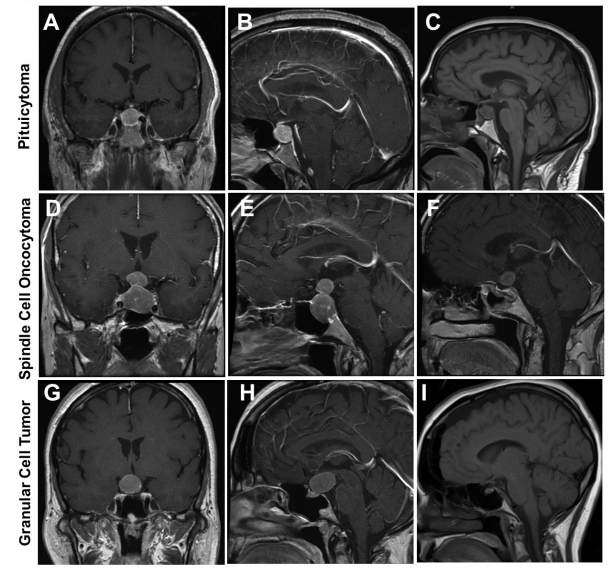
1. Mete O et al. (2013) Spindle Cell Oncocytomas and Granular Cell Tumors of the Pituitary Are Variants of Pituicytoma. Am J Surg Path 37(11):1694-1699

2. Zygourakis C et al. (2014) Pituicytomas and spindle cell oncocytomas: modern case series from the University of California, San Francisco. Pituitary 18:150-158

Table 4. Operative Approaches

Surgical Approach	**n**	**(%)**
Craniotomy	2/16	12.5
Transsphenoidal	14/16	87.5
Removal Methodology	**n**	**(%)**
Microscopic	7/13	53.8
Endoscopic	5/13	38.5
Combined	1/13	7.7
Extent of Resection	**n**	**(%)**
Biopsy	1/17	5.9
Subtotal Resection	10/17	58.8
Gross Total Resection	4/17	23.5

Figure 2. Pre- and Post-Operative T1-Weighted MRI



Left to right: Pre-Operative Coronal (A,D,E), Pre-Operative Sagittal, (B,E,H), Post-Operative Sagittal (C,F,I). Gross total resection was achieved in pituicytoma (C) and spindle cell oncocytoma (F). Sub-total resection was managed in granular cell tumor (I) due to capsular portion not safely separable from chiasm.

Table 5. Post-Operative Outcomes

Follow-Up	**Total Available**	**Median**	**Mean**	**Range**
Years	21	1.0	3.1	0-23
Presentation	**Improvement**	**No Change**	**Decline**	**New Symptom**
Dizziness	2/2	0/2	0/2	0/15
Headache	3/5	0/5	2/5	1/12
Visual Deficit	6/9	0/9	3/9	1/7
Hypothyroidism	2/2	0/2	0/2	0/14
Recurrence	**n**	**(%)**		
Total Recurrence	4/13	30.8		
Median PFS* (yr)	1.6			

*Progression-Free Survival