Case Report: MR Breast Imaging at 3T Invasive Lobular Carcinoma (ILC) and Complicated Cyst

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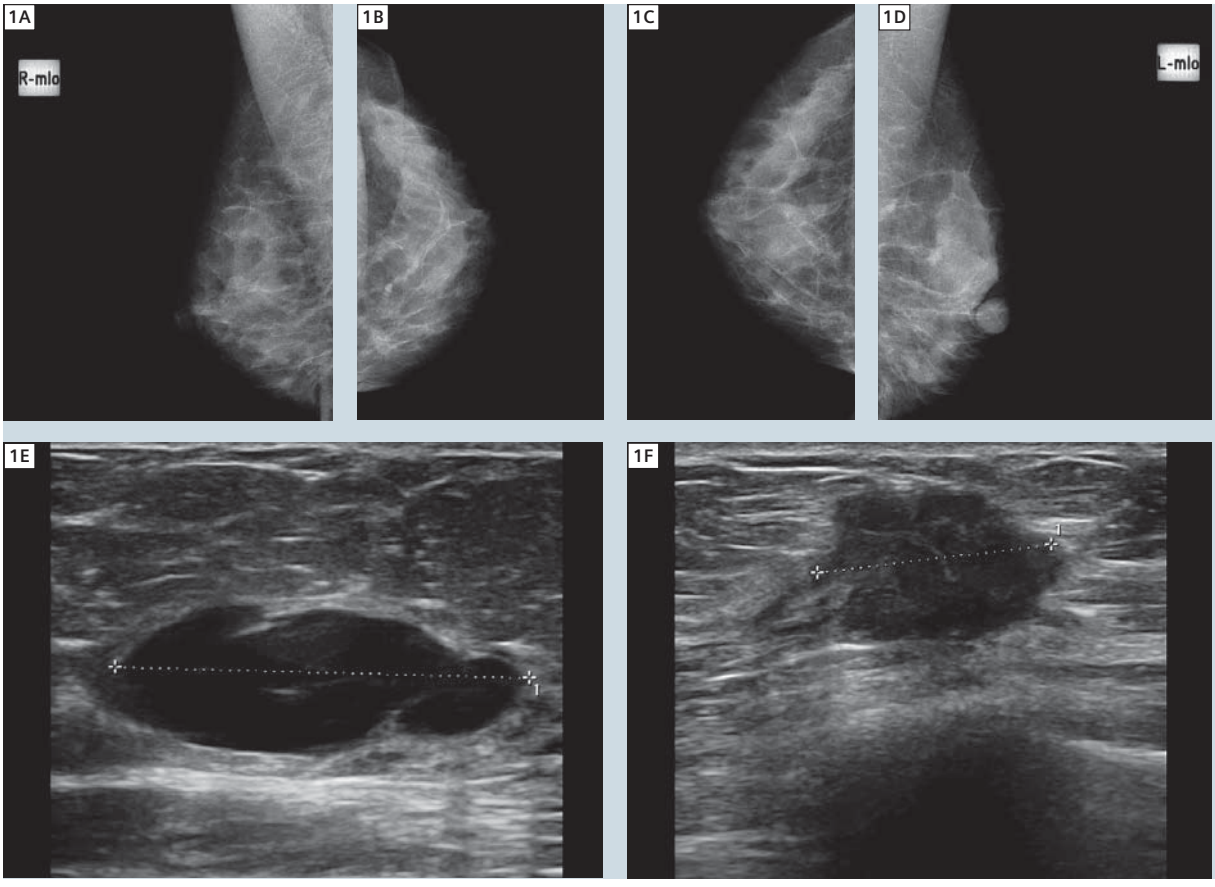
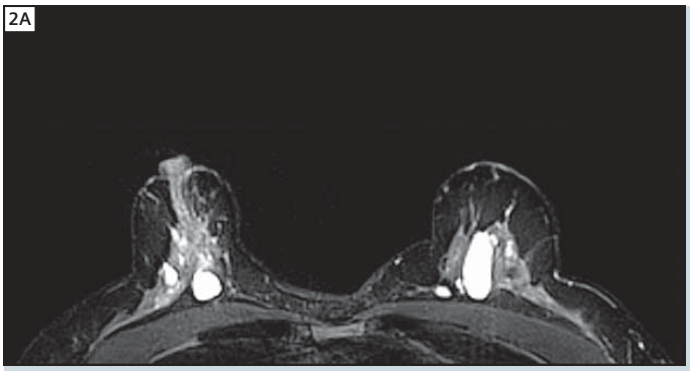
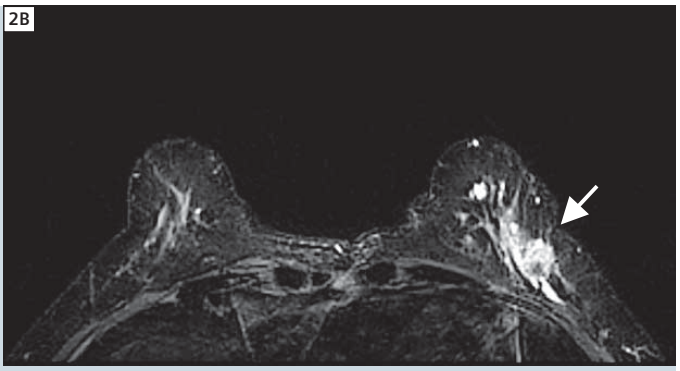
Patient history

