Ms Katherine Gale

Oncoplastic Breast Surgeon
Waitemata District Health Board
Auckland

Saturday, June 10, 2017 (Room 10)

16:30 - 17:25 WS #167: Update on Breast Cancer
17:35 - 18:30 WS #179: Update on Breast Cancer (Repeated)

Update on Breast Cancer

Katherine Gale FRACS

Oncoplastic Breast, Melanoma & General Surgeon

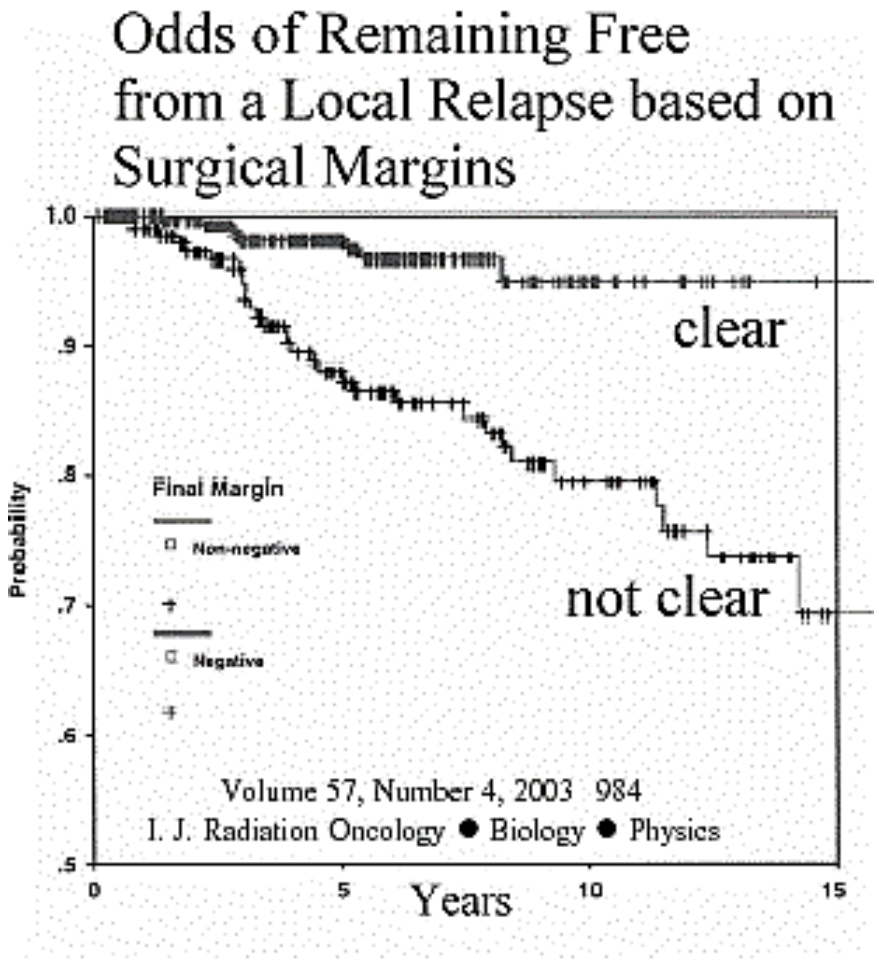
aobi

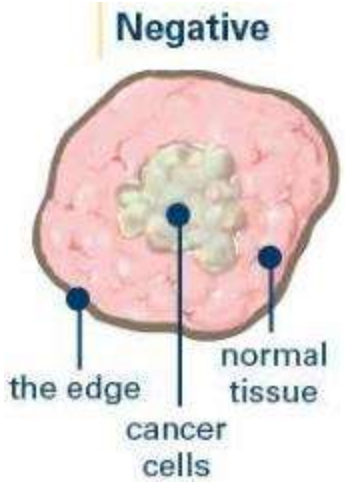
Auckland Oncoplastic Breast Institute

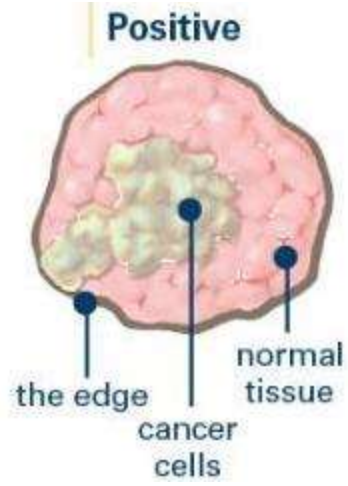
Agenda

- Breast: Margins
- Prognosis: Prediction Models -> Clinical Relevance?
- Axilla
- Oncoplastic Surgery
- Mx-Reconstruction, Radiotherapy & CPM
- Lymphoedema
- Take home messages

Margins – Is bigger better?







Margins Meta - Analysis

Margins Meta-Analysis

Relationship Between LR and Margin

Threshold Distance	# studies	#LRs/#subjects	OR*	95% CI
1 mm	6	235/2376	1.0	
2 mm	10	414/8350	0.91	0.46-1.80
5 mm	3	103/2355	0.77	0.32-1.88

* Adjusted for length of FU

p (association) = 0.90
p (trend) = 0.58

Houssami N, et al. Ann Surg Oncol 2014; 21: 717-730

ASTRO-SSO Margins Consensus: Summary

- Negative margins (no ink on tumor) optimizes local control
- Positive margin associated with at least a 2-fold increased risk of LR
- Not nullified by the boost, systemic therapy, or favorable biology – negative margin still important
- Wider margin widths do not significantly improve local control
- **The routine practice of obtaining margins more widely clear than no ink on tumor is not indicated**

J Clin Oncol. 2014 May 10;32(14):1507-15

How are we doing?

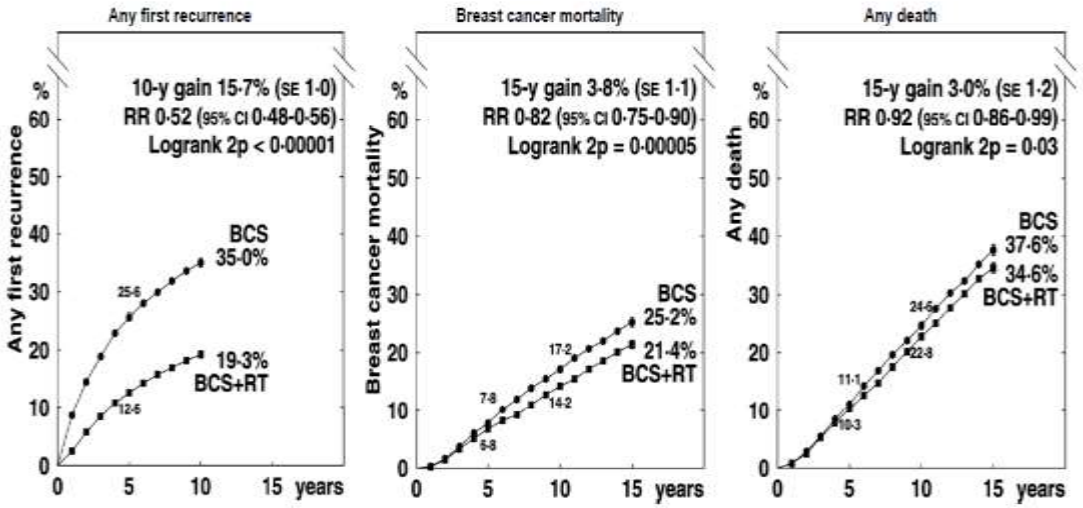
- LR <5% at 10yrs
- Improved imaging
- More detailed pathological examination of specimen
- WBRT
- Improved systemic therapy
- Multimodal therapy
- **Margins are only a part of the picture…**

Clinical Predictors of LRR

- Risk of LRR: Tumour size, nodes, margins, LVI
- Patient characteristics (age)
- Variables are imprecise
- Molecular markers may allow for greater personalization of LRR risk

Reduction in LR with RT

EBCTCG: Impact of Radiation on LRR



N=10801 in 17 randomized trials

EBCTCG Lancet 2011 378(9804):1707-1

	CS	CS + RT	Reduction
NSABP B-06	36%	12%	67%
Uppsala-Orebro	24%	9%	63%
Ontario	35%	11%	69%
Milan	24%	6%	75%
Swedish	14%	4%	71%

