Breast Cancer Surgery Today: Saving Life & Breast

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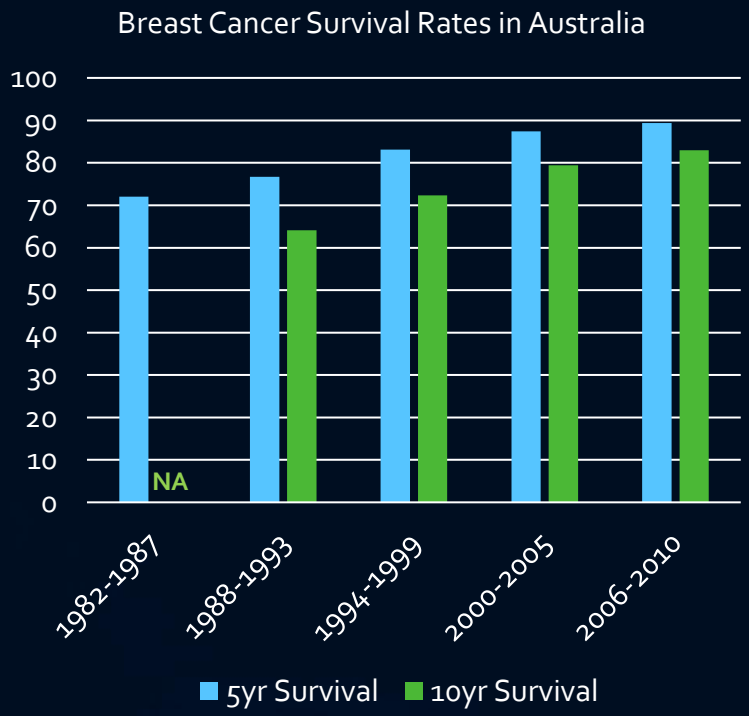
Breast Cancer Survival Rates

- Survival rates are improving due to:
  - Earlier detection (mammography)
  - Advances in therapeutic treatment (e.g. chemotherapy, Herceptin, endocrine therapy)
- Then ('80s): Surgery focused solely on survival, so mastectomies were the default procedure.
- Treatment priorities today go beyond surviving cancer.

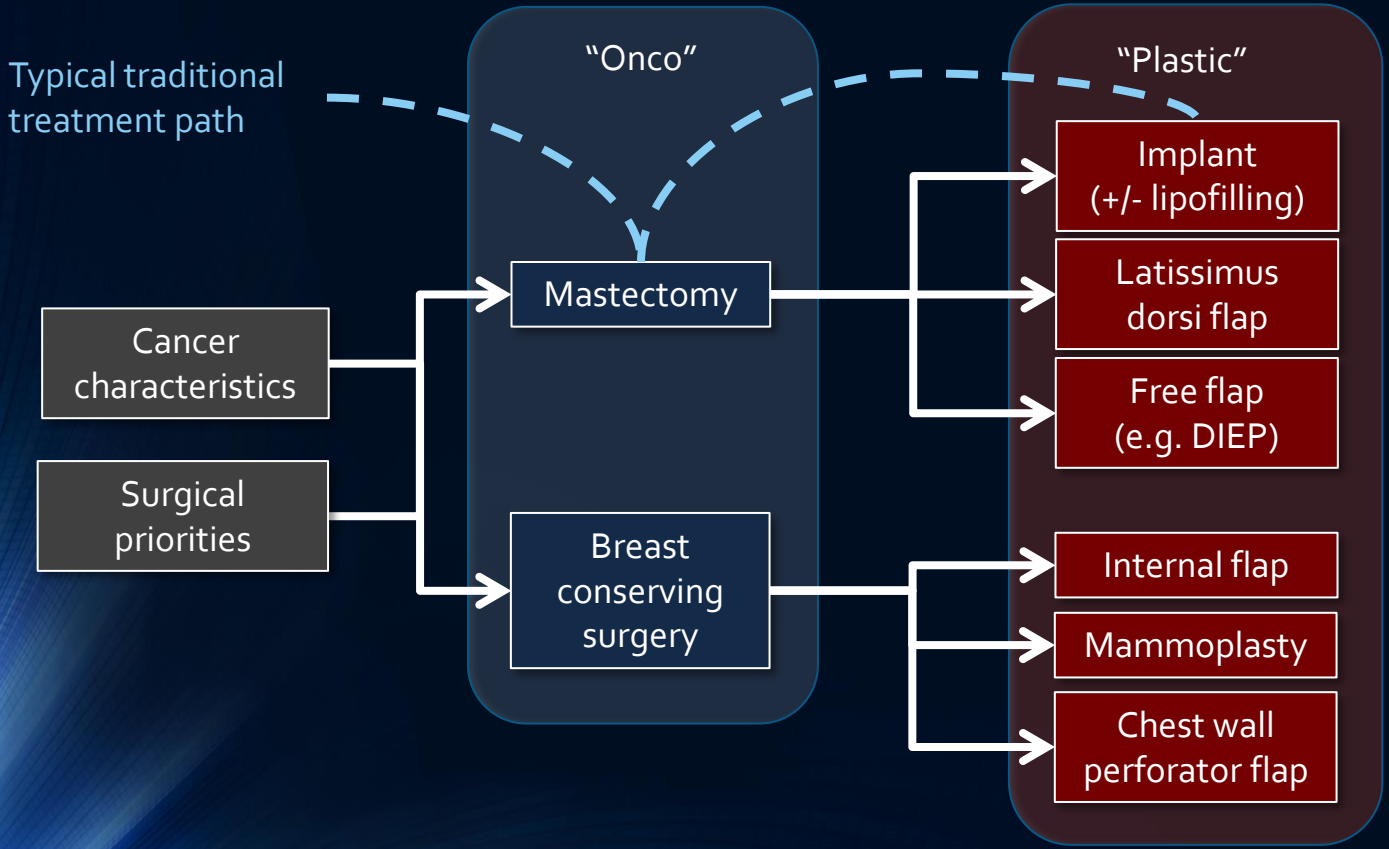


Source: AIHW Australian Cancer Database

Treatment Priorities Today

1. Survive cancer ("Saving Life")
2. Minimise discomfort
   a) During treatment
   b) After treatment
3. Minimise long-term impact to quality of life ("Saving Breast")
   a) Physiological
   b) Psychological

Today's Surgical Options



Cancer Characteristics & Surgical Priorities

Cancer characteristics

- Size of cancer relative to size of breast
- If multiple cancers are present, the dispersion of those cancers within the breast (multifocality/multicentricity)
- Location of cancer within the breast

