



Outcomes In Two Staged Implant-Based Breast Reconstruction In Patients With Genetic Cancer Risks

Author(s):

Savannah Hampton¹
Avinash Jayaraman²
Leksmi Nair³
Sumeet Teotia, MD⁴
Nicholas Haddock, MD⁵

Background:

Patients with known genetic cancer risks (GCR) often undergo therapeutic or prophylactic breast reconstruction (BR). Studies comparing complication rates and number of surgeries within this population are lacking.

Methods:

We retrospectively reviewed 443 tissue expander-based BR, performed by two surgeons at one tertiary-care academic hospital from January 2012 to February 2016. Patients were divided into groups by GCR status and mastectomy indication: GCR+, therapeutic (Group1, n=66); GCR+, prophylactic (Group2, n=46); GCR-, therapeutic (Group3, n=315); GCR-, prophylactic (Group4, n=21). GCR included mutations in BRCA, CHEK2, PALB2, and others. Rates of reconstruction loss and percentages of patients choosing flaps were calculated using ANOVA and Tukey-HSD. For patients completing implant-based reconstruction (n=269) ANOVA and Tukey-HSD was used for statistical analysis.

Results:

Among all patients, co-morbidities were equivalent. There was a statistical difference in age when comparing Group3 (50.31yrs) to Group1 (45.48yrs) and Group2 (42.2yrs), $p=.01$ and $p=.00$ respectively. No statistically significant differences in the percentage of patients choosing flap-based reconstruction or reconstruction loss rates between groups was found. Amongst implant patients, co-morbidities and age were equivalent except between Group2 (41.5yrs) and Group3 (48.9yrs), $p=.02$. Complication rates, number of complication-related surgeries before or after implant, and number of revision surgeries were equivalent. There were no significant differences in the percentages of patients undergoing at least one complication-related surgery before implant ($p=.06$), at least one complication-related surgery after implant ($p=.45$), or at least one revision surgery ($p=.13$).

Table 1. Age, BMI, comorbidities, percentage of lost reconstructions, and percentage of patients choosing flaps amongst **all tissue expander patients**

Group	N	Age (yrs)	BMI (kg/m ²)	Patients with History of Smoking (%)	Patients with Hypertension (%)	Patients with Diabetes (%)	Patients Losing Reconstruction after TE Explant (%)	Patients choosing flap reconstruction without implant (%)
1 (GCR+, therapeutic)	66	45.5*	27.5	21	17	5	0	40
2 (GCR+, prophylactic)	46	42.2*	27.1	24	11	7	2	36
3 (GCR-, therapeutic)	315	50.3*	26.5	26	26	6	2	39
4 (GCR-, prophylactic)	21	43.9	27.3	24	29	0	0	19
F, p (ANOVA) df between groups = 3 df within groups = 444 p (Tukey-HSD) if applicable		9.6, .00 *3&1: p=.01 *3&2: p=.00	.57, .64	.21, .89	2.5, .06	.52, .68	.52, .67	1.2, .31

Table 2. Percentages of patients with specific complications **amongst patients receiving implants.**

Group	N	Infection requiring IV antibiotics	Necrosis requiring surgery	TE Exchange for new TE	Implant Rupture	Seroma	Hematoma	Anatomical Implant Rotation	DVT	PE	Others
1 (GCR+, therapeutic)	39	5.1	2.6	0	0	10.3	0	2.6	0	0	0
2 (GCR+, prophylactic)	28	7.1	14.3	0	0	10.7	3.6	7.1	0	0	7.1
3 (GCR-, therapeutic)	185	6.5	7.6	3.2	1.6	9.7	6.0	5.4	0	0	10.8
4 (GCR-, prophylactic)	17	5.9	0	0	0	5.9	0	5.9	0	0	0
F, p (ANOVA) df between groups = 3 df within groups = 265 p (Tukey-HSD) if applicable		.05, .99	1.6, .19	.9, .43	.5, .71	.1, .96	1.2, .31	.3, .85	N/A	N/A	.2, .88

Table 3. Age, BMI, and percentages of patients with comorbidities **amongst patients receiving implants.**

Group	N	Age (yrs)	BMI (kg/m ²)	Patients with History of Smoking (%)	Patients with Hypertension (%)	Patients with Diabetes (%)
1 (GCR+, therapeutic)	39	45.5	24.6	20.5	12.8	2.6
2 (GCR+, prophylactic)	28	41.5*	24.2	21.4	14.3	3.6
3 (GCR-, therapeutic)	185	48.9*	24.0	23.2	17.7	2.7
4 (GCR-, prophylactic)	17	42.7	27.0	23.5	23.2	0
F, p (ANOVA) df between groups = 3 df within groups = 265 p (Tukey-HSD) if applicable		4.2, .01 *2&3: p=.02	1.9, .13	.06, .98	1.0, .39	.2, .91

Table 4. Mean numbers of surgeries per patient and percentages of patients undergoing different surgeries **amongst patients receiving implants.**

Group	N	Number of Complication-related surgeries before implant	Number of Complication-related surgeries after implant	Number of Revision surgeries	Total Number of surgeries	Percentage of patients with at least one revision surgery	Percentage of patients with at least one complication-related surgery before implant placement	Percentage of patients with at least one complication-related surgery after implant placement
1 (GCR+, therapeutic)	39	.2	0	.5	2.7	33.3	15.4	0
2 (GCR+, prophylactic)	28	.4	.1	.4	2.9	25	35.7	7.1
3 (GCR-, therapeutic)	185	.2	.05	.6	2.9	40	17.8	3.8
4 (GCR-, prophylactic)	17	.06	.06	.7	2.8	58.8	5.9	5.9
F, p (ANOVA) df between groups = 3 df within groups = 265 p (Tukey-HSD) if applicable		1.9, .14	.6, .60	.7, .53	.7, .58	1.9, .13	2.6, .06	.9, .45

Conclusions:

Implant-based reconstruction outcomes are equivalent between genetic risk and non-genetic risk patients. Subgroup analysis revealed no changes in complications or number of surgeries.