

Index

- A**
- ACC. *See* Adrenal cortical carcinoma (ACC)
- ACTH. *See* Adrenocorticotrophic hormone (ACTH)
- Acute thyroiditis, 14
- Adenomatoid tumor
- asymptomatic and identified, 204
 - cortical cells and focal lipomatous metaplasia, 205
 - spaces, small glandular, 205
- Adrenal cortical carcinoma (ACC)
- aldosteronism, 168
 - alveolar pattern, 169
 - cellular and nuclear pleomorphism, 167
 - cystic degeneration, 171
 - cytotoxic chemotherapy, 173
 - description, 173
 - eosinophilic cells, 167, 168
 - eosinophilic cytoplasm, 170, 172, 179, 180
 - feminizing/virilizing tumors, 165
 - histologic features, 173
 - insulin-like growth factor 2, 173
 - keratin, 181
 - lipid-rich adrenal cortical adenoma cells, 168
 - lipofuscin, 171
 - lipomatous/myelolipomatous, 167
 - lymphoma, 177
 - mitotic figures, 175
 - multivariate analysis, 165
 - myxoid change
 - and epithelioid cells, 170
 - and spindle cells, 170
 - necrosis, 175
 - nuclear-to-cytoplasmic ratios
 - and cellular monotony, 174
 - monotonous cells, 176
 - mucin, 178
 - pleomorphism, 176
 - oncocytic adenomas, 171
 - pale lipid-rich cell, 166
 - pale-staining cells, 167
 - pediatric tumors, 173
 - polymorphous cells, 176
 - primary hyperaldosteronism, 168
 - pseudoglandular growth pattern, 169
 - pseudoglandular pattern, 177
 - punctate microscopic foci, 175
 - small cell cytology, 178
 - spindle cell change, 179
 - spironolactone bodies, 169
 - subclinical Cushing syndrome, 166
 - trabecular growth pattern, 176
 - tumor behavior, 170
 - tumor size and weight, 174
 - unilateral tumors, 165
- Adrenal cortical hyperplasia
- autosomal dominant disorder, 159
 - description, 159
 - diffuse
 - ectopic ACTH production, 160
 - enlargement, 161
 - pancreatic neuroendocrine tumor, 160
 - secondary hyperplasia, 160
 - zona fasciculata, 160
 - nodular
 - definition, 161
 - endocrine atypia, 162
 - macro- and micronodules, 161, 162
 - PPNAD (*see* Primary pigmented nodular adrenocortical disease (PPNAD))
 - PRKARIA gene, 159
- Adrenal cysts
- CD31-immunostained sample, 156
 - endothelial-lined adrenal cysts, 156
 - fibrous-walled adrenal pseudocyst, 156
 - pheochromocytomas, 155
 - pseudocysts, 155, 156
 - vague symptoms, 155
- Adrenal gland
- abnormalities and pathogenic processes, 147
 - adipocytes and lymphocytes, 151
 - central adrenal vein, 150
 - chromaffin cells, 150
 - encapsulated cortical extrusions, 151
 - formalin, 148
 - heterotopia (*see* Heterotopia)
 - medullary hyperplasia, 147
 - pheochromocytomas, 147
 - right and left adrenal glands, 148
 - scattered adipocyte, 150
 - zona
 - fasciculata, 149
 - glomerulosa, 148
 - reticularis, 149
- Adrenal gland tumors
- adenomatoid, 204–205
 - angiosarcoma, 202
 - leiomyosarcoma, 203
 - teratoma, 204
- Adrenal medullary hyperplasia
- description, 187
 - MEN2A, MEN2B and cystic fibrosis, 188
 - pheochromocytoma, 188
 - trabecular growth pattern, 188