Surgical priorities

- Safe removal (excision) of cancers
  - Mastectomy or breast conserving surgery with margins
- Complication factors
  - Obesity, smoking, diabetes, autoimmune conditions, etc
- Quality of life
- Patient's preferences

Mastectomy vs. Breast Conserving Surgery

Mastectomy

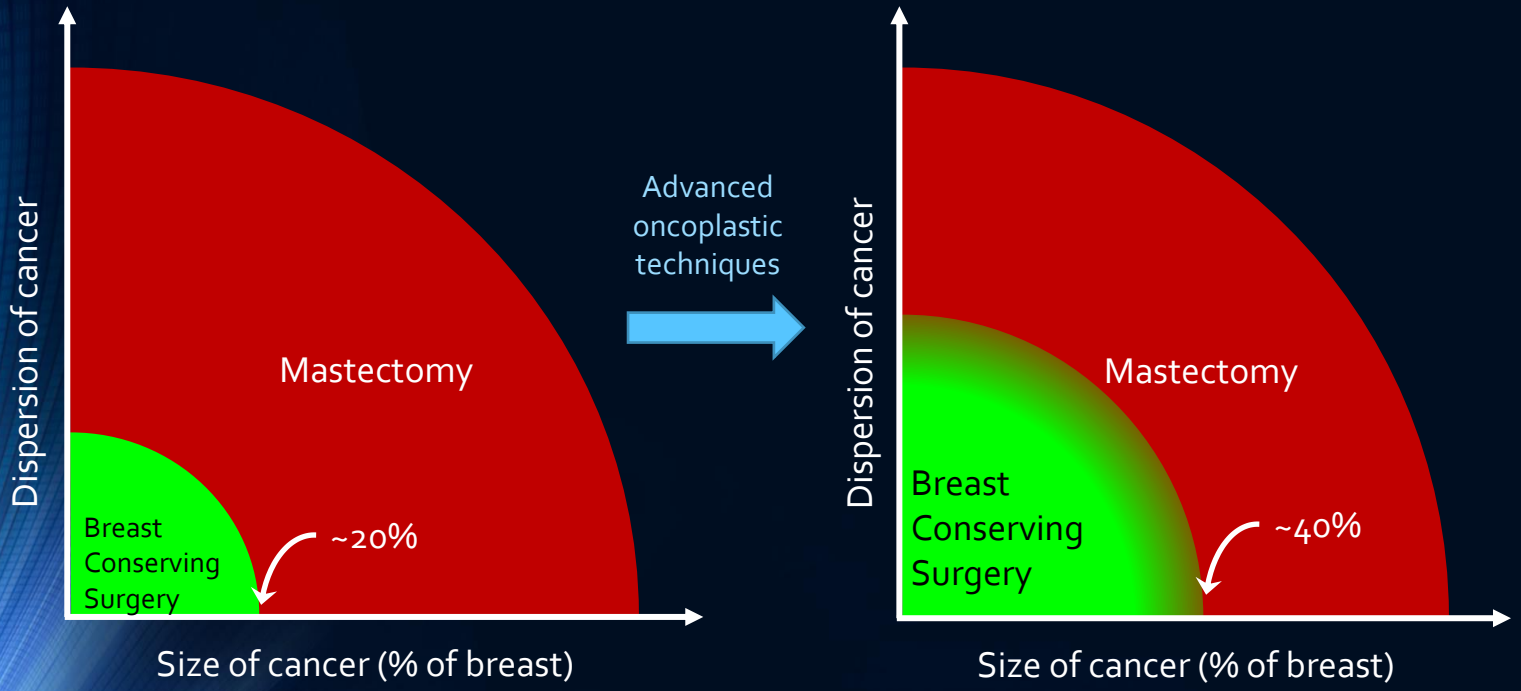
- Removal of the entire breast
- Required when cancer is large relative to the breast, or when multiple cancers are widely dispersed within the breast
- As some breast tissue will still remain, recurrence risk still exists
- Can be performed to allow for reconstruction (e.g. skin-sparing, nipple-sparing)

Breast Conserving Surgery

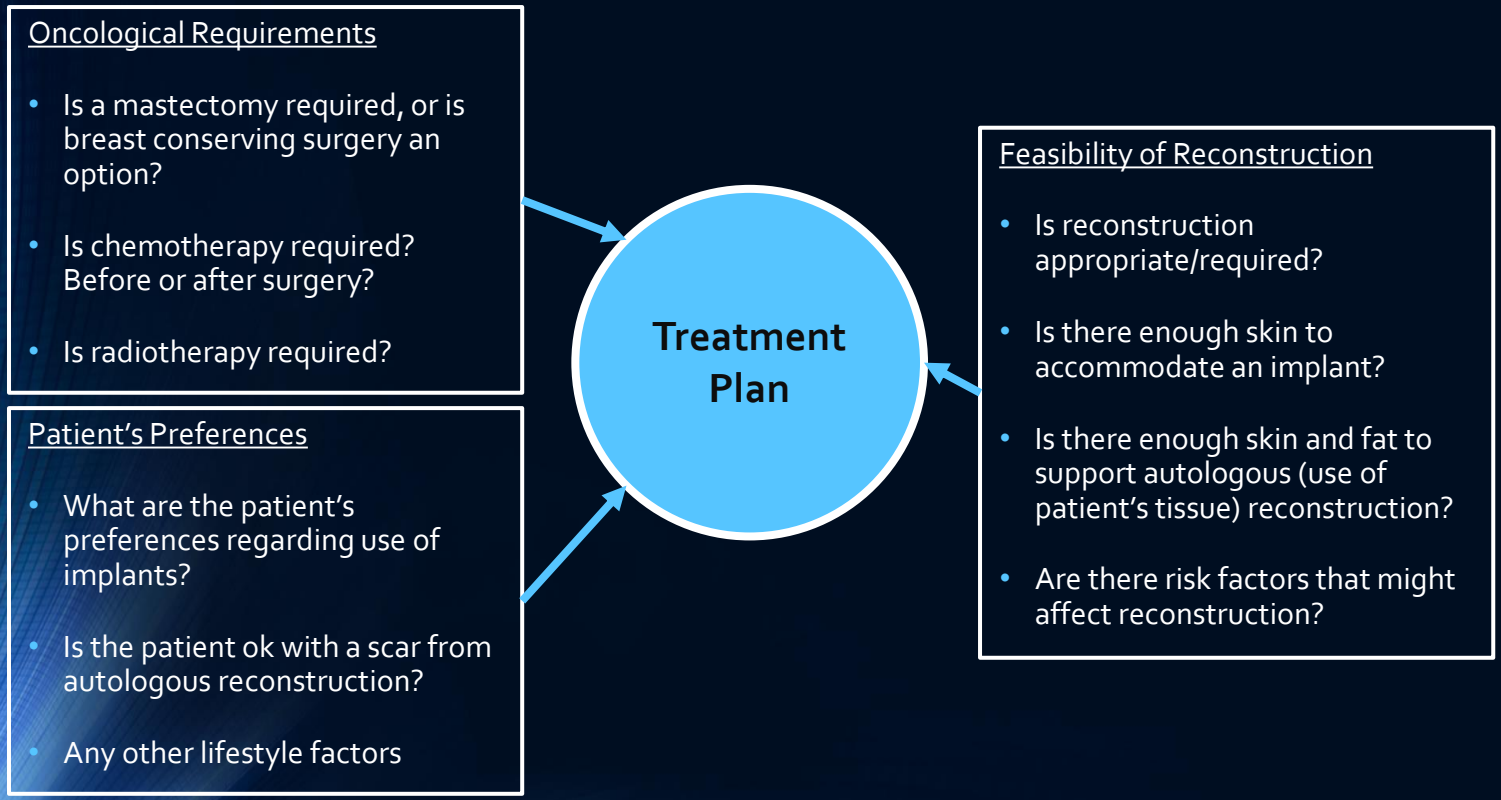
- Removal of the cancer with a safety margin of tissue
- Possible when cancer ≤ **20%** size of the breast, low dispersion of cancer within the breast
- When combined with radiotherapy, recurrence risk is equivalent to mastectomy
- Higher patient satisfaction levels compared to mastectomy, regardless of reconstruction[1-3]

