

# Index

*Note:* Page numbers of article titles are in **boldface** type.

## A

- Abducens nerve damage, in pituitary surgery, 611–612
- Abscess, pituitary, MRI for, 540–541
- Acromegaly
  - postoperative, **621–638**
    - clinical evaluation of, 623–624
    - definitions of, 621–623
    - insulin-like growth factor discordance in, 623
    - testing in, 623
    - treatment of
      - areas of uncertainty in, 634
      - debulking surgery, 625
      - dopamine agonists, 630–631
      - emerging, 633
      - financial considerations in, 633
      - medical, 627–628
      - options for, 624
      - pegvisomant, 631–633
      - radiation therapy, 633–634
      - repeat surgery, 624–627
      - somatostatin analogues, 628–630, 633
    - tumor aggressiveness and, 621–622
    - radiation therapy for, 575, 577–578, 581–582
- ACTH, overproduction of, in Cushing syndrome, 639, 641–643
- Adamantinomatous craniopharyngiomas, 538–540
- Adenomas, pituitary
  - atypical, 596
  - Cushing disease and. *See* Cushing disease.
  - cystic, 540
  - endoscopic transsphenoidal surgery for, **555–569**, 675
  - growth hormone-secreting, **621–638**
  - hemorrhagic, 540
  - incidentally found. *See* Incidentalomas.
  - invasion of, 597–598
  - large aggressive, **587–594**
  - malignant transformation of, 597, 601
  - MRI for, 530–532
  - nonfunctioning. *See* Nonfunctioning pituitary tumors.
  - prolactin-secreting. *See* Prolactinomas.
  - radiation therapy for. *See* Radiation therapy.
  - visual disorders in, **607–619**
- Adrenal insufficiency
  - postoperative, 686–687
  - preoperative testing for, 680
- Adrenalectomy, for Cushing disease, 655

- Adrenocorticotropin (ACTH), overproduction of, in Cushing syndrome, 639, 641–643
- Amenorrhea, in prolactinoma, 670
- Aminoglutethimide, for Cushing disease, 660
- Angiogenesis inhibitors, for nonfunctioning pituitary tumors, 589
- Apoplexy, pituitary, 532, 612–614
- Arachnoid cysts, MRI for, 537–538

## B

- BCNU wafers, for nonfunctioning pituitary tumors, 590
- Bevacizumab
  - for nonfunctioning pituitary tumors, 589
  - for pituitary carcinoma, 603–604
- Bilateral inferior petrosal sinus sampling, 642
- BIM-23A760, for nonfunctioning pituitary tumors, 590–591
- Bischloroethyl-nitrosourea wafers, for nonfunctioning pituitary tumors, 590
- Bromocriptine
  - complications of, 616
  - for Cushing disease, 655–657
  - for pituitary carcinoma, 601
  - for postoperative acromegaly, 630–631
  - for prolactinoma, 672–674
  - visual disorders due to, 616

## C

- Cabergoline
  - for Cushing disease, 656–657
  - for nonfunctioning pituitary tumors, 588–589
  - for postoperative acromegaly, 630–632
  - for prolactinoma, 588–589, 672–674
- Calcification, of craniopharyngiomas, 539
- Capecitabine, for nonfunctioning pituitary tumors, 591
- Carboplatin, for pituitary carcinoma, 603
- Carcinomas, pituitary, **595–606**
  - clinical presentation of, 599–601
  - diagnosis of, 601
  - epidemiology of, 597
  - genetic makeup of, 598–599
  - histopathology of, 596–597
  - hormones secreted from, 597, 599–601
  - imaging of, 601
  - incidence of, 595