- Adrenal myelolipoma
 adjacent adrenal cortical tissue, 184
 bilateral, 183
 cortical tissue, 184
 description, 183
 hematopoietic elements, 184
 hypersecretion, 183
 trilineage hematopoietic cells, 185
 yellow adipose tissue, 184
- Adrenal tumors, metastatic
 breast cancer, 209
 cortical, 207
 medullary, 207
 melanoma, 208
 neuroendocrine, 207
 primary, 207
 renal cell carcinoma, 208
- Adrenocorticotrophic hormone (ACTH)
 in congenital adrenal hyperplasia, 159
 cortical hyperplasia, 159
 neuroendocrine tumor, 160
- Amiodarone thyroid, 5–6
- Amyloid goiter, 25, 28–29
- Anaplastic thyroid carcinoma
 adjacent structures, invasion, 72
 atypical spindle cells, 73
 composition, 71, 73
 distant metastases, 71
 hemorrhage and necrosis areas, 72
 Hurthle cell carcinoma, dedifferentiation, 74
 papillary thyroid carcinoma (PTC), 74–75
 Rhabdoid features, 74
 Riedel (fibrous) thyroiditis, 71, 73
 TTF1, 71
 vascular invasion, 72
- Angiosarcoma, 92, 202
- Atypical parathyroid adenoma
 composition, 128
 hypercellular and fibrosis, 128
 indolent behavior, 128
 irregular growth and fibrous bands, 129
 Ki67 labeling index, 129
 monotonous growth, 129
 parathyroid carcinoma, 128
- B**
 Breast cancer, 209
 Brown tumor of bone, 113
- C**
 Calcifications, 81
 Carcinoembryonic antigen (CEA), 84
 Carcinoma showing thymus-like differentiation (CASTLE), 94–95
 CASTLE. *See* Carcinoma showing thymus-like differentiation (CASTLE)
- C cells, tumors
 hyperplasia, 78
 medullary thyroid microcarcinoma, 78–79
 MTC (*see* Medullary thyroid carcinoma (MTC))
- CEA. *See* Carcinoembryonic antigen (CEA)
- Chief cells, parathyroid histology, 103–104
- Classic PTC
 cervical and ipsilateral lymph nodes, 35
 characteristic cytologic features, 33
 colloid, 34
 cystic-appearing lymph node metastasis, 36
 growth patterns, 34
 intranuclear holes, 34
 invasive, 32
 low-power photomicrograph, 35
 multiple ill-defined firm masses, 32
 “Orphan Annie” nuclei, 32
 papillae with fibrovascular cores and cystic change, 32, 33
 prominent papillae with fibrovascular cores, 32, 33
 psammoma bodies, 33
- Columnar variant of PTC, 47
- Composite pheochromocytoma
 composition, 194
 ganglioneuroma, 194
- Cowden syndrome, 25
- Cribiform-morular variant of PTC
 aberrant nuclear and cytoplasmic staining, β -catenin, 41
 arches and anastomosing bars, 40
 autosomal dominant syndrome, 40
 morules, 41
 nuclear staining, TTF1, 41
 spindle/oval tumor cells, 41
- D**
 de Quervain thyroiditis. *See* Granulomatous (de Quervain) thyroiditis
 Diffuse hyperplasia. *See* Graves disease
 Diffuse sclerosing variant of PTC, 43
 Dys hormonogenetic goiter, 27–28
- F**
 Familial isolated hyperparathyroidism (FIH), 131
 Fibrous (Riedel) thyroiditis, 13, 16, 71, 73
 FIH. *See* Familial isolated hyperparathyroidism (FIH)
 Focal lymphocytic thyroiditis, 13, 18
- Follicular adenoma
 adipocytes, 57
 clear cell change, 56, 57
 degenerative feature and hyalinization, 59
 description, 55
 extensive signet ring cell change, 58
 immunoperoxidase markers, 56
 medium-power view, 59
 metaplastic bone/ossification, 59
 microfollicular and macrofollicular architectural pattern, 56
 mucin, 57
 prominent spindle cell change, 58
 signet ring cell change, 58
 thyroid, 56
- Follicular carcinoma
 capsular invasion, 60
 clear cell change, 61, 62
 description, 60
 mushroom-like area, 60
 signet ring cell change, 62
 spindle cell change, 62
 thrombus, 61
 vascular invasion, 60, 61
- Follicular thyroid neoplasms
 adenomas (*see* Follicular adenoma)
 carcinomas (*see* Follicular carcinoma)
 cytologic specimens, 55