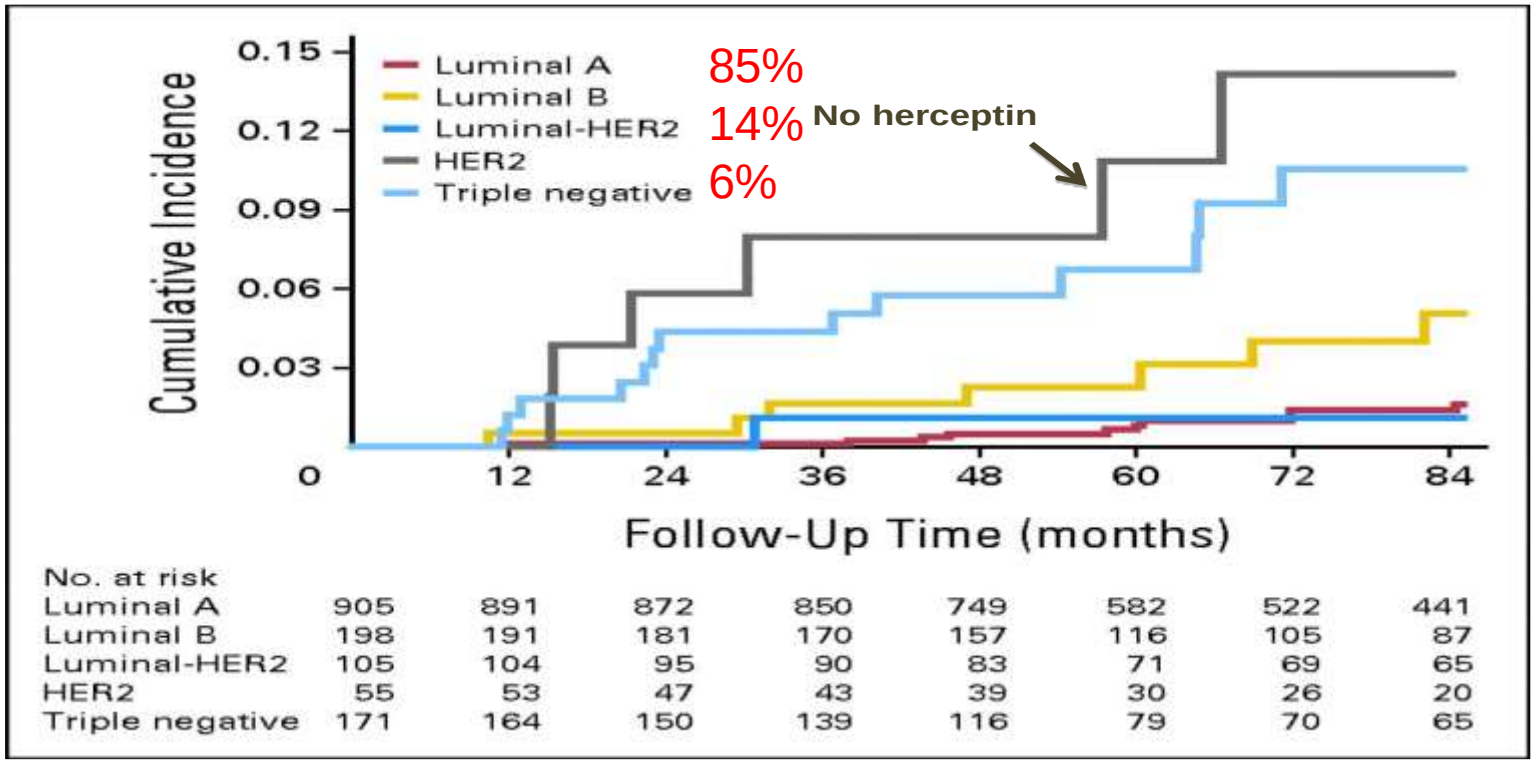
Effect of Systemic Therapy on LRR

Treatment	Relative risk of LRR
Tamoxifen vs placebo	0.47
Anastrazole vs Tamoxifen	0.83
Tamoxifen x2 Anast vs Tamx5	0.50
Chemo vs none (<50yrs)	0.63
Transtuzumab vs none	0.47

EBCTCG, Lancet 2005
Mannino, Radiother Oncol 2009

Molecular Profiles

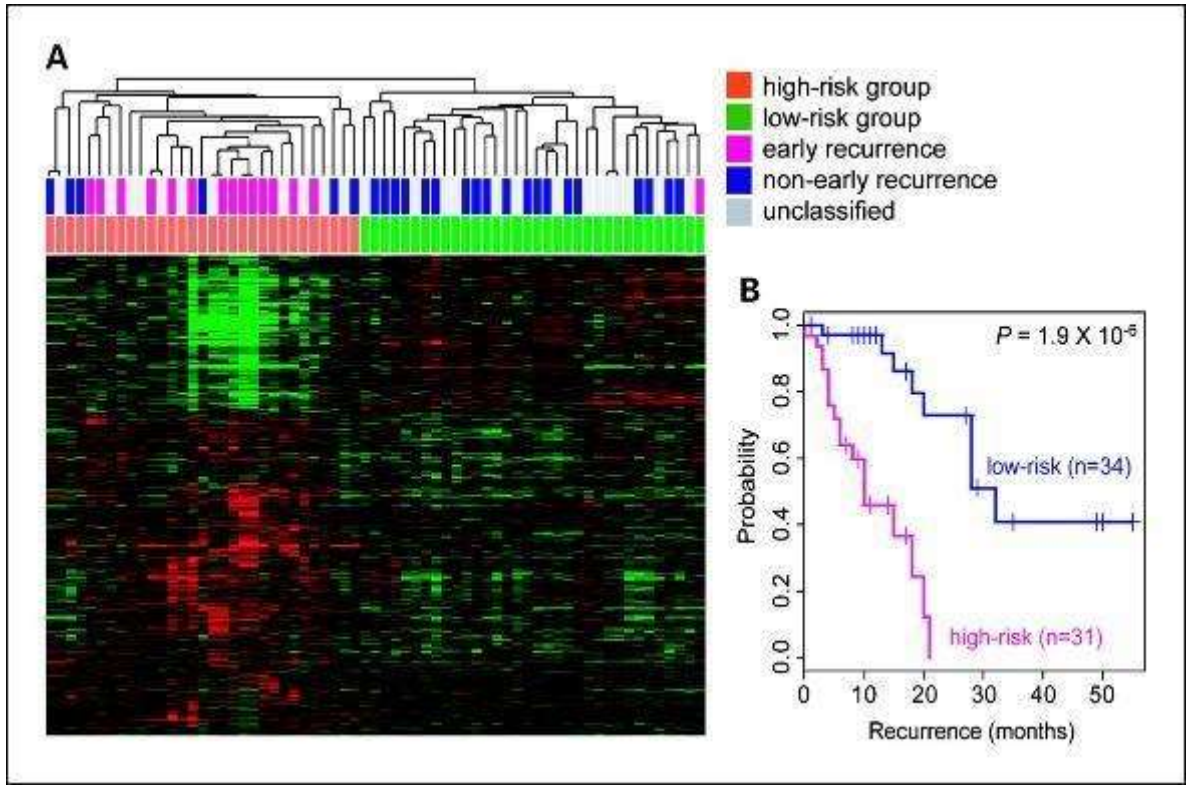
Subtype is Prognostic for LR

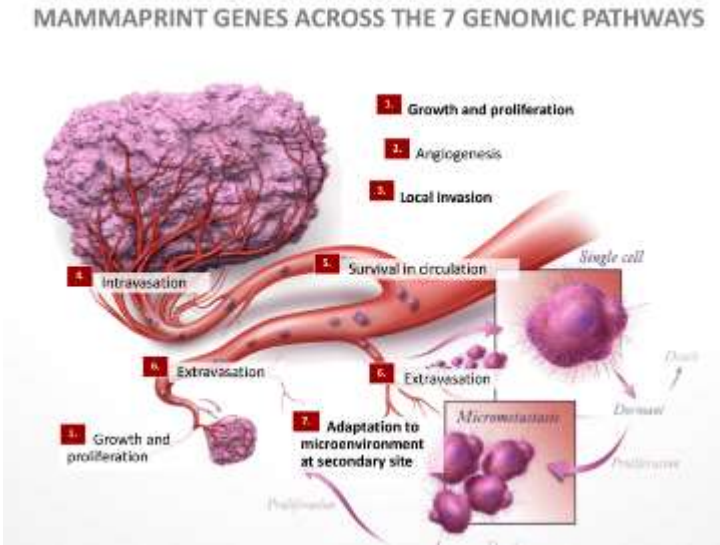


No. at risk								
Luminal A	905	891	872	850	749	582	522	441
Luminal B	198	191	181	170	157	116	105	87
Luminal-HER2	105	104	95	90	83	71	69	65
HER2	55	53	47	43	39	30	26	20
Triple negative	171	164	150	139	116	79	70	65

Arvold N et al. JCO **2011; 29(29)**

Genetic Profiles & Prognosis





Where we are now…

- Clear no ink on tumour = negative margin
- Is this a true negative?
- Bigger is not better, but needs to be ***accurate*** & ***enough*** of a margin
- Are there better ways to achieve clear margins while still achieving BCS benefits?
- Especially – Screen detected DCIS, multifocal unicentric disease & re-excisions?