- Carcinomas** (*continued*)
- invasion of, 597–598
  - metastasis from, 533, 600–601
  - molecular features of, 598–599
  - pathophysiology of, 597–599
  - prognosis for, 595–596, 601–602
  - treatment of, 590, 602–604
  - ultrastructure of, 598–599
- Cerebrospinal fluid leakage**
- in Cushing disease surgery, 647
  - in transsphenoidal surgery, 566–567
- Chemotherapy**, for pituitary carcinoma, 602–604
- Choristomas** (pituicytomas), MRI for, 532–533
- Computed tomography**
- for nonfunctioning pituitary tumors, 543–544
  - for pituitary lesions, 558
- Conivaptan**, for hyponatremia, 685
- Corticotroph adenomas**
- Cushing disease in, 641–642
  - incidental, 547
- Cortina criteria**, for acromegaly, 622, 624
- Cortisol**, measurement of
- in Cushing disease and syndrome, 547, 640–641
  - perioperative, 682–683
- Cranial neuropathies**
- after Cushing disease surgery, 647
  - after radiation therapy, 580
  - in prolactinoma, 670
- Craniopharyngiomas**, MRI for, 538–539
- Cushing disease**, **639–651**
- causes of, 639
  - definition of, 639
  - diagnosis of, 639–640
  - epidemiology of, 653–654
  - in incidentalomas, 547
  - in pituitary carcinoma, 599, 601
  - medical treatment of, 654–663
    - ACTH release modulating agents in, 655–659
    - combination, 663
    - glucocorticoid receptor blockers in, 661–663
    - steroidogenesis inhibitors in, 659–661
  - morbidity and mortality in, 654
  - radiation therapy for, 575–576, 581
  - recurrent, treatment of, 578, 580, 646–647, **653–668**
  - screening test for, 547
  - surgical treatment of, 639–648
    - approaches for, 642
    - complications of, 647–648
    - outcomes of, 643–646
    - recurrence after, 646–647
    - remission after, 643–646
  - treatment, failure of, 655
- Cushing syndrome**
- causes of, 641–641
  - Cushing disease as cause of, 639–640. *See also* Cushing disease.
  - definition of, 639, 653–654
  - diagnosis of, 640–641
  - morbidity and mortality in, 654
  - treatment of, 654–655
- Cyproheptadine**, for Cushing disease, 655–656
- Cyst(s)**
- arachnoid, 537–538
  - dermoid, 541
  - epidermoid, 541
  - Rathke cleft, 538
- D**
- Decompression**, for pituitary apoplexy, 532
- Deep vein thrombosis**, after Cushing disease surgery, 648
- Dermoid cysts**, MRI for, 541
- Desmopressin**, for diabetes insipidus, 684
- Dexamethasone suppression test**, for Cushing syndrome and disease, 547, 641
- Dexamethasone-suppressed**, corticotropin-releasing hormone stimulation test, 641
- Diabetes insipidus**
- postoperative, 647, 683–688
  - preoperative, evaluation of, 682
- Diplopia**, after pituitary surgery, 612
- Dopamine agonists**
- for Cushing disease, 656–657
  - for nonfunctioning pituitary tumors, 588–589
  - for pituitary carcinoma, 601
  - for postoperative acromegaly, 630–631
  - for prolactinoma, 588–589, 671–674
- Double vision**, after pituitary surgery, 617
- Driving restrictions**, after pituitary surgery, 617
- E**
- Ectopic ACTH secretion**, 641–642
- Electrodiagnostic tests**, before pituitary surgery, 614
- Endonasal approach**, to Cushing disease surgery, 642–643
- Endoscopic approach**, to Cushing disease surgery, 643
- Endoscopic transsphenoidal surgery**, **555–569**
- advantages of, 555
  - anatomic considerations in, 558–559
  - complications of, 567
  - equipment for, 559
  - for nonfunctioning pituitary tumors, 588
  - for prolactinoma, 675
  - history of, 556
  - nasal stage of, 561–563
  - postoperative care for, 567–568
  - preoperative assessment for, 558–559
  - reconstruction stage of, 566–567

