Evolution of Breast Reconstruction: A Review of the Literature
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### Background
- Breast Reconstruction is surgery performed on post-breast cancer patients to rebuild the breast mound, match the shape and size of the other breast, and improve self image/quality of life.
- Breast reconstruction was first documented in the 18th century, when patients were strapped to a chair and endured mastectomies without anesthesia. The patients would often feel embarrassed as a result due to their lack of breast, and this lead to the idea of reconstruction. Often survivors would survive the surgery only to die from the disease.
- Reconstruction technique has continued to evolve since, and is now a common practice in the medical community with a lower associated mortality.
- There are many factors to consider regarding breast reconstruction. Due to the numerous types of reconstruction, patients must thoroughly discuss what exactly they need or want with their plastic surgeon.
- At Cleveland Clinic (CC), the current method for breast reconstruction involves tissue expanders followed by silicone implants.

### Hypothesis
Breast reconstruction methods have changed a significant amount since their inception and are nearer than ever to perfection in terms of patient safety and satisfaction.

### Methodology
- A literature review of journal articles and educational pamphlets pertaining to breast reconstruction history and techniques was conducted.
- Methods spanning from the 18th century to the present day were summarized for the purpose of patient education.

### Breast Reconstruction Techniques: A Timeline (18th century-Present)

<table>
<thead>
<tr>
<th>Period</th>
<th>Description</th>
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<tbody>
<tr>
<td>18th Century</td>
<td>First documented case of breast mastectomy with idea of reconstruction. Women with breast cancer suffered through mastectomies as they were tied to a chair, and without anesthesia, their breasts were removed. Unlike the modern day, anesthesia was not yet developed for use in surgery. Many who survived the surgery nonetheless passed away from the disease itself.</td>
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<td>19th Century</td>
<td>The procedure evolved as surgical options improved and anesthesia was developed. Radical mastectomies became more common. This procedure consists of removal of the breast(s), lymph nodes, chest muscles, and at times section of the ribcage. This technique resulted in disfiguration and was thus discontinued.</td>
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<td>20th Century</td>
<td>With the development of silicone gel implants, cosmetic breast augmentation began.</td>
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<td>21st Century</td>
<td>The use of silicone gel implants was continued and developed to improve procedural outcomes. This method is now widely accepted as the safest, softest, and most natural in terms of appearance.</td>
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### Results
- Breast reconstructions have developed throughout the years, but personal preference is a significant consideration in deciding which reconstruction method a patient should undergo. A patient’s dialogue with her plastic surgeon is essential for the best possible outcome based on her personal circumstances and wishes.

### Types of Breast Mastectomy:
- **Skin Sparing:** In this procedure, all the breast skin, except the nipple and areola, is preserved. This makes reconstruction easier and most importantly avoids scarring on the breast, allowing for more aesthetic results following breast reconstruction.
- **Nipple and Areola Sparing:** In this procedure, all breast tissue is removed without removal of the skin, nipple, or the dark skin surrounding it (areola).
- These types of mastectomies are commonly employed to improve the results of breast reconstruction.

### Methods of Reconstruction:
- **Tissue expander**
- **Tissue implant**

### Limitations:
- Though breast reconstruction has improved the lives of many, the majority of breast cancer patients choose not to have reconstruction done following a mastectomy.
- Possible reasons for hesitation include:
  - Elective nature of the surgery
  - Overall lack of education regarding its potential benefits

### Conclusions
- Breast reconstruction has evolved greatly from rudimentary 18th century mastectomy techniques to current techniques which safely result in implants that are soft and natural in appearance.
- This progress can be attributed to the development of general anesthesia, tissue expanders, silicone gel implants, along with the ingenuity of surgeons and material scientists.
- For post-breast cancer patients, reconstruction is a viable option to consider. The specific technique to use for mastectomies (e.g. skin sparing & nipple and areola sparing) and reconstruction (tissue expander/implant) should be considered in detail based upon a patient’s unique circumstances and wishes as discussed with a plastic surgeon.

### Recommendations
- Expansion of this educational report as breast reconstruction is perfected.
- That patients considering breast reconstruction engage in further study on the topic and consider factors such as timing, which is important for the purpose of ensuring optimal results. Patients must discuss with their physician whether reconstruction should happen immediately or within a set amount of time.
- General recommendations for lifestyle changes to decrease a patient’s chance of surgical complication include smoking cessation and weight loss in overweight patients.