Bridging Anticoagulation with Oral Anticoagulants

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Disclosures

Timothy K. Liem, MD discloses the following:
• None

Indication for Anticoagulation Therapy

<table>
<thead>
<tr>
<th>Thromboembolic Risk</th>
<th>Mechanical Heart Valve</th>
<th>Atrial Fibrillation</th>
<th>VTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk</td>
<td>Any mechanical AVR</td>
<td>CHADS2 score 1-6</td>
<td>VTE &gt; 10% / yr arterial TE &gt; 10% / mo</td>
</tr>
<tr>
<td></td>
<td>- caged ball</td>
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<td>- filling disc</td>
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<td></td>
<td>- Recent CIA or TIA &lt; 60 yrs</td>
<td></td>
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<tr>
<td>Moderate Risk</td>
<td>Bileaflet AVR and ≤ 1 of atrial fib</td>
<td>CHADS2 score 1-4</td>
<td>VTE &gt; 5% / yr arterial TE &gt; 5-10% / mo</td>
</tr>
<tr>
<td></td>
<td>prior CIA or TIA</td>
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<td></td>
<td>HTN, DM, CHF or &lt;75 yrs</td>
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<tr>
<td>Low Risk</td>
<td>Bileaflet AVR without atrial fib or other CVA risk factors</td>
<td>CHADS2 score 0-2</td>
<td>VTE &gt; 1% / yr arterial TE &gt; 2% / mo</td>
</tr>
</tbody>
</table>

Adapted from Douketis, Chest 2012

Perioperative Management of Anticoagulation: To Bridge or Not to Bridge

Meta-analysis of peri-procedural OAC management in 12,278 patients

No difference in perioperative thromboembolism

3 to 5% increased risk of perioperative bleeding with bridging

In patients with a-fib who had warfarin interrupted for elective procedures:
Avoiding bridging anticoagulation was non-inferior to LMWH bridging for prevention of arterial thromboembolism, and decreased the risk of major bleeding.

Limitations:
• A-fib only, no mechanical valve/ VTE pts
• Only 3% had CHADS2 score 5-6
• Only 11% had major surgery


1884 pts with atrial fibrillation who had perioperative interruption of warfarin 5 days prior to surgery. Randomized to:
- LMWH (preop days 3-1)
- Placebo (preop days 3-1)
- Surgery


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A Double Blind Randomized Control Trial of Postoperative Low Molecular Weight Heparin Bridging Therapy Versus Placebo Bridging Therapy for Patients Who Are at High Risk for Arterial Thromboembolism (PERIOP 2)

1773 pts with prosthetic heart valves or high risk a-flib/a-flutter who require elective non-cardiac surgery or invasive procedure requiring VKA reversal

- 90-day major thromboembolism
- Major bleeding
- Survival

Recruitment completed November 2017

www.clinicaltrials.gov

Surgical and Invasive Procedures: Suggested Stratification by Bleeding Risk

High bleeding risk procedure (2-day risk of major bleeding >2%)

- Major surgery with extensive tissue injury
- Cancer surgery
- Major orthopedic surgery
- Cancer surgery
- Major surgery with extensive tissue injury

Low bleeding risk procedure (2-day risk of major bleeding <2%)

- Minor dental procedures
- Premalignant or cancerous skin nevi
- Premalignant or cancerous skin nevi
- Major surgery with extensive tissue injury

Interruption of DOACs for Surgery in Atrial Fibrillation Trials

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<th>ROCKET Af</th>
<th>ARISTOTLE</th>
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<tbody>
<tr>
<td>No. of patients</td>
<td>4,593/18,113</td>
<td>2,997/14,264</td>
<td>4,692/18,201</td>
</tr>
<tr>
<td>CHADS2 score</td>
<td>2.1</td>
<td>3.4</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Perioperative Management of Dabigatran
A Prospective Cohort Study

543 pts underwent 324 (60%) standard-risk and 217 (40%) high-risk procedures.

- Dabigatran stopped 1-6 days preop
- Major procedures: Resumed at 75mg (P<0.05)
- Major bleeding 1.8%
- Minor bleeding 5.2%
- Periop thromboembolism 0.2%

November 13-17, 2014, York Symposium, New York, NY
Summary

- Vitamin-K antagonists:
  - For patients at low- and moderate-risk for thromboembolism, LMWH bridging has no advantage, and is associated with increased bleeding.
  - For high-thromboembolism risk patients (Mechanical valves, CHADS₂ 5-6) postop bridging with prophylactic-dose LMWH or no bridging are associated with low periop thromboembolism and bleeding.

- DOACs: avoidance of perioperative bridging is a safer strategy in patients, regardless of their presumed risk for thromboembolism.

Perioperative Management of Anticoagulation: To Bridge or Not to Bridge

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<tr>
<td>High Risk</td>
<td>Any mechanical MVR</td>
<td>CHADS₂ score &gt;4</td>
<td>VTE &gt; 3 mos</td>
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<tr>
<td></td>
<td>Valve AVR</td>
<td>Rheumatic valve dz</td>
<td>Severe thrombophilia</td>
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<td></td>
<td>- caged ball</td>
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<td>Preop</td>
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<td></td>
<td>- tilting disc</td>
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<td>Antiphospholipid Ab</td>
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<tr>
<td></td>
<td>Recent CIA or TIA &gt;5mos</td>
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<td>Multi anomalies</td>
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<tr>
<td>Moderate Risk</td>
<td>3-15%/yr atrial TE</td>
<td>CHADS₂ score 2-4</td>
<td>VTE &gt; 3 mos</td>
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<tr>
<td></td>
<td>3-10%/yr VTE</td>
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<td>Severe thrombophilia</td>
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<td>VTE &gt; 3 mos</td>
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Additional Risk Stratification
- Procedure-related thrombosis risk (ATE and VTE)
- Procedure-related bleeding risk
- Pharmacokinetics of OAC medications (renal function)
- Ability to administer and absorb

210 MHV patients on warfarin undergoing 231 periprocedural bridging therapies
- 152 AVR bridging events/ 86 MVR (+ AVR) bridging events
- All bridged with prophylactic LMWH
- No thromboembolic events/ 1 mortality (0.4%)/ 3 major bleeding events (1.3%)

Bridging MHV patients undergoing massive, elective procedures with prophylactic LMWH results in low rates of thromboembolism with few major bleeding events.