- seller stage of, 564–566
  - sphenoid stage of, 563–564
  - technique for, 559–567
  - versus microsurgery, 556–558
- Epidermal growth factor receptor inhibitors, for Cushing disease, 659
- Epidermoid cysts, MRI for, 541
- Epistaxis, after Cushing disease surgery, 647–648
- Erdheim-Chester disease, 537
- Estrogens
  - deficiency of, 687
  - for nonfunctioning pituitary tumors, 591
- Etomidate, for Cushing disease, 660–661
- Everolimus
  - for nonfunctioning pituitary tumors, 589
  - for pituitary carcinoma, 604
- External beam radiation therapy, for pituitary adenomas
  - adverse events after, 582
  - in acromegaly, 581–582
  - in Cushing disease, 581
  - in prolactinomas, 82
  - nonfunctioning, 581
  - technique for, 572
  - versus stereotactic radiosurgery, 573

## F

- Fundoscopic examination, before pituitary surgery, 613

## G

- Galactorrhea, in prolactinoma, 670
- Gamma Knife radiosurgery, 573
- Genetic factors, in pituitary carcinoma, 598–599
- Germinomas, pituitary, MRI for, 536
- Getfinib, for Cushing disease, 659
- Giant adenomas, pituitary, MRI for, 531–532
- Gliadel wafers, for nonfunctioning pituitary tumors, 590
- Glucocorticoid receptor blockers, for Cushing disease, 661–663
- Granular cell tumors, MRI for, 533
- Granulomatous hypophysitis, MRI for, 537
- Growth hormone
  - deficiency of
    - postoperative, 687–688
    - preoperative testing for, 681
  - excess of, acromegaly in. *See* Acromegaly.

## H

- Headache, in prolactinoma, 675
- Hemorrhage, in pituitary apoplexy, 532, 612–614
- Histiocytosis, pituitary, MRI for, 536–537
- Hyperplasia, pituitary, MRI for, 533

- Hypogonadism, preoperative testing for, 681
- Hyponatremia, 684–685

## Hypophysitis

- granulomatous, MRI for, 537
  - lymphocytic, MRI for, 533–544

## Hypopituitarism, 679–689

- after radiation therapy, 580, 582
  - discharge instructions with, 685–686
  - in incidentalomas, 547–548
  - in lymphocytic hypophysitis, 533
  - in prolactinoma, 670
  - perioperative, treatment of, 682–683
  - postoperative, 685–688
  - preoperative
    - evaluation for, 679–680
    - signs and symptoms of, 680–682

## Hypothalamic-pituitary-adrenal axis dysfunction

- after Cushing disease surgery, 647
  - evaluation of, 686
  - perioperative management of, 682–683

## Hypothalamus, germinomas of, 536

## Hypothyroidism

- pituitary hyperplasia in, 533
  - postoperative, 687
  - preoperative testing for, 680–681

## I

- Imaging. *See specific type, eg, Computed tomography; Magnetic resonance imaging.*

## Incidentalomas, 543–553

- clinical experience with, 544, 546
  - evaluation of, 547–548
  - imaging for, 544
  - natural history of, 548
  - prevalence of, 544–546
  - treatment of, 548–550

- Infections, after Cushing disease surgery, 647

- Infundibulomas (pituicytomas), MRI for, 532–533

## Infundibulum, MRI of

- in abnormalities, 536–537
  - normal appearance, 530
  - technique for, 529–530

- Insulin-induced hypoglycemia test, 686–687

- Insulin-like growth factor test

- for acromegaly, 623

- for pituitary adenoma, 547

## J

- Junctional scotoma, 608–609

## K

- Ketoconazole, for Cushing disease, 659–660

- Ki-67 antigen, in pituitary carcinoma, 599

**L**

Langerhans cell histiocytosis, 536–537  
 Lanreotide, for postoperative acromegaly, 628–630, 632  
 LC1699, for Cushing disease, 661  
 LINAC-based radiosurgery, 573  
 Lymphocytic hypophysitis, MRI for, 533–544  
 Lymphomas, MRI for, 535

