

Triple-Negative Breast Cancer: Early Assessment with ¹⁸F-FDG PET/CT During Neoadjuvant Chemotherapy Identifies Patients Who Are Unlikely to Achieve a Pathologic Complete Response and Are at a High Risk of Early Relapse

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Study Highlights

- **Less than 42 percent decrease in ¹⁸F-FDG uptake at two cycles means residual tumor at the end of neoadjuvant chemotherapy and a high risk of early relapse.**
- **In non-responding patients as identified by PET, the risk of residual tumor at surgery was 100 percent (vs. 45 percent in responders), and the risk of early relapse was 44 percent (vs. 0 percent).**
- **PET identifies poor metabolic responders who would end up with residual tumor at the end of the planned neoadjuvant chemotherapy regimen and who have a high risk of early relapse.**

Abstract

Triple-negative breast cancer, an aggressive subtype, represents 15% of invasive breast tumors. While patients with triple-negative breast cancer have a relatively poor outcome, with higher relapse rates than for other breast tumor types, these aggressive tumors have more intrinsic responsiveness to neoadjuvant chemotherapy than estrogen receptor-positive tumors. This prospective study investigated whether early changes in ¹⁸F-FDG tumor uptake during neoadjuvant chemotherapy (NAC) can predict outcomes.

Methods:

Twenty (M0) patients underwent ¹⁸F-FDG PET/CT at baseline and after the second cycle. NAC was continued irrespective of PET results.

Results:

At surgery, 6 patients had a pathologic complete response, whereas 14 had residual tumor. Four patients showed early relapse (in the 2 y after surgery). There were 11 metabolic responders and 9 nonresponders using a 42% decrease in maximum standardized uptake value as a cutoff. In nonresponding patients, the risk of residual tumor at surgery was 100% (vs. 45% in responders; $P = 0.014$), and the risk of early relapse was 44% (vs. 0%; $P = 0.024$).

Conclusion:

A less than 42% decrease in ¹⁸F-FDG uptake at 2 cycles means residual tumor at the end of NAC and a high risk of early relapse.