**Discussion**

The results show a decrease in mean arterial pressure after steep trendelenburg for Robotic Prostatectomy. The cardiac output falls, with a remarkably consistent (P=0.00000026 - yes, that's 6 "0"s) reduction in Cardiac Power Index (CPI). The primary cause of the hypotension cannot be a fall in Total Peripheral Resistance Index (TPRI); it rises. The rise in TPRI may mitigate the hypotension, but further impairs perfusion. The Cardiac Index (CI) often falls alarmingly low, with a CPI falling to levels associated with poor outcomes in septic shock and congestive failure. (References in abstract.) However no persistent sequelae resulted from these low flow states.

The low flow state normalized on levelling the table, suggesting that the cause may be associated with excessive rather than insufficient right atrial filling pressures. A possible hypothesis, perhaps provable by TTE/TEE, might be that increased chamber diameter from excessive filling pressures leads to a Laplacian decrease in ejection, as seen in congestive failure.

Prediction of which patients might be at risk for the greatest decrease CPI has not been easy. There appears no clear association with age, weight, pre-op passive leg raise test, or ventricular ejection time or even trendelenburg duration.

Inotropes might appropriately be used to treat this hypotension, rather than a vasoconstrictor, which appears to reduce flow further. Additional intravenous fluid in the steep trendelenburg is often contraindicated.

Can the results of this study be believed with this relatively novel non-invasive technique of bioreactance (Cheetah NICOM)? The consistency with which the CPI is associated with trendelenburg is almost unprecedented in a clinical investigation, suggesting also a high degree of consistent reproducibility of bioreactance measurement.

**Results**

<table>
<thead>
<tr>
<th>NICD2</th>
<th>Height</th>
<th>Low</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>24</td>
<td>66</td>
<td>66.92</td>
<td>2.92</td>
</tr>
<tr>
<td>End</td>
<td>262</td>
<td>66</td>
<td>65.61</td>
<td>4.31</td>
</tr>
</tbody>
</table>

**Heart Rate**

<table>
<thead>
<tr>
<th>MAP</th>
<th>Start</th>
<th>131</th>
<th>64</th>
<th>97.43</th>
<th>14.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>End</td>
<td>108</td>
<td>64</td>
<td>82.82</td>
<td>10.66</td>
<td></td>
</tr>
</tbody>
</table>

**Card Index**

<table>
<thead>
<tr>
<th>Start</th>
<th>5.32</th>
<th>5.02</th>
<th>3.62</th>
<th>0.86</th>
</tr>
</thead>
<tbody>
<tr>
<td>End</td>
<td>4.39</td>
<td>4.89</td>
<td>2.55</td>
<td>0.79</td>
</tr>
</tbody>
</table>

**Card Perf Ind**

<table>
<thead>
<tr>
<th>Start</th>
<th>1.4</th>
<th>0.5</th>
<th>0.78</th>
<th>0.24</th>
</tr>
</thead>
<tbody>
<tr>
<td>End</td>
<td>0.9</td>
<td>0.5</td>
<td>0.50</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**TPRI**

<table>
<thead>
<tr>
<th>Start</th>
<th>45.67</th>
<th>1037</th>
<th>2385</th>
<th>806</th>
</tr>
</thead>
<tbody>
<tr>
<td>End</td>
<td>82.65</td>
<td>1520</td>
<td>2952</td>
<td>1365</td>
</tr>
</tbody>
</table>

**Summary:** Decreased Cardiac Power Index causes the hypotension frequently seen during trendelenburg in robotic prostatectomy. Very low Cardiac Index is common. Why?

---

**References:**