**M**

Macroadenomas, pituitary  
   malignant, 533  
   MRI for, 531–532  
   nonfunctioning, 544–550  
   versus meningiomas, 535  
 Macroprolactinomas. *See* Prolactinomas.  
 Magnetic resonance imaging, **529–542**  
   for cystic lesions, 537–541  
   for infundibular abnormalities, 536–537  
   for nonfunctioning pituitary tumors, 543–544, 548  
   for nonpituitary sellar lesions, 534–536  
   for pituitary carcinoma, 601  
   for pituitary lesions, 530–534, 558  
   for postoperative acromegaly, 624  
   for prolactinoma, 670  
   normal appearance in, 530  
   technique for, 529–530  
 Meningiomas, intrasellar, MRI for, 534–535  
 Meningitis, in transsphenoidal surgery, 567  
 Metastasis  
   from pituitary carcinomas, 533, 596–601  
   to pituitary, 535–536  
 O-6-Methylguanine DNA methyltransferase, in pituitary tumors, 589–590  
 Metyrapone, for Cushing disease, 660  
 Microadenomas, pituitary  
   cystic, 540  
   hemorrhagic, 540  
   MRI for, 531  
   nonfunctioning, 546–548  
 Microprolactinomas. *See* Prolactinomas.  
 Microscopic endonasal approach, to Cushing disease surgery, 642–643  
 Mifepristone, for Cushing disease, 661, 663  
 Mitotane, for Cushing disease, 660  
 MRI. *See* Magnetic resonance imaging.

**N**

Neurologic disorders, after Cushing disease surgery, 647  
 Neuromyotonia, optical, 612, 616  
 Nonfunctioning pituitary tumors, **543–553**  
   clinical experience with, 544, 546  
   evaluation of, 547–548

imaging for, 544  
 large aggressive, **587–594**  
 natural history of, 548  
 prevalence of, 544–546  
 radiation therapy for, 573–575, 581  
 treatment of, 548–550, **587–594**

**O**

Octreotide  
   for Cushing disease, 655, 658  
   for nonfunctioning pituitary tumors, 589  
   for pituitary carcinoma, 601  
   for postoperative acromegaly, 628–630, 632  
   visual disorders due to, 616  
 Ocular motility, evaluation of, before pituitary surgery, 613  
 Ocular neuromyotonia, after pituitary surgery, 612, 616  
 Oculomotor nerve damage, in pituitary surgery, 610  
 Oncocytomas, spindle-cell, 533  
 Optic chiasm damage, in pituitary surgery, 608  
 Optic nerve damage, in pituitary surgery, 608  
 Optic neuropathy, radiation-induced, 616  
 Optic tract damage, in pituitary surgery, 608–610  
 Optical coherence tomography, before pituitary surgery, 613–615

**P**

p53 protein, in pituitary carcinoma, 599  
 Pasireotide  
   for Cushing disease, 655, 658  
   for nonfunctioning pituitary tumors, 589  
   for postoperative acromegaly, 633  
 Pediatric patients, pituitary surgery in, vision disorders after, 612  
 Pegvisomant, for postoperative acromegaly, 631–633  
 Pergolide, for prolactinoma, 673  
 Peroxisome proliferator-activated receptor gamma agonists  
   for Cushing disease, 656  
   for nonfunctioning pituitary tumors, 590  
 Petrosal sinus sampling, 642  
 Pilocytic astrocytomas (pituicytomas), MRI for, 532–533  
 Pineal gland, germinomas of, 536  
 Pituicytomas, MRI for, 532–533  
 Pituitary apoplexy, 532, 612–614  
 Pituitary tumors  
   imaging of, **529–542**  
   treatment of  
     acromegaly after, **621–638**  
     carcinomas, 533, **595–606**  
     Cushing disease and. *See* Cushing disease.

