BREAST MDT TEACHING SESSION

Breast cancer: from diagnosis to treatment

A radiographer’s contribution across the breast MDT

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From the first mammogram to the final treatment decision — how imaging guides diagnosis, multidisciplinary planning and surgery.

PRESENTATION

Two routes into the breast cancer pathway

Screening

Mammographic abnormality
→ assessment clinic

Symptomatic

Breast concern
→ clinical assessment

Both pathways depend on timely, coordinated triple assessment

THE FRAMEWORK

Triple assessment: three complementary answers

1

Clinical examination

Is there a palpable or visible abnormality?

2

Imaging

Where is it, and how extensive is it?

3

Tissue sampling

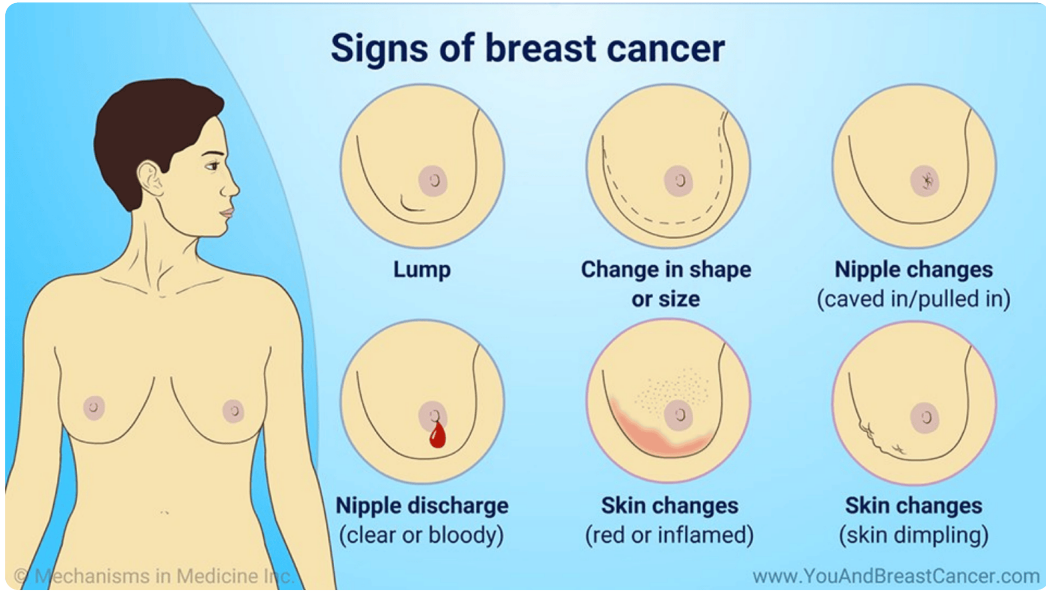
What is the diagnosis and tumour biology?

ASSESSMENT 1

Clinical examination: what are we looking for?

- Palpable mass or focal thickening
- Skin tethering, dimpling or erythema
- Nipple inversion or spontaneous discharge
- Axillary or supraclavicular lymphadenopathy

Correlate clinical findings with imaging



ASSESSMENT 2

Imaging defines the surgical map

Mammography

Masses, distortion and calcification extent

Ultrasound

Targeted lesion assessment and axillary nodes

MRI

Selected indications; not routinely required for everyone

Report systematically

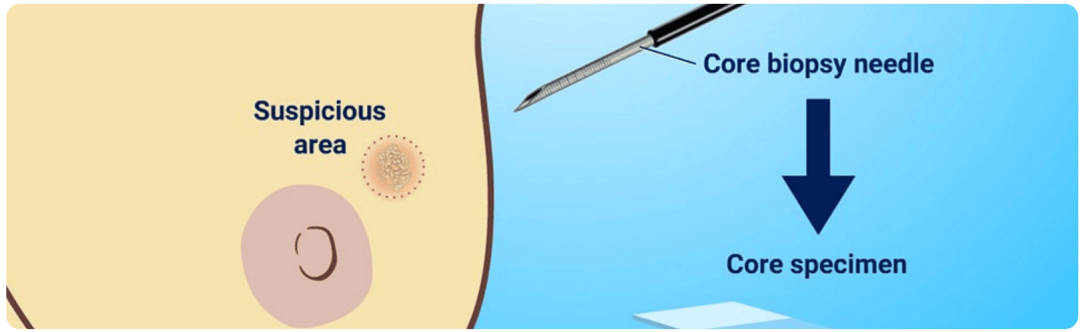
Site, size, overall extent and additional foci