- histologic patterns, 55
 - malignancy, 55
 - tumors with extensive vascular invasion, 55
 - Follicular variant of papillary thyroid carcinoma (FVPTC)
 - characteristic features, 38
 - classic PTC, 37, 39
 - cumulative diagnosis, 37
 - elongated follicles, 38
 - encapsulated tumors, 37
 - HBME-1 immunostain, 40
 - low-power photomicrograph, 39
 - numerous patterns, 38
 - photomicrograph shows, 38
 - thyroid parenchyma, 39
- G**
- Ganglioneuroma
 - adrenal gland, 198
 - needle core biopsy, 198
 - recognizable tumor, 197
 - spindled Schwann cells, 199
 - stroma-rich, 198
 - Granulomatous (de Quervain) thyroiditis
 - multinucleated giant cells, 15
 - noncaseating granulomas, 15
 - patchy areas, neutrophils and microabscesses, 14
 - patients, 13, 14
 - Graves disease
 - complications, 21
 - cut section, 22
 - diffuse hyperplasia, 23
 - diffusely enlarged thyroid, 22
 - follicular epithelium, 24
 - hyperthyroidism, 21
 - low-power photomicrograph, 22
 - papillae, 22, 23
 - patients treatment with iodine, 24
 - thyroid carcinomas, 21
 - thyroid parenchyma, 22
- H**
- Hashimoto thyroiditis
 - fibrous variant, 18
 - prominent lymphoid follicles, 17
 - solid cell nests, 18
 - thyroid, 13
 - H&E. *See* Hematoxylin and eosin (H&E)
 - Hematoxylin and eosin (H&E), 1, 4
 - Heterotopia
 - adipocytes and foci, lymphocytes, 152
 - cortical nodule, 152
 - embryologic path, 152
 - subcapsular space, 152
 - Hobnail variant of PTC, 48
 - HP-JT. *See* Hyperparathyroidism–jaw tumor syndrome (HP-JT)
 - Hurthle cell adenoma, 63, 64
 - Hurthle cell carcinoma, 65
 - Hurthle cell thyroid neoplasms, 63–65
 - Hyalinizing trabecular tumor
 - Carney's group, 51
 - description, 51
 - encapsulation and separation, 52
 - extracellular eosinophilic hyaline fibrosis, 52
 - prominent eosinophilic intranuclear inclusions, 52
 - RET/PTC* rearrangements, 51
 - tumor cells, 52
 - Hyperparathyroidism–jaw tumor syndrome (HP-JT), 131
- L**
- Langerhans cell histiocytosis, 91
 - Leiomyosarcoma, 203
 - Lipoadenomatous hyperplasia, 114
 - Lipohyperplasia, 109
 - Low-grade fibromyxoid sarcoma, 93
 - Lymphoma, 90
- M**
- Medullary thyroid carcinoma (MTC)
 - acinar growth pattern, 82
 - amyloid, 79
 - calcifications, 81
 - calcitonin, 83
 - CEA, 84
 - composition, 81
 - epithelioid cells, 80
 - growth patterns, 80
 - intranuclear pink holes, 80
 - neuroendocrine markers, 83
 - oxyphilic, 82
 - papillary architectural pattern, 83
 - recognition, 82
 - solid growth, necrosis, 81
 - spindle cells, 80
 - syndromic, 79
 - TTF1, 83, 84
 - Metastases to parathyroid carcinoma, 144
 - medullary thyroid carcinoma, 144
 - primary thyroid tumors, 143
 - thyroid tumors, 144
 - Metastases to thyroid
 - breast cancer metastatic, 100
 - melanoma metastatic, 101
 - primary tumors, 99
 - renal cell carcinoma metastatic, 100
 - resection, 99
 - Minocycline thyroid, 5–6
 - MTC. *See* Medullary thyroid carcinoma (MTC)
 - Multinodular goiter, 26–27
 - Multiple endocrine neoplasia (MEN) types 1 and 2A, 109
- N**
- Nephrolithiasis, 121
 - Neuroblastoma
 - children, 197
 - classification, 197, 199
 - ganglion and Schwann cells, 197
 - malignant, 197
 - nests, 200
 - primordial neural crest cells, 199
 - sporadic, 197