Oncoplastic BCS

- BCS
- Mx
- Inbetweener: OBCS
  - Wider excisions without compromising cosmesis
  - Reduced re-excision
  - Reduces Mx

1. Lumpectomy
2. OPS
3. Mastectomy

OBCS - margins improvement in selected cases?

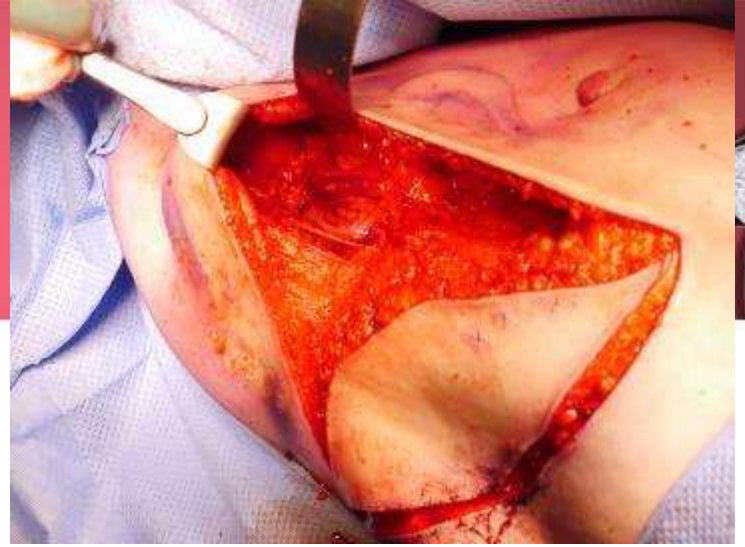
Oncoplastic breast surgery: published studies showing outcomes.

Author	Year	Number of subjects	Weight (g)/Volume of specimen	Close/Involv. margins (re-excision/mastectomy)	Local recurrence rate	Survival rate	FU period (mths)
Clough et al.	2003	101	222		9.4%	95.7%	44
Kaur et al.	2005	30	200	16%			
Rietjans et al.	2007	148	198	2.02%	3%	92.47%	74
Giacalone et al.	2007	31	190	21%			
Ballester et al.	2008	86	150	12.7%	2%		20
Meretoja et al.	2010	90		12.2%	0%		26
Fitoussi et al.	2010	540	187.7	18.9%	6.8%	92.9%	49

TABLE 2. Resection Data

	Oncoplastic Reduction	Oncoplastic Flap	BCT Alone	*P*
Tumor size (range), cm	2.51 (1.5–4)	2.92 (2–4.4)	1.23 (0.7–1.5)	
Lumpectomy weight (range), g	249 (200–338)	184 (94–310)	64	
Positive margins, %	12.4 (206/1658)	12.2 (136/114)	20.6 (619/3014)	<0.0001
Reexcision, %	2.94 (45/1522)	5.66 (59/1042)	14.6 (421/2882)	<0.0001
Completion mastectomy, %	7.87 (118/1522	4.46 (46/1031)	3.79 (99/2610)	<0.0001

But first the Axilla…



- All = ALND
- SNB
- SNB+ -> ALND
- SNB micromet -> leave
- SNB+ 1-2 nodes in BCS - > leave/RT
- (Z11 & AMAROS)
- cN+/USS-N+ ->NACT -> SNB -> ??ANLD

The Axilla

Z0011 Locoregional Recurrence

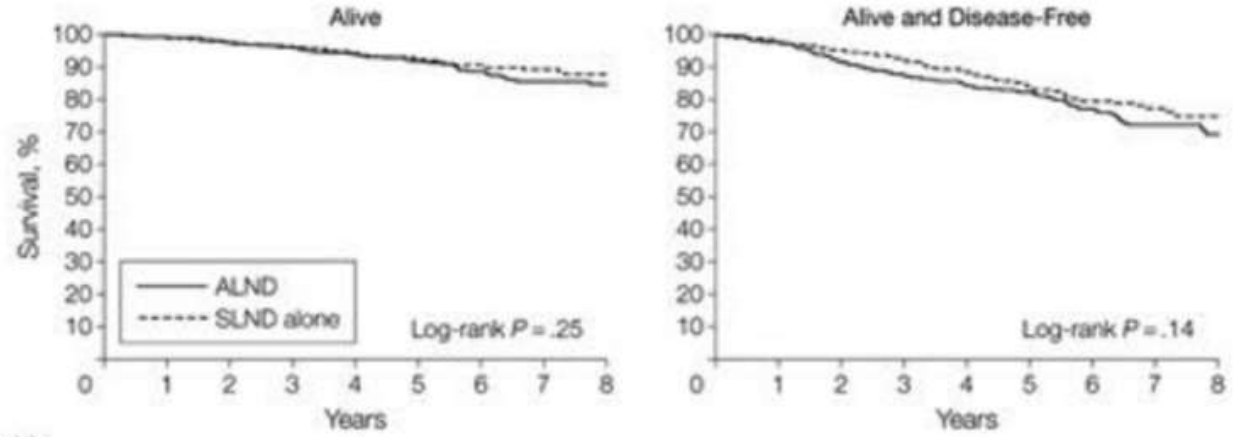
Recurrence @ 6.3 yrs median follow-up	SLN+ ALND (n=388)	SLN+ no ALND (n=425)
local	3.6%	1.9%
regional node	0.5%	0.9%
local+regional	4.1%	2.8% p=0.47

Additional positive nodes in 27% of ALND's

Courtesy of Hiram S. Cody III MD

New Era in Management of Axilla

Z0011 overall survival



Giuliano AE et.al. JAMA 2011;305:569-75

Axilla

Conclusions

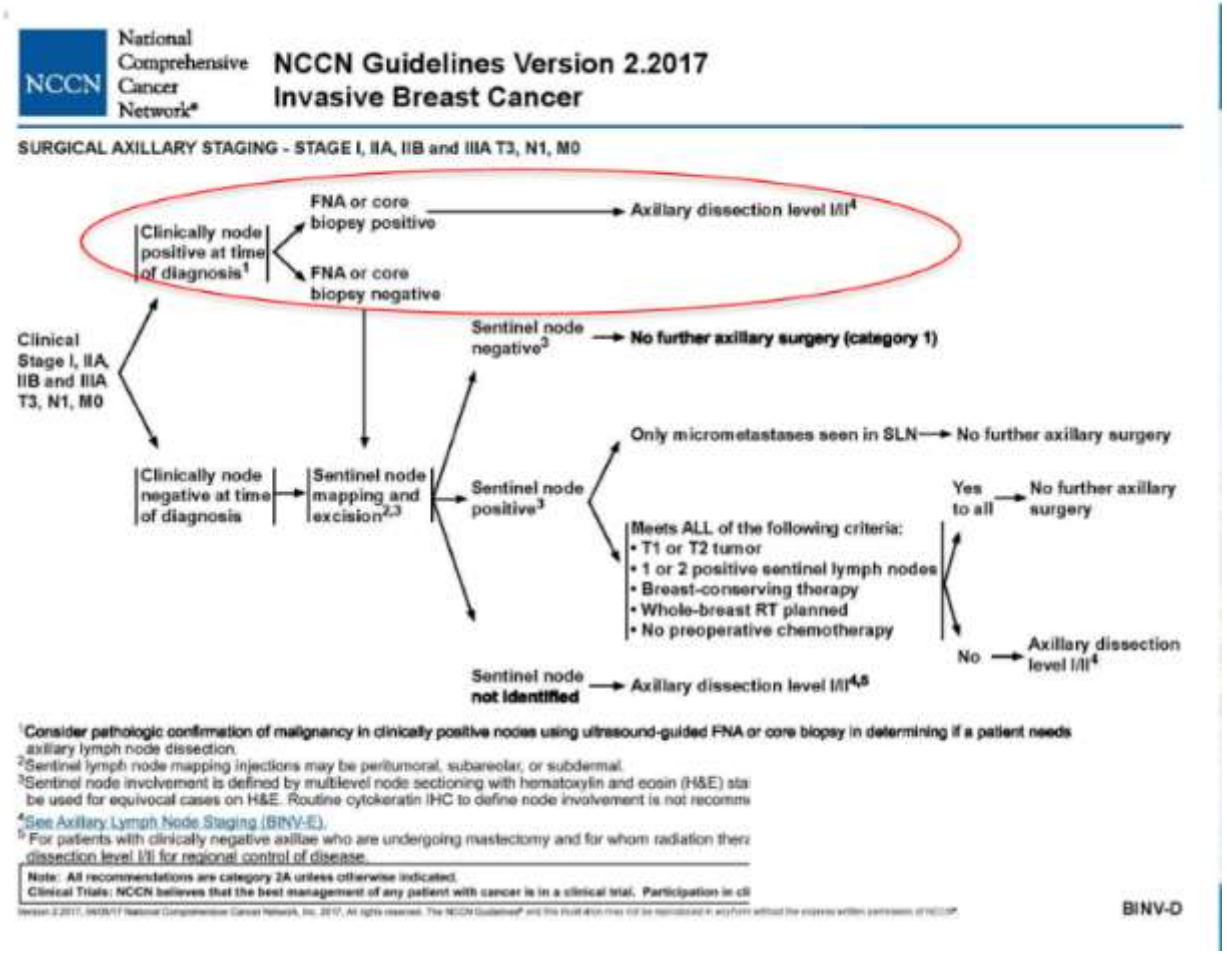
- Only 21% of patients will had >3 positive LNs (Z0011)
  - 79% of these patients will have 1-2 positive lymph nodes and be Z0011 eligible

Lymphoedema Rate no different!

