Acute Spinal Cord Compression: Treatment

- Spine Immobilization
- Foley Catheter
- ? IV Steroids / Diuretic / Mannitol
- Emergent Decompressive Laminectomy Or Radiation Treatment
Hypercalcemia of Malignancy

- **Causative tumors**
  - Metastatic Breast, Lung, or Prostate Cancer
  - Multiple Myeloma
  - Non-Hodgkin's Lymphoma
  - Adult T-cell Lymphoma / Leukemia
  - Renal Cell Cancer
  - Head & Neck Squamous Cell Cancer
Malignancy Hypercalcemia

- Symptoms
  - Vague Malaise / Weakness
  - Polydipsia
  - Lethargy / Confusion
  - Constipation
  - Vomiting
  - Back Pain
  - Can Have Coma Or Seizures
Malignancy Hypercalcemia

- Diagnosis
  - Total & Ionized Serum Calcium
  - Serum Albumin Sometimes Helpful
  - EKG Shows Short QT Interval
    - May Show Low Voltage, Long PR
  - Discrete Skeletal Lesions Not Demonstrable In 30% Of Patients
  - Serum Levels > 12 Mg % Dangerous
Malignancy Hypercalcemia

Treatment

- IV Hydration With Normal Saline
- Diuresis With IV Furosemide
  - Only After Fluid Loading; Avoid Thiazides
- IV Steroids
- Etidronate (7.5 Mg/Kg/Day IV For 3 Days)
- Mithramycin (15 To 25 Mcg/Kg/Day IV X 3 Days)
- Radiation Treatment To Tumor Site(s)
- Rarely May Need Hemodialysis
Considerations for Use of Etidronate (Didronel) for Tx of Malignant Hypercalcemia

- Acts Mainly To Reduce Bone Resorption
- Mainly Excreted Renally
- Causes Some Degree Of Hyperphosphatemia
- Should Be Withheld If Creatinine > 5 Mg %
- Dose (Must Be Diluted In 250 cc NS) :
  - 7.5 Mg/Kg/Day IV For 3 Days
- Dose Should Be Given Over 2 Hours
- Follow-up Treatment With Oral Tablets
  - 20 Mg/Kg/Day For 30 Days
Use of Mithramycin (Plicamycin) for Tx of Malignancy Hypercalcemia

- Acts As Antineoplastic Agent
- Method Of Action On Hypercalcemia Not Known
- Main Complication Is Bleeding
- GI Side Effects Common
- Can Cause Thrombocytopenia
- Most Useful As Second Agent For Cases Not Responsive To Etidronate
Hyperviscosity Syndrome

- Basic Cause Is Elevation Of Serum Proteins Producing Sludging & Reduction In Microcirculatory Perfusion
- Serum Viscosity Is Normally 1.4 To 1.8 Times That Of Water
- Symptoms Develop At Viscosity $> 5$
Hyperviscosity Syndrome

- Causative tumors
  - Multiple myeloma
  - Waldenstrom's macroglobulinemia
  - Chronic myelocytic leukemia
Hyperviscosity Syndrome

Symptoms

- Fatigue / Malaise
- Headache
- Anorexia
- Somnolence

If Microthromboses Occur:

- Deafness
- Visual Deficits
- Seizures
Hyperviscosity Syndrome: Diagnosis

- Anemia
- Rouleaux Formation (RBC’s Stacked Together in Long Chains) On Peripheral Blood Smear
- Retinal Hemorrhages / Exudates
- "Sausage-link" Appearance Of Retinal Vessels
- Factitious Hyponatremia (Due To H2O Displacement)
- Measurement Of Serum Viscosity & Serum Protein Electrophoresis (SPEP) Confirm Dx
Hyperviscosity Syndrome

Treatment

- If Comatose:
  - Emergent 2 Unit Phlebotomy & Saline Infusion
  - Rehydration With IV Saline
  - Emergency Plasmapheresis

- If Patient Has CML & Massive Leukocytosis:
  - Leukopheresis & Concurrent Chemo Treatment
Hyperleukocytic Syndrome

- Usually Occurs In New Onset AML
- Can Occur In CML With Blast Crisis
  - WBC > 100 K In AML Is Dangerous
  - WBC > 250 K In CML Is Dangerous
- Myeloblasts Invade & Damage Vessel Walls, Especially In Brain & Lung
- Serum Analyses Show Pseudohypoxia, Pseudohyperkalemia, & Pseudohypoglycemia
Hyperleukocytic Syndrome

- **Symptoms**
  - Marked Dyspnea
  - Headache, Confusion

- **Signs**
  - Hypoxia
  - Diffuse Lung Infiltrates
  - Neurological Deficits
Hyperleukocytic Syndrome

Treatment

- Temporizing With Leukopheresis
- Load With Allopurinol (600 Mg/M2)
- Then Give Hydroxyurea 3 To 5 Gm/M2
- Brain Radiation Treatment For CNS Leukostasis
- Definitive Chemotherapy Treatment Once WBC Decreased
Acute Tumor Lysis Syndrome