- Normal thyroid
 central lumen containing colloid, 3
 chromogranin immunostain, 4
 cut section, 2
 fat cells, 4
 follicles, 3
 gross image, 2
 immunopositivity, TTF1, 3
 thyroglobulin, immunopositivity, 3
- O**
 Oncocytic/Hurthle cell, 44
 Oxyphilic cells, 104
- P**
 Palpation thyroiditis, 7
 Papillary thyroid carcinoma (PTC)
BRAF mutations, 31
 classic (*see* Classic PTC)
 columnar variant, 47
 cribriform-morular variant (*see* Cribriform-morular variant of PTC)
 diffuse sclerosing variant, 43
 and FVPTC (*see* Follicular variant of papillary thyroid carcinoma (FVPTC))
 histologic variants, 31
 hobnail variant, 48
 microcarcinoma, 36, 37
 oxyphilic variant, 44
 patients, 31
 radioactive iodine, 31
 solid variant, 45
 tall cell variant, 46
 warthin-like variant, 42
 Papillary thyroid microcarcinoma
 benign thyroid disease, 37
 gross photograph, 36
 Paraganglioma, 96
 Parathyroid adenoma
 atypical parathyroid adenoma, 128–129
 chief cell
 composition, 123
 cystic change, 124
 degenerative edema, 123
 diffuse cellularity, 122
 edematous change, 123
 features, 122
 fibrous connective tissue capsule, 122
 glandular growth, 124
 hyalinization and metaplastic bone, 123
 large dilated follicular-like spaces, 125
 parenchyma cells and adipocytes, 122
 signet ring cell change, 124
 spindle cell change, 125
 stromal fat, 123
 clear cell, 126
 molecular basis, 121
 nephrolithiasis, 121
 oxyphil cell, 125–126
 parathyroid lipoadenoma, 127
 screening calcium, 121
 Parathyroid carcinoma
 clear cell, 137
 dilated follicular structures, 135
 features, 132
 FIH, 131
 glandular growth pattern, 135
 hemosiderin deposition, 134
HRPT2 tumor suppressor gene, 131
 hyperplasia and, 133
 intrathyroidal, 133
 invasive growth, 132
 monotonous growth pattern, 134
 multiple mitotic figures, 134
 nuclear atypia and mitotic activity, 137
 oxyphilic, 135–136
 palisading, 136–137
 perithyroidal soft tissue, 132
 postoperative radiation, 131
 prognostic factors, 131
 PTH, 131
 skeletal muscle, neck, 132–133
 trabecular growth pattern, 136
 vascular thrombus, 133
 Parathyroid histology
 chief cells, 103–104
 clear cytoplasm and pyknotic nuclei, 105
 cysts and inflammation, 103, 105–106
 normal, 104
 in older patients, 105
 oxyphilic cells, 104
 parathyroiditis, 106–107
 Parathyroid hormone (PTH), 109, 131
 Parathyroid hyperplasia
 asymmetric enlargement, 109
 brown tumor of bone, 113
 lipoadenomatous hyperplasia, 114
 lipohyperplasia, 109
 multiple endocrine neoplasia (MEN) types 1 and 2A, 109
 primary
 adipocytes, 110
 chief and clear cells, 111
 glandular growth pattern, 112
 nodular enlargement, 110
 nodular growth, 111
 nuclear palisading, 112
 oxyphilic cells, 111
 parenchymal mass, 110
 primary clear cell hyperplasia, 113–114
 PTH, 109
 secondary
 chief cells, 116
 diffuse hyperplasia, 117
 fibrosis and fibrous bands, 117
 foci of amyloid, 118
 hemosiderin deposition, 117
 nodular growth, 115
 nodular hyperplasia, 115
 oxyphilic cells, 116
 parathyroid tissue, implant, 118
 parenchymal mass, 115
 tertiary parathyroid hyperplasia, 118
 Parathyroiditis, 106–107
 Parathyroid lipoadenoma, 127
 Parathyromatosis
 calcimimetic agents, 139
 features, 140
 hypercellular parathyroid tissue, nodules, 140
 serum calcium level, 140
 Pendred syndrome, 25
 Pheochromocytoma
 adrenal cortical adenoma, 193
 alveolar and trabecular growth patterns, 191
 composite, 194