10-YR LOCOREGIONAL RECURRENCE
MEDIAN FU = 9.25 YRS

	ALND (n=420)	SLNB (n=436)	P Value
Local Recurrence	19 (5.6%)	12(3.8%)	0.13
Regional Recurrence	2(0.5%)	5(1.5%)	0.28
Total LRR	2(6.2%)	17(5.3%)	0.36
LE	11%	6%	NS

Pre-op Planning: Axilla



Summary of Advances

Choosing Wisely
An initiative of the ABIM Foundation

The American Society of Breast Surgeons
THE AMERICAN SOCIETY OF Breast Surgeons

Five Things Physicians and Patients Should Question

Released June 27, 2016

1. **Don't routinely order breast MRI in new breast cancer patients.**
   After a new diagnosis of breast cancer, breast MRI can be useful in selected patients to aid treatment decisions. However, there is a lack of evidence that routine use of MRI lessens cancer recurrence, death from cancer or the need for re-operation after lumpectomy surgery. The routine use of MRI is associated with an increased need for subsequent breast biopsy procedures, delays in time to treatment and higher cost of care. Increased mastectomy rates can occur if the MRI finds additional cancers or indeterminate findings cause patient anxiety, leading to patient requests for mastectomy.

2. **Don't routinely excise all the lymph nodes beneath the arm in patients having lumpectomy for breast cancer.**
   After a new diagnosis of invasive breast cancer, most patients undergoing partial breast removal (lumpectomy) benefit from a sentinel node (SN) biopsy, a procedure that removes a small number of lymph nodes beneath the arm. In the past, patients found to have cancer in any SN underwent extra surgery to remove more nodes. Recent evidence suggests further node surgery is not necessary in patients with cancer found in fewer than three SN if the patient receives other recommended cancer treatments.

3. **Don't routinely order specialized tumor gene testing in all new breast cancer patients.**
   There are multiple new tumor multi-gene signature tests that provide selected patients with information about their risk of distant cancer recurrence, dying of cancer or the likelihood they will benefit from chemotherapy. These tests are helpful in selected patients, including those with early stage hormone receptor positive cancers with low scores on 21 gene recurrence testing, who can safely omit chemotherapy. There is no evidence these tests should be used routinely in every patient. These tests should not be done in patients who indicate the test results would not change their choice of treatment.

4. **Don't routinely re-operate on patients with invasive cancer if the cancer is close to the edge of the excised lumpectomy tissue.**
   Patients undergoing partial breast removal (lumpectomy) of the breast for **invasive** cancer benefit from re-operation to excise more breast tissue if microscopic review of the lumpectomy breast tissue indicates cancer cells at the tissue edge. However, if cancer cells are close to the edge, but not at the actual edge, then re-operation is not mandatory but can be considered on a case-by-case basis.

5. **Don't routinely perform a double mastectomy in patients who have a single breast with cancer.**
   After a new diagnosis of breast cancer in a single breast, many patients desire removal of both breasts, believing their cancer risk in the other breast is high and their cancer cure rate will be improved with double mastectomy. Double mastectomy should not be routinely performed in these patients until they have been provided with adequate understandable information about the generally low risk they will develop cancer in the other breast and the minimal effectiveness, if any, of double mastectomy improving their life expectancy.

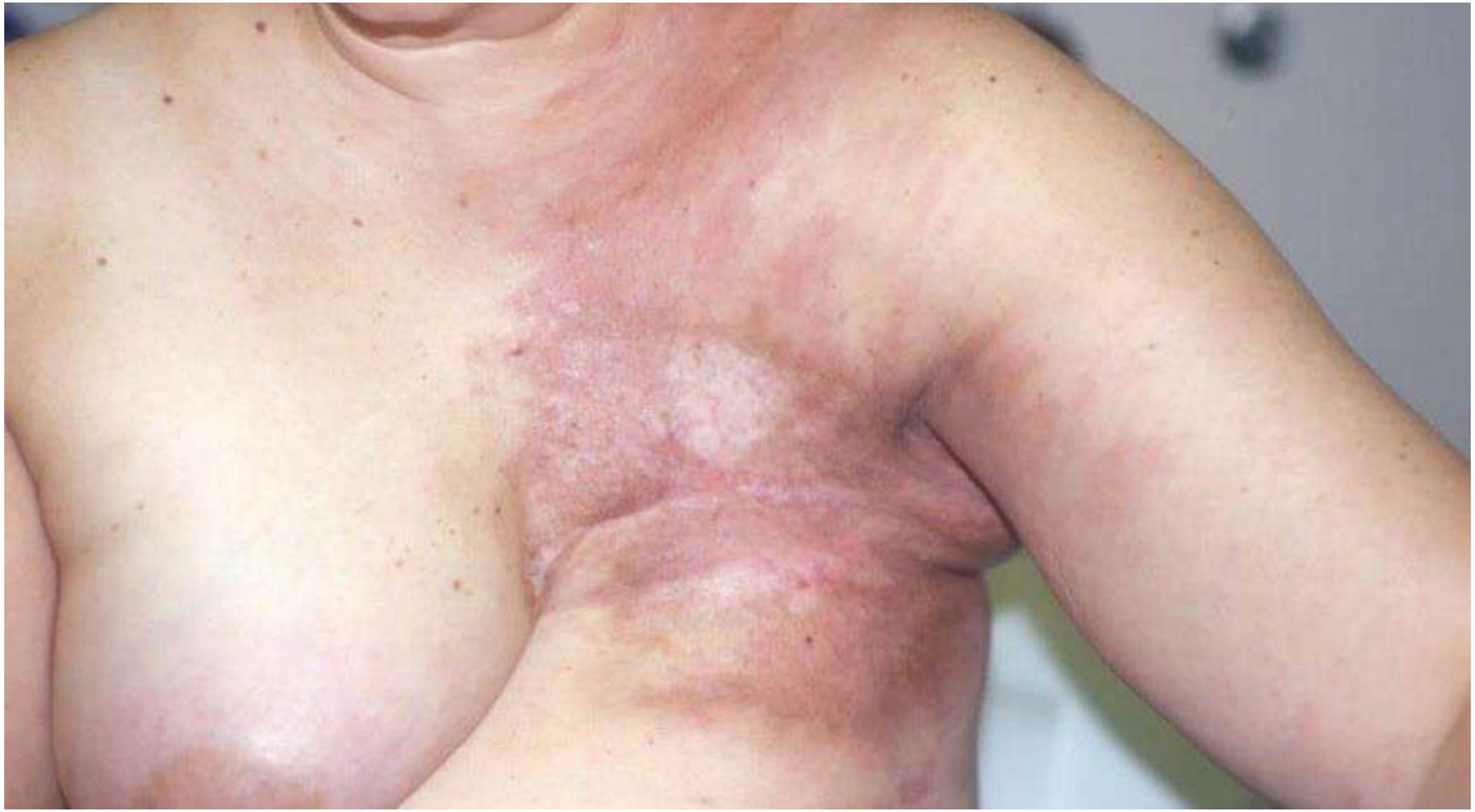
MAYO CLINIC

http://www.choosingwisely.org/societies/american-society-of-breast-surgeons

BC Considerations

- Tumour characteristics
- Patient factors
- Lesion: Breast Ratio
- Surgical oncology plan
- Neo/Adjuvant treatment
- Reconstruction options & timing
- Sequence of Rx
- Patient choice

Where we've come from….



