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Meta-Analysis of Cohort Studies on Phyllodes Tumor Cancer, Mastectomy and the Effects of Radiotherapy

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INTRODUCTION & AIM

Phyllodes tumor (PT) classified as a malignant tumor that exists on the spectrum between benign and malignant tumors, exhibiting a complicated histopathologic appearance and unpredictable clinical behaviors. Surgical excision is the mainstay treatment method, and radiotherapy or chemotherapy is usually given to advanced-stage or unresectable PT. This study aims to examine the effect of postoperative radiotherapy on overall survival in patients with stage T3 or T4 malignant PTs who undergo mastectomy.

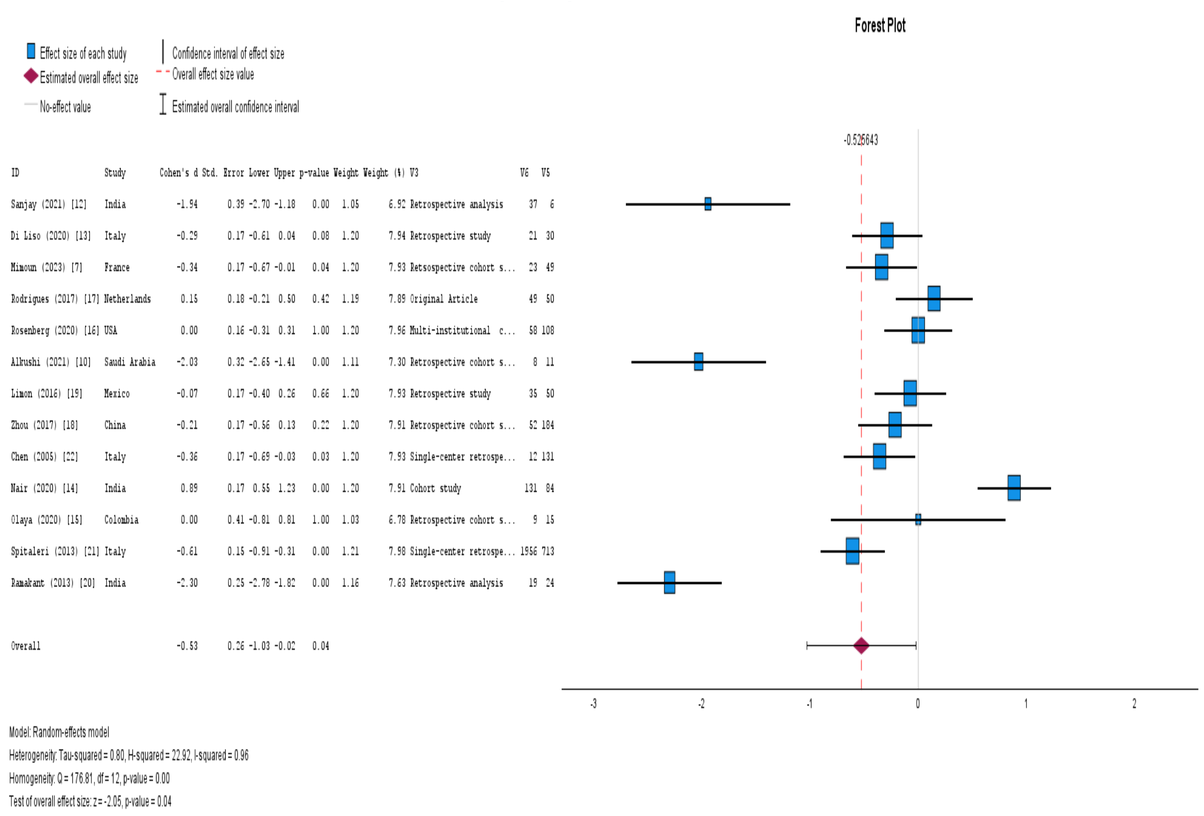
METHOD

Meta-analysis with a 95% confidence interval was performed to analyze the interaction between grade and treatment group. Meta-regression analysis was conducted, and propensity score-matched analysis and weighted Cox regression were performed to investigate the status of OS in patients, using IBM SPSS v. 29 software. We conducted a search across multiple databases (PubMed, Cochrane, and Scopus) for studies published from 2005 to 2025. These studies focused on patients diagnosed with stage T3 or T4 malignant PTs, who had undergone mastectomy and for whom postoperative data were available.

RESULTS & DISCUSSION

A total of 8,779 participants were included. In the subgroup analysis of patients with grade II and III tumors, mastectomy was associated with a significantly higher pooled hazard ratio (HR) compared to breast-conserving surgery (BCS) for malignant PTs, with an HR of 0.29 (95% CI: 0.20–0.42; I^2 = 72%, p = 0.001). Overall, the effect size was significant (z = -2.05, p = 0.04). The pooled odds ratio (OR) for cancer-related death in patients with malignant PTs who underwent mastectomy versus BCS was 3.27 (95% CI: 2.55–4.17; I^2 = 38%, p = 0.08).