1. Nano, M.T., et al., Psychological impact and cosmetic outcome of surgical breast cancer strategies. ANZ J Surg, 2005. 75(11): p. 940-7.
2. Al-Ghazal, S.K., L. Fallowfield, and R.W. Blamey, Comparison of psychological aspects and patient satisfaction following breast conserving surgery, simple mastectomy and breast reconstruction. Eur J Cancer, 2000. 36(15): p. 1938-43.
3. Kelsall, J.E., et al., Comparing oncoplastic breast conserving surgery with mastectomy and immediate breast reconstruction: Case-matched patient reported outcomes. J Plast Reconstr Aesthet Surg, 2017. 70(10): p. 1377-1385.

Oncoplastic Techniques Expand Options Available



Deciding on the Surgical Treatment Plan



Timing of Reconstruction

Immediate

- Most ideal option
- Single operation to remove cancer and rebuild breast
- No 'downtime' without breast mound

Delayed

- Complicated cases
  - Patient factors
    - BMI
    - Smoking
    - Pregnancy
  - Disease factors
    - Inflammatory breast cancer
- Co-ordination
  - Remote access, delayed reconstruction with plastic surgeon

Immediate-delayed (Staged)

- Radiotherapy or skin compromised
  - Tissue expander then change to implant

Post-Mastectomy Reconstruction: Implant-Based Reconstruction

Implant-Based Reconstruction

- A common and viable reconstruction option for many mastectomy patients.
- Today, implants are filled with silicone or saline, and come in a variety of shapes and sizes.
- Coupled with fat-grafting, the look of an implant-reconstructed breast can closely mimic that of a natural breast.

✓ Shorter recovery time

✓ Ease of symmetrisation

✓ Does not require additional incisions (scars)

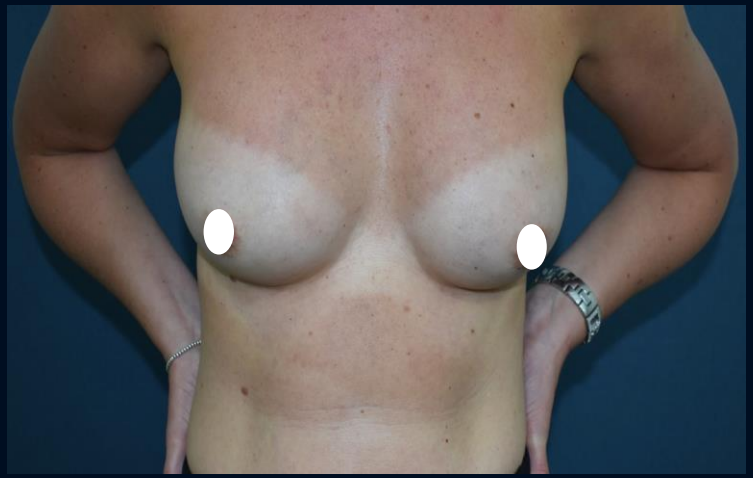
X Is not radiotherapy-resilient (staged reconstruction required)

X Asymmetry may arise when patient ages or changes in weight

X Risks associated with a foreign object in the body (e.g. capsular contracture, "BII", ALCL)

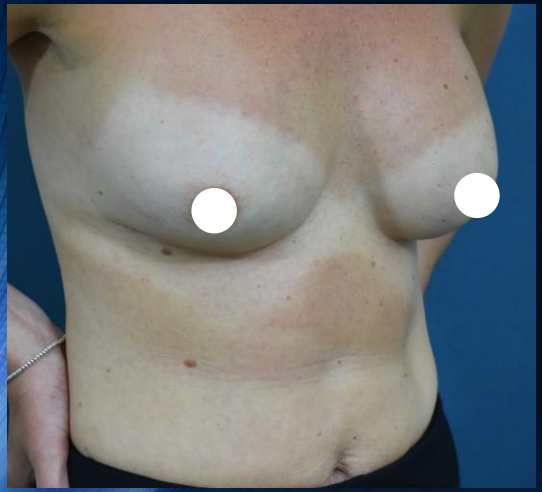
Implant-Based Reconstruction Case Example I

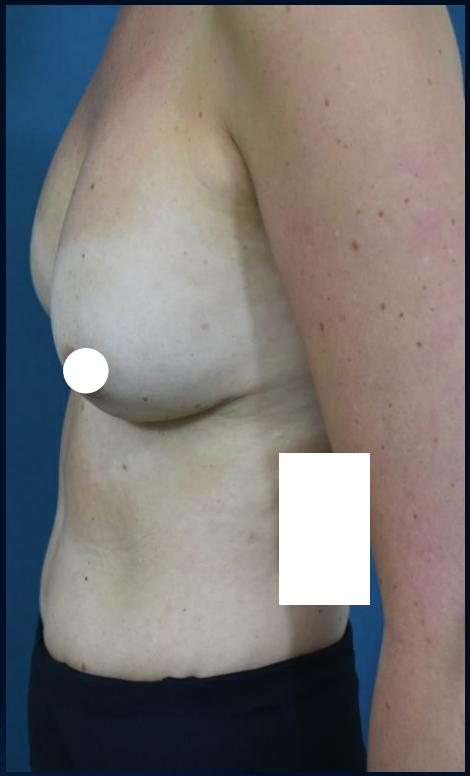
- Patient who underwent double mastectomies.
- Pre-pectoral implants
- Picture is 2.5-years post-op
- Patient was:
  - Smaller-breasted
  - Not obese
  - Healthy
  - Not ptotic



