

# Postoperative Management following Aortic stent graft

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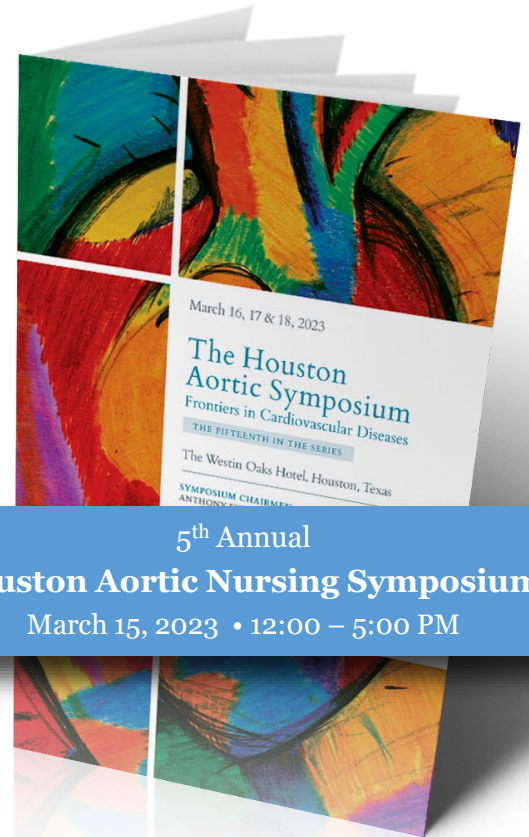
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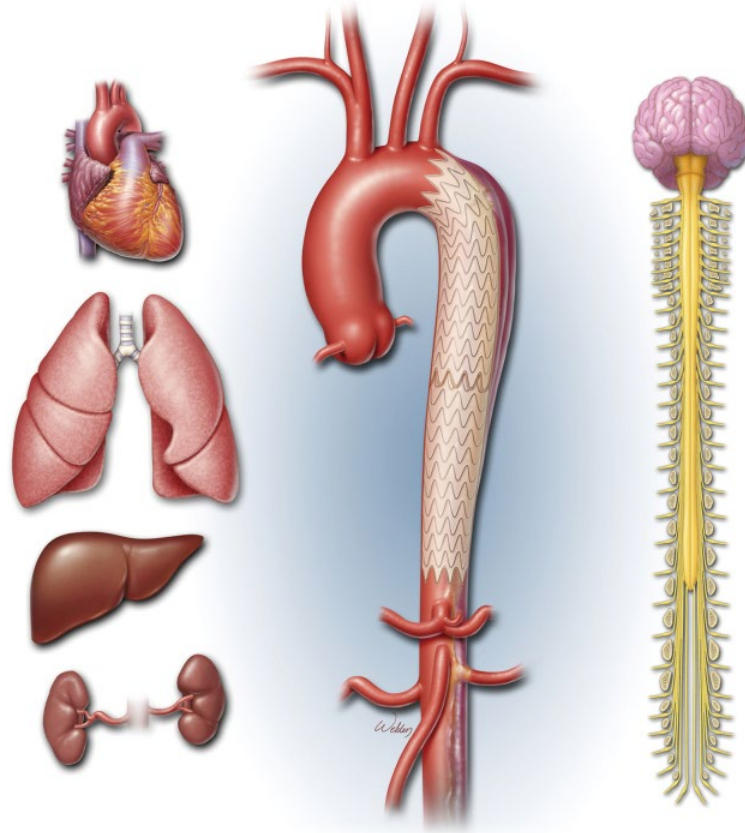
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# Postoperative management



# Neurological

- Stroke
  - Patients with chronic kidney disease and previous strokes are at higher risk
  - Degree of aortic coverage
    - Manipulation of the aortic arch
  - Aortic pathology
    - Severe or mobile atheroma
    - Penetrating aortic ulcer

# Neurological

- Vascular distribution of strokes
  - Anterior Circulation
  - Posterior Circulation
- Typically are embolic in origin
- Tend to happen early in postoperative course

# Neurological

- Early detection and recognition
- Code stroke or Neurology consult
- Stat imaging
  - CT non -contrast to evaluate for bleeding
  - CTA and possible MRI determined by Neurology
- Postoperative patients typically are not candidates for tPA
- Can consider cerebral angiogram by NeuroIR , but up to primary Surgeon discretion

# Neurological

- Spinal cord injury, Preventive strategies
  - Optimize spinal cord perfusion
  - Decrease oxygen demands
  - Early detection of any deficits
  - Use of modified Tarlov scale for assessment
    - 0 – no muscle contraction
    - 1 – minimal contraction without muscle shortening
    - 2 - Contraction but can't lift against gravity
    - 3 - Lift against gravity without resistance
    - 4 - Lift against gravity and some resistance
    - 5 – Normal strength

# Neurological

- **Preventing spinal cord injury**
  - Permissive hypertension can increase spinal cord collateral pressure
  - Keeping the hemoglobin above 10mg/dl for the first 24 hours -48
  - Maintain normal coagulation profile
  - If a patient is on dialysis may consider CRRT for the first to decrease the change in patient's blood pressure
  - Bedrest for the first 24-48 hours, depending on the extent of aneurysm repair
    - Keeping patient flat
    - May be able to use reverse Trendelenburg
    - Sometimes can sit up to 30 degrees after a period of being flat

# Cardiac

- Blood pressure
  - Moderate hypertension for the first 24 hours -48
    - SBP 130-160 mmHg
      - Utilize blood products
      - Start Norepinephrine drip



