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# The effect of oncoplastic reduction on the incidence of post-operative lymphedema in breast cancer patients undergoing lumpectomy

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## Purpose

- In breast cancer patients with macromastia, breast conservation surgery (BCS) followed by radiation therapy (RT) may be associated with a different complication profile than those without macromastia.
- Oncoplastic reduction mammoplasty (ORM) aims to reduce breast volume while excising the tumor bed and its margins.
- Since breast volume was found to be a risk factor for chronic breast lymphedema, this study was performed to determine the impact of ORM on chronic breast lymphedema as well as other complications compared to BCS without ORM.

## Material & Methods

- We performed a retrospective chart review on patients who underwent lumpectomy with RT from 2014 to 2018.
- Chronic breast lymphedema (CBL) was defined as swelling that persisted >1 year post-RT.
- Breast volumes (BV) were determined by contoured breast volumes or, if unavailable, estimated by the 95% isodose volumes from the RT treatment planning system.
- Univariate analysis was used to evaluate patient factors and treatment outcomes in women with BV ≥1300 cc compared to <1300 cc.
  - These same analysis was performed in women who underwent ORM vs. BCS alone.
- Regression analysis was used to:
  - Evaluate factors associated with ≥1 complication
  - Identify factors associated with the development of CBL

## Results

- The total population included 1173 patients:
  - 1122 (95.7%) underwent BCS alone without ORM
  - 51 (4.3%) underwent ORM
  - 733 (62.5%) had a BV <1300 cc
  - 440 (37.5%) had BV ≥1300 cc
- Multivariate regression analysis demonstrated that compared to patients with BV < 1300 cc, patients with BV ≥1300 cc had:
  - Higher BMI (OR=1.200, P<0.001)
  - Increased risk of CBL (OR=2.127, P=0.024)
  - Decreased risk of grade 2 radiation dermatitis (OR=0.457, P=0.002)

### Logistic Regression:

#### Patient Factors and Complications in Women with Breast Volumes ≥ 1300

variable	OR (95% CI)	p-value
age	0.99 (0.977-1.006)	0.241
race (black vs. white)	1.18 (0.871-1.598)	0.285
race (other vs. white)	1.17 (0.477-2.871)	0.731
<b>BMI</b>	<b>1.20 (1.168-1.234)</b>	<b>&lt;0.001</b>
hx of diabetes	1.10 (0.794-1.532)	0.559
hx of hypertension	0.99 (0.695-1.407)	0.951
size of lumpectomy specimen	1.00 (1.000-1.001)	0.097
<b>grade 2 radiation dermatitis</b>	<b>0.46 (0.281-0.742)</b>	<b>0.002</b>
grade 3 radiation dermatitis	0.56 (0.285-1.095)	0.090
<b>post-op breast lymphedema &gt;1 year</b>	<b>2.13 (1.102-4.104)</b>	<b>0.024</b>

## Results

### Logistic Regression: Patient Factors and Complications in Women with ORM

variable	OR (95% CI)	p-value
BMI	1.016 (0.976-1.058)	0.441
concurrent ALND procedure	1.239 (0.511-3.004)	0.635
<b>post-op wound dehiscence</b>	<b>12.43 (4.398-35.143)</b>	<b>&lt;0.001</b>
<b>post-op hematoma</b>	<b>5.93 (2.375-14.823)</b>	<b>&lt;0.001</b>
<b>post-op seroma</b>	<b>0.20 (0.086-0.468)</b>	<b>&lt;0.001</b>
<b>post-op breast lymphedema &gt;1 year</b>	<b>1.221 (0.408-3.654)</b>	<b>0.721</b>

- ORM was associated with the following outcomes:
  - Increased risk of hematoma (OR=5.93, P<0.001)
  - Increased risk of wound dehiscence (OR=12.43, P<0.001)
  - Decreased risk of seroma (OR=0.20, P<0.001)
  - No change in risk for chronic breast lymphedema
- No significant difference in hypofractionated radiation frequency (76.5% of ORM patients, 72.9% of BCS alone patients, P=0.632)
- No significant difference in boost dose radiation usage (90.2% of ORM patients, 93.8% of BCS alone patients, P=0.376)

## Conclusion

Our data demonstrates that patients with breast volumes ≥1300 cc were two times more likely to develop CBL. Although patients with ORM had an increased risk for surgical site complications, the ORM procedure may have mitigated their risk for CBL. ORM should be considered at the time of BCS in women with macromastia to reduce their future risk of CBL as there is no cure for this disease.