

C-36 The High-Risk Patient Undergoing Knee Replacement Surgery

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Objective

After completion of this session, the participant will be able to:

- Prepare an anesthetic plan to safely manage a joint replacement candidate with multiple comorbidities.

Case Stem Question

A 78 yo male is scheduled to undergo a left total knee replacement

He has a history of atrial fibrillation, HTN, chronic obstructive pulmonary disease (COPD)

He presents with a history of osteoarthritis of his left knee with progressively worsening pain.

Despite multiple conservative treatment measures, the patient's knee pain has steadily increased in severely, impacting his mobility.

VS: BP 170/90 HR 95 R 18 EKG-Atrial fibrillation Hgb/Hct: 11.5mg/dl; 32%

NA 140, K 5.3

His medications include losartan, metoprolol, apixaban and budesonide/formoterol

He has taken diclofenac and acetaminophen for his pain. His PCP orders oxycodone for him for exacerbations of his pain.

Guiding Questions for Discussion

1. How do these medications work?
2. What impact do they have on his surgery?
3. Any concerns about his BP? How would you proceed?

The patient has a history of COPD.

4. What steps would you take to evaluate his lung disease?
5. What if his exam demonstrates wheezing? What is your course of action?

Attempting to elicit exercise tolerance is difficult, as the patient claims he can't walk far due to his severe knee pain.

6. What are your options?

The patient's Hemoglobin is in the low normal range..

7. Would you cancel the case due to concerns for intraoperative bleeding?

The surgeon wants the patient to be given general anesthesia for the case.

8. What are the advantages and disadvantages of general vs neuraxial anesthesia during this case?

You decide to perform a spinal anesthetic and sedation for the case.

9. What anesthetic considerations do you have for placing a spinal?

10. What local anesthetic would you use for the spinal?

After administering the spinal, you place the patient supine and his left leg is positioned by the orthopedic surgery team. You notice that his blood pressure has dropped to 70/40.

11. What is your course of action?

During the surgery, there is a risk for a significant amount of blood loss. How can blood loss be mitigated during this surgery?

12. IV propofol sedation is used to augment the spinal anesthetic. The patient occasionally complains of his position. A colleague suggests adding fentanyl and midazolam

After increasing his sedation, you notice the patient getting intermittently hypoxic.

13. What actions do you take to mitigate hypoxia?

14. As the procedure progresses the patient appears uncomfortable and restless. Despite confirming an effective spinal level for the surgery, he appears uncomfortable. Oxygen saturation appears normal at 98%. What is the possible source of discomfort?

15. What are major complications of tourniquet application. What can be done to minimize them?

16. The procedure is finished. What are the options for post-op analgesia? Discuss the advantages and disadvantages of different options.

References

1. Turnbull ZA, Sastow D, Giambone GP, Tedore T. Anesthesia for the patient undergoing total knee replacement: current status and future prospects. *Local Reg Anesth.* 2017 Mar 8;10:1-7.
2. Kendall, M.C., Cohen, A.D., Principe-Marrero, S. et al. Spinal versus general anesthesia for patients undergoing outpatient total knee arthroplasty: a national propensity matched analysis of early postoperative outcomes. *BMC Anesthesiol* 21, 226 (2021).
3. Li J, Ma Y, Xiao L Postoperative Pain Management in Knee Arthroplasty. *Orthopedic Surgery* Vol 11, Issue 5 October 2019 pp 755-761