Does Immediate Breast Reconstruction lead to a delay in Adjuvant Chemotherapy for Breast Cancer? A Meta-analysis and Systematic Review

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Problem Statement

In a multidisciplinary approach to breast cancer, timely delivery of adjuvant chemotherapy is crucial. With an increasing frequency of immediate breast reconstructions (IBR) following mastectomy (MAS), concerns have arisen regarding its complication rates and effects on time to chemotherapy

Aim

This research aims analyse whether or not undergoing an immediate breast reconstruction following mastectomy for breast cancer leads to delays in time to adjuvant chemotherapy, with a meta analysis and systematic review.

Methods

23 original studies were identified following PRISMA guidelines, using seven electronic databases, hand-searched reference lists, review articles, and conference abstracts. Eligibility criteria included women receiving adjuvant chemotherapy who underwent either mastectomy only or mastectomy and immediate breast reconstruction. The primary outcome was time to chemotherapy (TTC) after surgery and secondary outcome was complication rates. A Random-effects model was used in the analysis.

Results

23 studies were included in analysis.

Patient numbers

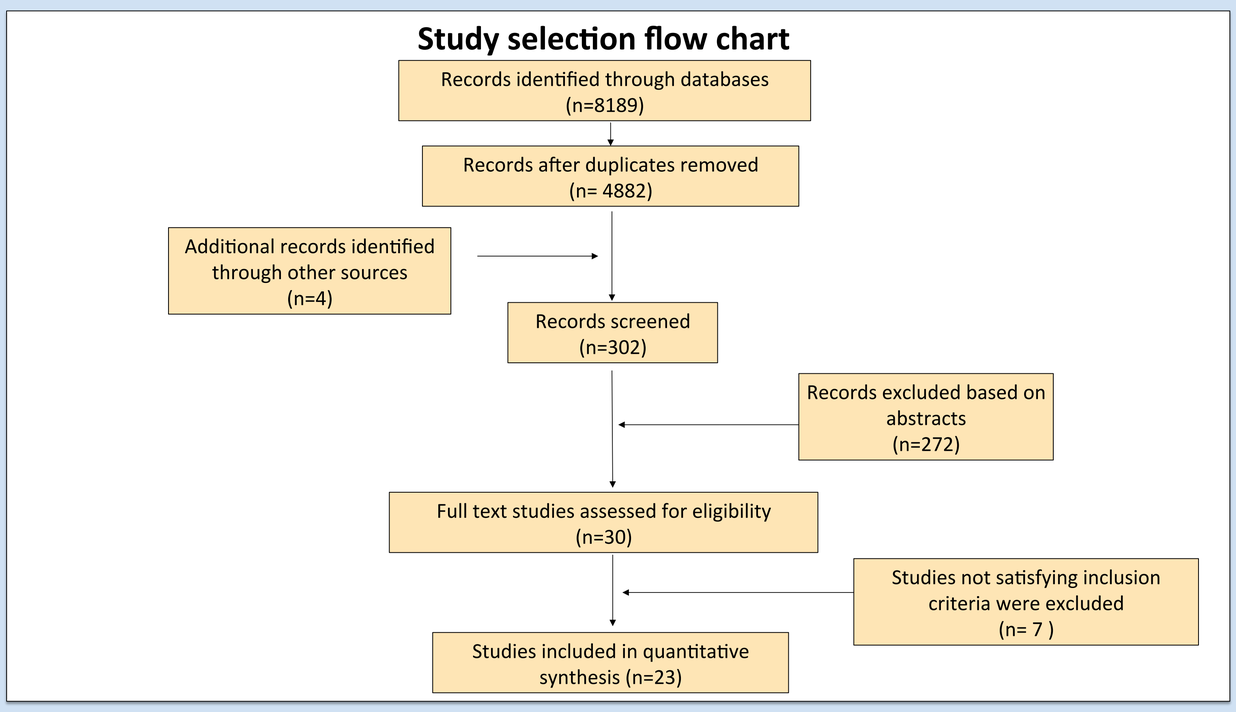
Total number of patients was 7163 (IBR: 2891; MAS: 4272). 55% of IBR performed were autologous compared to 54% prosthetic IBR. TTC in IBR was 44.23 days [SD: 15.56] vs MAS: 39.85 days [SD: 15.25] (p>0.001).

Delays past 90 days and complications

Difference in mean number of patients delayed past 90 days was not significant in IBR: 10.7 vs 10.4 MAS (p=0.90). IBR patients were more likely to have complications compared to the MAS group (OR: 1.82, 95% CI: 1.03-3.20, p=0.04).

Delays in chemotherapy stratified based on reconstruction type

Median TTC in autologous IBR was 37.67 [SD: 21.46] and median TTC in prosthetic IBR was 35.26 [SD: 20.98]. Different reconstruction methods yielded different mean TTC. Transverse rectus abdominis flaps (TRAM) had a median time of 43.20 days [SD: 4.9], Prosthetic 35.26 days [SD: 4.90], Latissimus Dorsi (LD) flap was 31.65 days [SD: 13.4] and Deep inferior epigastric perforator artery (DIEP) flap was 27.10 [SD: 13.4].



Time to Chemotherapy

	Mastectomy only	Immediate Breast Reconstruction
Number	4272	2981
Median time to chemotherapy (days)	39.85	44.3
Standard deviation	15.29	15.56

Figure 2: Results of meta analysis of comparing time to chemotherapy for mastectomy and IBR

	Total	Mastectomy only	Immediate Breast Reconstruction
Patient numbers	7163	4272	2891

Figure 1: Patient numbers included in meta analysis

Difference	P-value
Difference of 4.45 days	p<0.001

Figure 3: Difference in median time to chemotherapy between MAS and IBR

Complications

IBR VS MAS	Odds Ratio	Lower Limit	Upper limit	P-value
Complications	1.82	1.03	3.20	0.04

Figure 4: OR comparing likelihood of complications in IBR to MAS

Patients Delayed Past 90 Days

	DIEP	LD	All Prosthetic	All Autologous	TRAM
Mean time to chemotherapy (days)	27.10	31.65	35.26	37.67	43.20
Standard deviation	20.98	21.46	4.90	13.40	7.50

Figure 5: Difference in median time to chemotherapy stratified on method of reconstruction

	Mastectomy only	Immediate Breast Reconstruction
Total patient numbers delayed past 90 days	73	118
Mean number of patients delayed past 90 days	10.72	10.43
Difference	0.29	p=0.90

Figure 6: Difference in time to chemotherapy between Mastectomy only and Immediate Breast Reconstruction

Conclusion

We concluded that there is a statistically significant longer time to chemotherapy following IBR of 4.38 days, yet there no difference in delays past 90 days. Therefore, the longer TTC in IBR is unlikely to be of any clinical significance

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