ASSESSMENT 3

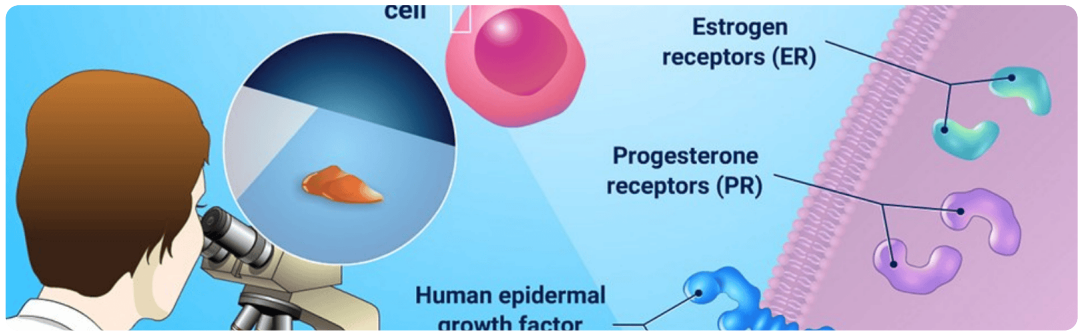
From image to tissue diagnosis



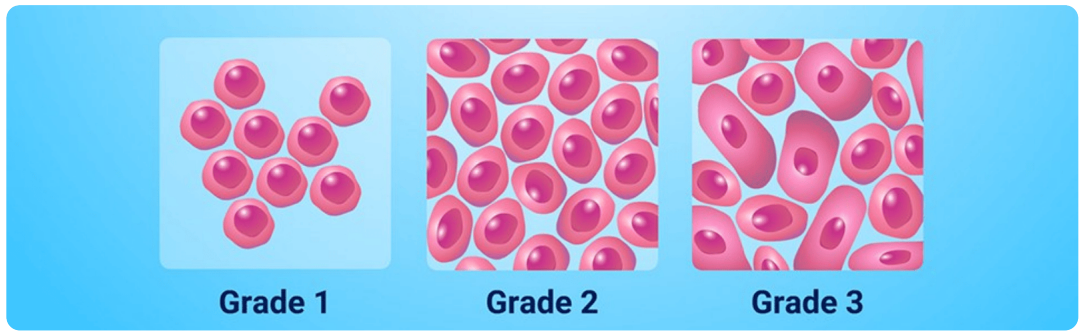
1 Image-guided target identification



2 Precise needle positioning



3 Tissue sampling under control



4 Specimen confirmation and labelling

DIAGNOSIS

Pathology: information that changes treatment

In situ or invasive

DCIS versus invasive carcinoma

Type and grade

Histological type and grade

Receptor status

ER, PR and HER2 status guide systemic treatment choices

Concordance & MDT

Imaging–pathology concordance and MDT review

SCORING SYSTEMS