Breast r – Key

ARTICLES
Long-Term Results of a Randomized Trial Comparing Breast-Conserving Therapy With Mastectomy: European Organization for Research and Treatment of Cancer 10801 Trial
Joop A. van Dongen, Adri C. Voogd, Ian S. Fentiman, Catherine Legrand, Richard J. Sylvester, David Tong, Emmanuel van der Schueren, Peter A. Helle, Kobus van Zijl, Harry Bartelink
NUMBER 16
TWENTY-YEAR
BREAST-CONS
Umberto Veronesi, M.D., Nata
Roberto Saccozzi, M.D., Alberto L

Comparison of psychological aspects and patient satisfaction following breast conserving surgery, simple mastectomy and breast reconstruction

S.K. Al-Ghazal, L. Fallowfield, R.W. Blamey

Received: February 4, 2000; Received in revised form: May 16, 2000; Accepted: June 30, 2000;

Health Psychology
1997, Vol. 16, No. 3, 284–298

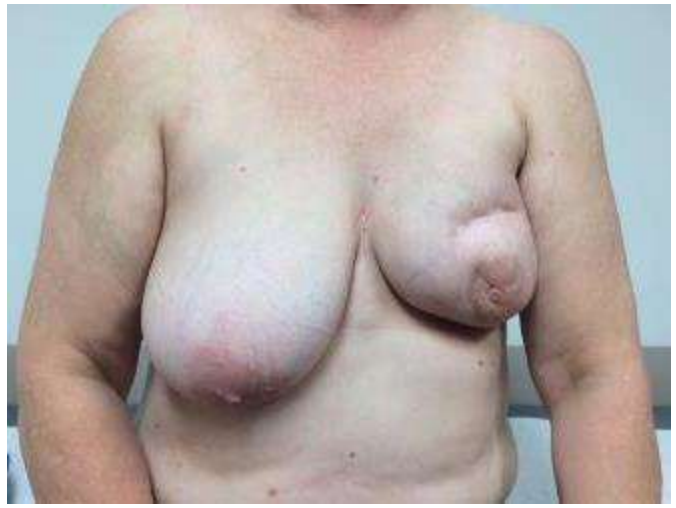
0278-6133/97/$3.00

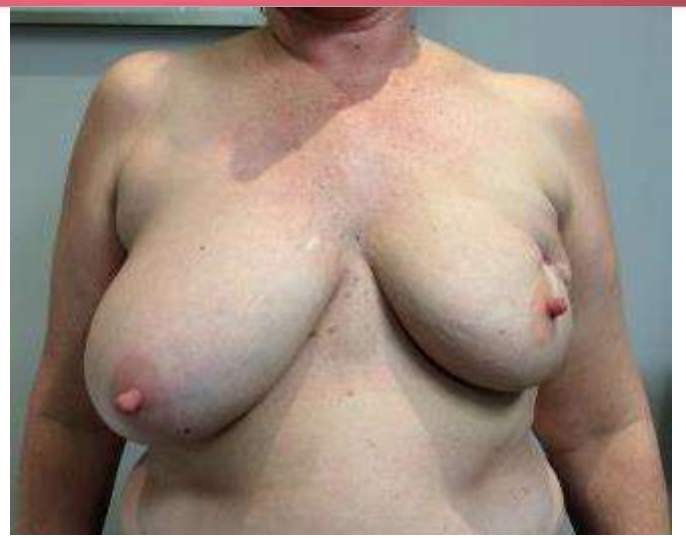
REVIEW ARTICLE

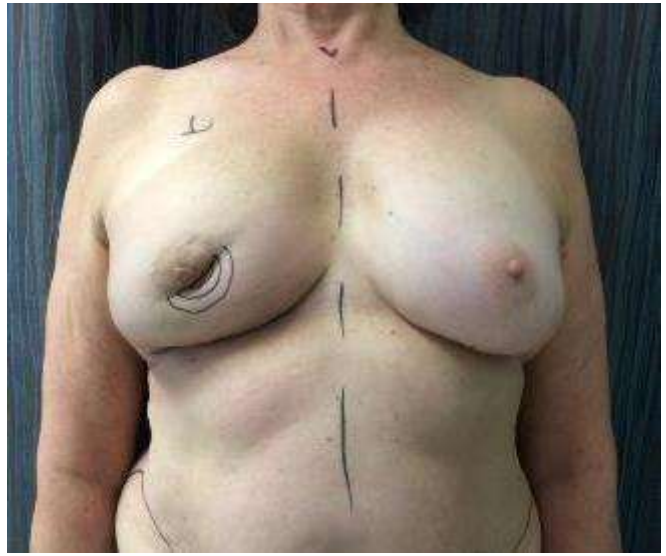
Psychosocial Outcomes of Breast-Conserving Surgery Versus Mastectomy: A Meta-Analytic Review

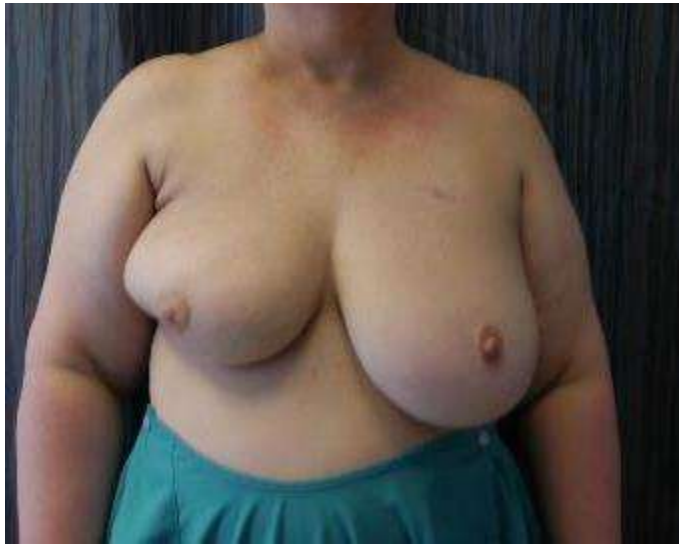
Anne Moyer
University of California, San Francisco

Is oncoplastic breast conserving surgery necessary?









OPBS

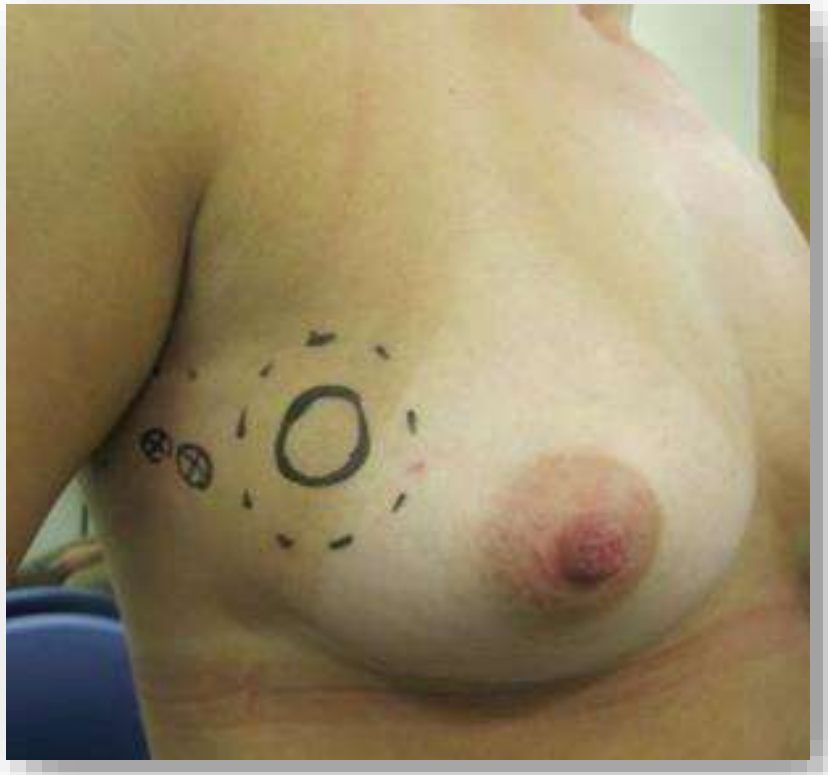
- With improvements in local control, & increased expectations of both patient & surgeon; contemporary goals of breast cancer treatment are not limited to cure but include ***maximizing quality of life***.
- Preserving the anatomic and sensory components of breast aesthetics must now be one of the main goals in breast conserving surgery[1-11].

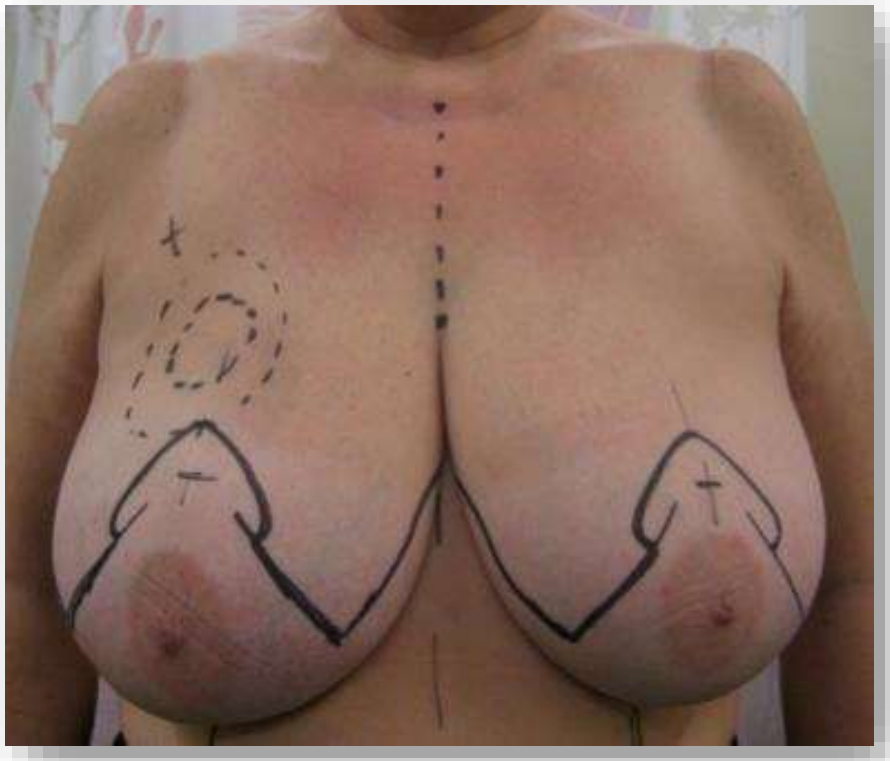
Clough, Baildam, Macmillan, McCulley, Rainsbury, Reitjens, Fitousi

