RADIAL SCAR IN THE LIGHT OF ACR BI-RADS®

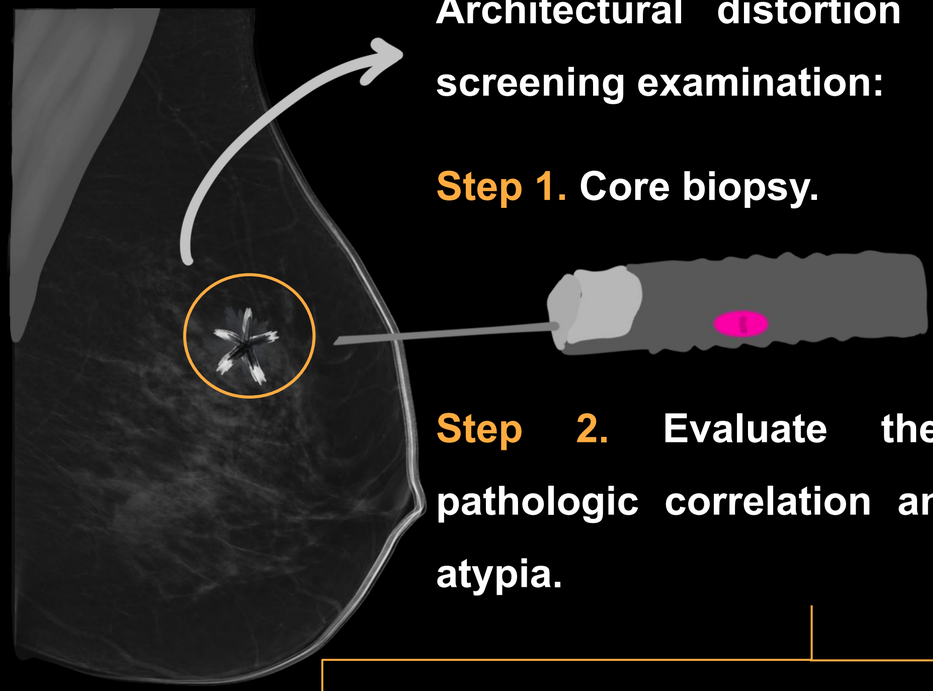
CONCEPTS

Radial scars (RS) and complex sclerosing lesion (CSL) are **benign lesions** usually detected incidentally during screening tests, that manifest at histologic analysis as stellate/radial arrangement of ductal structures with sclerotic background, central fibroelastic core, sometimes containing hyperplasias, atypias, or malignancy at periphery.

RS bigger than 10 mm is called CSL.

An isolated RS/CSL **without associated atypia rarely upgrade to malignancy**, and in these cases **follow-up imaging** is preferable in despite of surgical excision.

MANAGEMENT



Architectural distortion found during screening examination:

Step 1. Core biopsy.

Step 2. Evaluate the radiologic pathologic correlation and check for atypia.

