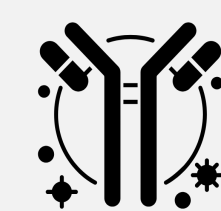


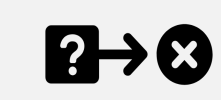
Introduction



Capsular contracture is one of the most common complications of implant-based breast reconstruction, yet its risk factors remain incompletely understood.¹



Atopic diseases are characterized by barrier dysfunction, chronic inflammation, and immune dysregulation. These are features that may impair healing and promote fibrosis, suggesting a potential link to contracture development.^{2,3}

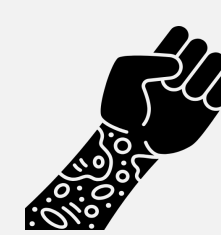


The relationship between preexisting atopic disease and implant-based breast reconstruction complications remains unclear.



Large-scale data are needed to better characterize this risk.

Aims



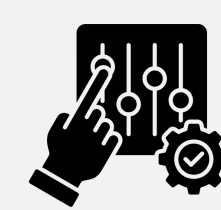
Evaluate the association between preexisting atopic disease and implant-related complications following implant-based breast reconstruction.



Compare rates of capsular contracture, capsulectomy, implant removal, revision, mechanical complications, and mastodynia between atopic and non-atopic patients.



Assess complication risk at three years postoperatively using multivariable Cox proportional hazards regression.



Control for confounding using propensity score matching.

Methods

- TriNetX query of more than 158 million patients across 111 healthcare organizations from 2016–2022.
- Female patients ages ≥ 18 years who underwent implant-based breast reconstruction.

- **Atopic Cohort:** Preexisting eczema, asthma, allergic rhinitis, or dermatitis (n = 5,301).
- **Non-Atopic Cohort:** No atopic diagnosis (n = 32,877).

- Propensity score matching controlled for age, race, ethnicity, BMI, major comorbidities, corticosteroid exposure, breast malignancy, and oncologic treatment exposures (radiation, chemotherapy, hormone therapy).

- Outcomes assessed at three years.
- Primary outcomes: capsular contracture, capsulectomy, and implant removal.
- Secondary outcomes: breast revision, mechanical complications, and mastodynia.

Results

Postoperative complications at 3 years

Implant-based breast reconstruction — atopic vs. non-atopic patients (n = 5,280 per cohort)

OUTCOME	ATOPIC (%)	NON-ATOPIC (%)	HR	95% CI	P-VALUE
PRIMARY OUTCOMES					
Capsular contracture	7.09%	6.95%	1.022	0.876–1.194	0.779
Peri-implant capsulectomy	11.37%	9.91%	1.160	1.022–1.318	0.022
Implant removal	19.22%	17.24%	1.130	1.022–1.250	0.017
SECONDARY OUTCOMES					
Mastodynia	12.72%	9.55%	1.358	1.193–1.545	<0.0001
Revision of reconstructed breast	27.33%	26.37%	1.054	0.972–1.143	0.201
Mechanical complications	14.42%	14.08%	1.024	0.916–1.146	0.673
Implant breakdown/leakage	1.67%	1.86%	0.891	0.658–1.206	0.455

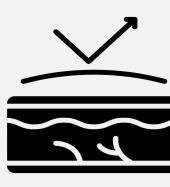
● Significant (p < 0.05)

Gray = non-significant

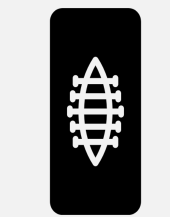
Results



After matching, 5,280 patients remained in each cohort.



At **3 years**, risk of implant removal was elevated in atopic patients (19.22% vs 17.24%; HR 1.13; p = 0.017)



At **3 years**, rates of peri-implant capsulectomy were higher in the atopic cohort (11.37% vs 9.91%; HR 1.16; p = 0.022).



At **3 years**, rates of mastodynia were higher in the atopic cohort (12.72% vs 9.55%; HR 1.36; p < 0.0001).



No significant differences in capsular contracture, mechanical complications, or breast revision were identified.

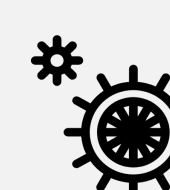
Conclusions



Preexisting atopic disease is associated with increased rates of mastodynia, implant removal, and capsulectomy following implant-based breast reconstruction, though the underlying mechanisms remain unclear.



Risk of secondary intervention is elevated despite the absence of increased capsular contracture or mechanical complications, suggesting alternative pathophysiologic pathways.



Atopic disease represents an independent risk factor for secondary surgical intervention; however, objective prospective validation is needed to confirm this association.



Enhanced preoperative counseling and postoperative surveillance may be warranted in this population, pending further clarification of the true risk magnitude and its causes.



Prospective studies are needed to objectively assess whether this risk difference exists, quantify it, and identify the precise mechanisms driving secondary intervention in atopic patients.

References

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3. Zhao Y, Bao L, Chan LS, DiPietro LA, Chen L. Aberrant Wound Healing in an Epidermal Interleukin-4 Transgenic Mouse Model of Atopic Dermatitis. *PLoS One.* 2016;11(1):e0146451. Published 2016 Jan 11. doi:10.1371/journal.pone.0146451