

ASSESSING THE EFFICACY OF MESH IN COSMETIC BREAST PROCEDURES: A COMPREHENSIVE REVIEW OF COMPLICATIONS AND COSMETIC OUTCOMES

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Background: The insertion of a synthetic or biologic mesh “internal bra” has been used in cosmetic breast procedures for soft tissue reinforcement as a means to mitigate postoperative ptosis. However, there have been concerns regarding risk of complications as a result of mesh placement and a lack of quantitative data regarding postoperative cosmetic outcomes.

Methods: Manuscripts that provided data with respect to the effects of mesh “internal bra” for soft tissue support on quantitative and qualitative cosmetic outcomes, patient reported outcomes, complications, and surveillance were reviewed. Meta-analysis was performed to determine the overall complication rates and cosmetic outcomes and patient reported outcomes were reviewed.



Results: Meta-analysis showed the following summary effect sizes – infection/abscess had a pooled rate of 3.49% ($Q = 10.4\%$, $I^2 = 13.8\%$), hematoma was 1.37% ($Q = 9.76\%$, $I^2 = 18.0\%$), seroma was 2.27% ($Q = 11.0\%$, $I^2 = 45.3\%$). While 5 studies attempted to quantify cosmetic outcomes, only 2 studies compared outcomes between patients who underwent procedures with and without the use of mesh. Both reported smaller increases in sternal notch to nipple distance and nipple to inframammary fold distance without clear statistical significance.