No atypia

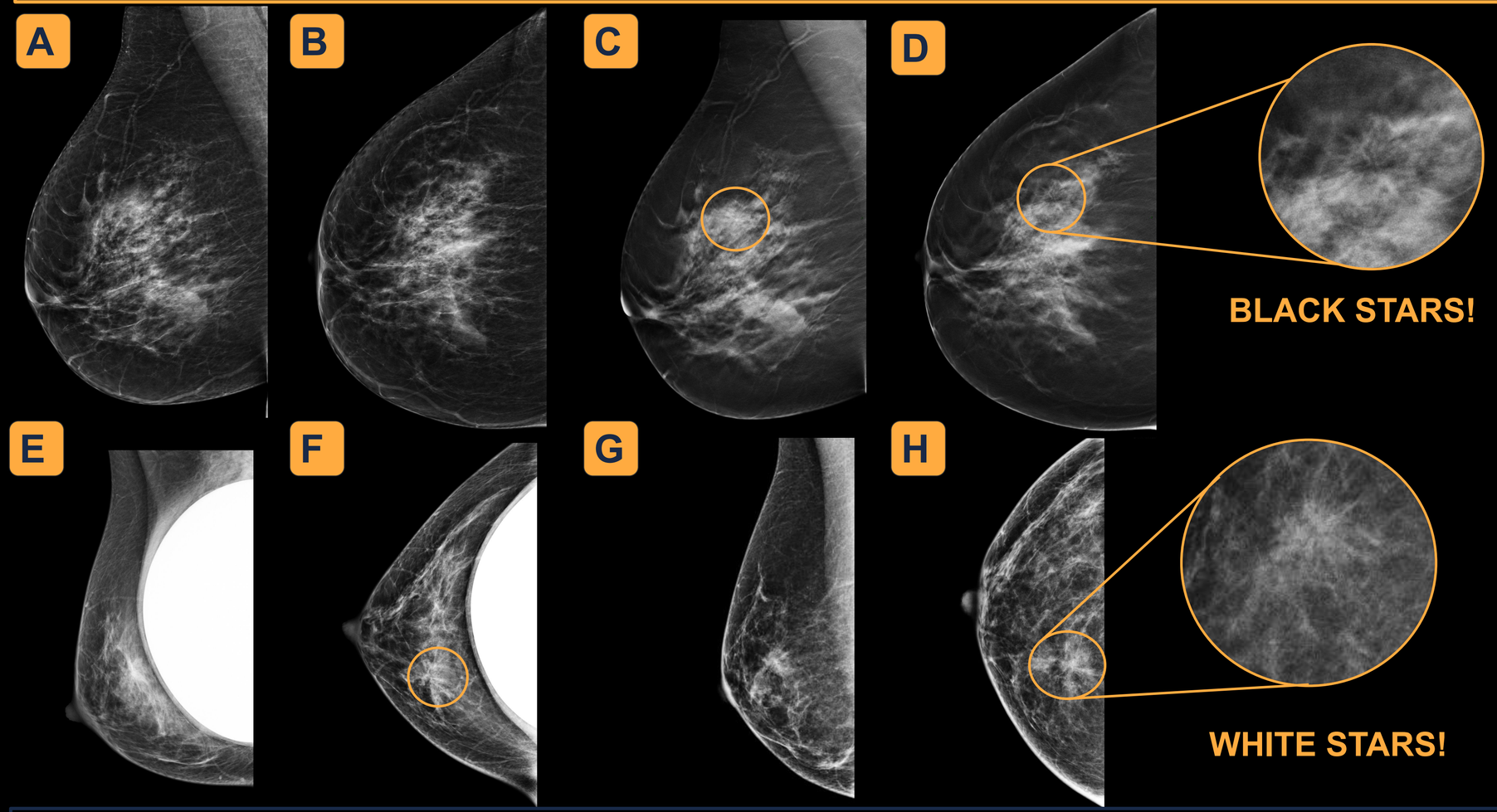
Step 3. Follow-up may be reasonable

Atypia

Consider excision

RADIAL SCAR ON MAMMOGRAPHY/TOMOSYNTHESIS

Screening Mammograms



TEACHING POINTS

Radial Scar (RS) and complex sclerosing lesions (CSL) usually manifest as architectural distortion with long, radiating spicules, intervening lucency ("black stars", fig A-D), without a central mass. May also appear as a stellate opacity (the “white star”, fig. F-H), a mass having irregular borders and spiked linear extensions.

