

| Assessment Points | | |
|-------------------|--|--|
| System | Effect | Possible Pathogenesis |
| RESP | Bronchitis, sinusitis, pneumonia, pneumonitis, airway obstruction | Direct effect of HIV Opportunistic infections Neoplasm (e.g., Kaposi sarcoma) |
| CV | Cardiomyopathy, coronary artery disease, pericardial effusion, endocarditis, pulm hypertension, vacuities | Direct effect of HIV Medication side effect, namely antiretroviral drugs (reverse transcriptase inhibitors) Autoimmune disease Neoplasm |
| HEME | Anemia, neutropenia, thrombocytopenia, lymphadenopathy, coagulopathy, hematologic malignancy | Direct effect of HIV Medication side effect |
| NEURO | Meningitis, encephalitis, encephalopathy, cognitive impairment, HNCI, AIDS dementia, autonomic and peripheral neuropathies, seizures | Direct effect of HIV Opportunistic infections Neoplasm |
| RENAL | Acute and chronic renal failure, nephropathy | Direct effect of HIV Medication side effect, namely antiretrovirals |
| GI | Oral lesions, dysphagia, odynophagia, diarrhea, HIV/AIDS enteropathy, pancreatitis, hepatobiliary involvement | Direct effect of HIV Opportunistic infections Medication side effect Neoplasm |
| ENDO | Lipodystrophy, metabolic syndrome, hypercortisolism, adrenal insufficiency, SIADH, hyperthyroidism, hypothyroidism, lactic acidosis | Direct effect of HIV Opportunistic infections Medication side effect |

Key References: Bajwa SJ, Kulshrestha A: The potential anesthetic threats, challenges and intensive care considerations in patients with HIV infection, *J Pharm Bioallied Sci* 5(1):10–16, 2013; Panlilio AL, Cardo DM, Grohskopf LA, et al.: Updated U.S. Public Health Service guidelines for the management of occupational exposures to HIV and recommendations for postexposure prophylaxis, *MMWR Recomm Rep* 54:1–17, 2005.

Perioperative Management

Preoperative Preparation

- Meticulous medication review, specifically for HAART drugs.
- Careful physical exam for signs of illnesses associated with an immunocompromised state (e.g., lymphadenopathy, Kaposi sarcoma lesions).
- Should continue antiretroviral medications throughout the periop period.
- Preop lab work (CBC, coagulation panel, renal and liver enzyme panels).
- Additional tests (ECG and CXR).
- CD4+ cell count to evaluate the severity of individual's disease and the likelihood of opportunistic infections and neoplasm.
 - A positive correlation between viral load and rate of transmission has been observed in certain populations.

Monitors

- Standard ASA monitors
- Additional monitors as indicated

Airway Management

- Should have awareness of active resp pathology such as infection, inflammatory processes, or airway

obstruction as a consequence of immunocompromised state or neoplasm.

- Concern for hypotension if active systemic infectious process or cardiac dysfunction.
- Careful dosing of medications to minimize drug interactions.

Choice of Anesthetic

- Based on type of procedure and pt's comorbidities.
- Pts with AIDS, given they are significantly immunocompromised and may have CV or infectious AIDS-defining illness, may not tolerate general anesthesia.
- Regional and neuraxial anesthesia have been used successfully in these pts and should be considered, but coagulopathy should be ruled out.
- HIV-infected pts may be given the option of cesarean section to decrease the risk of mother-baby transmission, though certain cesarean-associated complication rates have been found to be higher in HIV-infected pts.
- Drugs metabolized by CYP450 system should be dose adjusted if pt is on HAART regimen, specifically protease inhibitors and non-nucleotide reverse transcriptase inhibitors.

Extubation

- Standard extubation criteria apply.

Postoperative Period

- Susceptibility to infections.
- Significant cardiac events.
 - The antiretroviral drug abacavir has recently been shown to independently increase the risk of CV disease in HIV-infected pts.

Occupational Exposure

- Periop team members at higher risk of occupational transmission.
- Vigilance and meticulous handling of sharps and contaminated materials to decrease work-related exposure.
- Risk of exposure correlated with depth of skin inoculated, hollow-bore needle usage, and volume of HIV-infected body fluid involved.
- Know your hospital's policy regarding occupational exposures.
- Begin postexposure prophylaxis with a combination of antiretroviral medications as soon as possible but certainly within 72 hr of exposure.

Acromegaly

Russell T. Wall III

Risk

- People within USA:
 - Prevalence is 40 cases/million; incidence is 3 to 8 new cases/million/y.
 - Occurs with equal frequency in men and women and most frequently diagnosed in third to fifth decades of life (5 to 20 y lag between onset of symptoms and diagnosis).

Perioperative Risks

- Common conditions increasing periop risk include airway abnormalities, CV dysfunction (Htn), resp

impairment (obstructive sleep apnea), endo abnormalities (hyperglycemia).

Worry About

- Difficulty or inability to ventilate and/or intubate
- Extent of CV disease
- Postop airway obstruction

Overview

- Acromegaly is a slowly progressive, debilitating endocrinopathy resulting from excess secretion of growth hormone, usually from a benign macroadenoma of the anterior pituitary gland, and characterized by

overgrowth of soft tissues and bone and cartilage of skeleton (nose, jaw, hands, fingers, feet, toes). Excess growth hormone before puberty (epiphyseal closure) leads to gigantism (<5% of acromegalics).

Etiology

- Greater than 99% of cases result from primary pituitary adenoma.