Implant-Based Reconstruction Case Example I

- Good symmetric breast mounds
- Good size and shape





Beyond Prostheses:
Autologous Reconstruction

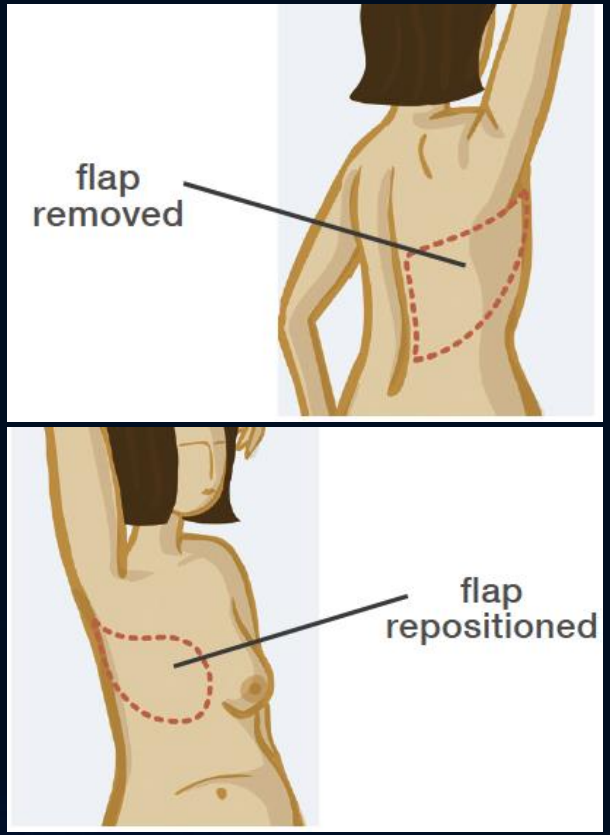
Autologous Reconstruction

- The use of the patient's own tissue ("flap") is becoming more popular in the context of breast reconstruction.
- Compared to implant-based reconstruction:
  - ✓ Cosmetically more suited for larger breasted patients
  - ✓ Radiotherapy-resilient
  - ✓ Evolves naturally with the patient over time (shape and size)
  - ✓ More natural feel
  - ✓ Does not require ongoing maintenance
  - ✓ Avoids implant-associated risks
  - X Longer surgery
  - X Potentially longer recovery time
  - X Will require addition incision at donor site, although scar will fade with time
  - X Some patients do not have sufficient tissue for autologous reconstruction

Post-Mastectomy Reconstruction: Autologous Reconstruction (Latissimus Dorsi)

Latissimus Dorsi Reconstruction

- Skin, fat, (+/- muscle) are taken from the back and rotated into breast cavity on vascular pedicle
- Appropriate in cases where there is insufficient skin for implant
- Can also be used as a salvage procedure for local recurrence
- Can be used in conjunction with implant
- Side effects (uncommon) may include chronic pain and decrease in arm mobility. Rare complication may lead to flap loss.



Latissimus Dorsi Autologous Reconstruction Case Example

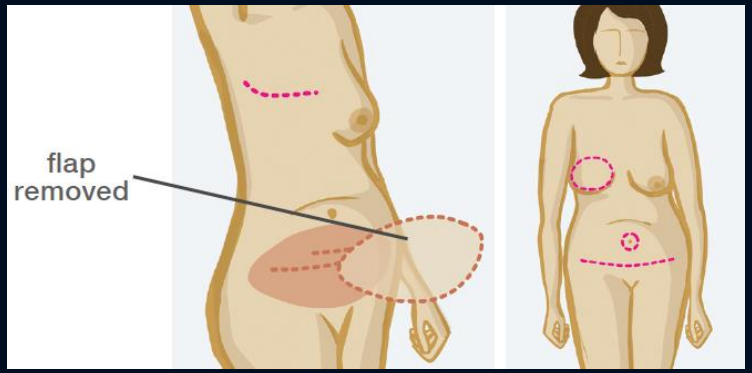
- Right skin-sparing mastectomy for cancer and DCIS
- Patient was poor candidate for implant and DIEP
- Breast reduction (mammoplasty) was performed on left breast for symmetrisation

Latissimus Dorsi Autologous Reconstruction Case Example

Post-Mastectomy Reconstruction: Autologous Reconstruction Free Flap (DIEP)

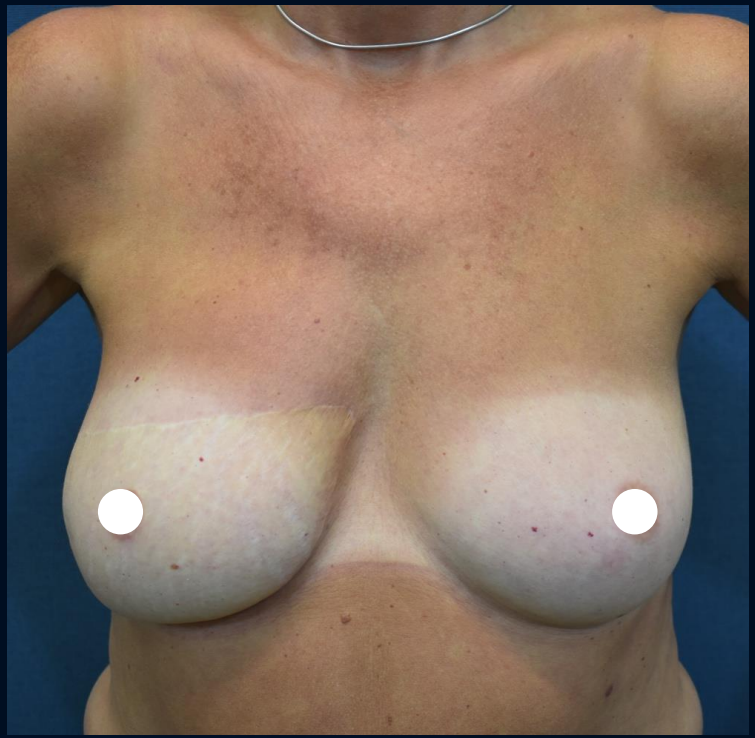
Free Flap Reconstruction (DIEP)

- Skin, fat, (+/- muscle) from a separate part of the body is placed in the cavity left behind by the removed breast
- Typically used to reconstruct large breasts, and where remaining skin might be insufficient for an implant
- Abdominal flaps (DIEP) are preferred for their lower morbidity vs flaps from buttocks or thighs
- Requires patient to have sufficient tissue to be used as a flap
- Microsurgery associated with free-flaps require a plastic surgeon

