Does Lymphovenous Bypass for Breast-Cancer Related Lymphedema Impact Bioimpedance Spectroscopy Measurements?

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Background
- Breast cancer related lymphedema (BCRL) is common after treatment of breast cancer
- Bioimpedance spectroscopy (BIS) measures tissue resistance to an electrical current to determine extracellular fluid and is used as an objective measurement of BCRL
- Lymphovenous bypass (LVB) is a surgical method to treat refractory BCRL

Aims
- We aimed to determine if BIS measurements can accurately assess reduction in BCRL in patients who underwent LVB

Methods
- Patients who underwent LVB for BCRL from Jan. 2015-Dec. 2018
- All patients underwent baseline BIS prior to oncologic surgery with serial BIS measurements during follow-up visits
- LVB type and number of anastomoses determined at surgeon’s discretion
- Differences in BIS over time were compared using a t-test
- Linear regression used to evaluate the correlation between number of LVB performed and BIS change

Results
- 9 patients underwent LVB for BCRL
- Average change pre-LVB 4-SD
- Post-LVB 3-SD change after 6 mo, 2-SD change after 20 mo
- No correlation between number of LVB anastomoses performed and degree of BIS change
- 75% of patients with persistent clinical lymphedema reported subjective symptom improvement

Discussion
- After LVB BIS measurements significantly decrease
- Although 45% of patients had persistent lymphedema, 75% of those patients reported symptomatic improvement thus aligning more accurately with decrease in BIS measurements
- The number of LVB performed did not correlate with the degree of BIS change pre and post-LVB
- Future directions include higher stage BCRL intervention, greater number of patients enrolled, longer follow up
- BIS may be used as a tool to monitor for response to LVB

Table 1. Clinicopathologic characteristics

<table>
<thead>
<tr>
<th>Lymphedema Stage</th>
<th>Pre-LVB, n (%)</th>
<th>Post-LVB, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No evidence of BCRL</td>
<td>0</td>
<td>5 (55.5)</td>
</tr>
<tr>
<td>Subclinical</td>
<td>2 (22.2)</td>
<td>0</td>
</tr>
<tr>
<td>Stage 1</td>
<td>6 (66.6)</td>
<td>4 (44.5)</td>
</tr>
<tr>
<td>Stage 2</td>
<td>1 (111)</td>
<td>0</td>
</tr>
<tr>
<td>Stage 3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2. Clinical stage of BCRL pre- and post-LVB.