- Usually Occurs 6 To 72 Hours After Initiation Of Chemo treatment Or Radiation Treatment
- Due To Rapid Release Of Cell Contents Into Bloodstream
- Most Common Tumor Causes :
  - Leukemias (With High WBC Counts)
  - Lymphomas
  - Small Cell Cancer
  - Metastatic Adenocarcinoma
Acute Tumor Lysis Syndrome

Etiologic Factors

- Large Tumor Burden
- High Growth Fraction
- High Pretreatment Serum LDH Or Uric Acid
- Preexisting Renal Insufficiency
TUMOR CELL LYSIS

- Efflux of K+
- Release of nucleic acid
  - Purine catabolism
    - Hyperuricemia
      - Hyperkalemia
      - Arrhythmias
      - EKG abnorm.
      - Precipitation of uric acid crystals
      - Acute renal failure
    - Fluid depletion
      - Fever, vomiting, diarrhea
      - Poor intake
  - Hyper phosphatemia

Arrows = activation or consequences
Acute Tumor Lysis Syndrome

- Main Life-threatening Problems:
  - Hyperkalemia
  - Hyperuricemia (Causes Uric Acid Nephropathy)
  - Hyperphosphatemia With Secondary Hypocalcemia
- Can Result In Acute Renal Failure & Arrhythmias
Acute Tumor Lysis Syndrome Treatment

- Stop The Chemotherapy Treatment
- Aggressive IV Hydration / Diuresis
- +/- Alkalinize Urine To Ph 7
  - Decreases Urate But May Worsen Hypocalcemic Tetany
- CaCl2, Nahco3, Glucose / Insulin, Kayexalate For Hyperkalemia
- Emergency Hemodialysis
  - If K > 6, Urate > 10, Creat. > 10, Or Unable To Tolerate Diuresis
- Can Use Allopurinol For Prevention
Syndrome of Inappropriate Antidiuretic Hormone Secretion (SIADH)

- **Causative Tumors:**
  - Small Cell Lung Cancer Most Common (Ectopic ADH)
  - Pancreatic Cancer
  - Bowel Cancer
  - Thymus Cancer
  - Prostate Cancer
  - Lymphosarcoma
  - Any Brain Tumor

- **Vincristine Or Cyclophosphamide**
- **Other Meds (Narcotics, Phenothiazines, Etc.)**
SIADH: Symptoms

- Altered Mental Status
  - Lethargy
  - Confusion
- Anorexia, Nausea, Vomiting
- Peripheral Edema
- If Severe, Coma Or Seizures
SIADH: Diagnosis

- Normal Renal, Thyroid, Adrenal, & Cardiac Function
- Absence Of Diuretic Treatment
- Euvolemia Or Hypervolemia
- Hyponatremia With Less Than Maximally Dilute Urine
- Excessive Urine Na Excretion (> 30 Meq/Liter)
SIADH: Treatment

- Serum Na > 125 Usually Not Require Treatment
- Fluid Restriction Only, If Mild
- Furosemide With NS Bolus (Increases Free Water Clearance)
- Hypertonic Saline (3 %) Only Needed For:
  - Seizures
  - Coma
  - Cardiovascular Compromise
- Only Correct At About 1 Meq/Liter/Hour (If Too Fast Can Cause Central Pontine Myelinolysis)
- Seizure Control With Benzodiazepines
Malignancy - Caused Adrenal Crisis

- Causative Tumors:
  - Melanoma
  - Lung Cancer
  - Breast Cancer
  - Renal & Other Retroperitoneal Cancers

- Withdrawal Of Chronic Steroid Treatment
- Infection Of Adrenals
- Adrenal Hemorrhage
- Aminoglutethamide Chemo Treatment
Malignancy - Caused Adrenal Crisis

- **Symptoms**
  - Weakness, Lethargy
  - Thirst

- **Signs**
  - Dehydration
  - Hypotension
  - Hyponatremia, Hyperkalemia, Hypoglycemia, Azotemia, +/- Eosinophilia
Malignancy - Caused Adrenal Crisis

- **Diagnosis**
  - Serum Electrolytes, BUN
  - Serum Cortisol (Draw Prior To Treatment)
  - CT Of Retroperitoneum (+/- MRI)
- Start Treatment Prior To Full Workup
Malignancy - Caused Adrenal Crisis: Treatment

- IV Fluid Bolus (NS)
- IV Steroids (At Least 300 Mg Equivalents Of Hydrocortisone Per Day Initially)
- +/- Calcium, NaHCO3, Glucose / Insulin For Hyperkalemia
- IV Glucose
- Evaluate For Source Of Infection
- Maintain Steroid Coverage
Oncolologic Emergencies

Summary

- Have Low Threshold For Workup Of Vague Symptoms In The Cancer Patient
  - Better to overreact than underreact
- Consider Direct Effects Of Meds
- Treat Complications Aggressively If Primary Tumor Still Treatable
- Have Prearranged Referral Arrangements For Special Emergent Treatment's
Thank you

Any Questions???