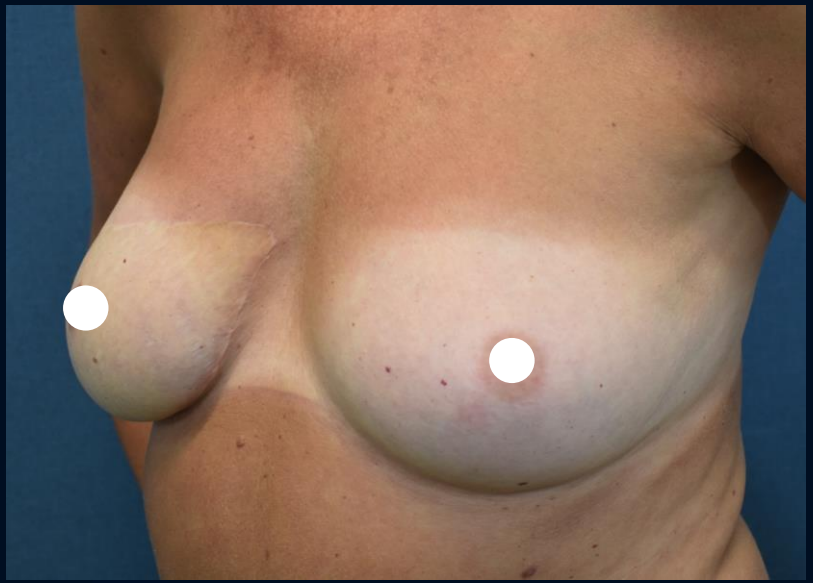


DIEP Autologous Reconstruction Case Example

- Patient with previous right simple mastectomy
- Patient desired reconstruction using autologous tissue – needed skin paddle
- DIEP was performed with a nipple tattoo



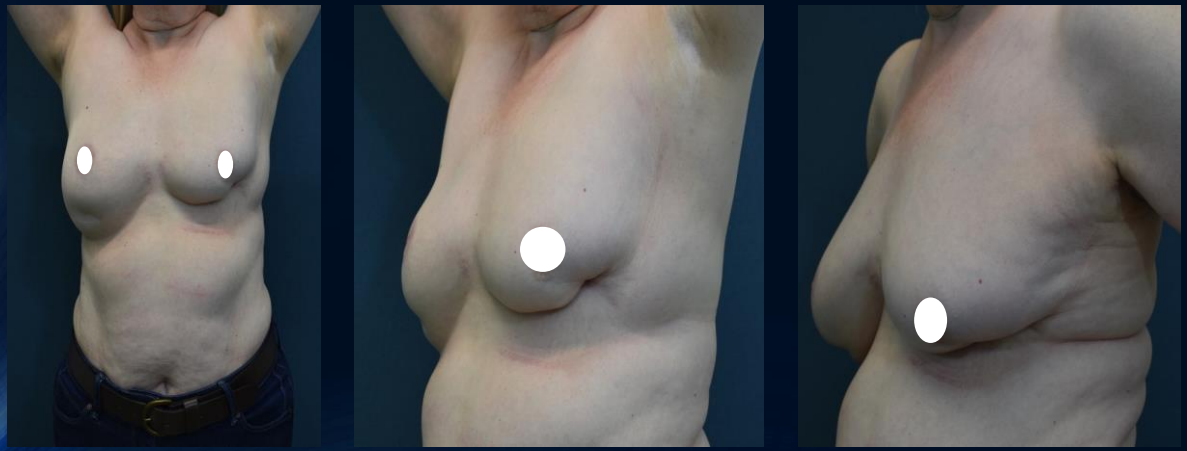
DIEP Autologous Reconstruction Case Example



Breast Conserving Surgery
Do's and Don'ts

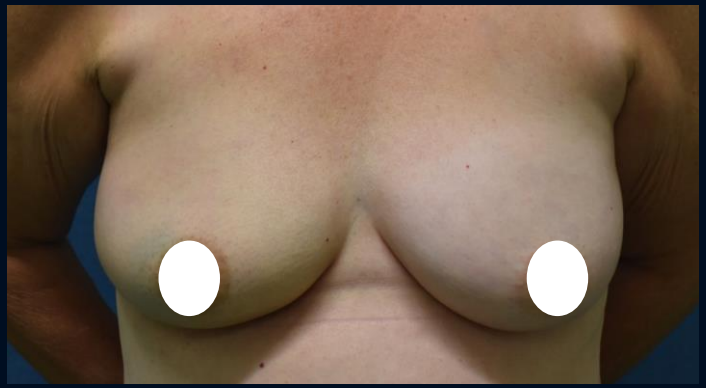
Breast Conserving Surgery: Don’ts

- Performing breast conserving surgery without a good plan can lead to poor outcomes for patients, leaving them as *breast cripples*.
- (Below) Cancer was excised but reconstruction was not undertaken. This resulted in loss of volume, shape and contour, and skin-tethering.



Breast Conserving Surgery: Do's

- A good surgical plan achieves the desired oncological result, as well as optimal cosmetic outcome.
- BCS coupled with reconstruction should yield positive results:
  - Shape
  - Contour
  - Symmetry
  - Feel & Texture
  - Scarring
- In some cases, patients are more satisfied with the appearance of their breasts after treatment compared to before.

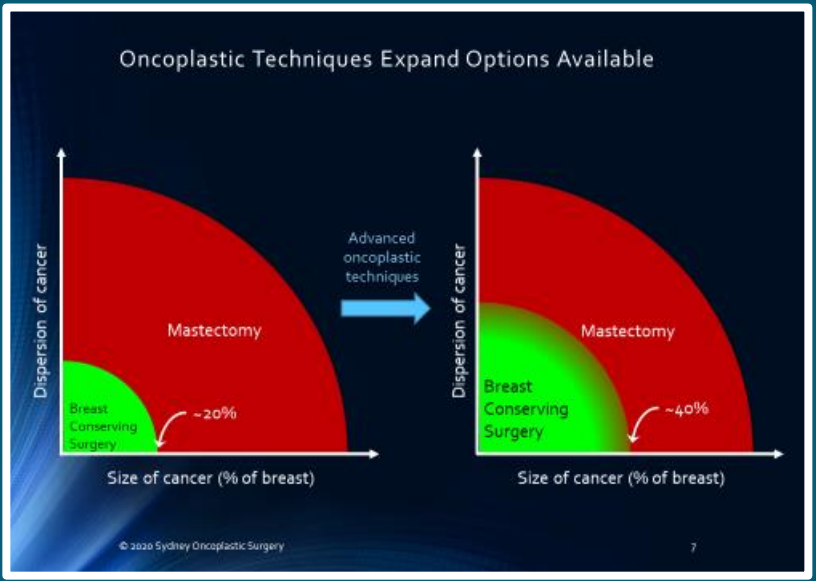


Post-BCS Reconstruction: Internal Flap

Internal Flap

- Simple BCS-based reconstructive technique that is reserved for smaller tumours
- Unaffected breast tissue is reshaped/rotated to occupy defect from cancer excision
- Low complication rate
- Good cosmetic and haptic result

Remember this slide?

