PitNET/Pituitary Adenoma Classification: Survival Tips

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Case-Based Questions (please see page 4 for answers)

1.	A 65-year-old female presents with homonymous hemianopsia and endocrinology testing showing only mildly elevated prolactin. MRI reveals a 3.2 cm sellar and suprasellar tumor. The tumor is resected via a transnasal approach. IHC for SF1 is diffusely, strongly positive within the nuclei of neoplastic cells. IHC for TPIT, PIT1, LH and FSH are negative. What is the most likely diagnosis?	
	a.	Corticotroph tumor
	b.	Gonadotroph tumor
	c.	Immature PIT1 lineage tumor
	d.	Null cell tumor
	e.	Tumor of no distinct cell lineage

2.	A 50-year-old female with obesity, hypertension, type 2 diabetes mellitus, and striae, was found to have a 0.6 cm pituitary tumor following motor vehicle accident; the patient elected not to intervene and the tumor grew to 1.5 cm over the course of several years and was associated with worsening hypertension and hyperglycemia. Prolactin was 21.39 (2.74-19.64 ng/mL). Total serum cortisol was mildly elevated, but formal testing for Cushing syndrome was not performed. Resection of the mass was performed, and H&E-stained sections showed a monomorphous cells with purple cytoplasm, oval nuclei, and moderately condensed chromatin. The following immunostains were positive within tumor cells: TPIT, ACTH, CAM5.2 (diffuse cytoplasmic pattern, no Crooke hyaline); the following immunostains were negative: SF1, PIT1. What is the most likely diagnosis?	
	a.	Corticotroph tumor
	b.	Gonadotroph tumor
	c.	Immature PIT1 lineage tumor
	d.	Null cell tumor
	e.	Tumor of no distinct cell lineage

3.	A 25-year-old male presented with gynecomastia and fatigue and was found to have serum prolactin of greater than 500 (2.74-19.64 ng/mL) and a 1.8 cm sellar/suprasellar tumor. Dopamine agonists were briefly employed, but the patient was lost to followup and presented years later with visual symptoms and a 2.5 cm mass, prompting tumor resection. This showed a monomorphous population of cells that disrupted the normal anterior pituitary architecture; neoplastic cells had lilac/fuchsia cytoplasm and oval nuclei with dark chromatin. No intracytoplasmic vacuoles to suggest giant mitochondria were observed. The following immunostains were diffusely and strongly positive: PIT1, prolactin. While patchy, faint ER immunoreactivity was observed, no immunoreactivity for the following stains was noted: SF1, TPIT, growth hormone, TSH, and GATA3. CAM5.2 immunostain showed strong, diffuse cytoplasmic immunoreactivity without fibrous bodies. What is the best tumor class in this case?	
	a.	Corticotroph tumor
	b.	Gonadotroph tumor
	c.	Lactotroph tumor
	d.	Null cell tumor
	e.	Tumor of no distinct cell lineage

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Correct Answers and Rationales

Question 1 Correct Answer and Rationale: **B. Gonadotroph tumor**

Rationale: Gonadotroph tumors are the most common nonfunctioning adenomas and frequently present with signs or symptoms referable to mass effects. Multiple studies have shown that IHC for transcription factor SF1 is more sensitive than IHC for LH or FSH, although the latter enjoy high specificity.

Question 2 Correct Answer and Rationale: **A. Corticotroph tumor**

Rationale: Corticotroph tumors typically show strong TPIT immunoreactivity along with variable ACTH immunoreactivity. Low molecular weight cytokeratin staining (in this case, CAM5.2) is present in the vast majority of corticotroph tumors and the absence of immunoreactivity would raise concern for alternate tumor types. Clinically, corticotroph tumors range from nonfunctioning to fully functioning, with obvious manifestations of Cushing disease, including central obesity, moon face, buffalo hump, purple striae, proximal muscle weakness, hypertension, hyperglycemia, osteoporosis, mood changes, easy bruising, and increased infection susceptibility.

Question 3 Correct Answer and Rationale: **C. Lactotroph tumor**

Rationale: Although most lactotroph tumors are responsive to dopamine agonists, shrinking the tumor without the need for resection, occasional lactotroph adenomas do not respond to therapy or medical therapy is poorly tolerated. Lactotroph adenomas are among the PIT1 lineage tumors that do not show immunoreactivity for growth hormone or TSH, and typically show estrogen receptor immunoreactivity. Lactotroph tumor recurrence is more common in macroadenomas, men, younger patients, and those with incomplete treatment response.