

Impact of Pre-operative MRI on Ductal Carcinoma in Situ Surgical Outcomes:

A study in Canadian Women.

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BACKGROUND & AIM

Ductal carcinoma in situ (DCIS) poses diagnostic challenges. Mammography is the primary tool used for DCIS detection, however, extent of disease beyond radiographic calcifications is difficult to determine, leading to rates of positive resection margins as high as 25%. Although there is no standard recommendation for pre-operative magnetic resonance imaging (MRI) in DCIS, there has been an increase in its use. However, its benefit remains controversial. We examined patterns and impact of MRI usage in a cohort of Canadian women.

METHODS

Women who underwent surgery between 2007-2017 at a high-volume tertiary cancer center for a first diagnosis of pure DCIS were retrospectively reviewed. All patients underwent conventional breast imaging, while MRI use was left to the discretion of the provider. Primary outcome of interest was to examine patterns of MRI use, and whether MRI changed the surgical management. Secondary aims were to assess the accuracy of MRI in estimating size of DCIS, and to identify the impact of MRI on re-excision rates and local recurrence rates, if any. For this analysis, patients were excluded if they had microinvasive DCIS, or a prior diagnosis of invasive or in situ breast cancer. The correlation between MRI size and true pathological size was analyzed using Pearson correlation co-efficient.

RESULTS

Overall, 461 consecutive patients who underwent breast surgery for pure DCIS were included in this cohort. Median age at time of diagnosis was 57 (Interquartile range (IQR): 50-64). Of the 461 patients, 162 (35.1%) underwent MRI. Those who had MRI were more likely to be younger (Median age of 54; IQR: 46-62, $p < 0.001$). In 8 patients (4.9%), MRI lead to a change in surgical plan from breast-conservation to mastectomy. Re-excision rates for positive margins was slightly higher in those who underwent MRI (25.3%), when compared to those who did not (23.1%) ($p = 0.034$). Overall in-breast recurrence rates for all 461 patients was 4.3%, with a median time to recurrence of 4 years. In-breast recurrence rates were not statistically different between the two groups; patients who had MRIs had an in-breast tumor recurrence rate of 6.2%, versus 3.3% in those who did not ($p = 0.155$). With respect to agreement between pathological size and MRI estimation of size, the correlation showed a moderate linear relationship between the measurements (correlation coefficient (R) = 0.625, $p < 0.0001$) (Figure 1).