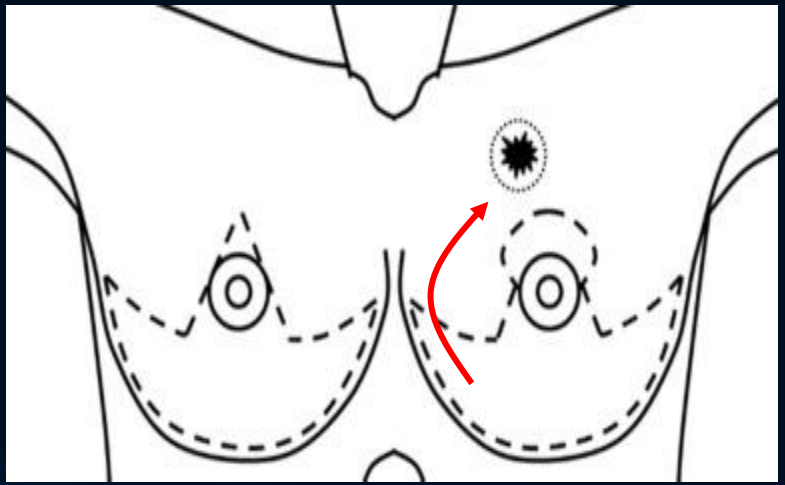


- Without the development of the next two techniques of reconstruction, breast conserving surgery would be limited to only cases of very small cancers
- Mammoplasty and the Chest Wall Perforator Flap ("CWPF") are welcomed advances to the field

Post-BCS Reconstruction: Mammoplasty

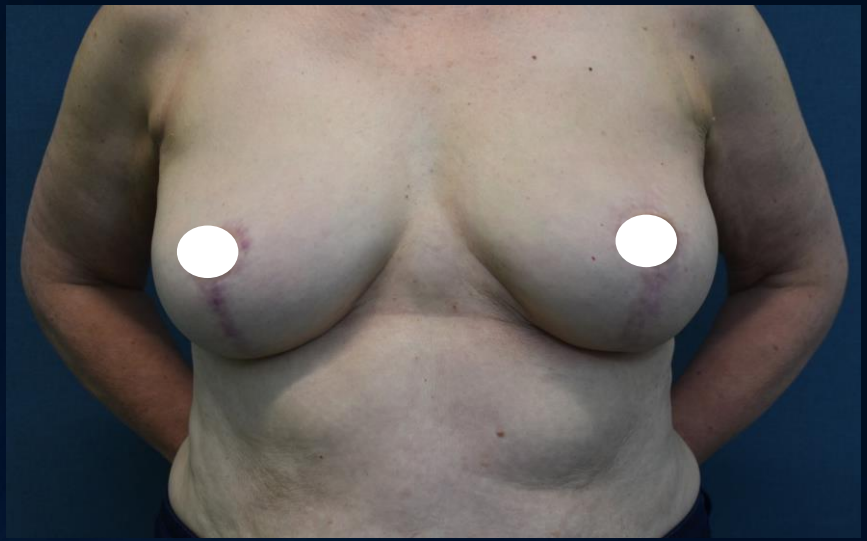
Mammoplasty

- A set of surgical procedures initially designed for breast reduction
- Now, a set of techniques used to remove large cancers in larger breasted women, and subsequently reshape the remaining breast tissue to achieve an acceptable appearance
- Two categories:
  - Therapeutic (cancer-affected breast)
  - Reductive (symmetrise unaffected breast)



Mammoplasty Case Example 1

- Originally referred for mastectomy + DIEP
- 5cm DCIS in left E-cup breast
- BCS was able to be performed with mammoplasty



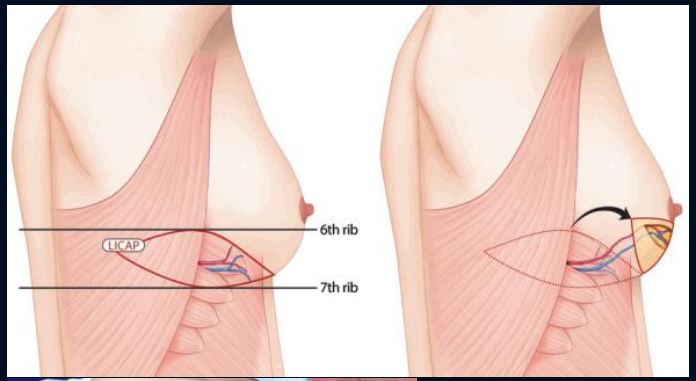
Mammoplasty Case Example 2

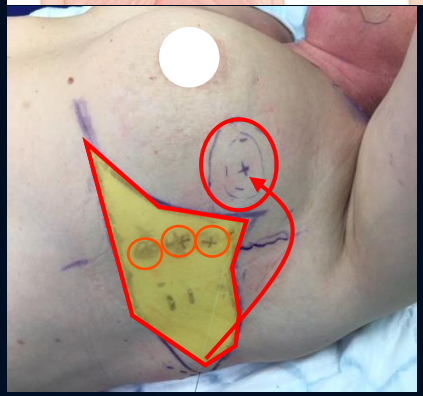
- F-cup breasted patient with grade 4 ptosis (chronic back pain)
- Bilateral breast cancer with involved left nipple
- Mammoplasty technique used, and both nipples were removed
- 1-year post op

Post-BCS Reconstruction: Chest Wall Perforator Flap

Chest Wall Perforator Flap ("CWPF")