endoscopic surgery for, **555–569**, 675  
 hypopituitarism management in, **679–689**  
 nonfunctioning. *See* Nonfunctioning pituitary tumors.  
 prolactinomas. *See* Prolactinomas.  
 radiation therapy for. *See* Radiation therapy.  
 stereotactic radiosurgery for, **571–586**, 634, 675–676  
 visual outcomes after, **607–619**  
 Pneumosinus dilatans, 535  
 Polydipsia, after pituitary surgery, 683–684  
 Polyuria, after pituitary surgery, 683  
 Positron emission tomography, for pituitary carcinoma, 601  
 Prolactin  
   deficiency of, preoperative testing for, 682  
   elevated, in pituitary carcinoma, 599–601  
 Prolactinomas, **669–678**  
   clinical findings in, 669–670  
   differential diagnosis of, 670–671  
   incidental, 546–547  
   prevalence of, 669  
   resistant to dopamine agonists, 674  
   treatment of, 548, 588–589, 671–676  
     medical, 671–674  
     radiation therapy, 82, 578–579, 675–676  
     surgical, 674–675  
 Proton therapy, 573

## Q

Quinagolide, for prolactinoma, 673

## R

Radiation therapy. *See also* Stereotactic radiosurgery.  
   complications of, 616–617  
   for Cushing disease, 655  
   for nonfunctioning pituitary tumors, 588  
   for pituitary adenomas, external beam, 572–573, 580–582  
   for pituitary carcinoma, 602  
   for postoperative acromegaly, 633–634  
   for prolactinoma, 675–676  
   visual disorders due to, 616  
 Rathke cleft cysts, MRI for, 538  
 Resection  
   for large nonfunctioning pituitary tumors, 588  
   for pituitary carcinoma, 601  
 Retinoic acid receptors, in Cushing disease, 658–659  
 Rhinorrhea, after Cushing disease surgery, 647  
 Rosai-Dorfman disease, 537  
 Rosiglitazone, for nonfunctioning pituitary tumors, 590

## S

Saline solution, for hyponatremia, 685  
 Scotoma, junctional, 608–609  
 Silent apoplexy, 532  
 Sinusitis  
   after Cushing disease surgery, 647  
   after transsphenoidal surgery, 567  
 Somatostatin analogues  
   for Cushing disease, 657–658  
   for nonfunctioning pituitary tumors, 589  
   for postoperative acromegaly, 628–630, 633  
 Somatotroph adenomas, incidental, 547  
 Spindle-cell oncocytomas, MRI for, 533  
 Stereotactic radiosurgery  
   for pituitary adenomas, **571–586**  
     adverse events after, 580  
     in acromegaly, 575, 577–578  
     in Cushing disease, 575–576  
     in prolactinomas, 578–579, 675–676  
     nonfunctioning, 573–575  
     recurrent, 578, 580  
     remission in, 578, 580  
     techniques for, 572–573  
     versus external beam radiation therapy, 573  
   for postoperative acromegaly, 634  
 Steroidogenesis inhibitors, for Cushing disease, 659–661

## T

Temozolomide  
   for nonfunctioning pituitary tumors, 589–590  
   for pituitary carcinoma, 603  
   for prolactinoma, 674  
 Testosterone, deficiency of, postoperative, 687  
 Thromboembolic disease, after Cushing disease surgery, 648  
 Tolvaptan, for hyponatremia, 685  
 Transsphenoidal surgery  
   complications of, 616  
   endoscopic. *See* Endoscopic transsphenoidal surgery.  
   for Cushing disease, 654  
   for nonfunctioning pituitary tumors, 588  
   for prolactinoma, 674–675  
 Trigeminal nerve damage, in pituitary surgery, 612  
 Trilostane, for Cushing disease, 660  
 Trochlear nerve damage, in pituitary surgery, 610–611

## V

Valproate, for Cushing disease, 655–656  
 Vascular endothelial growth factor inhibitors, for nonfunctioning pituitary tumors, 589  
 Vasopressin, for diabetes insipidus, 684

## Visual disorders

after pituitary surgery, **607–619**

anatomic considerations in, 608–612

causes of, 616–617

management of, 617

preoperative assessment an, 612–613

prognosis for, 613–614

treatment of, 614–616

in prolactinoma, 670

surgery for, 548–549

Visual evoked potentials, before pituitary surgery, 614

**W**

World Health Organization, pituitary tumor definitions

of, 595–597