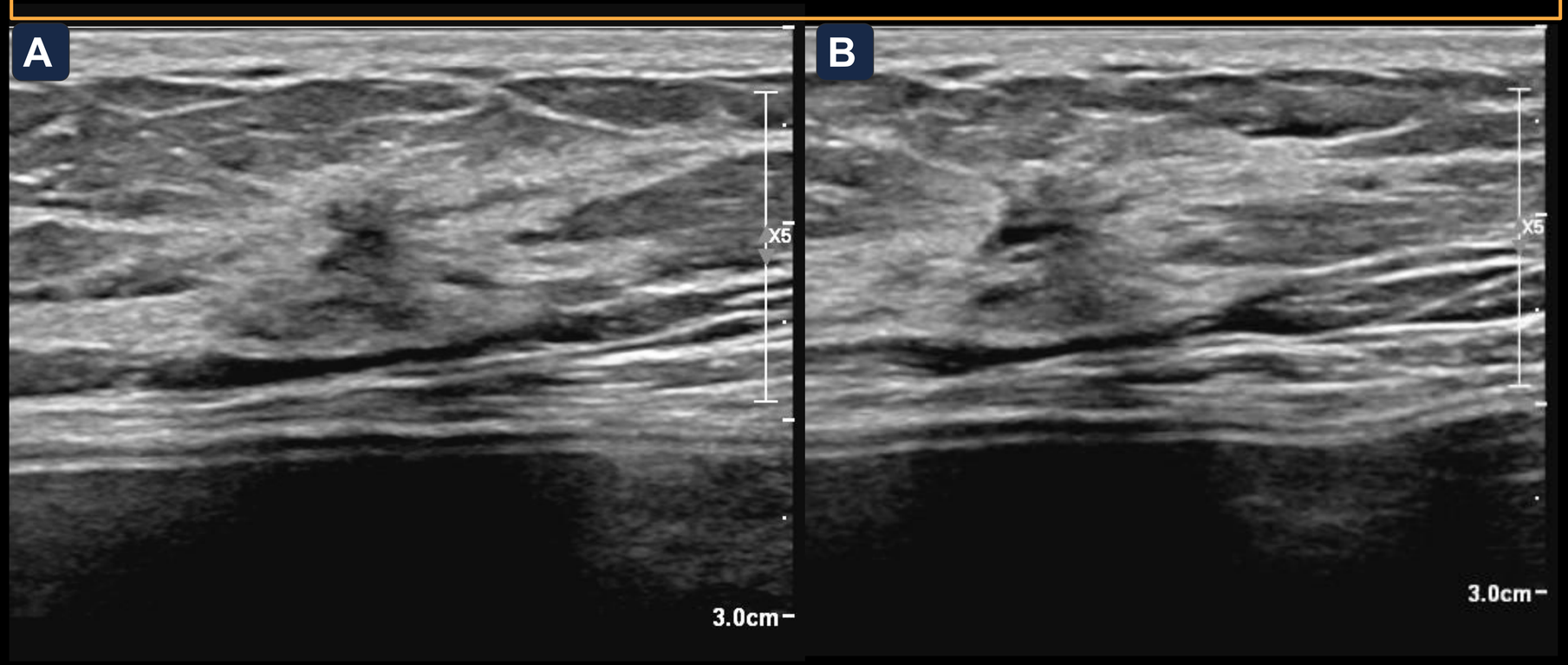
RS/CLS are mammographically indistinguishable from malignancies, **biopsy is imperative!**

Tomosynthesis may better demonstrate the presence of architectural distortion, especially in dense tissue.

Figures (A-D). RS manifesting as architectural distortion with long, radiating spicules and lucency center, conspicuous on tomosynthesis (yellow circle). A - Mammography (MG) Craniocaudal (CC) view. B - Tomosynthesis (DBT) CC view. C - MG Oblique mediolateral (MLO) view. D - DBT MLO image with zoomed-in area of interest. (E-H) Architectural distortion with a lucent center on right upper inner quadrant (yellow circle). E - MG MLO view. F - CC view. G - MLO after Eklund maneuver. H - CC after Eklund maneuver and image with magnification area of interest.

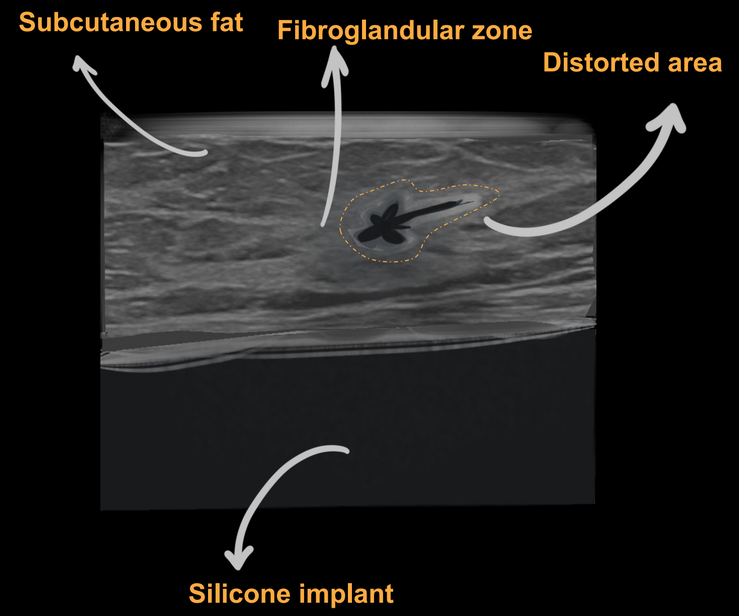
RADIAL SCAR ON ULTRASOUND

A 43-year-old woman investigating architectural distortion finding on mammography



Figures A and B. Ultrasound (US) - Irregularly shaped hypoechoic mass with distorted parenchymal area, as well as posterior acoustic shadowing, corresponding to the mammographic finding on right upper inner quadrant.