Oncoplastic Breast Surgery

Surgery for breast cancer that optimises both the oncological and cosmetic outcomes

Scenarios

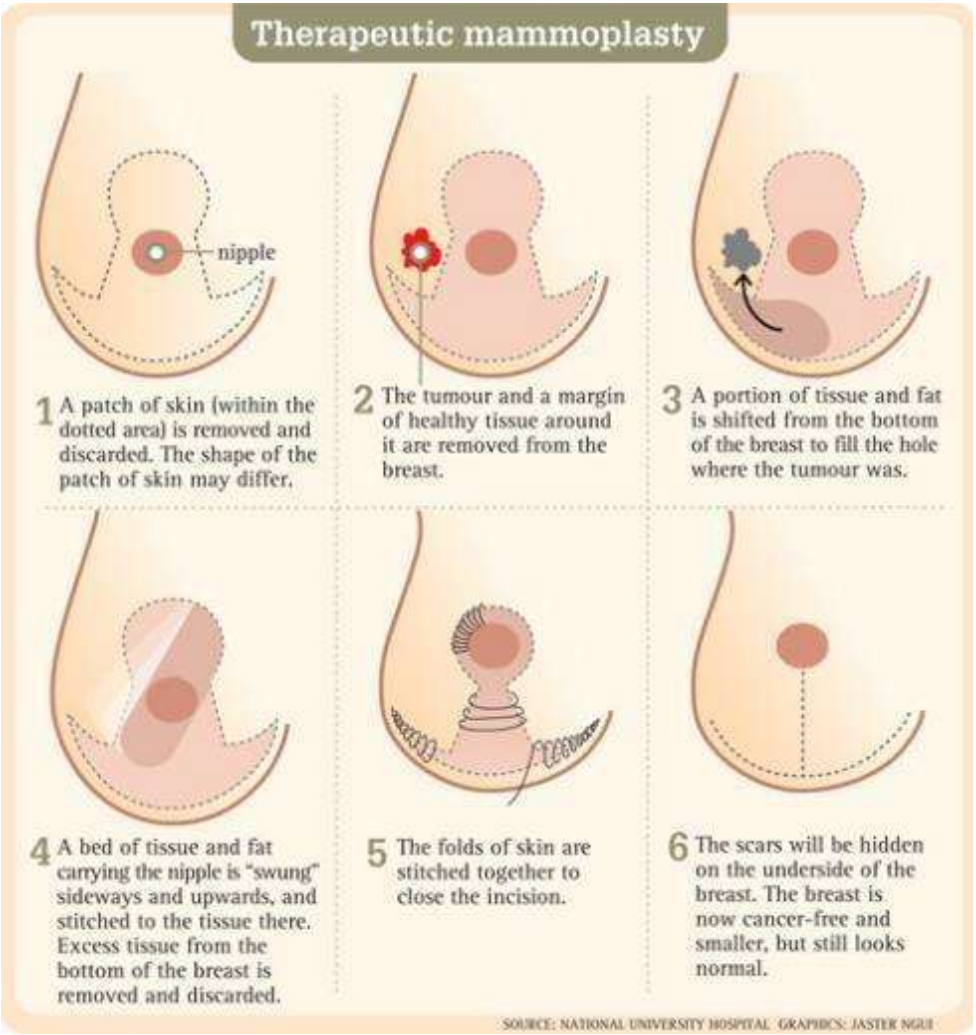


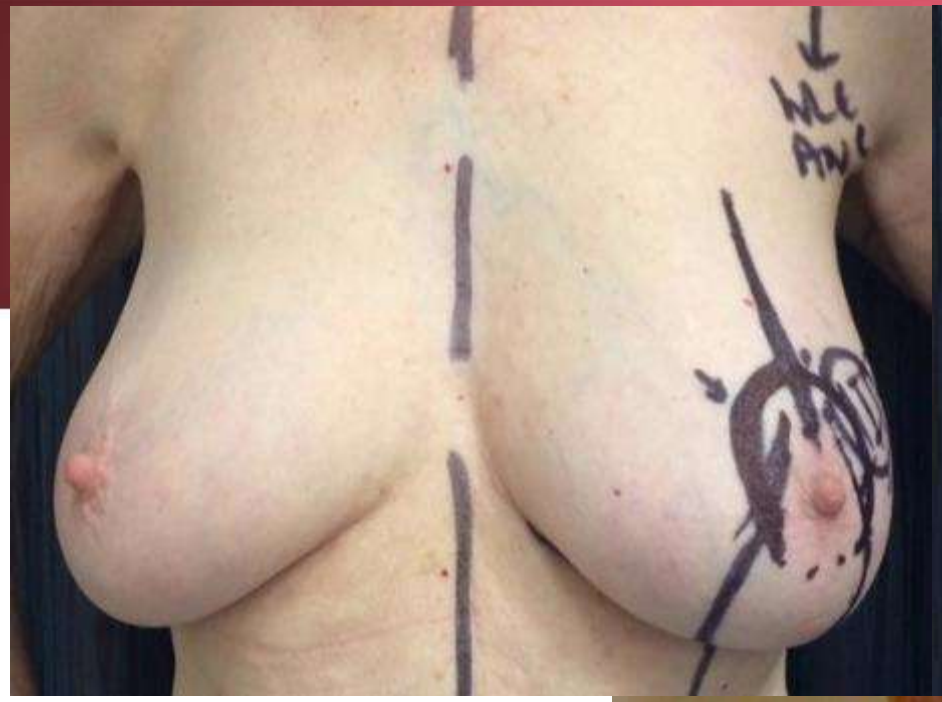


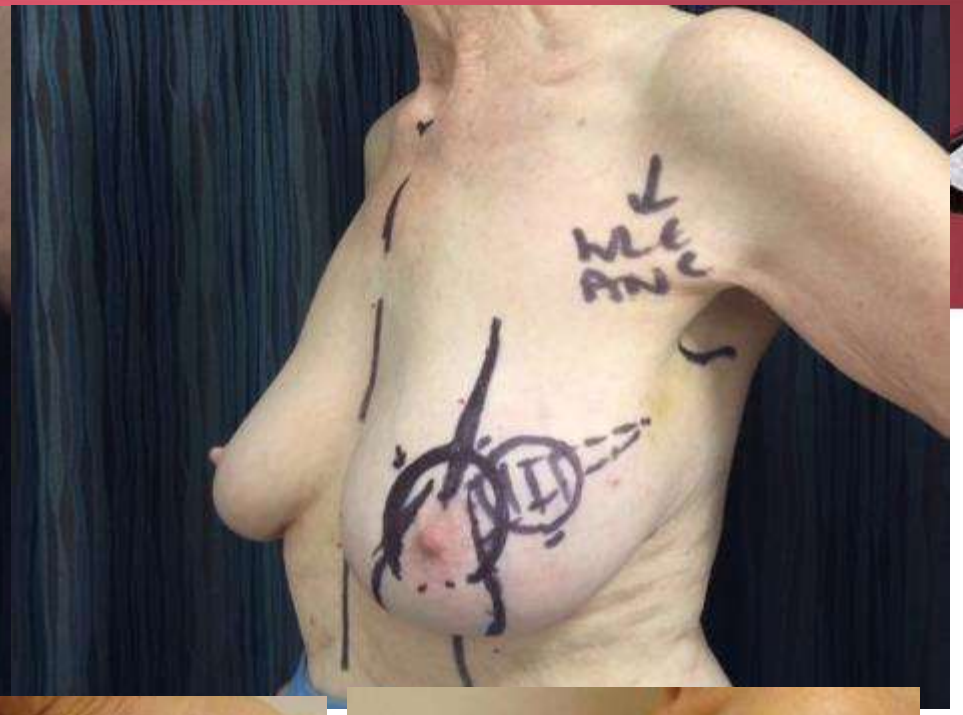
Oncoplastic BCS Techniques

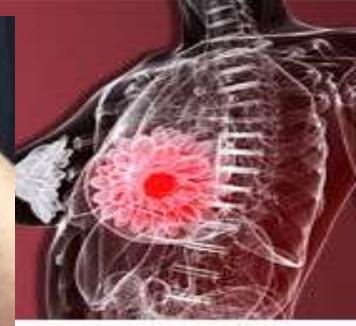
- **Volume Replacement**
  - Parenchymal advancement
  - Chest wall perforator flaps; LiCAP, LTAP, TDAP
  - Fat grafting
- **Volume Displacement**
  - Glandular flaps (level I Oncoplastic closure)
  - Therapeutic Mammaplasty

