

Impact of Breast Reconstruction Modality on Breast Cancer Recurrence Detection

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Background

- 5-year breast cancer locoregional recurrence rate ranges from 4-11%
- Scant literature evaluating long-term recurrence rates in patients with prosthetic versus autologous reconstruction

Objective: Evaluate the impact of reconstructive modality on oncologic outcomes including:

- Locoregional recurrence rate
- Size at recurrence
- Time to detection

Methods

- Retrospective cohort analysis (1990 - 2010)
- Excluded: <18 y.o., prior breast surgery, inflammatory cancer, latissimus dorsi flap reconstruction
- Kaplan-Meier curve estimated cumulative incidence of locoregional recurrence at time intervals:
 - Less than 13, 13-18, more than 18 years
- Cox proportion hazard model stratified by time for time to recurrence analysis

Table 1: Demographics and primary tumor characteristics

		Prosthetic Reconstruction (n= 502)	Autologous Flap Reconstruction (n= 415)	P Value
Age	Years	59.8	63.7	<0.01
BMI	Mean	25.5	27.5	0.05
Follow up Time	Month	108.9	124.8	<0.01
Reconstructive Modality	Tissue Expander	501	-	1
	Single Stage Implant	2	-	
	Pedicled TRAM	-	370	
	Free TRAM	-	4	
	DIEP	-	37	
	Superior Gluteal	-	5	
	SIEA	-	2	
Tumor Size	Tis	159	106	0.01
	T1 (<2 cm)	244	198	
	T2 (2 – 5 cm)	84	84	
	T3 (>5 cm)	14	23	
	T4	1	3	
Stage	DCIS	160	108	0.12
	1a	175	138	
	1b	0	1	
	2a	88	80	
	2b	41	38	
	3a	17	23	
	3b	1	1	
	3c	8	11	
	4	11	10	
Chemotherapy	Neoadjuvant	47	31	0.38
	Adjuvant	168	110	
Radiation	Adjuvant	78	54	

Results

- Primary tumors in autologous group were larger and with a trend towards more advanced stage
- No difference between chemotherapy or radiation treatment between groups