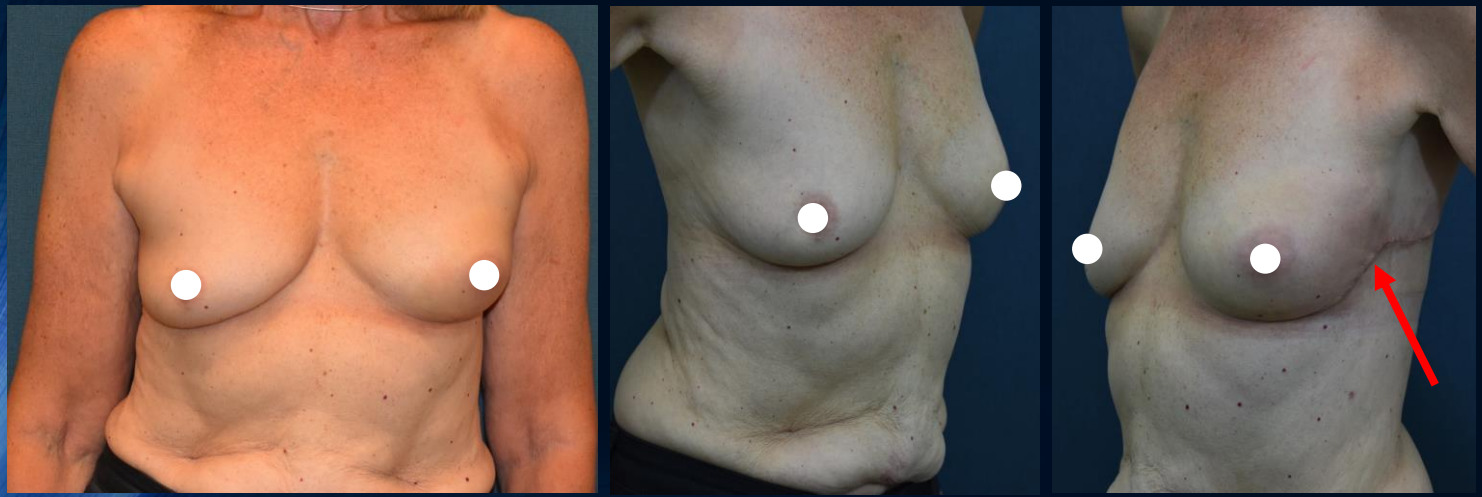
- Skin and fat from under the armpit is rotated to fill in the cavity in the breast
- Appropriate for small to larger-breasted patients with moderate sized tumours (20%-40%)
- Serves as an alternative to mastectomy + implant
- Radiotherapy-resilient. Arm movement is unhindered





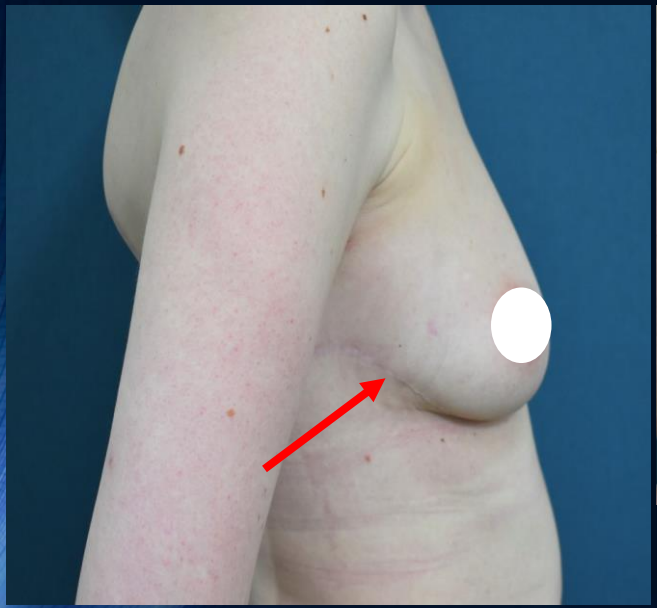
CWPF Case Example 1

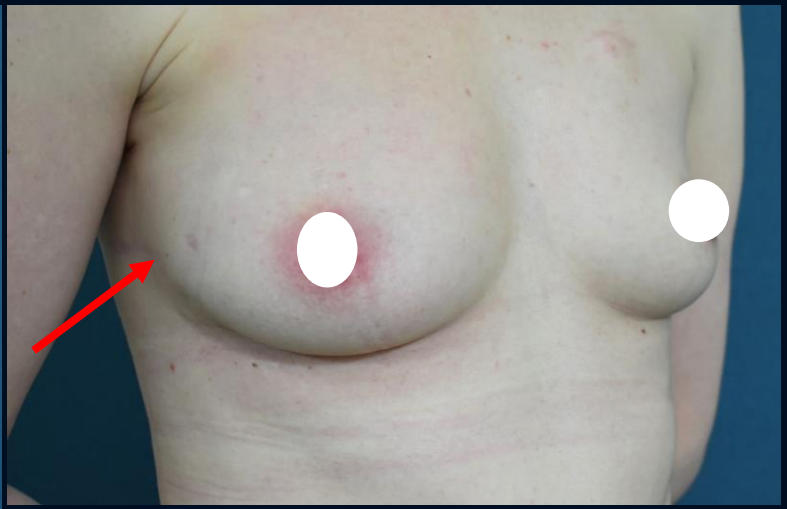
- Large cancer in left petite-breast
- 3-weeks post op
- Good shape, symmetry, contour
- No visible scar on breast



CWPF Case Example 2

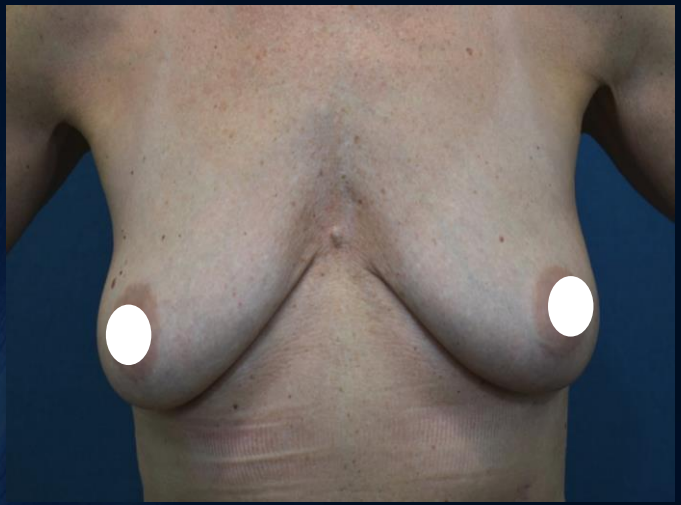
- Scar is expected to fade over time
- 1-year post op:

