Assessing the Value of Autologous Fat Grafting: A Focused Review of the Safety, Effectiveness, and Efficiency Among Reconstructive and Cosmetic Applications

Scott L. Spear, MD1; Courtney N. Coles, MPH2; Braden K. Leung, PhD3; Matthew Gitlin, PharmD2; Mousam Parekh, MS4, David Macarios, MBA, MSc4

1Sibley Memorial Hospital, Washington DC; 2BluePath Solutions, Santa Monica, CA; 3ACELITY, San Antonio, TX; 4LifeCell, an ACELITY Company, Bridgewater, NJ

Introduction

- In 2014, 15.6 million cosmetic and 5.8 million reconstructive autologous fat grafting (AFG) procedures were performed in the United States.

- There is increasing evidence suggesting the safety and effectiveness of AFG.

- However, little is known about the efficiency of AFG.

Study Objective:

- To conduct a literature review of the safety, effectiveness, and efficiency of AFG in all applications.

Methods

- Systematic literature review of fat grafting procedures

  - **Time Frame:** April 1, 2010 and April 30, 2015

  - **Database:** PubMed

  - **Variables collected:** Study, patient, surgical characteristics, and safety, effectiveness and efficiency outcomes

  - **Data Output:** Descriptive Statistics (Weighted Mean or Weighted Percentage), Univariate Analysis

- Two reviewers independently reviewed the articles and any differences were resolved by a third reviewer.
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Results

Studies Included:

- Clinical trials
- Randomized Controlled trials
- Prospective/ Retrospective studies
- Epidemiology studies
- Burden and cost of illness
Results (Cont’d)

Study characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Breast</th>
<th>Facial</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Follow-Up Time Months</td>
<td>25.4</td>
<td>15.1</td>
<td>52.2</td>
</tr>
<tr>
<td>(Range)</td>
<td>(5-91)</td>
<td>(3-27)</td>
<td>(12-71.5)</td>
</tr>
<tr>
<td>Mean Study Size Subjects</td>
<td>121.1</td>
<td>69.2</td>
<td>241.3</td>
</tr>
<tr>
<td>(Range)</td>
<td>(18-1000)</td>
<td>(12-500)</td>
<td>(12-789)</td>
</tr>
</tbody>
</table>

Patient characteristics

- Facial application patient cohort had a higher mean age and BMI (body mass index) compared to breast or other applications.
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Results (Cont’d)

Fat processing technique

<table>
<thead>
<tr>
<th>Variable</th>
<th>Breast (Range)</th>
<th>Facial (Range)</th>
<th>Other (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reoperation</td>
<td>20% (3-68%)</td>
<td>3% (0-12%)</td>
<td>6.5% (5-16%)</td>
</tr>
<tr>
<td>Cyst Formation</td>
<td>5% (0-25%)</td>
<td>0% (0%)</td>
<td>Not Reported</td>
</tr>
<tr>
<td>Fat Necrosis</td>
<td>6% (0-19%)</td>
<td>1.1% (0-2%)</td>
<td>1.4% (0-3%)</td>
</tr>
<tr>
<td>Infection</td>
<td>1% (0-4%)</td>
<td>4.3% (0-14%)</td>
<td>0.4% (0-1%)</td>
</tr>
<tr>
<td>Retention</td>
<td>62% (39-78%)</td>
<td>63% (54-85%)</td>
<td>70%*</td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td>93% (68-100%)</td>
<td>89% (46-100%)</td>
<td>96% (91-100%)</td>
</tr>
</tbody>
</table>

* Range Not Available

Breast cancer recurrence rates post-reconstruction were about 3% using a weighted average (by sample size).
Results (Cont’d)

Efficiency outcomes

- For breast applications, there was an association between volume injected and operating room time.
- Data was not available for facial/other applications.

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Facial</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean Harvest Volume (Range)</strong></td>
<td>558 ml (120-1299ml)</td>
<td>62 ml (35-360ml)</td>
<td>1753.8 ml*</td>
</tr>
<tr>
<td><strong>Mean Injection Volume (Range)</strong></td>
<td>145 mL (20-606 ml)</td>
<td>14.5 ml (2.1-27.1 ml)</td>
<td>336.1 ml (18-692 ml)</td>
</tr>
<tr>
<td><strong>Operating Room Time (Range)</strong></td>
<td>125 minutes (40-210 minutes)</td>
<td>Not Reported</td>
<td>Not Reported</td>
</tr>
</tbody>
</table>

* Range Not Available

Conclusions

- Safety/Effectiveness: The safety and effectiveness results were consistent and validate previous research published.
Conclusions (Cont'd)

- **Safety/Effectiveness**: The safety and effectiveness results were consistent and validate previous research published.

- **Efficiency**: The efficiency data available, although limited, suggest that there is an opportunity to reduce OR time and resources.

- **Limitation**: There was high variability and lack of uniformity in reporting among these studies.

- **Limited data suggests need for the ASPS effort to collect and standardize data by using the GRAFT registry.**

References

Available upon request

Contact: PubsMgt@Acelity.com

Disclosures

- **SLS**: Consultant to LifeCell, an ACELITY Company, Allergan, Establishment Labs, and Novadaq and Endurance Labs
- **CNC**: Received funding to conduct research
- **BKL**: Employee of ACELITY
- **MG**: Received funding to conduct research
- **MP, DM**: Employees of LifeCell, an ACELITY Company

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