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Can MRI Predict Active Surveillance Failure in Desmoid-Type Fibromatosis?

Ryan Quigley:

You're listening to ReachMD, and this is an *AudioAbstract*. I'm Ryan Quigley, and today, I'll be reviewing a study exploring whether MRI radiomics can predict active surveillance failure in desmoid-type fibromatosis.

For patients with asymptomatic or mildly symptomatic desmoid-type fibromatosis, active surveillance is often the preferred starting point. Some tumors stabilize or regress, while others progress or become symptomatic. A key challenge is identifying who can safely continue observation and who may eventually need treatment, without committing everyone to years of unnecessary follow-up.

A study published in *Annals of Surgical Oncology* asked whether a single early MRI could help answer that question. The investigators used radiomics, a method that converts medical images into quantitative information about tumor shape, signal intensity, and texture.

The international cohort included 200 patients with extra-abdominal desmoid-type fibromatosis from the Netherlands, Italy, and Canada. All started with active surveillance and had an MRI at diagnosis or within the following year, before surveillance failure. The Dutch and Italian cohorts came from prospective observational studies, while Canadian data were drawn retrospectively from a prospectively maintained database.

The researchers analyzed T1- and T2-weighted MRI scans and used machine learning to predict which patients would start active treatment. That outcome, termed surveillance failure, included systemic therapy, surgery, or another local treatment prompted by symptoms or radiologic progression. To test how well the model performed across settings, they trained it in two countries and validated it in the third.

So, what did they find? Over a median follow-up of 35 months, 52 patients, or 26 percent, required active treatment. The median time-to-treatment among those patients was 10 months.

Using MRI features from both sequences, the model showed an area under the curve of 0.76 in Italy and 0.77 in Canada. That's reasonably good discrimination between patients who did and didn't require treatment. But performance dropped to 0.58 in the Netherlands, only slightly above chance. Internal cross-validation across the pooled dataset yielded an area under the curve of 0.69.

But discrimination isn't the same as reliably identifying patients who'll need treatment. At the evaluated classification thresholds, the model identified just 43 percent of surveillance failures in Italy, 32 percent in the Netherlands, and six percent in Canada. So even where overall discrimination appeared promising, the model missed many patients who eventually needed treatment. These results don't support using it today to determine who can safely stop surveillance.

Adding clinical variables didn't improve the combined model. Models based on T1 or T2 imaging alone also performed similarly to the two-sequence approach. And 37 percent of patients experienced radiographic progression, but only 26 percent began active treatment. None of the models predicted radiographic progression reliably.

The study's international validation is a strength, but the cohorts were relatively small, and they contained few surveillance failures. Imaging protocols, tumor locations, and the timing of the first MRI varied across centers. The Canadian analysis was retrospective, and prediction relied on a single imaging time point rather than changes over time.

Where does that leave clinical practice? Radiomics may eventually help personalize follow-up and patient counseling in desmoid-type fibromatosis. But for now, these models need refinement, standardized imaging, and further validation before they can guide surveillance intensity or discharge decisions.

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This has been an *AudioAbstract*, and I'm Ryan Quigley. To access this and other episodes in our series, visit ReachMD dot com, where you can Be Part of the Knowledge. Thanks for listening!

Reference:

Hakkesteegt SN, Spaanderman DJ, Colombo C, et al. Predicting failure of active surveillance in desmoid-type fibromatosis using radiomics: an international multi-center cohort study. *Ann Surg Oncol*. 2026;33(9):8591-8600. doi:10.1245/s10434-026-19931-4

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