Our meta-analysis showed no benefit and potential harm from postmastectomy radiotherapy and no benefit in overall survival. Mastectomy patients had worse prognosis compared with BCS patients, which might be attributed to confounding by indication and more aggressive tumors received more aggressive treatment. Our result calls into question the practice of using postmastectomy radiotherapy to improve outcomes and are consistent with previous reports of the relatively radioresistant nature of PT. In clinical practice BCS should be chosen when feasible and postmastectomy radiotherapy reserved for the selected cases with positive margins and recurrence. However, study limitation includes the retrospective design of majority of included studies, significant heterogeneity and absence of measurement of potentially confounding factors (i.e. Margin status and radiotherapy dosage). These results must be verified in a prospective randomized trial.



ID	Study	Cohen's d	Std. Error	Lower	Upper	p-value	Weight	Weight (%)	V3	V6	V5
Sanjay (2021) [12]	India	-1.94	0.39	-2.70	-1.18	0.00	1.05	6.92	Retrospective analysis	37	6
Di Liso (2020) [13]	Italy	-0.29	0.17	-0.61	0.04	0.08	1.20	7.94	Retrospective study	21	30
Mimoun (2023) [7]	France	-0.34	0.17	-0.67	-0.01	0.04	1.20	7.93	Retsospective cohort s...	23	49
Rodrigues (2017) [17]	Netherlands	0.15	0.18	-0.21	0.50	0.42	1.19	7.89	Original Article	49	50
Rosenberg (2020) [16]	USA	0.00	0.16	-0.31	0.31	1.00	1.20	7.96	Multi-institutional c...	58	108
Alkushi (2021) [10]	Saudi Arabia	-2.03	0.32	-2.65	-1.41	0.00	1.11	7.30	Retrospective cohort s...	8	11
Limon (2016) [19]	Mexico	-0.07	0.17	-0.40	0.26	0.66	1.20	7.93	Retrospective study	35	50
Zhou (2017) [18]	China	-0.21	0.17	-0.56	0.13	0.22	1.20	7.91	Retrospective cohort s...	52	184
Chen (2005) [22]	Italy	-0.36	0.17	-0.69	-0.03	0.03	1.20	7.93	Single-center retrospe...	12	131
Nair (2020) [14]	India	0.89	0.17	0.55	1.23	0.00	1.20	7.91	Cohort study	131	84
Olaya (2020) [15]	Colombia	0.00	0.41	-0.81	0.81	1.00	1.03	6.78	Retrospective cohort s...	9	15
Spitaleri (2013) [21]	Italy	-0.61	0.15	-0.91	-0.31	0.00	1.21	7.98	Single-center retrospe...	1956	713
Ramakant (2013) [20]	India	-2.30	0.26	-2.78	-1.82	0.00	1.16	7.63	Retrospective analysis	19	24
Overall		-0.53	0.26	-1.03	-0.02	0.04					

CONCLUSIONS

Our meta-analysis demonstrates that postoperative radiotherapy following mastectomy for stage T3 or T4 malignant PTs does not improve overall survival and may be associated with increased cancer-related mortality. Our findings are in favor of the conservative application of radiotherapy and the concept of radical surgery with breast-sparing where applicable. While higher levels of evidence are not available, we believe treatment should be individualized based on biological factors, margins and patient preference and not standard in the adjuvant setting.

FUTURE WORK/ REFERENCES/ACKNOWLEDGMENT

Prospective, multicenter registries and randomized controlled trials are warranted to establish the safety and efficacy of postoperative radiotherapy in malignant PT. Stratification by grade, margin status, molecular markers is crucial for future trials. Modern radiotherapy techniques (IMRT, proton therapy) are required for toxicity reduction, and long-term follow-up is needed for evaluation of late sequelae such as secondary malignancy and sarcomas.

References:

1) Lee, Eun-Shin, et al. "Phyllodes tumors of the breast: a comprehensive review." Annals of Surgical Treatment and Research 110.2 (2026): 65-75.
2) Yang, Ping, et al. "Effect of adjuvant radiotherapy on overall survival and breast cancer-specific survival of patients with malignant phyllodes tumor of the breast in different age groups: a retrospective observational study based on SEER." Radiation Oncology 19.1 (2024): 59.
3) Zhuang, Zilin, et al. "The Impact of Adjuvant Chemotherapy on the Long-Term Prognosis of Breast Malignant Phyllodes Tumors: A Propensity Score–Matched Study." Journal of the National Comprehensive Cancer Network 22.7 (2024).
4) Tan, Benjamin Y., et al. "Phyllodes tumours of the breast: a consensus review." Histopathology 68.1 (2016): 5-21.
5) Adamopoulos, I., “A Novel AI-based Modeling with Bias Classification Hybrid Risk Evaluation System for Confidence Enhanced Network Meta-Analysis of Occupational Hazards and Burnout Risk among Public Health Inspectors”, MJAIH , vol. 2025, pp. 219–233, Sep. 2025, doi: 10.58496/MJAIH/2025/021.

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