UK five-point assessment: concordance matters

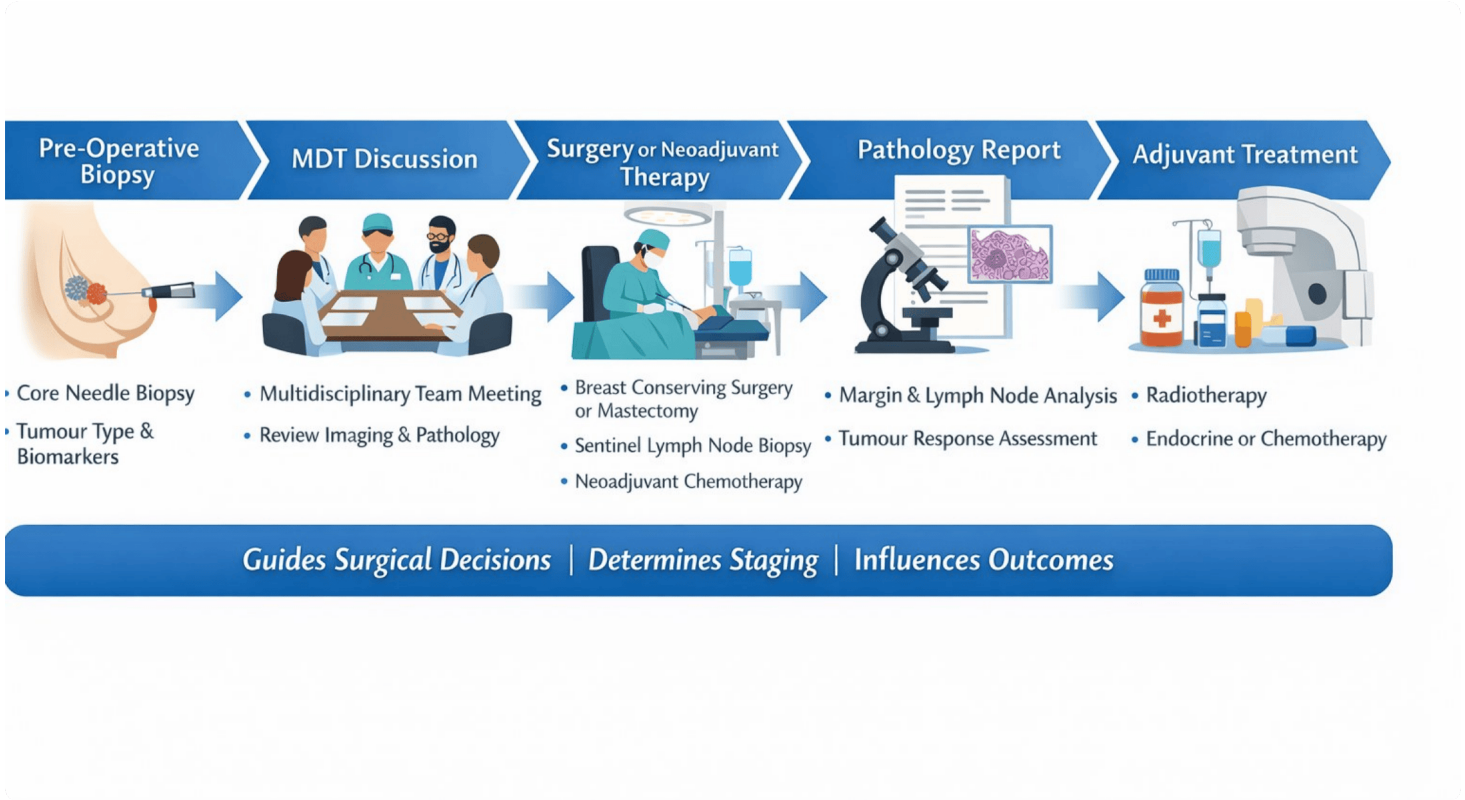
Assessment	Normal	Benign	Indeterminate	Suspicious	Malignant
Clinical	P1	P2	P3	P4	P5
Ultrasound	U1	U2	U3	U4	U5
Mammography	M1	M2	M3	M4	M5
Histology	B1	B2	B3	B4	B5a / B5b

Key principle: **a benign biopsy does not resolve suspicious imaging unless findings are concordant.**

Note: B3 and B4 are specific histopathological categories, not direct equivalents of imaging scores.

TREATMENT

The breast cancer surgical pathway



Imaging findings carry through every stage of the surgical decision.

