

**SPEAKER 1:** Benign breast disease refers to a condition in the breast where there is an abnormality, but it's not cancerous. This is significant because we know that these women are at an increased risk for developing breast cancer in the future at some point.

And our hope is that by understanding better exactly what the changes are in the tissue, we can help to predict which women would be at higher risk to develop a breast cancer and which women would not.

There is a risk tool called the breast cancer risk assessment tool, which is online and available to the public. And this tool helps to identify women and their risk of breast cancer. However, the tool was originally developed to identify large groups of women at increased risk who would then be eligible to go on to prevention studies.

Unfortunately, this tool, when used for an individual woman, really does not provide an accurate level of risk prediction for her personal breast cancer risk. So our idea was that by studying the specific findings in benign breast biopsies that women have, we can help to identify factors that really help us to refine the prediction of how high their future breast cancer risk is.

So we have a very large group of women called a cohort of over 10,000 women who have had a benign breast biopsy at Mayo Clinic. And we've studied what is in their benign breast biopsy tissue. And we have information on long term follow up in these women to tell us which of them did develop a later breast cancer.

And by correlating the findings in their benign biopsy with the later breast cancers, we have developed a way to predict better than the current tool which women are at increased risk for breast cancer.

So when there's a benign breast biopsy, that tissue is then evaluated under the microscope and that is essentially what we're talking about here, what we call the pathology or histology findings in the tissue.

And there are various types of changes. One has to do with how the breast tissue in the lobules change with age. That's called involution and this occurs normally with the aging process. But in some women, this process is delayed or stalled or changed.

And how well this involution process happens is one of the factors that we found that helps to predict a woman's future breast cancer risk. The other factors have to do with certain types of proliferation of the epithelial cells. These are the cells that would eventually, in the lactating state, create milk.

And so these epithelial cells, when they're not used for lactation, are still present in the breast. And when they start to proliferate abnormally, what we call epithelial proliferation, then there are signs that there's an increased risk of breast cancer.

And there are two specific findings in our study. One is sclerosing adenosis and the other is called columnar cell hyperplasia. These are specific histology findings that were associated with an increased risk of breast cancer in our study.

And more importantly than those findings, there's also the finding of atypical hyperplasia when the epithelial cells are growing so abnormally that they're starting to take on some of the features of a very low grade cancer.

In our publication that's coming out, there are tables that allow practitioners to calculate an individual woman's risk of breast cancer. In addition, we are working on developing an online model so that practitioners, as well as the public, would be able to access this model.

And after a benign breast biopsy, a woman would be able to enter her own information and obtain an estimate of her own personal breast cancer risk in the future.

In terms of additional future work, we're also looking to further refine this model by using other tissue biomarkers and potentially assessments of gene expression in the tissue, which may even further improve our ability to predict risk for an individual woman.