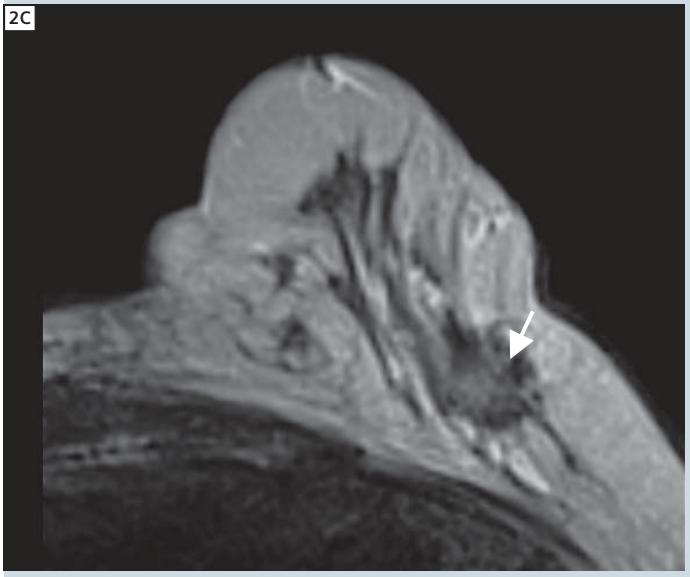
A 54-year-old patient consulted her gynecologist because of a palpable mass in the left lateral breast. While a conventional mammogram, performed at an other institution, was not conclusive (Figs. 1A–D), ultrasound revealed multiple cystic lesions in both mammae (largest cyst in the left mamma shown in Fig. 1E). A hypoechogenic lesion with irregular shape was detected in the left lateral caudal quadrant with a maximum diameter of approximate 2 cm. Because of its features on ultrasound, this lesion was suspected to be potentially malignant (BI-RADS 5). An ultrasound-guided biopsy was performed. Based on histopathology, an invasive lobular carcinoma (ILC) was diagnosed. The patient was then referred to our institution for preoperative evaluation and exclusion of multifocal disease.