CLINICAL DEPTH

Operative decision-making: breast and axilla

Surgical choice integrates imaging extent, histology, receptor status and patient factors

Breast surgery

- **Wide local excision** with targetted margins — typically 2 mm for invasive disease and DCIS
- **Mastectomy** for multicentric disease, diffuse microcalcification or central tumours
- **Oncoplastic techniques** (therapeutic mammoplasty, local perforator flaps) extend breast-conserving surgery
- Marked lesion localisation and bracketing wires guide excision of extensive disease

Axillary surgery

- **Sentinel lymph node biopsy** is standard for the clinically and imaging node-negative axilla
- Ultrasound-guided **node needle sampling** stages the axilla before surgery
- Node-positive after neoadjuvant therapy: **targeted axillary dissection** of the marked node plus SLNB
- **Axillary clearance** reserved for persistent nodal disease; drives lymphoedema risk

IMAGING → SURGERY

How imaging reshapes surgical planning

MRI and contrast-enhanced mammography map extent, reveal occult disease and change operative recommendations

~23%

of patients have surgical recommendations changed after MRI — rising to **53%** in multifocal disease

± Additional foci

MRI identifies additional suspicious lesions in **27–37%** of patients

Refined extent

More accurate tumour size prompts **wider excision or conversion to mastectomy**

↔ Contralateral disease

Synchronous contralateral malignancy detected in **3–5.5%**

BCS feasibility

Clarifies breast-conserving options in **invasive lobular carcinoma**, where conventional imaging underestimates extent

Sources: published MRI and CEDM cohort studies; NICE NG101 recommends MRI when conventional imaging is discordant.

EVIDENCE

The evidence — and when imaging matters most

CEDM alters surgical plans in 18.5–25% of early breast cancer patients

Study evidence

Single-centre MRI study (137 patients)
Recommendations changed in **23%**, mainly multifocal disease; subtype made no difference

MRI cohort (155 patients)
Surgical strategy altered in **23.2%** — mastectomy or wider excision for additional malignant foci

Contrast-enhanced mammography
Altered plans in **18.5–25%** of early breast cancer patients

Greatest impact when

- **Multifocal / multicentric disease** suspected — MRI changed surgery in 53% of multifocal cases
- **Invasive lobular carcinoma** — better extent assessment, may reduce reoperation
- **Dense breasts** limit mammographic accuracy
- **Discordant conventional imaging** — MRI recommended by NICE NG101

BALANCE OF BENEFIT AND RISK

Limitations, risks and MDT integration

Advanced imaging informs, but the multidisciplinary team decides

Limitations and risks

- **False-positive MRI** up to 78% for biopsied lesions in some series
- Routine MRI may **increase mastectomy rates** without improving long-term outcomes
- **Overestimation** of tumour size can drive more extensive surgery than necessary