TEACHING POINTS



Architectural distortion without mass. Subtle irregular, iso to hypoechoic mass, with or without posterior acoustic shadowing.

Can be sonographically occult.

When the lesion has US representation, it is the **best method to guide the biopsy!**

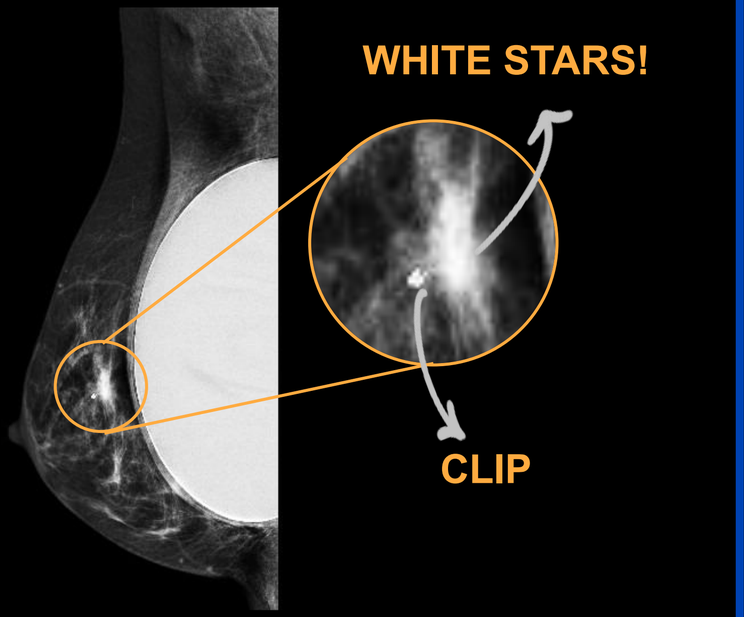
RADIAL SCAR ON MRI

A 43-year-old woman following-up after ultrasound-guided biopsy of suspicious area (architectural distortion) finding on mammography.

Figure. Axial Magnetic resonance imaging (MRI) contrast-enhanced T1-weighted image (A) and sagital T1-weighted image (B), showing an architectural distortion with tenuous enhancement (yellow circle). Tissue marker clip caused magnetic susceptibility artifacts.

TEACHING POINTS

COMPARING FINDINGS



Irregular or spiculated “tumor-like” mass can mimic an invasive malignancy.

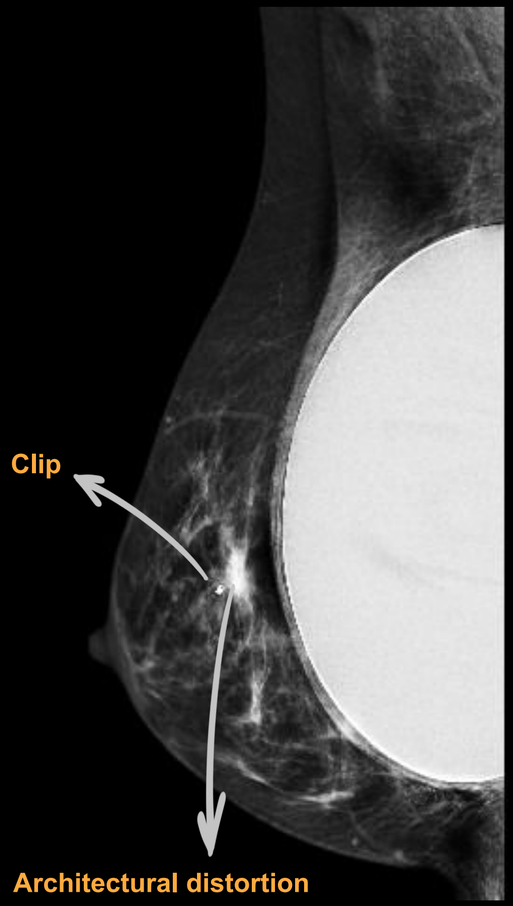
Stellate architectural distortion, without mass effect, with mild or no enhancement.