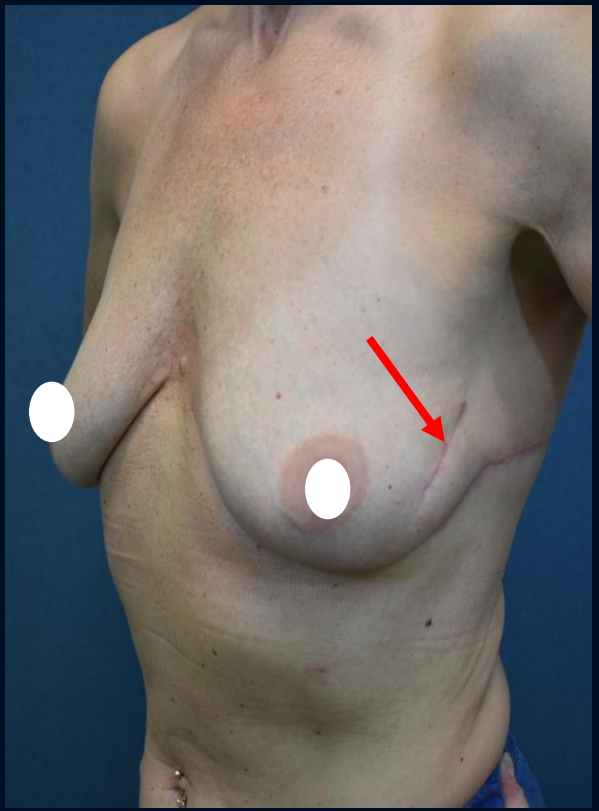




CWPF Case Example 3

- Re-excision of margin
- Suited to ptotic breasts



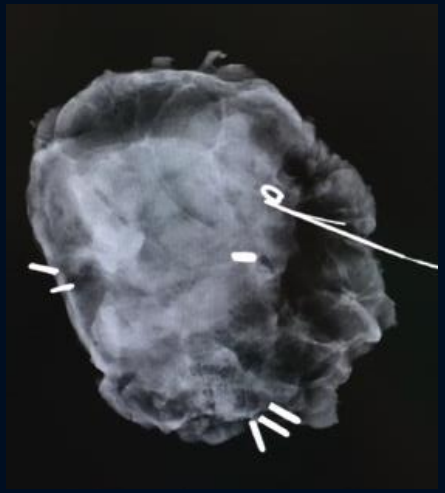


Neoadjuvant Chemotherapy

DOWNSIZING, INFORMATION, AND TRIALS

Neoadjuvant Chemotherapy

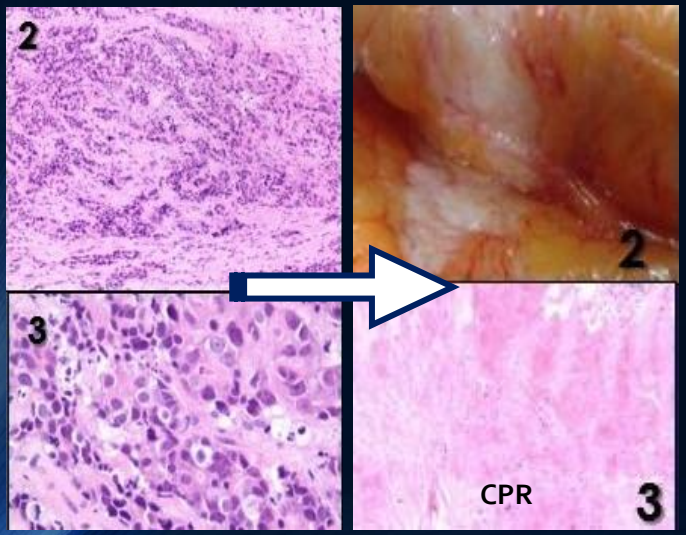
- Chemotherapy given before primary treatment (surgery)
- Suited for certain large cancers (e.g. TNBC, HER2+)
- Multiple benefits
  - No difference in prognosis or overall survival if chemotherapy is given before or after surgery[1]
  - Prognostic indicator
  - Trial of other treatments if tumour is not reducing/stagnant in size
  - Shrink tumour – increase likelihood of BCS[2]

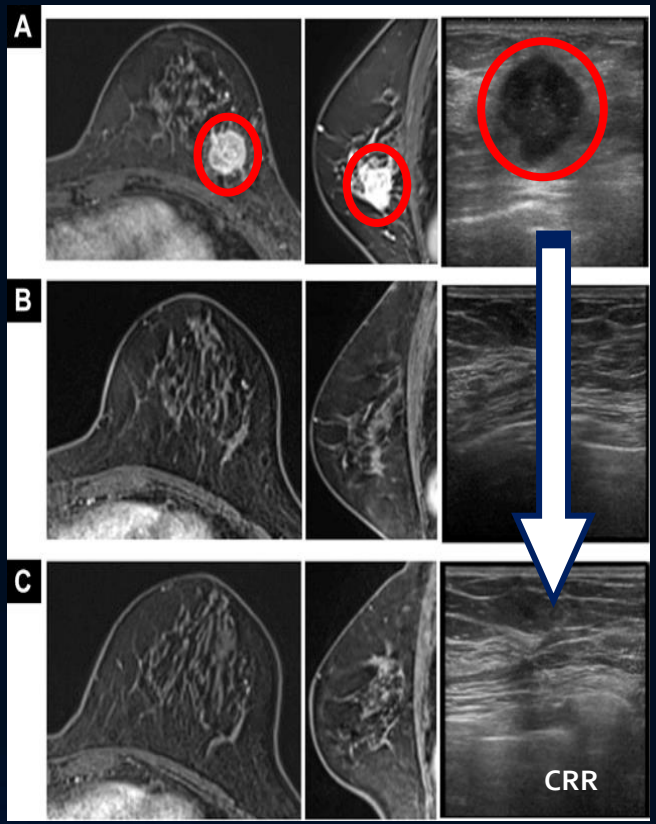


1 - Shin, H.C., et al., *Breast-conserving surgery after tumor downstaging by neoadjuvant chemotherapy is oncologically safe for stage III breast cancer patients.* Ann Surg Oncol, 2013. **20**(8): p. 2582-9.
2 - Loibl, S., et al., *Surgical procedures after neoadjuvant chemotherapy in operable breast cancer: results of the GEPARDUO trial.* Ann Surg Oncol, 2006. **13**(11): p. 1434-42.

Downsizing of Cancer → BCS

- Through neoadjuvant chemotherapy, some tumours shrink in size. This facilitates the use of breast conserving surgery in place of mastectomies.





Concluding Points

- Survivorship of breast cancer patients is now high and will continue to improve over time.
- Treatment priorities must include both "survival" and "post-treatment quality of life."
- Advances in Surgery, Medical Oncology, and Radiotherapy are increasing our ability to save patients' "lives and breasts."
- What can GPs do?
  - Support patients with encouraging statistics on survival.
  - Introduce the idea and value of reconstruction, neoadjuvant chemotherapy, and drug trials.

About Dr Eva Nagy

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She completed 2 years of sub-specialty training in breast surgery at the Poche Centre and at the Nottingham Breast Institute, and has treated more than 1000 patients in an oncoplastic context.

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