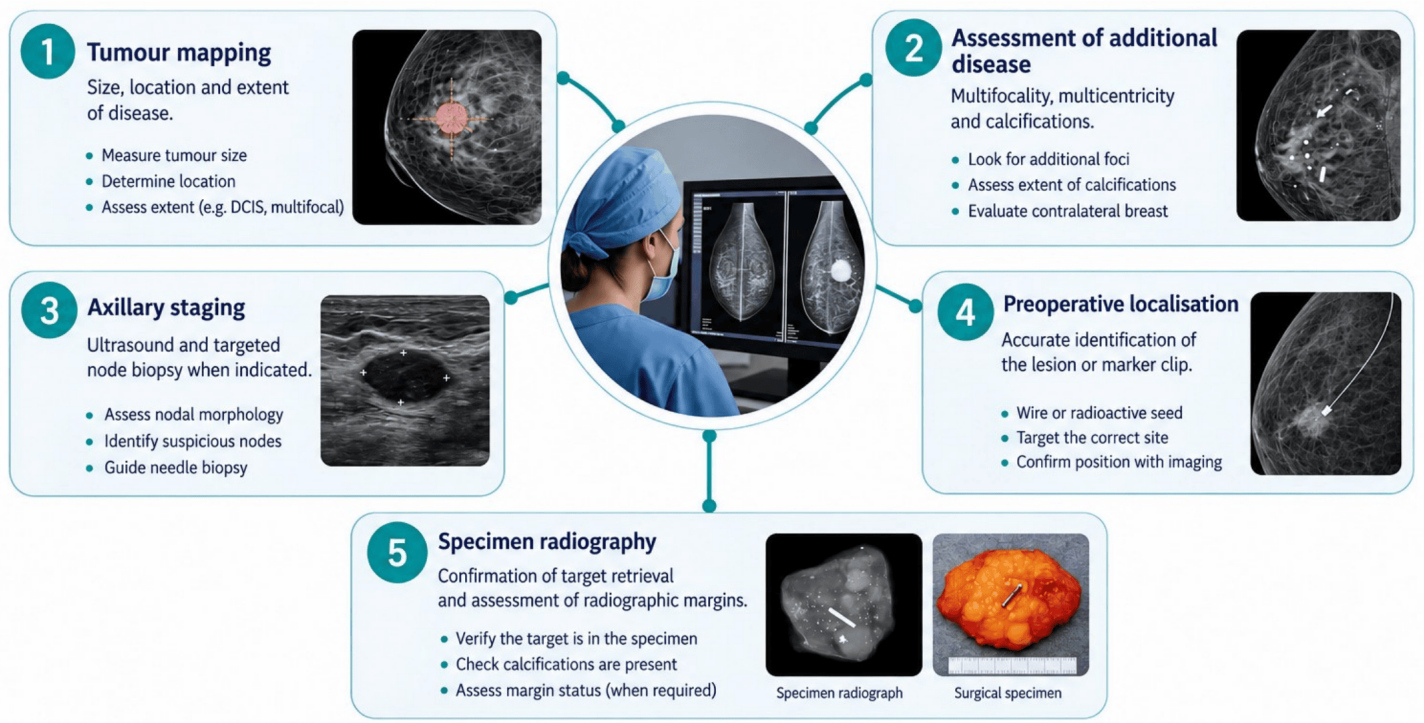
Multidisciplinary integration

- Findings interpreted in the **MDT tumour board** — surgeons, radiologists and oncologists together
- Joint decisions on whether imaging-detected lesions warrant **biopsy, wider excision or mastectomy**
- Ensures **proportional, patient-centred** surgical decisions

Radiology maps the disease; the MDT maps the operation — changing surgical recommendations in roughly 20–25% of patients.

MDT COLLABORATION

What the surgeon needs from radiology

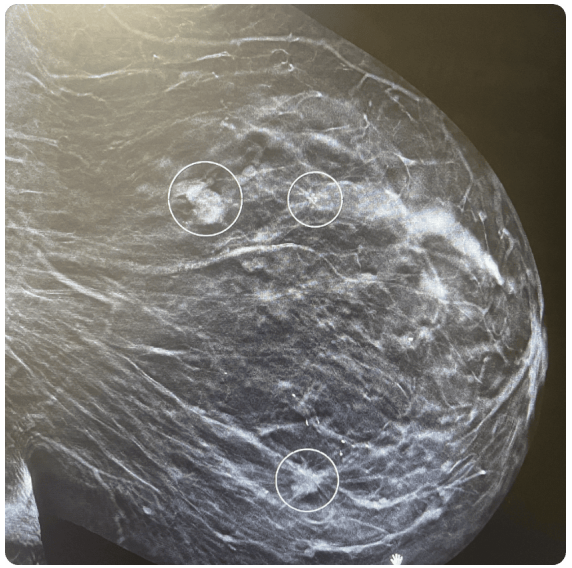


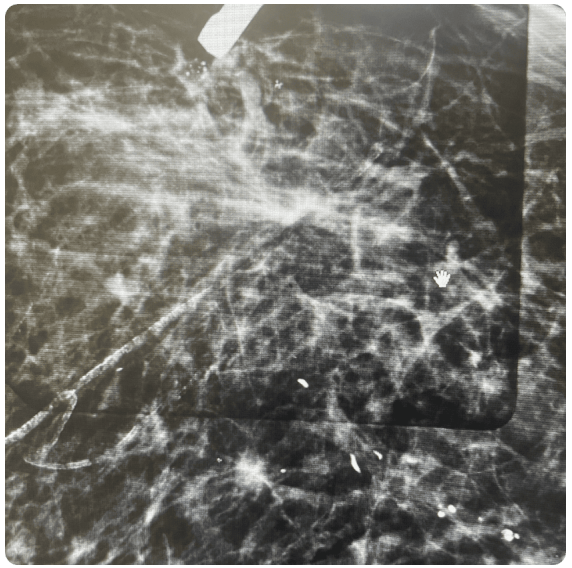
Accurate imaging enables precise, individualised surgical planning.

