From Theory to Technical Excellence: Cannula Injection in the Lip and Face

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FACULTY INFORMATION

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Dr. Bloom has disclosed that he is a consultant for Allergan, Galderma, Merz, Revance Therapeutics, ThermiAesthetics, InMode, Sinclair Pharmaceuticals, Alma Lasers, Remedly, Aqua Pharmaceuticals, Cearna, MEND, and Prollenium.
LEARNING OBJECTIVES

• Describe the rationale for selecting a blunt cannula for filler injection

• Describe advanced techniques for cannula injection to optimize outcomes while minimizing adverse events
The Rationale for Blunt Cannula
POTENTIAL ADVANTAGES OF CANNULA INJECTION

- Single point of entry for broader coverage
- Mechanical action on fibroblasts stimulates new collagen production
- Virtually no bruising
- Less pain
- Minimal downtime
- Less chance of intravascular injection reduces risk of
  - Vascular occlusion/necrosis
  - Filler embolization
  - Blindness

RISK FOR INTRA-ARTERIAL INJECTION WITH SHARP NEEDLE

Clinical Trial Data in Favor of Blunt Cannula for Filler Injections
THE IMPRECISION OF SHARP NEEDLE INJECTION?

- Cadaver study: With sharp needle technique, filler was found in supra-periosteal layer as expected, but also in subdermis and dermis

Possible Factors Influencing Spread in Tissue Layers

<table>
<thead>
<tr>
<th>TECHNIQUE SPECIFICS</th>
<th>PRODUCT PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Angled approach vs perpendicular approach</td>
<td>• Rheologic properties influence the amount of spread in the tissue</td>
</tr>
<tr>
<td>o Needle and cannula trajectories represent possible paths of least resistance</td>
<td>o Viscosity</td>
</tr>
<tr>
<td>o When the path of least resistance traverses multiple anatomical layers, the</td>
<td>o Elasticity</td>
</tr>
<tr>
<td>chance of backflow to these layers increases</td>
<td>o Cohesivity</td>
</tr>
<tr>
<td>• Lumen of needle may influence backflow</td>
<td>• Other product-related factors</td>
</tr>
<tr>
<td>• Applied pressure to the syringe might influence backflow positively</td>
<td>o Particle size</td>
</tr>
<tr>
<td></td>
<td>o Concentration of HA/hydration</td>
</tr>
<tr>
<td></td>
<td>o Crosslinking</td>
</tr>
<tr>
<td></td>
<td>o Temperature</td>
</tr>
</tbody>
</table>

TEMPORAL HOLLOW INJECTION – SHARP NEEDLE RESULTS IN UNEVEN DISTRIBUTION IN MULTIPLE LEVELS
TEMPORAL HOLLOW INJECTION – BLUNT-TIP CANNULA RESULTS IN EVEN DISTRIBUTION IN THE TARGET LAYER

TEAR TROUGH INJECTION –
SHARP NEEDLE RESULTS IN UNEVEN DISTRIBUTION IN MULTIPLE LAYERS

TEAR TROUGH INJECTION – BLUNT-TIP CANNULA RESULTS IN EVEN DISTRIBUTION IN THE TARGET LAYER

THE CANNULA ENTAILS AN INITIAL ANGLED DESCENT FOLLOWED BY MORE HORIZONTAL ADVANCEMENT OF THE CANNULA AT DEPTH

BLUNT-TIP MICROCANNULA = LESS BRUIsing/HEMATOMAS AND PAIN, WITH FASTER RECOVERY VS SHARP NEEDLE

- 95 patients aged 30 to 76 years (facial, décolleté, and hand augmentation)
- Topical anesthesia peel-off mask of lidocaine/tetracaine
- Cross-linked HA (20 mg to 28 mg per mL) injected into the mid-dermis
  - Microcannula or needle inserted in entire length of the fold, depression, or lip
  - Filler injected in a linear retrograde fashion with variable volume
- Overall GAIS (no significant differences microcannula vs. hypodermic needle)
  - 1 month: excellent (55%), moderate (35%), somewhat improved (10%)
  - 6 months: excellent (23%), moderate (44%), somewhat improved (33%)
- Adverse events
  - Visual Analog Scale for Pain during the injections: 3 (mild) for microcannula vs 6 (moderate) for hypodermic needle
  - Bruising and ecchymosis were more marked with hypodermic needle

GAIS = Global Aesthetic Improvement Scale
SAFETY AND EFFICACY OF CANNULA INJECTION