degenerative features, hyalinization
and fibrosis, 192
description, 187
epithelioid cells, 190
histologic features, 190
macroscopically cystic lesions, 192
metastasis, skull, 193
mitotic figure, 192
neuroendocrine tumors, 190
nuclear
pleomorphism, 191
pseudoinclusions, 191
paraganglioma, 193
pseudocyst, 193
syndrome-associated tumors, 189
yellow adrenal cortical tissue, 189
“zellballen” growth pattern, 190

Poorly differentiated thyroid carcinoma
external-beam radiotherapy, 67
insular growth pattern, 68
necrosis, 68
operational pathologic definition, 67
relapse-free and cause-specific survival
rates, 67
TP53 mutations, 68
Turin criteria, 67
uniform tumor cells, 68

PPNAD. *See* Primary pigmented nodular adrenocortical
disease (PPNAD)

Primary pigmented nodular adrenocortical
disease (PPNAD)
affected adrenal glands, 162
bilateral micronodular hyperplasia, 162
corticomedullary junction, 163
description, 159
lipofuscin, 163
zona reticularis–type, 163

R

Renal cell carcinoma, 208
Rhabdomyosarcoma, 94
Riedel thyroiditis. *See* Fibrous (Riedel) thyroiditis

S

Schwannoma, 203
Sclerosing mucoepidermoid carcinoma
in adult women, 87
invasive growth recognition, 88
mucous cells, 88
Solid cell nests
oval cells with fine chromatin, 4
PTCs, 4
Solid variant of PTC, 45
Solitary fibrous tumor, 91
Squamous cell carcinoma
adolescent, Hashimoto thyroiditis, 89
keratinization, 89
pure squamous differentiation, 89
Struma ovarii, 9–10
Synovial sarcoma, 93

T

Tall cell variant of PTC, 46
Teratoma, 95, 204
Thyroglossal duct cyst, 9

Thyroid goiter
amyloid, 25, 28–29
Cowden syndrome, 25
dys hormonogenetic goiter, 27–28
endemic, 25
malignancy, 25
medications, 25
meta-analysis, 25
multinodular goiter, 26–27
nontoxic, 25
Pendred syndrome, 25
toxic multinodular, 25

Thyroid histology
calcitonin mRNA, 1
C cells, 1
colloid, 1
ectopic thyroid tissue, 8
immunohistochemical stains, 1
minocycline and amiodarone, 5–6
normal thyroid (*see* Normal thyroid)
palpation thyroiditis, 7
radiation changes, 5
solid cell nests (*see* Solid cell nests)
struma ovarii, 9–10
thyroglossal duct cyst, 9
thyroid needle-biopsy site, 7
TTF1, 1

Thyroiditis

acute inflammation, 13, 14
de Quervain granulomatous, 13, 14–15
fibrous (Riedel), 13, 16
focal lymphocytic, 18
Hashimoto, 13, 17–18

Thyroid needle-biopsy site, 7

Thyroid-stimulating hormone (TSH), 3

Thyroid transcription factor 1 (TTF1), 1, 3, 83, 84

Thyroid tumors

angiosarcoma, 92
CASTLE, 94–95
Langerhans cell histiocytosis, 91
low-grade fibromyxoid sarcoma, 93
lymphoma, 90
paraganglioma, 96
rhabdomyosarcoma, 94
sclerosing mucoepidermoid carcinoma,
87–88
solitary fibrous tumor, 91
squamous cell carcinoma, 89
synovial sarcoma, 93
teratoma, 95

TSH. *See* Thyroid-stimulating hormone (TSH)

TTF1. *See* Thyroid transcription factor 1 (TTF1)

U

Unusual adrenal tumors
adenomatoid, 201, 204–205
angiosarcoma (*see* Angiosarcoma)
leiomyosarcoma, 203
malignant melanoma, 201
primary lymphoma, 201
schwannoma, 203
teratoma, 204

W

Warthin-like variant of PTC, 42