# Cardiac

- Blood pressure
  - Can liberalize blood pressure once cleared by Surgeon
    - Typically SBP > 110 mmHg
    - Small group of patient's may want to keep moderate hypertensive for up to 2 weeks

# Cardiac

- Arrhythmias
  - Atrial fibrillation
    - Can cause hypotension due to loss of the atrial kick
    - Monitor and correct electrolyte abnormalities
    - Rate control with beta blockers
    - Amiodarone drip per protocol
    - May need anticoagulation

# Cardiac

- Ventricular Arrhythmias
  - Close monitoring of the patients telemetry
  - Correct electrolyte imbalance
  - Evaluate preoperative echo and may need post op echo
    - Left atrial enlargement can identify patients that are high risk for ventricular arrhythmias

# Cardiac

- Myocardial infarction
  - Endovascular aortic repair patients are at a high risk of major cardiovascular events
    - Underlying coronary artery disease
    - Increased ventricular afterload and reduced diastolic coronary perfusion caused by changes due to aortic stent graft
  - Need to monitor troponins and BNP/ proBNP
    - If initial is negative can monitor daily
    - If positive then monitor q 6hrs x 3
  - Monitor EKG for acute changes

# Pulmonary

- Intubated patient
  - Target lung -protective ventilation
  - Aggressive weaning protocol
  - Diuresis if positive fluid balance from surgery
- Extubated patient
  - Encourage coughing and deep breathing
  - Pulmonary toilet, including incentive spirometer
  - Bronchodilator therapy

# Renal

- Impaired renal function following aortic stent graft has many causes
  - Advanced stages of CKD
  - Renal artery embolization, ischemia, vessel injury
  - Blood loss > 1 L
  - Long procedure time
  - Possible contrast -induced nephrotoxicity.
- Need to monitor patients creatinine and urine output

# Renal

- Admit day before for gentle hydration overnight.
- Post operative management
  - Optimize fluid status
  - Avoid nephrotoxic medications
  - Continue with Aspirin following the procedure
  - If the patient had a renal stent placed then Plavix should be started 2 weeks afterwards
- Again if the patient requires dialysis CRRT should be considered in the immediate post-operative phase

# Renal

- Persistent elevation in creatinine
- Hematuria
- Decrease in hemoglobin
- Flank pain
- CTA to evaluate for
  - Kidney injury, perinephric hematoma
  - Extravasation into retroperitoneal space
  - If a renal stent was placed, stenosis or occlusion
- Renal duplex can also be done instead or in conjunction of a CT scan



# Gastrointestinal

- Bowel ischemia
  - After FB -EVAR bowel ischemia is reported in 0.7 – 4%
  - Risk factors
    - Ruptured aneurysms
    - Long operative time
    - Multiple transfusions

# Gastrointestinal

- Bowel Ischemia
  - Microembolization
  - Hypogastric artery coverage
  - Dissection due to wire manipulation
  - Thrombus of target artery
- Colonic ischemia
  - Coverage of the Inferior mesenteric artery
  - Microembolization

# Gastrointestinal

- Close monitoring
  - Liver panel and lactic acid
  - Assess for abdominal pain and distension
  - Bloody diarrhea
  - Nausea/vomiting
- Imaging
  - CTA
  - Colonoscopy

# Inflammatory

- Postimplantation syndrome
  - Inflammatory immune-mediated response
  - Cause fever and leukocytosis
- Monitor closely
  - Monitor WBC and CRP along with vitals
  - May need to check blood and urine cultures
  - Supportive treatment

# Hematological

- Monitor Hemoglobin for signs of bleeding
  - Keep HH > 10 first 24 -48 hours
- Monitor for coagulopathy
  - Check PT, PTT, INR, Fibrinogen
  - Correct using FFP, platelets, Cryoprecipitate, or vitamin K
- Hold prophylaxis Lovenox or heparin for 48 - 72 hours

# Hematological

- Antiplatelet therapy
  - For patients that had a Fenestrated device or mesenteric branches
    - Aspirin only
  - Directional branches to the Renal arteries
    - Aspirin initially
    - Plavix – start 14 days after procedure
      - Decrease risk of hemorrhagic complications if a delayed spinal drain is needed

# Recap

Neurologic	Stroke Spinal cord ischemia	Neuro exam, CT/CTA, code stroke Tarlov scale, HH > 10, SBP 130-160, flat, spinal drain
Respiratory	Respiratory failure Pulmonary edema	Vent support Pulmonary toilet, IS, bronchodilators, diuretics, monitor BNP/creatinine
Cardiac	MI Afib/Vtach	Troponin/EKG initial and Q6 if +, may need cards consult Electrolyte replacement, BB/amiodarone
Renal	AKI  Perinephric hematoma	Fluid resuscitation, monitor creatinine, if need dialysis CRRT first 24-48 hours Flank pain, monitor HH and creatinine, may need CTA
GI	Bowel ischemia Ischemic colitis	Abdominal pain, N/V, CTA, EGS Abdominal pain, bloody BM, GI/colonoscopy
Inflammatory	Postimplantation syndrome	Monitor WBC, temp, CRP, Supportive care
Hematologic	Bleeding Hypercoagulable antiplatelet	Monitor HH and other s/s of bleeding, CT/US if needed Correct coagulopathy Need ASA immediately, Plavix in 2 weeks if renal stents




# Thank You!



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