CASE 1

Multicentric invasive lobular carcinoma

Imaging defines disease distribution and informs surgical feasibility





Case details

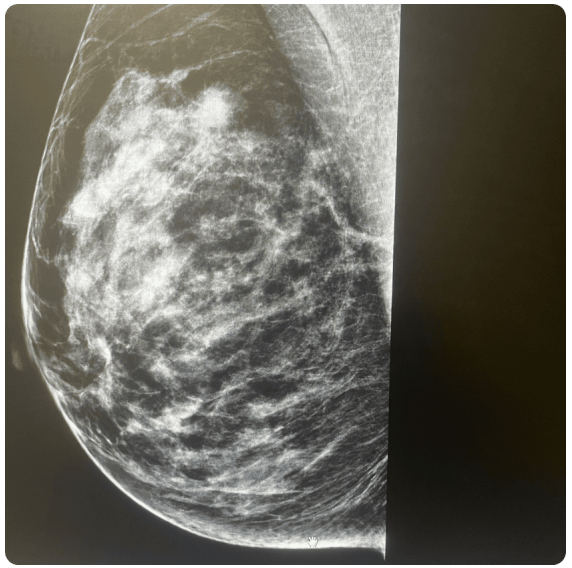
- 78 years; screen-detected
- Multicentric ILC: 11 mm and 5 mm
- Clinically P1; node negative
- ER 8, PR 8, HER2 negative

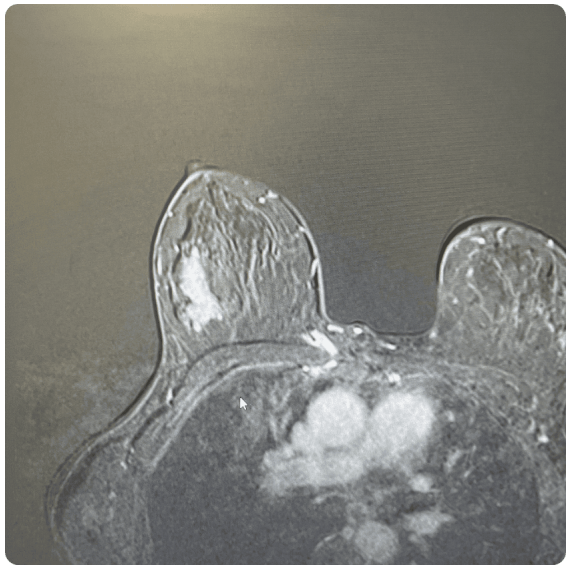
Discussion: How does multicentricity affect the planned breast operation?

CASE 2

Imaging before neoadjuvant chemotherapy

Symptomatic presentation: different modalities, different estimates of extent





Case details

- 48 years; symptomatic
- 50 mm P2 nodularity
- 13 mm M3 asymmetry
- 23 mm U4 lesion
- 54 mm MRI extent
- N2; staging negative

Discussion: Which imaging findings were most influential in treatment planning?

CLINICAL DEPTH

Specimen radiography and margin assessment

Radiographers verify the target before the patient leaves theatre

Intraoperative roles

- Confirm the **lesion and marker clip** are within the specimen
- Check **localisation wire / seed position** relative to the target
- Measure **specimen-to-lesion distances** and communicate to the surgeon
- Identify **calcification extent** — may prompt immediate cavity shave