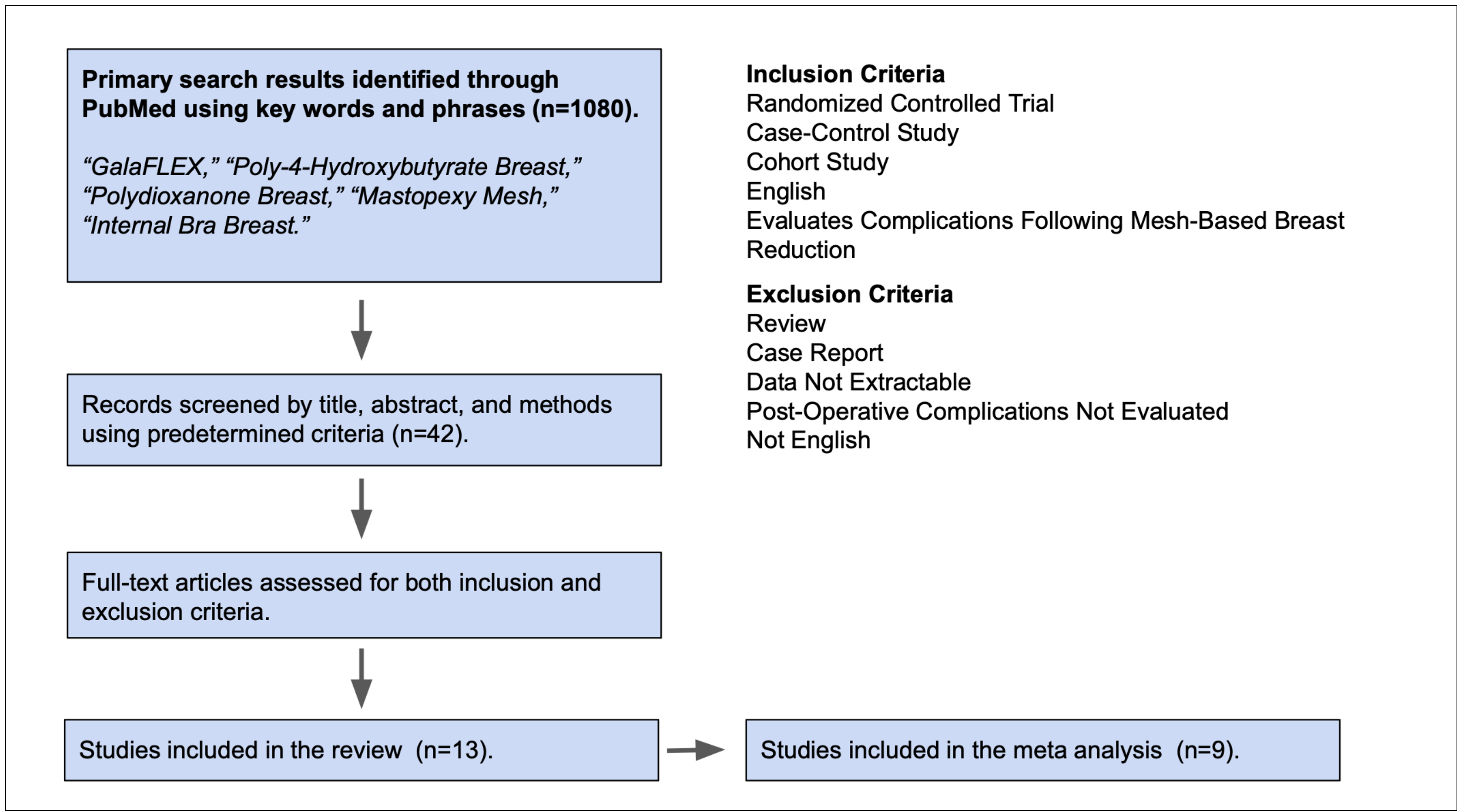


Figure 1. Diagram of literature review and systematic inclusion of manuscripts.

Table 1: Forest Plot Summary Data

Complication	Summary Effect Size (%)	Q (%)	I ² (%)
Infection/Abscess	3.49	10.4	13.8
Hematoma	1.37	9.76	18.0
Seroma	2.27	11.0	45.3
Fat Necrosis	0.867	-1.45	238
Capsular Contracture	3.50	-44.7	107
Nipple Sensation Loss	2.93	2.88	-4.07

References:

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Table 2: Weighted mean of complications across all studies that reported complications in this review (n = 11).

Complication	Total Events/Total Breasts	Weighted Mean (%)
Infection/Abscess	37/1569	3.02
Fat Necrosis	7/613	0.86
Nipple Sensation Loss/Neuralgia	35/1045	4.95
Hematoma	18/1555	1.69
Seroma	42/898	2.43
Capsular Contracture	10/401	0.50

Discussion: Mesh is commonly used across surgical specialties with a generally well-demonstrated favorable safety profile, however there is a deficit of high-quality studies regarding safety and rates of complications of mesh in breast surgery specifically.¹ The majority of studies are limited by lack of appropriate controls, systematic follow-up, and small sample sizes. Complications with low heterogeneity on pooled analysis (defined by I^2 of less than 50%) were infection and/or abscess (3.49%), hematoma (1.37%) and seroma (2.27%), the rates of which were on par with those reported in the literature for breast surgeries without the use of mesh.¹⁻⁴ Weighted means of the most commonly reported complications were not significantly different from complications in breast surgery without mesh. Overall, the use of mesh sling in breast surgery does not appear to have significantly different risks of complications when compared to the risk profile of breast surgery without mesh as reported in the literature.

The primary approach to quantifying ptosis and pseudoptosis was by measuring the change in nipple to inframammary fold distance and/or sternal notch to nipple distance over time. While two studies reported smaller increases in SNN and N-IMF in the patients who underwent mesh placement compared to those without mesh over a follow up period of approximately three years, the changes do not appear to be substantial.

Conclusion: The use of the mesh “internal bra” system has become increasingly popular in practice. While there does not appear to be a significant difference in risk profile compared to breast surgery without the use of mesh, the current data, albeit limited, does not support the claims of improved cosmetic outcomes. Further well-controlled, quantitative studies are necessary to objectively evaluate cosmetic benefits with the use of mesh in breast surgery.