RISK BENEFIT ASSESSMENT OF INTRACARDIAC LINES IN THE CURRENT ERA

Jenna Heichel, MSN, CRNP
PCICS 2018
• Reviewed 6,690 intracardiac catheters in 5,666 patients over a 10-yr period
  • 39.12% RA catheters | 35.77% LA catheters | 25.11% PA catheters
• Total of 40 complications (0.59%); 1 mortality
  • 25 related retention complications (0.37%)
  • 15 related bleeding complications (0.22%)
Transthoracic intracardiac catheters in pediatric patients recovering from congenital heart defect surgery: Associated complications and outcomes

Heidi R. Flori, MD; Lori D. Johnson, RN, MS; Frank L. Hanley, MD; Jeffrey R. Fineman, MD

• Reviewed 351 patients with total of 523 catheters
  • 276 RA catheters | 155 LA catheters | 68 CA catheters | 24 PA catheters

Morbidity Associated with Catheter Removal

- Risk factors
  - LA or PA cath
  - Age <3 months
  - Thrombocytopenia

Intervention Occurrence w/ Identified Risk Factors

Morbidity Occurrence During ICU Stay

- Non Function: 10.9%
- Thrombus: 0.6%
- Infection: 1.5%

Morphidities Associated with Catheter Removal

- Bleeding: 35%
- Need for Intervention: 8%
- Hemodynamic Compromise: 2.6%
Complications of intrathoracic lines placed during cardiac surgery

Himanshu Pratap, MS, MBBS, a Johnny Millar, MBChB, PhD, b Warwick Butt, MBBS, b,c,d and Yves d’Udekem, MD, PhD, a,b,d Melbourne, Victoria, Australia

- 1404 intracardiac lines inserted into 1118 patients over 8 years
- Overall complication rate: 2.1% (30); no mortality
- Surgical intervention required in 9 (0.8%) cases (8 for bleeding)

<table>
<thead>
<tr>
<th>Complication</th>
<th>LA line (n = 724)</th>
<th>PA line (n = 413)</th>
<th>RA line (n = 267)</th>
<th>Total (n = 1404)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migration and/or premature removal</td>
<td>2</td>
<td>3</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Bleeding</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Thrombosis</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Occlusion</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Failed removal</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6 (0.8)</strong></td>
<td><strong>7 (1.6)</strong></td>
<td><strong>17 (6.3)</strong></td>
<td><strong>30 (2.1)</strong></td>
</tr>
</tbody>
</table>
• 115 intracardiac catheters placed in 112 patients over 7-yr period
  • 45 RA | 68 LA | 2 PA
• Catheter-associated adverse events: 4.3%
  • 1.7% Infection
  • 1.7% Non-function
  • 0.9% Leakage/Extravasation
  • 0% Thrombosis or Migration
• Removal-associated adverse events: 19.1%
  • Minor: 14%
  • Serious (+ intervention): 5.1%
  • 1 mortality
CURRENT SURVEY DATA

Institution Location

- Northeast 19%
- Midwest 35%
- Southeast 16%
- Southwest 15%
- West Coast 15%

Catheter Usage

- RA
- LA
- PA
CURRENT SURVEY DATA

Removal Personnel

- RN: 65%
- ICU APP: 4%
- ICU Fellow: 19%
- CVS Fellow: 4%
- CVS APP or Fellow: 8%

Blood Availability

- No: 60%
- Yes: 40%

- LA Only: 60%
- Uncrossmatched: 40%
**BENEFITS**

- *Reliable* access in patients with challenging access
- *Direct placement* during surgery
- *Very low risk of thrombosis*, ideal in single ventricle patients
- *Arrhythmia recognition* through waveform analysis
- *Direct pressure measurement*, helpful in evaluating:
  - Preload
  - Ventricular compliance
  - Pulmonary reactivity
  - Trans-pulmonary gradient
- *Venous oximetry* measurements
RISKS

- *Bleeding* upon removal (most common complication)
- *Fractured* or *retained* catheter
- *Migration* of catheter
- Line occlusion or *thrombosis* development
- *Infection* risk
- Propensity to elicit *arrhythmias*
CONCLUSIONS

• Relatively low complication rate & safe utility
• Reinforcement technique is important
• Bedside echocardiogram to assess catheter location
• Strict guidelines for use & removal
• Consider a selective approach to utilizing intracardiac lines
REFERENCES