Usual Treatment

- Surgery—primary therapy:
 - Transsphenoidal pituitary microsurgery versus transcranial; transsphenoidal more common

and preferred, with less morbidity. Smaller tumors (<10 mm diameter) yield probable cure. Otolaryngologists often assist neurosurgeons with access using sublabial or endonasal approach.

- Pituitary radiation—reserved for persistent postsurgical disease or when surgery is contraindicated.
- Medical—adjunctive therapy or for nonsurgical candidates, effective if adenoma cells have dopamine and/or somatostatin receptors:

- Dopamine agonists—bromocriptine and cabergoline.
- Somatostatin analogue—octreotide and lanreotide, inhibits GH release.

Assessment Points

| System | Effect | Assessment by Hx | PE | Test |
|--------|--|--|--|---|
| HEENT | Bone and soft tissue overgrowth of head and neck | TMJ arthritis Hoarseness Deep voice | Enlarged frontal, nasal bones Enlarged sinuses Macroglossia with glossoptosis Prognathism Hypertrophy of larynx Vocal cord thickening and edema Subglottic narrowing Enlarged thyroid gland (25%) with possible tracheal compression/deviation Recurrent laryngeal nerve paralysis | Indirect laryngoscopy Lateral neck x-rays CT of neck |
| CV | CAD PVD LV dysfunction Cardiomyopathy | Chest pain Htn CHF Dysrhythmias Diastolic dysfunction | Htn CHF Dysrhythmias Cardiomegaly Diastolic dysfunction | CXR ECG ECHO |
| RESP | Airway soft tissue overgrowth Upper airway and small airway narrowing | Obstructive sleep apnea (60% of pts) | Barrel chest with kyphosis | PFTs (if indicated) Sleep study |
| RENAL | Increased GI Ca ²⁺ absorption Hypercalciuria Increased total body Na ⁺ | Urolithiasis | Peripheral edema | |
| ENDO | Increased BMR Hyperprolactinemia (some adenomas secrete GH and prolactin) Hyperthyroidism (3–7%) Insulin resistance (80%) Glucose intolerance (30–45%) Overt DM (15–25%) Hypertriglyceridemia (20–45%) Hyperphosphatemia Colon polyps/malignancy | Heat intolerance Men: ↓ Libido, impotence Women: Menstrual abnormalities | Hyperhidrosis Enlarged thyroid (25%) | To diagnose acromegaly: ↑ 24 h GH levels Best screening test: ↑ serum IGF I Definitive test: Oral glucose tolerance test (GH levels do not ↓) TFTs Glucose Cholesterol, triglycerides Phosphorus Colonoscopy |
| CNS | Pituitary mass effect | Headache Hypersomnolence Visual disturbances | | CT MRI (with gadolinium) to determine tumor size +/- extrasellar expansion |
| PNS | Carpal tunnel syndrome | Paresthesias | Median nerve compression | EMG, NCV |
| MS | Bone and soft tissue overgrowth Osteoporosis Myopathy | Arthralgias Osteoarthritis (knees, hips, shoulders, lumbosacral spine) Fatigue, weakness | Enlarged hands and feet Hip, knee, shoulder, low back pain Muscle weakness | X-ray |

Key References: McGoldrick KE: Eye, ear, nose, and throat diseases. In Fleisher LA editor: *Anesthesia and uncommon diseases*, ed 6, Philadelphia, PA, 2012, Elsevier, pp 22–23; Melmed S, Jameson JL: Disorders of the anterior pituitary and hypothalamus. In Jameson JL editor: *Harrison's endocrinology*, ed 3, New York, NY, 2013, McGraw-Hill Education, pp 39–42.

Perioperative Implications

Preoperative Preparation

- Optimize hemodynamics—BP control, no CHF.
- Somatostatin analogue (octreotide) may shrink large macroadenoma.

Monitoring

- Pulse oximeter may be difficult to fit (large fingers, toes); recommend A-line, brachial or femoral preferable. Visual evoked potentials have limited usefulness.

Airway

- Large masks, airways, blades, intubating LMA, tracheostomy equipment available.
- Consider awake fiberoptic endotracheal intubation.

Induction

- If GA, anticipate airway obstruction
- If hypopituitarism from mass effect, then may need hydrocortisone
- Possible lumbar drain if suprasellar extension
- Prophylactic antibiotics

Maintenance

- For PIA or TIVA, use short-acting agent(s) for rapid recovery.
- If OSA, use opioids with caution.
- For transsphenoidal approach, surgical use of cocaine or epinephrine. Beware of increased BP and dysrhythmias.
- For transsphenoidal approach >15-degree head up tilt, caution for VAE.
- If prep pneumoencephalography, do not use nitrous oxide.
- Monitor serum glucose and treat hyperglycemia.
- Pack pharynx before surgery to prevent bleeding into laryngeal area and post-extubation laryngospasm.

Extubation

- Extubate awake with intact reflexes.
- Anticipate airway obstruction.
- No nasal CPAP, possible posttranssphenoidal surgery.

Adjuvants

- If myopathy, cautious use of muscle relaxants.
- If sleep apnea, cautious use of narcotics.
- If peripheral neuropathy, document prior to regional.

Postoperative Period

- Transient diabetes insipidus (20%), permanent 1% to 9%
- CSF rhinorrhea <5% of pts
- Anterior pituitary insufficiency (ACTH, TSH, gonadotropins) (20%); hormonal replacement with tapered cortisol therapy if necessary
- Meningitis, sinusitis, hematoma, cranial nerve palsy (III, IV, VI), nasal septal perforation, visual disturbances <1% each

Anticipated Problems/Concerns

- Airway management
- Hemodynamic stability