

# The Impact of Premastectomy Versus Postmastectomy Radiation Therapy on Outcomes in Prepectoral Implant-Based Breast Reconstruction

Catherine J. Sinnott MD<sup>1</sup>, Mary T. Pronovost MD, MSN<sup>2</sup>, Christine Hodyl DO<sup>3</sup>, Anke Ott Young MD, PhD<sup>2,3</sup>  
<sup>1</sup>Long Island Plastic Surgical Group, Garden City NY, <sup>2</sup>Yale New Haven Health/Bridgeport Hospital, Bridgeport, CT,  
<sup>3</sup>Mount Sinai South Nassau Hospital, Oceanside, NY Email: Catherine.Sinnott@gmail.com

## PURPOSE

- To compare the impact of premastectomy versus postmastectomy radiation therapy on outcomes after prepectoral implant-based breast reconstruction.

## BACKGROUND

- Prepectoral implant breast reconstruction is being increasingly performed over subpectoral reconstruction because of the reduced invasiveness, postoperative pain and risk of animation deformity.
- Radiation therapy is a well-known risk factor for complications in implant-based breast reconstruction.
- However, the effect of premastectomy versus postmastectomy radiation therapy on outcomes after prepectoral breast reconstruction has not been well-defined.

## METHODS

- A retrospective chart review was conducted of all patients who underwent prepectoral breast reconstruction with inferior dermal flap and acellular dermal matrix (ADM) performed by the senior author from 2010 to 2019.
- Outcomes were assessed by comparing rates of infection, seroma, hematoma, dehiscence, mastectomy skin flap necrosis (MSFN), capsular contracture, rippling, implant loss, local recurrence and metastatic disease.

## METHODS



Prepectoral implant reconstruction technique. Top left, Wise pattern mastectomy incision. Top center, de-epithelialized dermal flap from inferior pole sewn to ADM. Top right, ADM and de-epithelialized dermal flap sewn to chest wall. Bottom left, implant pocket with implant covered with de-epithelialized dermal flap inferiorly and ADM superiorly. Bottom center, draping of mastectomy flaps over the implant. Bottom right, flap inset with a free nipple graft.

## RESULTS

	Prepectoral Total	Premastectomy Radiation	Postmastectomy Radiation	p-value
No. of patients	369	26	45	
No. of breasts	592	28	71	
Follow up (Months)	18.3±17.7	21.7±21.9	22.3±17.6	0.908
<b>Demographic</b>				
Age (yrs)(Mean±SD)	52.7±9.6	58.0±6.0	53.5±11.3	0.046*
BMI (kg/m <sup>2</sup> ) (Mean±SD)	28.7±6.0	28.7±6.6	29.8±6.2	0.546
Smokers (%)	7.6 (28)	15.8 (3)	8.9 (4)	0.415
Diabetes (%)	5.1 (19)	0	4.4 (2)	0.529
Premastectomy Chemo. (%)	13.3 (49)	15.8 (3)	35.6 (16)	0.114
Postmastectomy Chemo. (%)	19.0 (70)	10.5 (2)	44.4 (20)	0.009*
<b>Clinical</b>				
Unilateral (%)	39.6 (146)	63.2 (12)	57.8 (26)	0.689
Bilateral (%)	60.4 (223)	36.8 (7)	42.2 (19)	N/A
Prophylactic (%)	45.9 (272)	17.9 (5)	16.9 (12)	1.000
Therapeutic (%)	54.1 (320)	82.1 (23)	83.1 (59)	N/A
Implant Volume (cc)	370.2±120.6	366.8±145.4	381.4±132.4	0.709
Adjuvant Lipofilling (%)	41.7 (247)	32.1 (9)	43.7 (31)	0.293
Free Nipple Grafts (%)	48.5 (287)	7.1 (2)	26.8 (19)	0.032*
<b>Complications</b>				
Infection (Major) (%)	3.4 (20)	7.1 (2)	8.4 (6)	1.000
Infection (Minor) (%)	1.7 (10)	10.7 (3)	1.4 (1)	0.067
Seroma (%)	0.8 (5)	14.3 (4)	0	0.005*
Hematoma (%)	0.2 (1)	0	0	N/A
Dehiscence (%)	0.8 (5)	3.6 (1)	1.4 (1)	0.488
Necrosis Major (%)	2.2 (13)	7.1 (2)	2.8 (2)	0.317
Necrosis Minor (%)	4.2 (25)	0	4.2 (3)	0.556
Capsular Contracture (%)	5.6 (33)	10.7 (3)	19.7 (14)	0.382
Rippling (%)	0.7 (4)	0	0	N/A
Implant Loss (%)	5.1 (30)	21.4 (6)	9.9 (7)	0.184
Local Recurrence (%)	1.9 (11)	7.1 (2)	5.6 (4)	1.000
Metastatic Disease (%)	0.2 (1)	0	0	N/A

## RESULTS



65-year-old female 5 years status post bilateral prepectoral breast reconstruction.



45-year-old female 2 years status post left unilateral prepectoral breast reconstruction.

## RESULTS

- 369 patients (592 breasts) underwent prepectoral implant-based breast reconstruction during the study period.
- 26 patients (28 breasts) received premastectomy radiation and 45 patients (71 breasts) received postmastectomy radiation.
- 305 patients (493 breasts) did not receive radiation therapy.
- Premastectomy radiation patients had higher rates of seroma, minor infection, implant loss and local recurrence compared to non-radiated patients (p<0.05).
- Postmastectomy radiation patients had higher rates of major infection, implant loss, capsular contracture and local recurrence compared to non-radiated patients (p<0.02).
- Premastectomy radiation was associated with a higher rate of seroma compared to postmastectomy radiation (14.3% vs. 0%; p<0.005).
- Outcomes after prepectoral breast reconstruction were otherwise comparable between premastectomy and postmastectomy radiation groups.

## CONCLUSIONS

- Pre- and postmastectomy radiation therapy were associated with higher rates of infection and implant loss compared to non-radiated prepectoral implant reconstruction patients.
- Premastectomy radiation therapy was associated with a higher rate of seroma compared to postmastectomy radiation in prepectoral implant reconstruction.