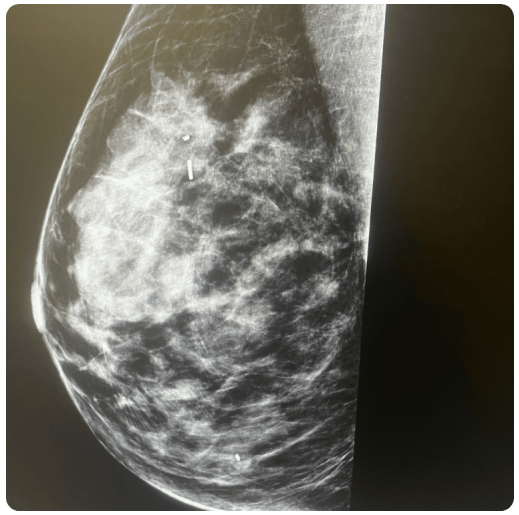
Margins and re-excision

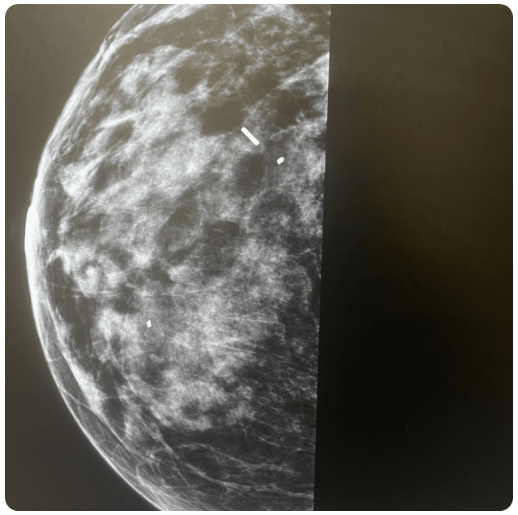
- **Clear margin** — "no ink on tumour" is adequate for invasive disease
- **2 mm** is the conventional standard for **pure DCIS**
- **Involved margins** (<1 mm) carry the highest re-excision risk
- **Cavity shaved margins** reduce re-excision rates without changing survival

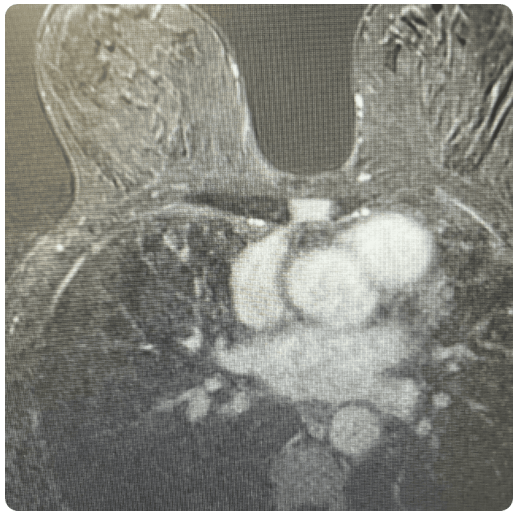
CASE 2 · FOLLOW-UP

Imaging response after neoadjuvant treatment

Radiological response informs, but does not replace, surgical planning







Complete radiological response ≠ confirmed pathological complete response

Surgery pending: consider localisation of the original tumour bed and planned axillary management.

CLINICAL DEPTH

Assessing response after neoadjuvant chemotherapy

Response is staged pathologically — ypTNM — and quantified to guide prognosis

Before and during treatment

- **Clip placement** at diagnosis marks the tumour bed before it shrinks or disappears
- Axillary nodes sampled or marked before NAC enable **targeted axillary surgery**
- Surgery is planned on the the residual imaging finding
- Response is reported as **ypTNM** — e.g. ypT0/is ypN0 after complete response

Residual Cancer Burden

RCB-0	**pCR** — no residual invasive disease in breast or nodes
RCB-I	Minimal residual disease; excellent prognosis
RCB-II	Moderate residual disease; considers adjuvant escalation
RCB-III	Extensive residual disease; worst prognosis, treatment intensification

SUMMARY

Take-home messages

1. Image quality influences treatment decisions
2. Concordance is as important as detection
3. Disease extent and localisation guide surgery
4. Specimen imaging supports target retrieval
5. Radiographers are integral to the whole pathway

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Clinical images: anonymised local teaching cases. Illustrative graphics are schematics, not diagnostic images.

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Thank you

Questions?

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