Table 2: Characteristics of locoregional recurrences

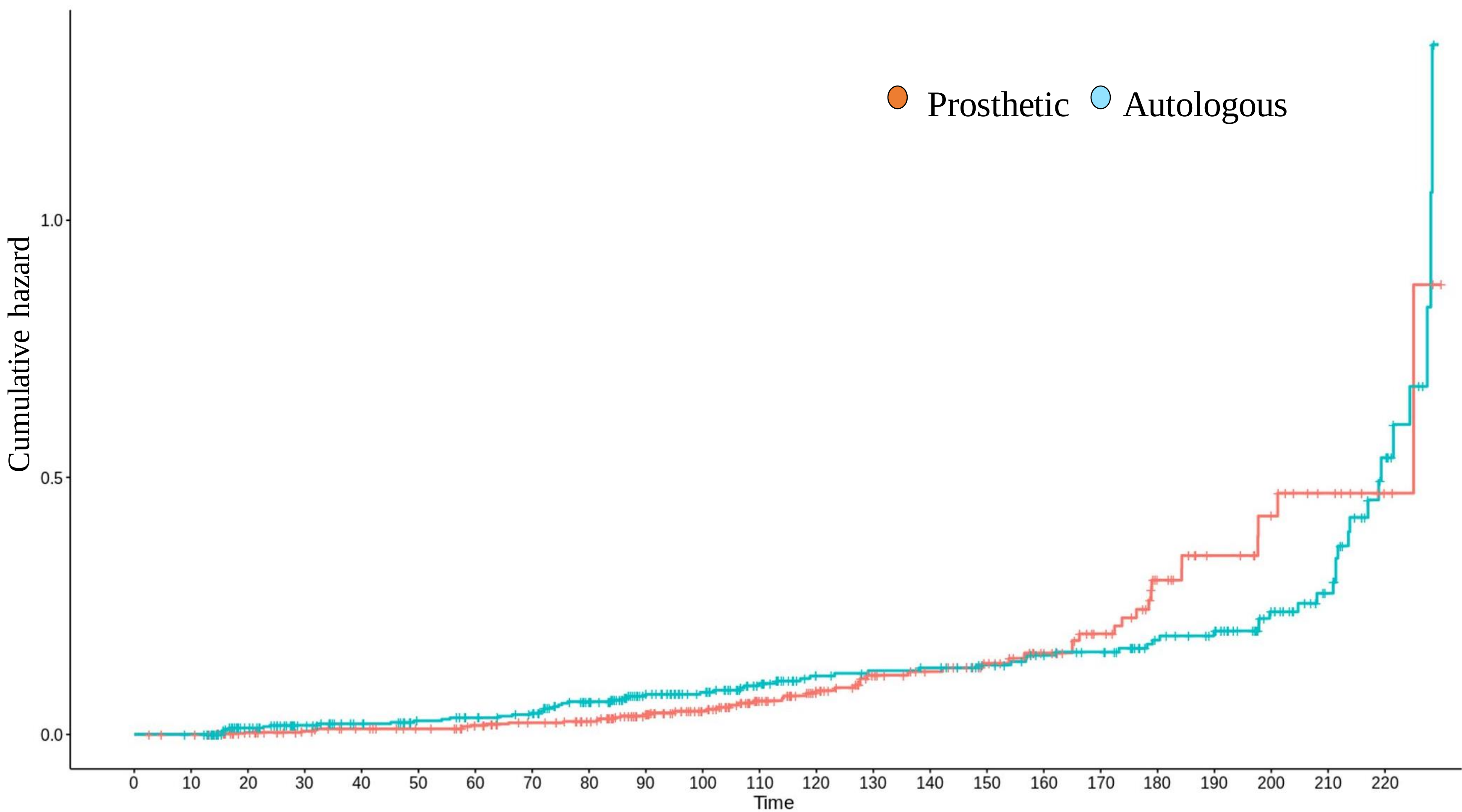
		Prosthetic Reconstruction	Autologous Flap Reconstruction	P Value
Patients with Recurrence % (n)		10.3% (52)	15.8% (66)	0.02
Days to Recurrence	Mean (SD)	1930 (221)	2630 (222)	0.02
Positive Lymph Nodes	0	12	13	0.15
	1 – 3	9	7	
	4 – 9	4	2	
	10+	1	3	
Size of Recurrence	Tis	10	10	0.014
	T1 (<2 cm)	22	24	
	T2 (2 – 5 cm)	4	4	
	T3 (>5 cm)	0	2	
	T4	16	26	
Stage	DCIS	9	10	0.02
	1a	10	13	
	2a	3	6	
	3a	4	0	
	3c	1	1	
Deceased	4	25	36	0.03
	Yes	36	47	

Table 3: Disease-free survival probability by time interval

Survival Probability	13-18 years	More than 18 years
Prosthetic	72.8% (CI: 64.8-81.8%)	62.6% (CI: 51.8 - 75.5%)
Autologous	82.7% (CI: 78.0 - 87.7%)	65.6% (CI: 56.5 - 76.1%)
Hazard Ratio (HR)		
	0.41 (0.18 – 0.92)*	1.56 (0.18 – 13.48)*
P-Value	0.03*	0.68*

*HR and p-value calculated from univariate time stratified cox regression to estimated survival probability time intervals, Reference time interval < 13 years

Figure: Risk of breast cancer recurrence stratified by time



- Higher overall autologous long-term recurrence rate
- Locoregional recurrence detected on average 700 days later in autologous group
 - Autologous recurrences larger, more advanced stage, and with higher mortality at detection
- Stratified by time:
 - Similarly low recurrence rate until approximately 13 yr in both groups
 - 13-18 yr: Prosthetic group with increased incidence of recurrence
 - Suggesting higher detection during this period on prosthetic reconstructions

Conclusions

- Autologous flap reconstruction appears to delay the detection of recurrence
- May be due to the masking of the entire breast footprint
- Subpectoral prosthetic reconstruction superficializes much of the posterior breast margin, enabling clinical detection of recurrence
- Consider increased long-term surveillance in autologous reconstruction patients