Volume Displacement BCS

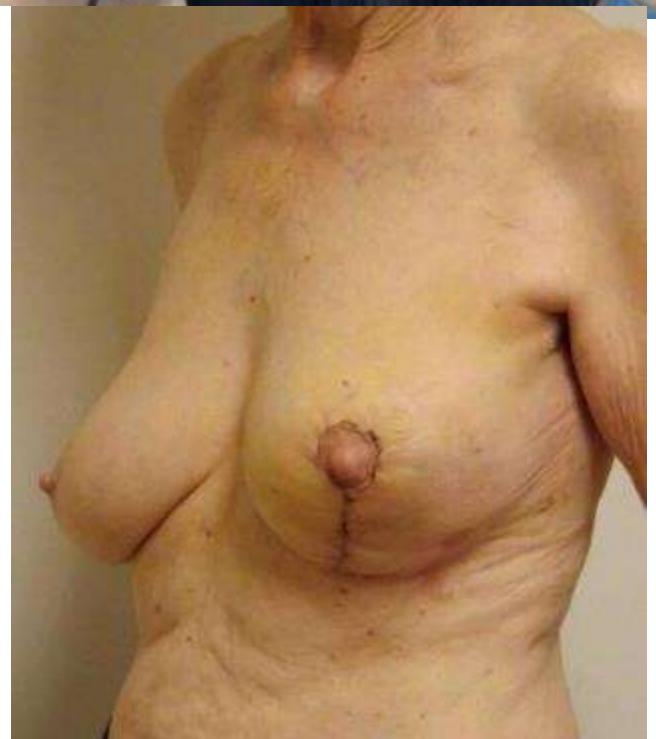


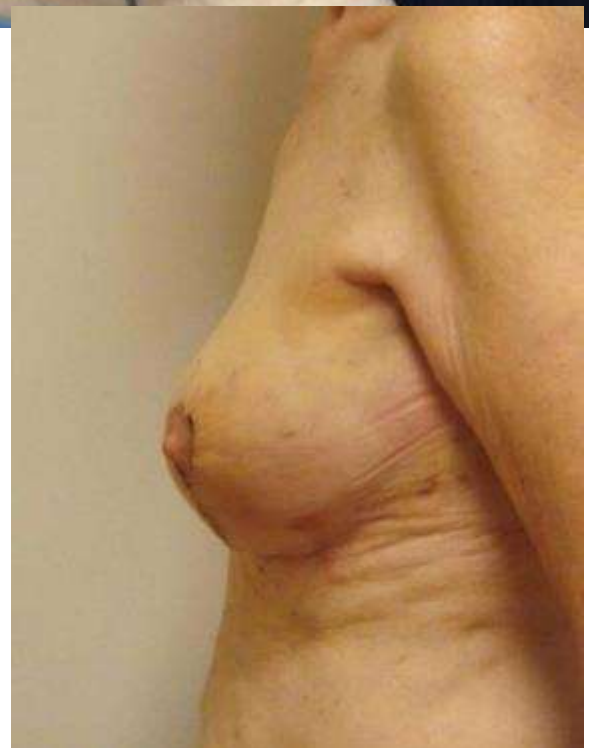


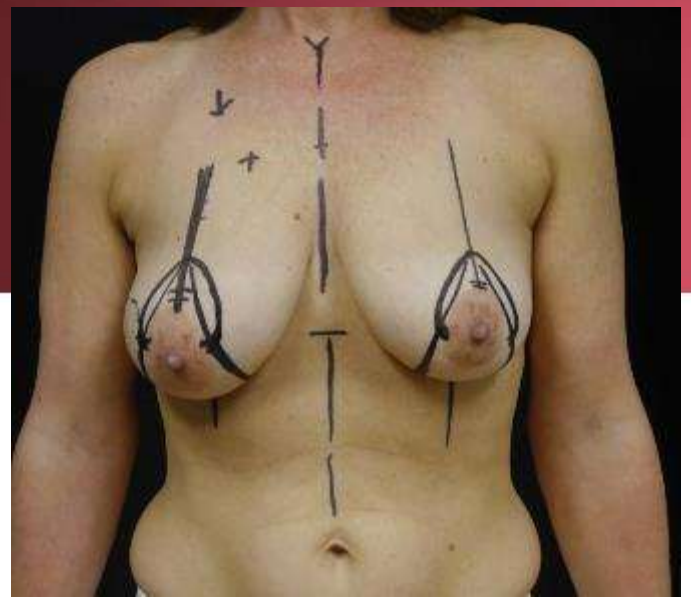


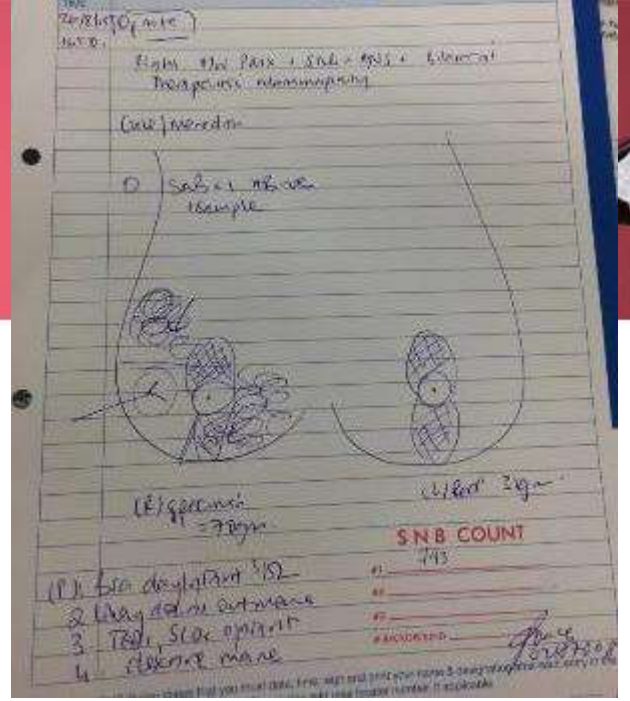


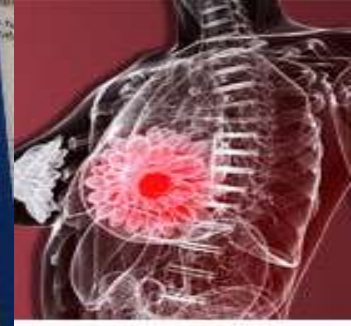
- 78yr lady
- Grade 1 Ptosis, C cup
- L WLE & ANC
- 50gm specimen
- 22mm gd 2 IDC, 24mm w DCIS, ER/PR+, Her2-, clear margins, 1/18 nodes
- No vol loss or tethering after RT

