Postoperative pain

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Common case presentation

68 year old male complaining about postoperative pain after arriving to the floor from the PACU.

References:[1,2,3,4,5,6,7,8,9,10,11]

I. Receiving the Phone call and initial thoughts

a. **Where is the pain?**
   Is it from the incision site, the shoulder, the flank, or from the suprapubic region and penis?
b. **What surgery did the patient have?**
   It is important to know the exact surgery the patient had with specific details. It is important to know whether or not the patient has a ureteral stent. Was there a significant resection done in the bladder/prostate. What was the bleeding risk? For example, in a partial nephrectomy, how deep was the resection, what was the blood loss? etc. This will likely require reading the brief operative report or talking to the surgical team.
c. **Does the patient have a Foley catheter, and if so, is it draining?**
   If a Foley is in place, the patient could be having bladder spasms. If the surgery was a TURP or TURBT, the catheter could be obstructed and the patient could be having pain from bladder distension.
d. **What are the vital signs?**
   It is important early on to make sure the patient is not hypotensive. Severe flank pain and hypotension after a partial nephrectomy would alert you to a possible bleed. Severe abdominal pain and distension with tachypnea and hypotension after a transurethral resection of a large bladder tumor could alert you to a possible intraperitoneal bladder rupture. If the pain is associated with concerning changes in the vital signs, you should evaluate the patient urgently.
e. **What pain medications have been given to this point?**
   Maybe the patient was not given enough pain control and the doses need to be titrated. It is

important to know how much opioid medication the patient has already received to avoid respiratory collapse from overdose.

II. Differential Diagnosis

a. **Bladder Spasms**
   This is the most common cause of lower abdominal and pelvic pain after lower urinary tract surgery or when a Foley is still in place
b. **Incisional pain**
   Can be significant for larger abdominal surgeries and open renal surgery
c. **Bladder distension**
   This could be from a clotted off catheter after transurethral resection case or from postoperative urinary retention
d. **Postoperative Bleeding**
   The patient could develop severe flank pain or abdominal pain if there is a significant postoperative bleed. This is usually accompanied by change and hemodynamic status
e. **Intraperitoneal bladder rupture**
   The patient can have severe abdominal pain and distension. If the patient is on continuous bladder irrigation, the abdomen can fill with fluid and lead to respiratory distress
f. **Renal Colic**
   Ureteral obstruction could be secondary to ureteral edema with intrinsic obstruction or do to extrinsic compression from injury, kinking, or hematoma compressing the ureter
g. **Ureteral stent pain**
   Ureteral stents can cause abdominal and flank pain. The distal coil can also cause significant bladder spasm pain, dysuria, and over activity
h. **Phrenic nerve irritation**
   CO_2 gas trapped after laparoscopic surgery can lead to shoulder pain, usually noticed when the patient sits up. This is caused by irritation of the diaphragm and phrenic nerve
i. **Myocardial Infarction (MI), Pulmonary Embolism (PE), Pneumothorax**
   If the patient is having chest pain with associated changes in hemodynamic and respiratory status, you need to think seriously about MI, PE, or even tension Pneumothorax, especially in the perioperative period

III. Evaluation

a. **Physical Exam**
   i. **Vital signs:** Hypotension, tachycardia, and respiratory distress are usually signs of more acute causes of pain such as bleeding, MI, PE, or bladder rupture
   ii. **Heart:** Check for tachycardia, arrhythmias
   iii. **Lungs:** Auscultation may reveal concern for hydrothorax, or hemothorax, especially after percutaneous nephrostolithotomy

iv. **Abdomen/Pelvis:** Feel for abdominal distension, bladder distension. Check the incision site for expanding hematoma. Check for costovertebral angle tenderness. A fluid wave can be seen with ascites
v. **Catheters/Drains:** Look for very bloody drainage and interrogate the Foley or nephrostomy tube if doesn't appear to be draining. If continuous bladder irrigation is being utilized, ensure that the catheter is not obstructed by clot and that the drainage bag is not full

b. **Laboratory Data**
i. **Hemogram:** Large drop in hemoglobin may alert you to bleeding. Significant increase or decrease in WBC can be seen in infection or bowel injury
ii. **Serum Electrolytes:** Elevated Creatinine can alert you to urine leak/bladder rupture. Serious electrolyte abnormalities can also be seen after long transurethral resection cases, especially in the setting of a perforation
iii. **Arterial blood gas:** Acidosis can be present with bowel ischemia
iv. **Lactic Acid levels:** Can be elevated with bowel ischemia