CORRELATING IMAGING MODALITIES

MG/DBT

"Black Star": central radiolucency, radiating long, thin spicules.

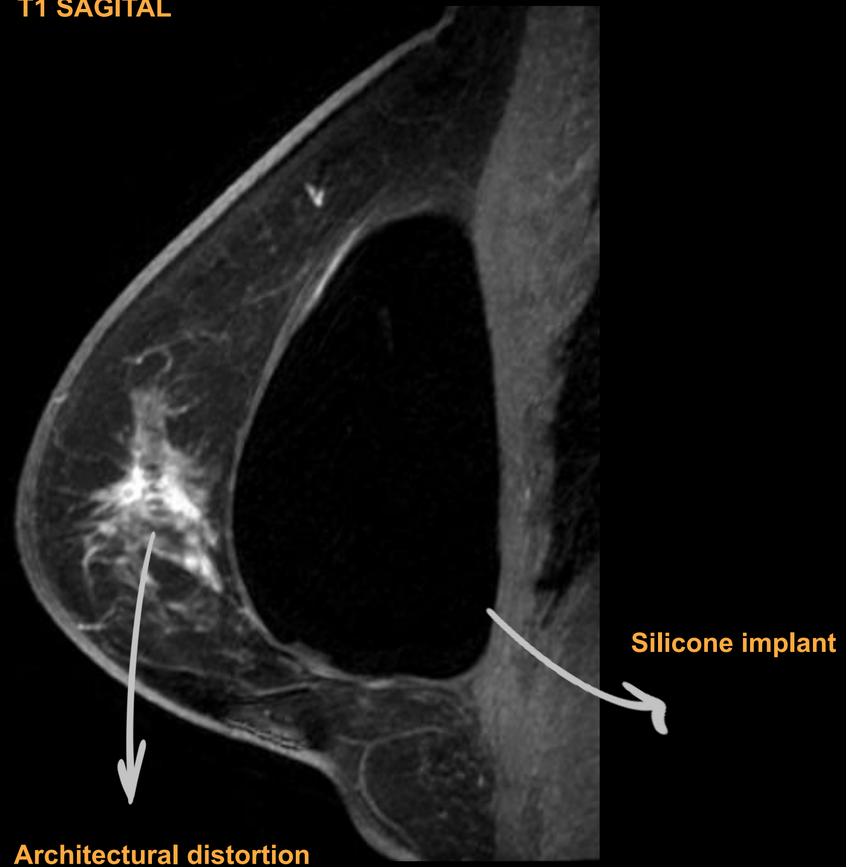
CC



MRI

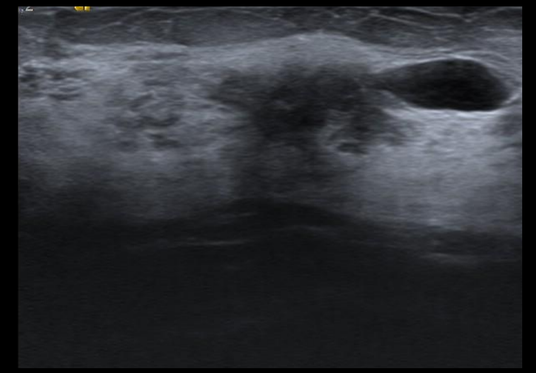
Stellate architectural distortion: no mass effect, mild or no enhancement.

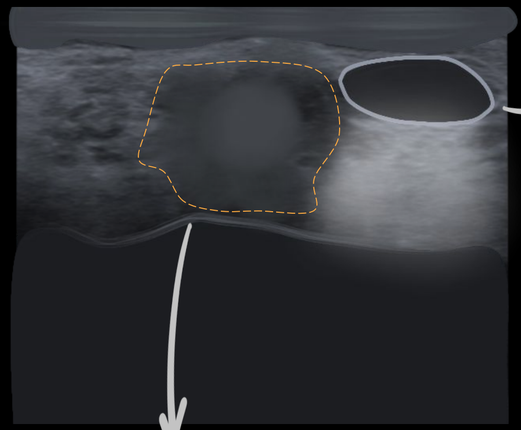
T1 SAGITAL



US

Irregularly shaped hypoechoic mass/distorted parenchymal area, ill-defined borders.





Subtle irregular/architectural distortion, hypoechoic mass with shadowing