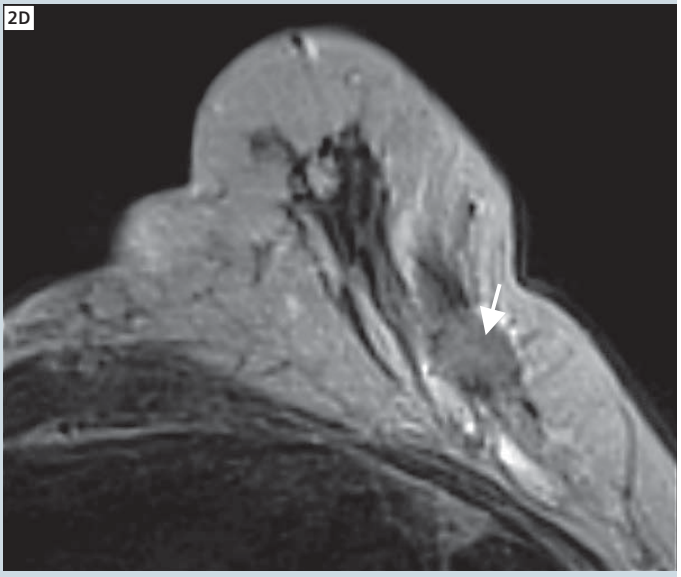


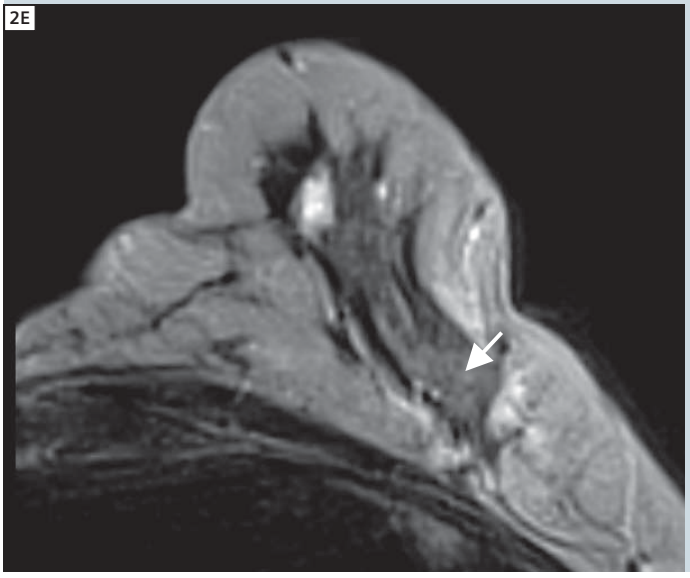
1 Conventional mammogram and ultrasound of a 55-year-old patient with palpable lesion of the left mamma, performed at another institution.
1A: mediolateral oblique (mlo) projection.
1B: craniocaudal (cc) projection, right side.
1C, D: cc and mio projection left side.
1E: largest cyst in the left mamma;
1F: suspicious finding in the left caudal lateral mamma.