c. **Radiologic Studies**
i. **Abdominal Radiography:** KUB can be used to ensure a stent placed intraoperatively is in appropriate position. A "ground glass" appearance can be seen with ascites
ii. **Chest Radiography:** Large pleural effusion can be seen with hydrothorax following PCNL or renal surgery
iii. **Cystogram:** Cystogram is an important study for patients with concern of intraperitoneal bladder rupture
iv. **Antegrade Nephrostogram (AGNG):** AGNG can be used to evaluate for ureteral obstruction or significant urine leak following PCNL or ureteral reconstruction when a nephrostomy tube is in place
v. **Ultrasound:** Ultrasound can be used to evaluate for hydronephrosis if there is concern for ureteral obstruction in the postoperative period
vi. **CT scan:** CT scan is not typically utilized in the immediate postoperative period, but can be used to evaluate for large hematoma or residual stone. CT cystogram can be performed in evaluation for urine leak or bladder perforation

IV. Management

The WHO recommends a multimodal approach to the treatment of pain[1]

a. **Bladder spasms**
B&O suppositories work well in the immediate postoperative period. PO oxybutynin or sublingual hyoscyamine can also be used to manage bladder spasm pain
b. **Penile or urethral pain**
c. **In male patients with pain at the urethral meatus, either antibiotic ointment can help with lubricating the meatus or lidocaine jelly can be effective for relieving meatal related pain.**

d. **Incisional Pain/Renal Colic**
   Opioids continue to be a cornerstone of postoperative pain management. When possible, oral administration of opioids is recommended over parenteral opioids.[12] When parenteral opioids are needed beyond the first several hours after surgery, PCA is recommended in favor of provider-initiated bolus dosing.[13] Patients with chronic pain on opioids may have developed tolerance and require increased amounts of opioids to provide adequate pain relief.[14,15]
   Non-opioid analgesics should also be considered as part of a multimodal approach. IV acetaminophen and IV NSAIDS such as ketorolac or ibuprofen have proven beneficial to decrease opioid requirements in the postoperative period.[2] Renal function and bleeding risk need to be assessed prior to use of NSAIDs. Finally, topical agents can be effective as well. Lidocaine patches are helpful with abdominal and flank incisions. Ice packs are effective with scrotal incisions.
e. **Ureteral stent pain**
   Alpha-blockers such as tamsulosin and alfuzosin have been shown to decreasing stent pain in numerous studies.[3] Anticholinergics medications can help with bladder irritation caused by the distal coil of the stent
f. **Ipsilateral Shoulder Pain**
   Phrenic nerve irritation after laparoscopic surgery is relatively resistant to opioid analgesics. NSAIDs have shown some limited efficacy, but need to be used with caution after renal surgery.[8,9,10] Gabapentin is another drug with evidence of some efficacy for this type of pain[11]
g. **Treat the Underlying Cause of Pain**
   Ensure proper drainage of stents and PCN tubes. Significant bleeding may need intervention with either IR or surgical management. Intraperitoneal bladder rupture is usually managed surgically. Early diagnosis is important
h. Also we can look to other specialties that guide post-operative pain.[16]

V. Prevention of Postoperative Pain

a. **Anesthesia**
   i. Have a discussion and plan
      a. Tap blocks, epidural, local
   ii. immediate post-operative pain control
   iii. Discuss the patient's pre-operative opioid use
   iv. Plan for non-steroidal anti-inflammatories (Tylenol or Toradol)
b. **Surgeon**
   i. Local blocks and re-injection of incisions at the end of the case.
      a. Injection site
         a. Penile block
         b. Laparoscopic incision injections[17]
         c. Pain pumps[18,19]

b. Injection medication
a. Long acting (Liposomal bupivacaine) vs. short acting (lidocaine, bupivacaine)[20]

ii. Pelvic surgery could consider belladonna & opium suppository

c. **Nursing**

i. Discuss with your nursing staff post-operative pain issues
ii. Drug type, dose, timing, and duration.
iii. Watch the AUA summit on **opioid stewardship**.[21]
iv. Consider alternate medication for muscle relaxation
v. Use of warm or cold packs
a. In scrotal surgery, immediately placing ice pack indirectly on the skin can reduce swelling, bleeding, and pain.
vi. Alternate therapy such as aromatherapy,[22] acupuncture,[23] music[24] ect.

Key Takeaways

1. Always try and rule out dangerous causes of pain such as MI, PE, acute bleeding.
2. Try to get an understanding of the surgery and likely causes of the pain to tailor your treatment appropriately.
3. Immediately notify the surgical team of pain outside of what should be expected postoperatively or pain associated with significant changes in vital signs or laboratory values.

Other Resources

AUA Position Statement on Opioids

Post Operative Opioid Prescribing Strategies

Pain Management fact sheet from UrologyHealth.org

2018 Quality Improvement Summit on Opioid Stewardship

Videos

AUA Core Curriculum: Post Operative Pain

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