ARterial Thrombosis

Background:
Arterial thrombosis is the most frequent major complication of cardiac catheterization. Incidence estimated between 3 to 8%.

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<th>%</th>
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<tbody>
<tr>
<td>UCSF</td>
<td>25/1037</td>
<td>2.4% (1)</td>
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<tr>
<td>HSC</td>
<td>165/4952</td>
<td>3.3%, 8.6% (2,3)</td>
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<td>Indiana</td>
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<td>7% if &lt; 7 kg (4)</td>
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Increased frequency in: infants <10 kg, interventional procedures (large French-size catheters), intimal damage, traumatic arterial cannulation. (increased total time of arterial cannulation)

Mechanism: vessel spasm with stasis, intimal injury +/- subintimal dissection and flap formation → leading to thrombus formation

Morbidity: tissue loss, claudication, leg length discrepancy

Management Algorithm:

1. Prevention
Minimal traumatic percutaneous entry into vessel to minimize intimal injury. Heparination (bolus 50-150 units/kg, maintain ACT > 100) during cardiac catheterization

2. Treatment
Prompt diagnosis Doppler pulse ≠ palpable pulse. Treat non-palpable pulse, weak pulse or cool extremity.

   - Early rx
     Remove pressure bandage
     Re-start heparin early (within 2 hours post cath).
     Re-bolus 50 U/kg/hr with maintenance 28 U/kg/hr (≤ 1 year old), 20 U/kg/hr (> 1 year old) with monitoring for therapeutic levels.
     May switch over to low molecular weight heparin.

   - Persistent/severe
     Thrombolytic therapy (see below)
     Surgical thrombectomy

Investigations: U/S of vessels if persistent non-palpable pulse after 24 hours of heparin.
If patient requires longer-term anticoagulation, contact Thrombosis Team who will monitor levels as an outpatient.

Heparin:

Heparin is prophylactic NOT thrombolytic. It prevents propagation of existing thrombus.

Prevention: Effectiveness of systemic heparinisation in preventing thrombosis during cardiac catheterization reduced incidence to 0.8 % (4). Note, this data pre-dates the subsequent increased volume of interventional procedures.

Management: 71% (32/45) improved with heparin therapy alone. (ref 2)

Thrombolysis: Tissue Plasminogen Activator (at HSC)

Notify responsible HSC cardiologist prior to starting.
Consult Thrombosis Team.
Dosage: See “Anticoagulation & Anti-thrombotic Medications” in manual


45 of 526 (8.6%) patient with decreased or absent femoral pulses
33% < 10 kg

71% (32/45) improved with heparin therapy alone.
84% (11/13) were successful treated with streptokinase
2.4% of total patients received streptokinase
No episodes of serious systemic bleeding.

REFERENCES: