

Meta-Analysis of Long-Term Oncological Outcomes of BCS vs. Mastectomy in Breast Cancer with BRCA Mutations

Ashiq Z, Lodhi MTK, Hashmi SN, Seabrook M, Shah MA, Rao AM
Shaukat Khanum Memorial Cancer Hospital and Research Centre, Lahore, Pakistan

BACKGROUND

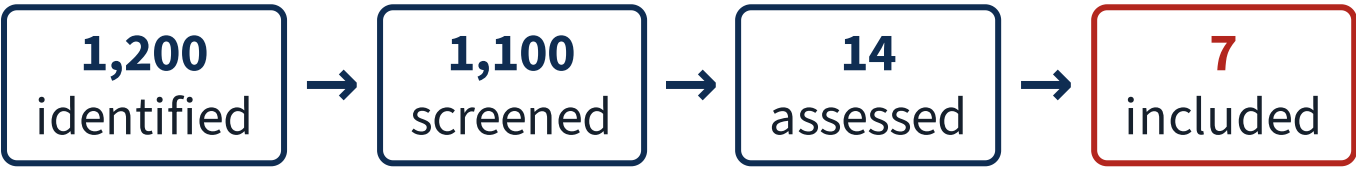
- BRCA1/2 carriers present at a younger age and have a high risk of second primary breast cancers, ipsilateral and contralateral.
- In the general population, breast-conserving surgery (BCS) with radiotherapy gives survival equivalent to mastectomy; whether this applies to BRCA carriers remains uncertain.

Objective: to compare long-term oncological outcomes, including survival and recurrence patterns, between BCS and mastectomy in BRCA1/2-associated breast cancer.

METHODS

- Design:** systematic review and meta-analysis (PRISMA).
- Search:** PubMed, Embase, Medline, Google Scholar; October–December 2025.
- Inclusion:** germline BRCA1/2 carriers; BCS compared with mastectomy; at least one oncological outcome.
- Exclusion:** case reports, reviews, editorials; non-comparative; non-English.
- Analysis:** odds ratios, random-effects model, I^2 ; quality by Newcastle–Ottawa Scale.

STUDY SELECTION



Included studies

Study	Country	BCS	Mx	F/U, y
Pierce 2010	Multi	219	353	≤15
Nilsson 2014	Sweden	45	118	≤15
Van den Broek 2019	Netherlands	76	80	10
Huang 2020	China	44	132	5–10
Wan 2021	China	179	312	7.5
Shubeck 2022	USA	99	325	7.9
Emiroglu 2023	Turkey	31	44	5

F/U, median follow-up; all studies high quality.

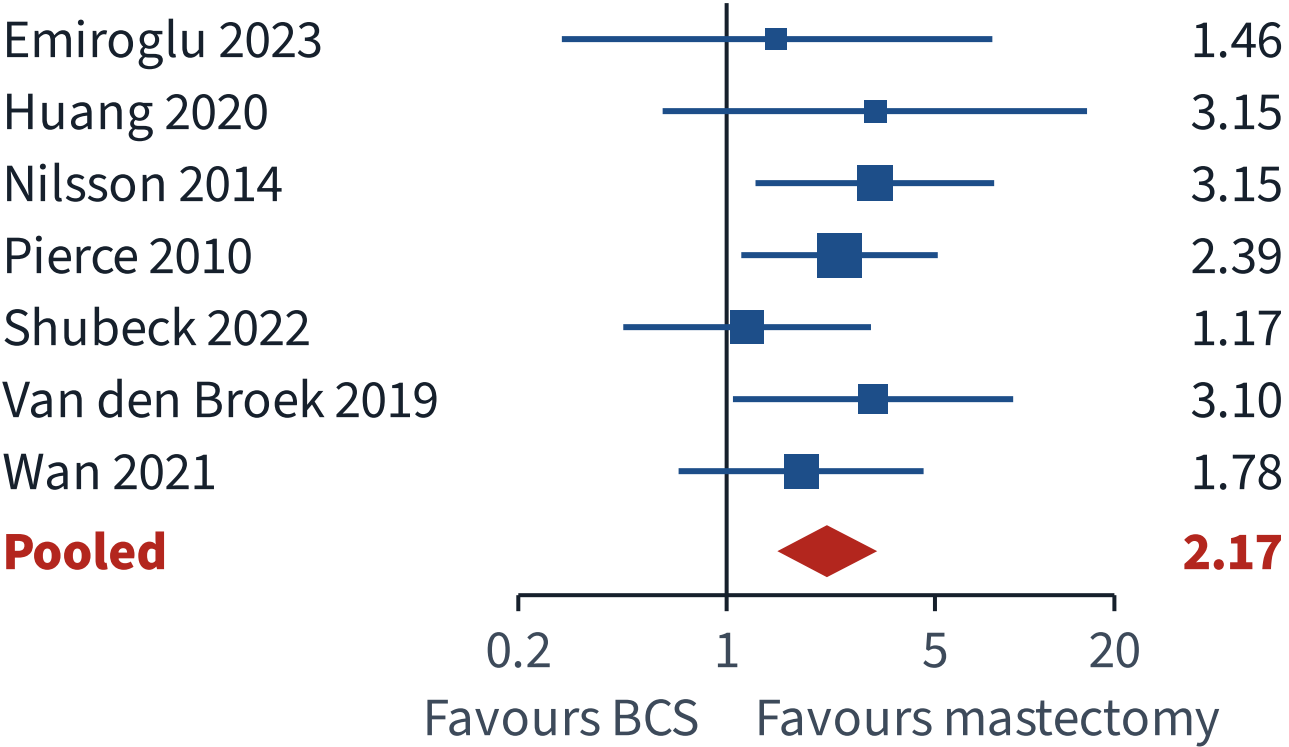
RESULTS

2,057
BRCA1/2 carriers

693
BCS

1,364
mastectomy

Local recurrence: odds ratio, BCS vs mastectomy



Pooled OR **2.17 (95% CI 1.48–3.20)**, $P < .001$; $I^2 = 0\%$.
No clear funnel-plot asymmetry.

Pooled outcomes

Outcome	BCS	Mx	OR (95% CI)	P
Local recurrence	8.9%	4.4%	2.17 (1.48–3.20)	<.001
Distant recurrence	11.7%	14.6%	0.78 (0.58–1.04)	.09
Disease-free survival	84.1%	82.4%	1.31 (0.89–1.91)	.17
Overall survival	80.4%	82.3%	1.05 (0.75–1.46)	.76

$I^2 = 0\%$ for every outcome. Disease-free survival from five studies; overall survival from four.

IMPLICATIONS

- Survival and distant control after BCS were comparable to mastectomy; the higher local recurrence did not translate into worse survival.
- Counsel patients about the increased local recurrence risk; where breast reconstruction is limited, as in Pakistan, BCS is a feasible alternative.

CONCLUSION Long-term oncological outcomes were similar after BCS and mastectomy in BRCA mutation carriers; however, BCS was associated with a higher local recurrence rate. Breast conservation should be actively discussed as a treatment option, supported by adjuvant therapy and regular surveillance.

Mx, mastectomy. Limitations: retrospective, non-randomised studies; incomplete reporting of adjuvant therapy.