

Destructive Thyroiditis Secondary to Pembrolizumab in a Young Woman with Triple-Negative Breast Cancer: A Case Report

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Introduction

- Pembrolizumab (anti-PD-1) has improved outcomes in triple-negative breast cancer (TNBC).
- Endocrine immune-related adverse events (irAEs), particularly thyroid dysfunction, are common, occurring in ~12–15% of patients receiving ICI therapy.
- Destructive thyroiditis typically presents with transient thyrotoxicosis due to inflammatory hormone release, followed by permanent hypothyroidism.
- We report a young woman who developed pembrolizumab-induced destructive thyroiditis during neoadjuvant therapy for TNBC, with successful continuation of immunotherapy and a subsequent uneventful pregnancy.

Case Presentation

- Patient** 29-year-old premenopausal woman
No significant comorbidities
- Breast cancer** Left breast mass (Oct 2023)
Grade III invasive ductal carcinoma
Triple-negative (ER-/PR-/HER2-)
Ki-67: 30%
Stage IIB (cT2N0M0)
- Family history** Early-onset breast cancer
(paternal aunt age 35; cousin age 25)
- Treatment** Neoadjuvant pembrolizumab
(200 mg, 3-weekly) + carboplatin/
paclitaxel (March 2024)
- Past thyroid history** Autoimmune thyroid disease 5 years
prior (treated with carbimazole, later
levothyroxine); euthyroid and off
treatment for >1 year before cancer
diagnosis.

Key Investigations (May 2024)

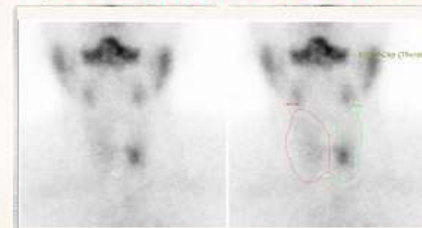
Thyroid function tests (thyrotoxic phase)

TSH	<0.008 µIU/mL
Free T4	3.72 ng/dL (Ref: 0.93 – 1.7)
Free T3	12.29 pg/mL (Ref: 2.0 – 4.4)

Autoantibodies

Anti-TPO	>1300 U/mL
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Thyroid scintigraphy (Technetium-99m)



Anterior view Anterior view (marked)
Near-absent uptake, consistent with destructive thyroiditis
and ruling out Graves' disease.

Timeline of Key Events

Oct 2023	Jan 2024	Mar 2024	May 2024	Jul 2024	Mar 2025 – 2026
Left breast mass identified.	Biopsy confirms Grade III TNBC.	Initiation of neoadjuvant pembrolizumab + chemotherapy.	Onset of thyrotoxicosis (neck pain, palpitations). Scintigraphy confirms destructive thyroiditis.	Transition to hypothyroidism; levothyroxine initiated.	Pembrolizumab completed (17 cycles) without interruption. Successful pregnancy with levothyroxine replacement.

Clinical Course

- Three to six weeks after starting pembrolizumab, the patient developed anterior neck pain, palpitations, tremors and sinus tachycardia.
- Thyroid function tests were consistent with thyrotoxicosis and anti-TPO was strongly positive. Thyroid scintigraphy showed near-absent uptake, confirming destructive thyroiditis.
- She was managed conservatively with propranolol (20 mg TID); no antithyroid drugs were required.
- By July 2024, she transitioned to overt hypothyroidism (TSH 72.5 µIU/mL) and was started on levothyroxine.
- Pembrolizumab was continued throughout all 17 planned cycles as per guidelines.
- Thyroid function was monitored regularly during treatment and throughout pregnancy.
- At seven months' gestation, she remained euthyroid on levothyroxine 150 µg daily (TSH 1.91 µIU/mL, free T4 1.36 ng/dL) with an uneventful pregnancy.

Representative Laboratory Values

Time point	TSH (µIU/mL)	Free T4 (ng/dL)	Free T3 (pg/mL)	Clinical phase
Baseline (Mar 2024)	1.2	1.1	–	Euthyroid
May 2024 (Thyrotoxic)	<0.008	3.72	12.29	Thyrotoxicosis (destructive)
Jul 2024 (Hypothyroid)	72.5	0.8	–	Hypothyroidism
Pregnancy (2026, 7 months)	1.91	1.36	–	On levothyroxine (150 µg daily)



Pembrolizumab was completed for all 17 planned cycles without interruption and the patient achieved a successful pregnancy.

Key Takeaways

- Pembrolizumab can cause a classic biphasic destructive thyroiditis.
- Immunotherapy can be safely continued with appropriate monitoring.
- Early recognition and symptom management are essential to prevent complications.
- In young women of childbearing age, with a history of thyroid autoimmunity, close monitoring and titrated levothyroxine replacement can lead to a successful pregnancy.

Conclusion

This case highlights the classic biphasic evolution of pembrolizumab-induced destructive thyroiditis and demonstrates that immunotherapy can be safely continued with vigilant endocrine monitoring. A history of thyroid autoimmunity may identify patients who require closer surveillance. Early recognition and appropriate management are crucial, and a successful pregnancy is achievable with titrated levothyroxine replacement.

References

- Brahmer JR et al. Nat Rev Clin Oncol. 2018;15:83–92.
- Barroso-Sousa R et al. J Clin Endocrinol Metab. 2018;103:3581–90.
- NCCN Clinical Practice Guidelines in Oncology. Management of Immunotherapy-Related Toxicities. Version 2024.