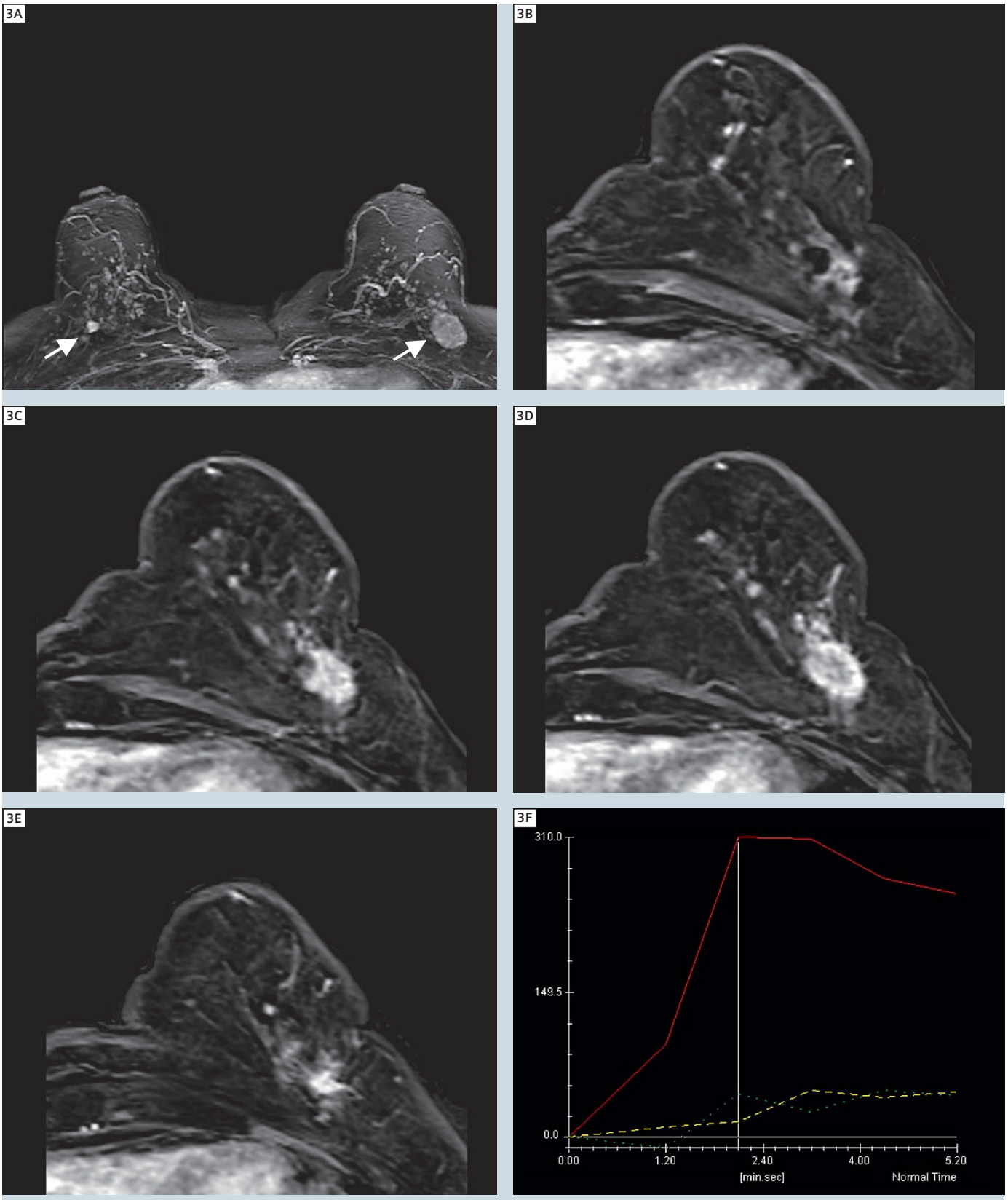




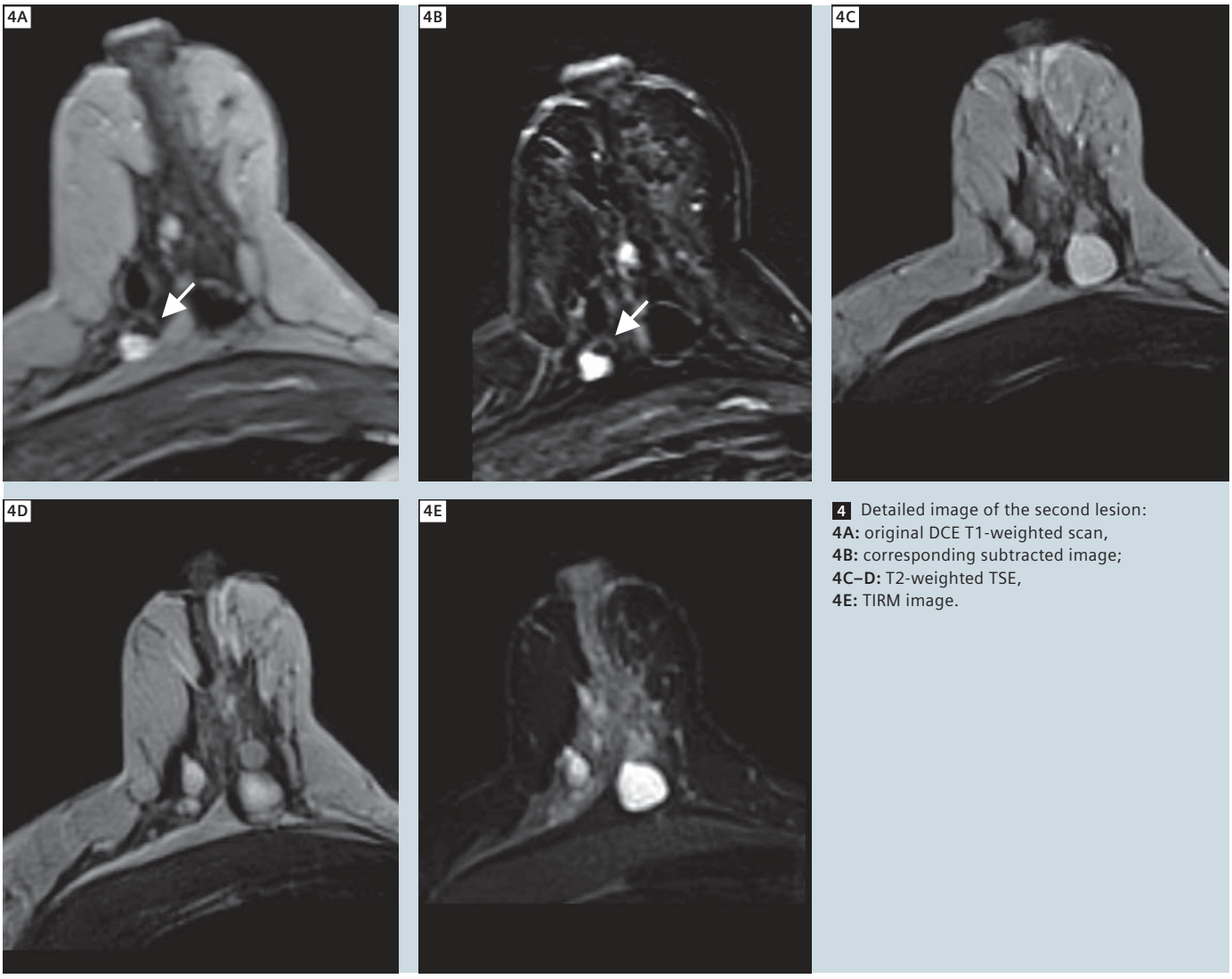




2 **2A, B:** Demonstrate multiple cysts in both mammae and the biopsy proven tumor in the left lower lateral breast: T2-weighted TIRM (with *syngo* BLADE): TR / TE / TI = 3460 / 69 / 230 ms, slice thickness 3.5 mm, 350 x 350 FOV, 320 matrix.
Figures 2C–E: Display the tumor: T2-weighted TSE without fat-suppression (*syngo* BLADE): TR / TE = 3260 / 100 ms, slice thickness 3.5 mm, 349 x 349 FOV, 384 matrix.



3 **Figure 3A:** MIP based on DCE T1w (3D FLASH) showing the tumor (arrow left breast) and a second suspicious lesion on the contralateral side (arrow). **Figures 3B–E:** Show the lesion in detail. **Figure 3F:** Corresponding signal-intensity time curves (red line region-of-interest within tumor lesion). (3D FLASH parameters: TR / TE = 6.09 / 2.45 ms, slice thickness 1.5 mm, 340 x 340 FOV, 314 x 448 matrix).



4 Detailed image of the second lesion:
4A: original DCE T1-weighted scan,
4B: corresponding subtracted image;
4C–D: T2-weighted TSE,
4E: TIRM image.

Sequence details

All images were acquired using our 3T MAGNETOM Verio and a seven-channel breast coil. The image protocol included T2-weighted TSE with and without fat-saturation, acquired with the *syngo* BLADE k-space sampling scheme to reduce motion artefacts and the routinely applied dynamic 3D T1-weighted FLASH (DCE T1w) scan, including automatically generated subtraction and MIP reconstructions.

Conclusion

In concordance with the ultrasound examination, large cysts are present (Fig. 2A). The biopsy-proven ILC in the left lower lateral mamma is clearly outlined on T2-weighted TIRM images (arrow in Fig. 2B) and T2-weighted TSE by its space occupying character and des-truction of the architecture of the breast (Figs. 2C–E); DCE T1w scans show typical pattern of a malignant lesion (Figs. 3B, E); the corresponding signal-intensity time curve showed a fast increase, followed by a wash-out (red curve in Fig. 3F). However, DCE T1w revealed an additional focus with similar DCE T1w kinetics on the contra-lateral side with a maximal diameter of 0.6 cm, which was therefore classified as BI-RADS 4. With the given set-up in our institution, a direct MRI-guided biopsy of the lesion was not possible and therefore a further correlation with ultrasound and an ultrasound-guided biopsy were performed. Based on these results, this lesion was than classified as a complicated cyst (BI-RADS 3) and a preservative surgery of the left mamma was performed. Postoperative follow-up was unsuspicious.

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