SPHAL for Lip Augmentation:
- Multi-center, open-label, prospective study
- 60 subjects
- Mean total volume (ie, both lips and optional perioral rhytids) of 2.2 mL
- Clinically significant improvement at week 12
  - GAIS for both lips
    • Investigator-reported: 98.0%
    • Subject-reported: 84.3%
  - MLFS (investigator-reported): 96.1%

GAIS = Global Aesthetic Improvement Scale; MLFS = Medicis Lip Fullness Scale; SPHAL = Small-Particle Hyaluronic Acid Plus Lidocaine
### TREATMENT-EMERGENT ADVERSE EVENTS (TEAE)

**Injection Site Bruising**

<table>
<thead>
<tr>
<th>Level</th>
<th>Events</th>
<th>Subjects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>5</td>
<td>4</td>
<td>6.7%</td>
</tr>
<tr>
<td>Moderate</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>4</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

**Injection Site Swelling**

<table>
<thead>
<tr>
<th>Level</th>
<th>Events</th>
<th>Subjects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>10</td>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>Moderate</td>
<td>4</td>
<td>2</td>
<td>3.3%</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>8</td>
<td>13.3%</td>
</tr>
</tbody>
</table>

**Injection Site Pain**

<table>
<thead>
<tr>
<th>Level</th>
<th>Events</th>
<th>Subjects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>2</td>
<td>1</td>
<td>1.7%</td>
</tr>
<tr>
<td>Moderate</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
<td>1</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

**Any Related TEAEs**

<table>
<thead>
<tr>
<th>Level</th>
<th>Events</th>
<th>Subjects</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>17</td>
<td>9</td>
<td>15%</td>
</tr>
<tr>
<td>Moderate</td>
<td>4</td>
<td>2</td>
<td>3.3%</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>9</td>
<td>15%</td>
</tr>
</tbody>
</table>

- No TEAEs for 81.7% subjects; No “severe” related TEAEs reported
- Lip safety lip assessments were reported as normal at all study points, with exception of 1 report of abnormal texture that returned to normal by week 4
OPTIMAL TECHNIQUES FOR PRECISION CANNULA INJECTIONS

1. Injection principles
2. Choosing the right cannula
3. Minimizing adverse events
• Obtain the best possible results with optimal safety
  – Treat each area at the appropriate depth of injection (not too superficial)
    • Based largely on a knowledge of the facial anatomy
  – Use the appropriate filler for each site and expected results based on product rheology & characteristics (eg, viscosity, G’, HA concentration, etc.)

• Select the correct cannula size for the product and the area to be injected
  – Delicate areas (lips, tear troughs) require thinner cannulas vs areas of thicker tissue need a more robust cannula (midface, temples)
  – The cannula pilot hole should always be one size or gauge larger than the cannula being used
SELECTING THE RIGHT CANNULA SIZE

For low concentration and viscosity HA fillers, superficial injections

30G x 1" (25mm):
*tear trough, fine lines - precise work*

For fillers of medium concentration and viscosity HA fillers

27G x 1" (25mm):
*precise work*

27G x 1 ½" (38mm):
*most versatile size, used for most facial indications*

27G x 2" (50mm):
*extra length to cover larger treatment area*
SELECTING THE RIGHT CANNULA SIZE

For medium to thick HA and non HA fillers, median to deep injections:
- 25G x 1½” (38mm): can be used for most facial indications
- 25G x 2” (50mm): extra length to cover larger treatment area

For viscous & highly concentrated fillers, injections deep into the skin to create volume:
- 23G x 1¾” (29mm): precision for thick fillers
- 22G x 2” (50mm): most versatile size for thick fillers
- 22G x 2¾” (70mm): perfect for the hands

For facial fat graft (not recommended for fillers):
- 18G x 2¾” (70mm)
- 16G x 4” (100mm)
MINIMIZING THE RISK OF ADVERSE EVENTS WITH CANNULAS

- Adverse events are rare
  - Risk of blindness and necrosis are rare, but firm knowledge of the vascular anatomy is key prevention and management
- Aspirate before injecting
- Inject slowly with the least amount of pressure possible
- Move tip with delivery of product
- Incrementally inject 0.1 to 0.2 mL of product
- Use small syringe to deliver precise aliquots
- Use small gauge needle (cannula) to slow injection speed
- When indicated, use blunt microcannulas
- Stop injecting if resistance is encountered or if patient experiences pain/discomfort
- Always monitor the patient during and post-injection