Clinical Cases in Inpatient Anticoagulation Management: Focus on Bridging

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Learning Objectives

1. Discuss current strategies for perioperative antithrombotic management
2. Compare bleeding and thrombotic event rates between available anticoagulants
3. Develop anticoagulant treatment plans for complex inpatient scenarios

Commonly Used Abbreviations:
AT=antithrombotic medication (includes OACs and antiplatelet agents)
DOAC=direct oral anticoagulant (includes dabigatran, rivaroxaban, apixaban, edoxaban etc)
DVT=deep venous thrombosis
OAC=oral anticoagulant (includes warfarin and DOACs)
PE=pulmonary embolism
TE=thromboembolism; VTE=venous thromboembolism (includes DVT and PE), ATE=arterial thromboembolism

Systematic Approach to Developing Inpt/Perioperative Antithrombotic Plans

1. Risk stratify patient and procedure
2. Assess need for interruption of OAC
3. If interrupting, determine timing of OAC cessation
4. If interrupting, assess need for bridge
5. If bridging, determine bridging agent, dose, and timing
6. If not bridging, assess need for VTE prophylaxis during interruption and determine optimal regimen
7. Determine ideal timing for resumption of OAC
8. Throughout - Monitor closely and mitigate risk

Key Takeaways

- Anticoagulants are high risk medications, and acute care and/or perioperative settings further heighten bleeding and thrombotic risks
- Evaluate patient-specific bleeding risk and thrombotic risk carefully and collaboratively, and monitor frequently
- Oral anticoagulants rarely need to be resumed immediately after a major procedure or bleed
- Therapeutic bridging likely causes more harm than good for most (if not all) patients
- Pharmacists should be prepared to lead on developing antithrombotic management plans in acute care and perioperative settings

General Notes:

Clinical Case #1: A patient on a DOAC for cancer-associated VTE requires urgent surgery

HPI: D.J. is a 58yom with advanced lung adenocarcinoma admitted multiple times in recent weeks for worsening malignant pleural effusions
PMH: HTN, multiple DVT/PE (most recent LLE proximal DVT diagnosed 6 weeks ago)
Home meds: lisinopril, apixaban 5 mg BID (held on admission by hospitalist), oxycodone
His respiratory status is tenuous on NIPPV. Thoracic surgery is consulted and plans for VATS with possible open thoracotomy, scheduled for hospital day 4. You round with the primary team the morning of hospital day 2 – Apixaban has been held since admission over the prior weekend and no antithrombotic is currently ordered.

How would you risk stratify this patient for thrombotic and bleeding complications?

What anticoagulation strategy do you recommend for this patient at this time?

Would you bridge this patient with a parenteral anticoagulant preoperatively?

If so, how? (agent, dose, timing?)

When and how would you reinitiate anticoagulation postoperatively?

Clinical Case #2: A patient on a DOAC for a Hx of AFib is admitted for a critical condition with uncertain procedural plan

HPI: M.M. is a 68yof a/w nausea and abdominal pain and found to have a SBO and AKI (eCrCl 30-40mL/min). She is made strict NPO and Surgery is c/s
PMH: HTN, DM2, paroxysmal AFib (CV score=4), HLD, PUD (bleed requiring EGD 2 months ago)
Home meds: lisinopril, rivaroxaban 20 mg qDay, metformin, atorvastatin, esomeprazole
Surgery is consulted and pursues monitoring with conservative management (IVF, NGT) and will reconsider intervention in the coming days if warranted. The admitting primary team hospitalist asks you for a recommendation on anticoagulation management while she is strict NPO and interventional plan is TBD.

How do you risk stratify this patient?

What anticoagulation strategy do you recommend for this patient at this time?

Would you bridge this patient with a parenteral anticoagulant while her DOAC is interrupted?

If so, how? (agent, dose, timing?)

When and how would you reinitiate anticoagulation?

Clinical Case #3: A patient on a DOAC for a Hx of VTE sustains a hip fracture requiring urgent total hip arthroplasty (THA)

HPI: 84yof residing at a nursing home p/w inability to ambulate, found to have fragility hip fracture. Wt=67kg. VS and labs WNL
PMH: osteoporosis, current daily tobacco use with 50pyh, HTN, dementia, Hx of LUE DVT 2 years ago (during hospitalization), COPD
Home meds: vit D/calcium, lisinopril, metoprolol, apixaban 5 mg BID
The admitting hospitalist holds apixaban on admission (last dose yesterday at 2100) and orders enoxaparin 40 mg SC qDay per the institutional hip fracture admission order set. Ortho schedules a THA tomorrow at 0800 and usually requests a fascia iliaca block for regional anesthesia and a spinal if feasible. You will be rounding with the surgical and medical teams and should provide recs for a perioperative antithrombotic plan.

How would you risk stratify this patient for thrombotic and bleeding complications?

Which of these anesthetic strategies would be generally safe in this patient - spinal neuraxial anesthesia and/or a fascia iliaca nerve block?

What anticoagulation strategy do you recommend for this patient at this time?

Would you bridge this patient with a parenteral anticoagulant preoperatively?

If so, how? (agent, dose, timing?)

When and how would you reinitiate OAC postoperatively?

Clinical Case #4: A patient on warfarin for mechanical heart valve (MHV) develops an intracranial hemorrhage (ICH)

HPI: T.F. is a 72yom that fell off a ladder while working on his roof. He sustained an SAH and multiple rib fractures
PMH: mAVR (bileaflet), HTN, Afib, HLD
Home meds: aspirin, atorvastatin, metoprolol, losartan, warfarin
Initial INR was 2.7. He received 2000 units of 4F-PCC + 10 mg vitamin IVPB in the trauma bay. He was intubated for airway protection and transferred to the ICU for close observation. Neurosurgery is consulted and recommends non-operative management and serial neuro checks/imaging. Repeat head CT the following day demonstrated stable SAH and no midline shift. The trauma team is asking if bridging is required and when to resume full anticoagulation.

What anticoagulation strategy do you recommend for this patient at this time?

Would you bridge this patient with a parenteral anticoagulant while OAC interrupted?

If so, how? (agent, dose, timing?)

When and how would you reinitiate anticoagulation?

How would your plan change if he had a mechanical MVR?

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