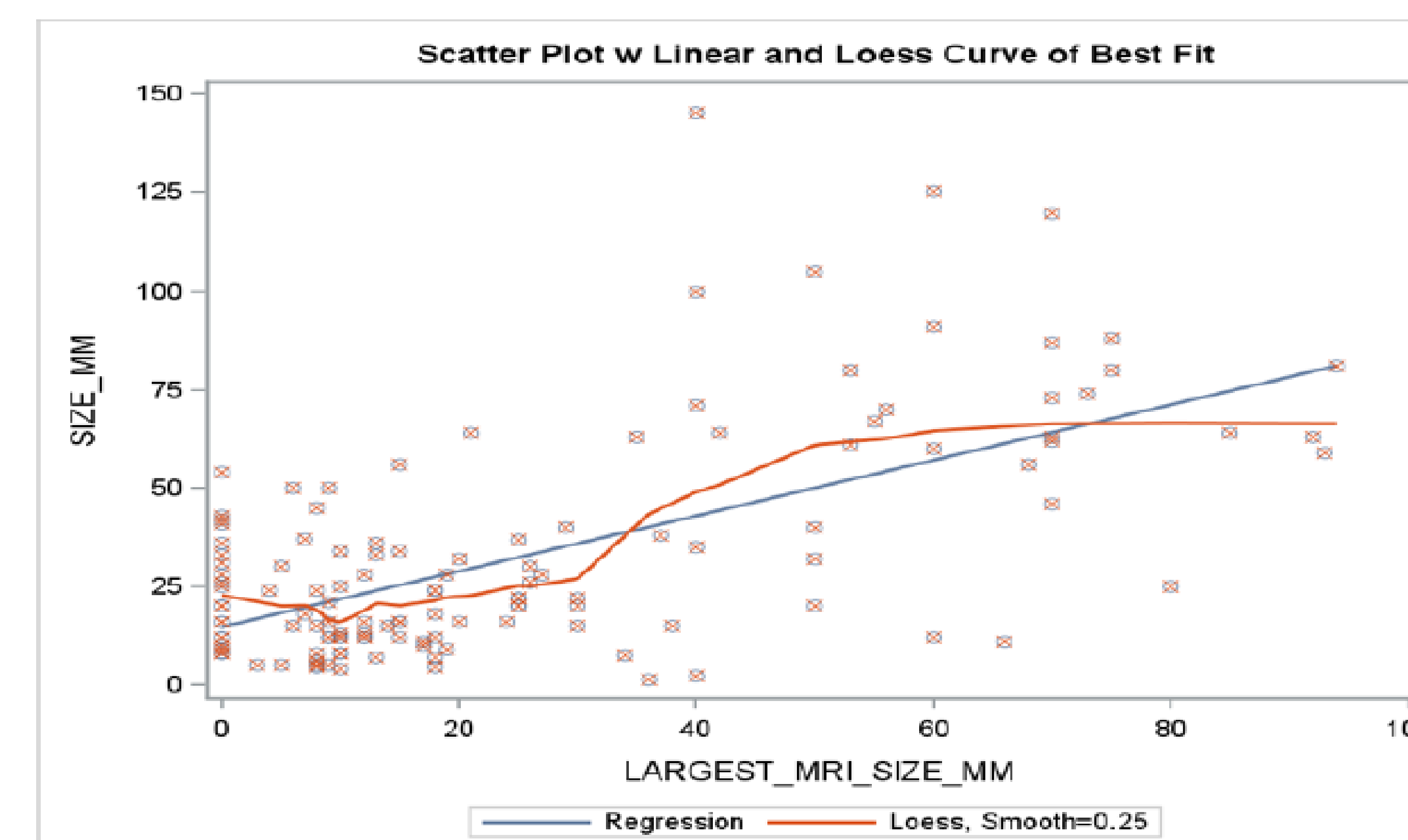
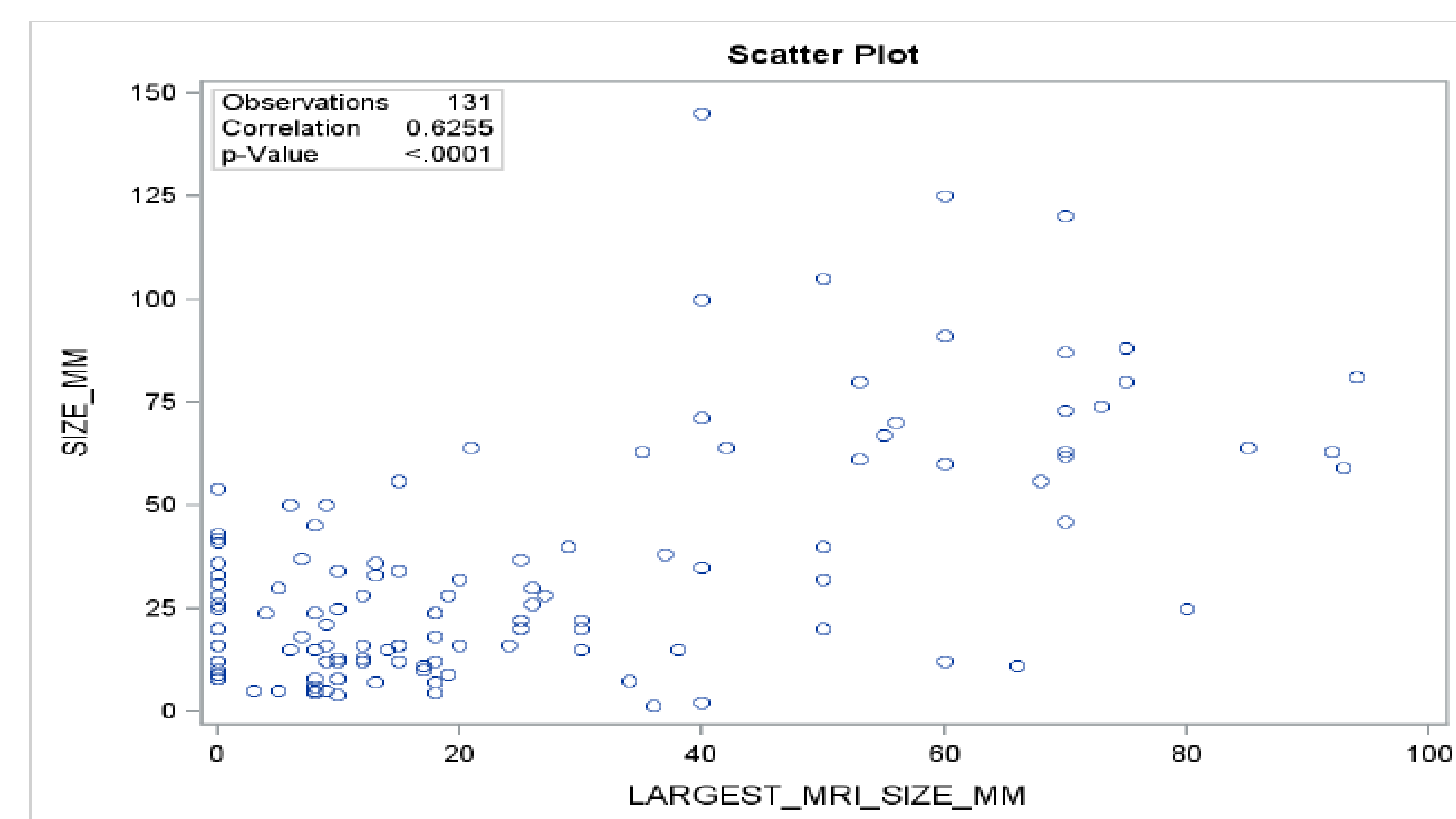


Figure 1a Scatterplot (left, above); Figure 1b (right, above) Scatterplot with linear regression and Loess Curve of Best fit demonstrating the agreement between pathological size and MRI estimation of disease size in this cohort of 461 consecutive women diagnosed and treated with a first diagnosis of DCIS (2007-2017). The correlation showed a moderate linear relationship between the measurements (correlation coefficient (R) = 0.625, $p < 0.0001$).

CONCLUSION

In this cohort, MRI lead to more mastectomies but did not decrease re-excision or local recurrence rates. Although MRI estimated the size of DCIS moderately well, it had little added value to conventional breast imaging for surgical outcomes and should be used cautiously in the management of DCIS for women over 50.