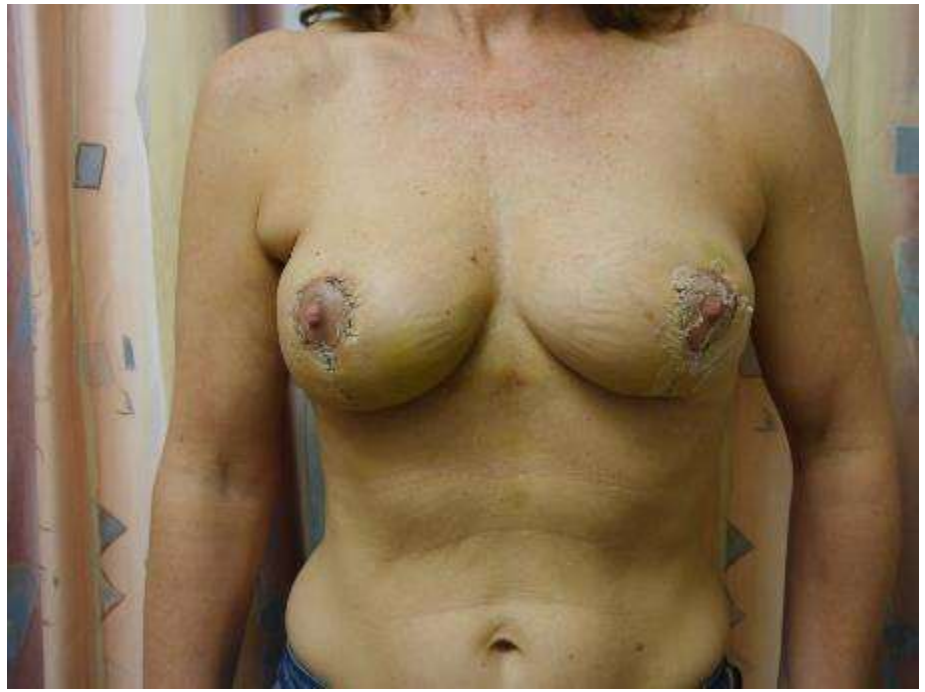


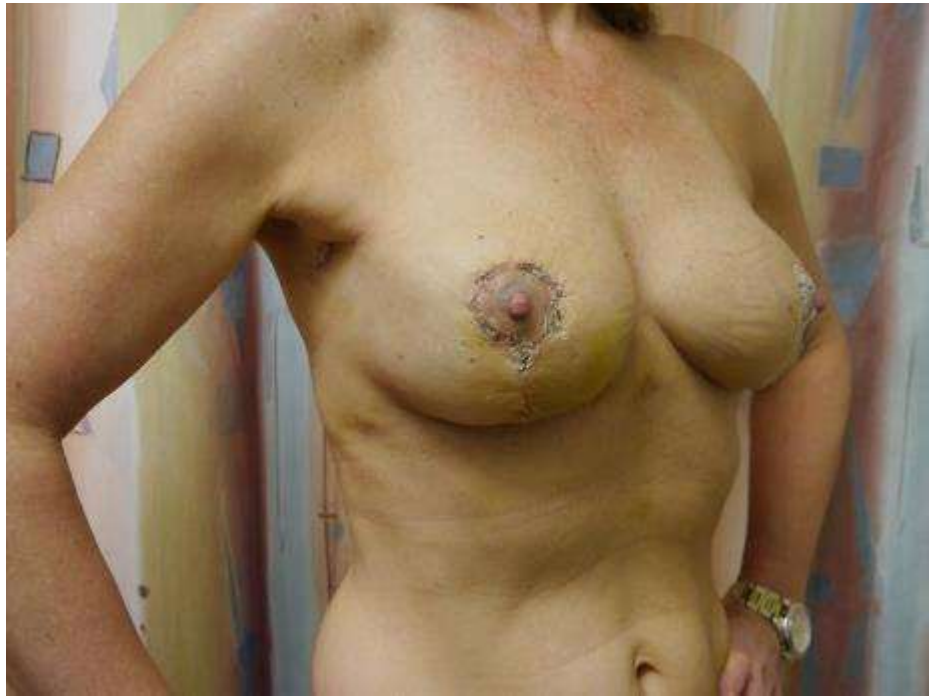


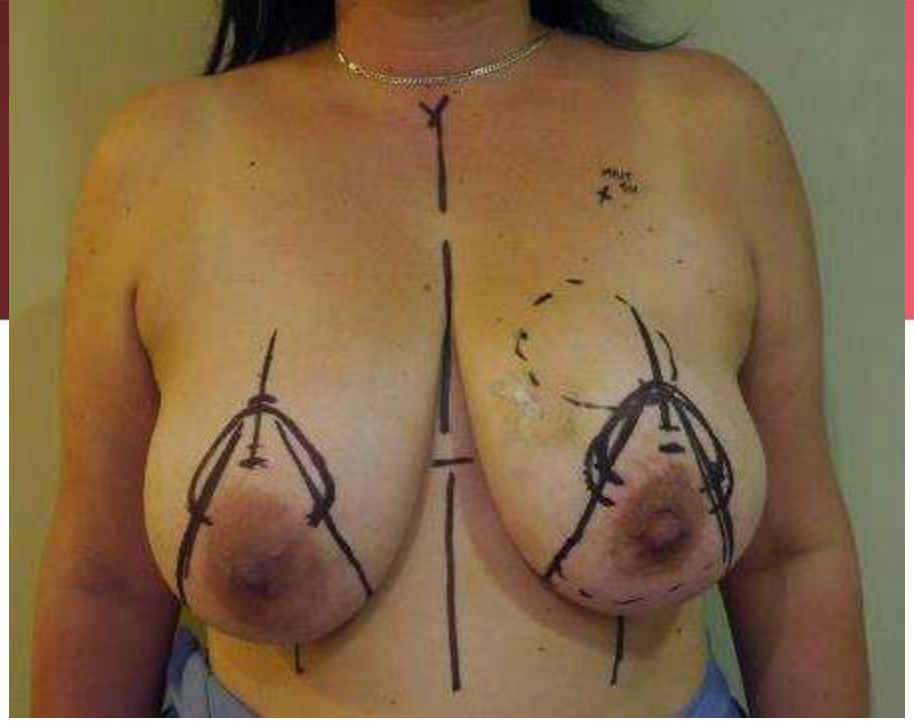


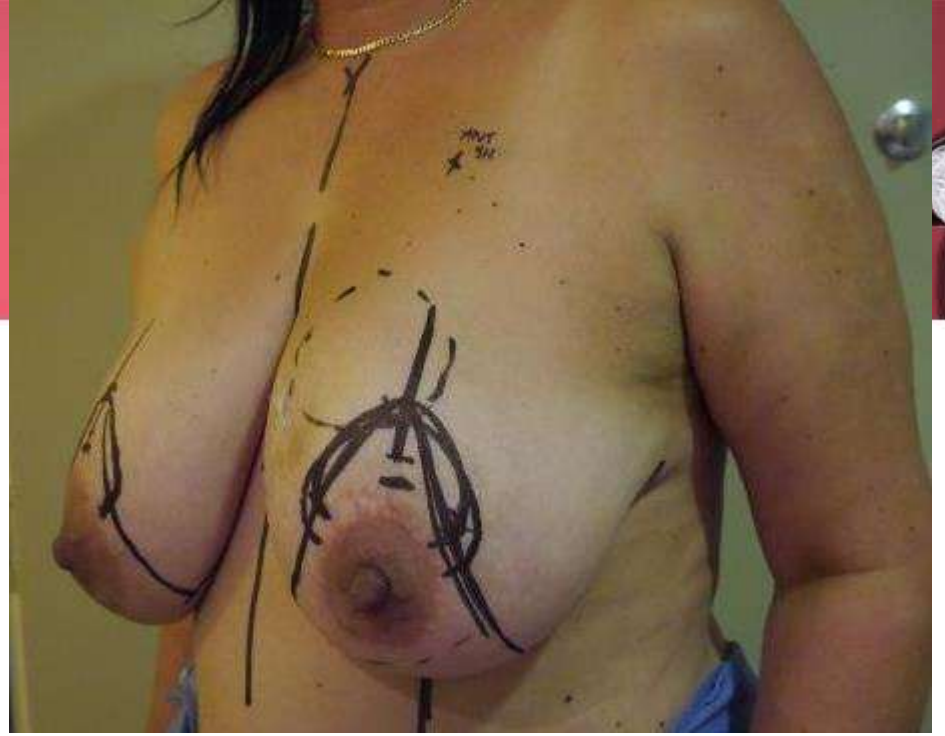

SNB COUNT

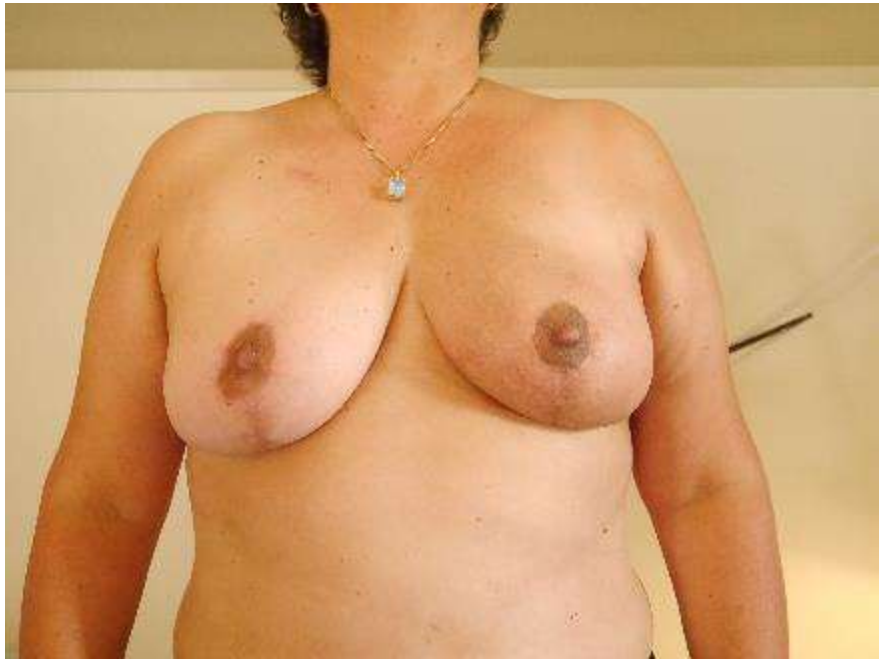


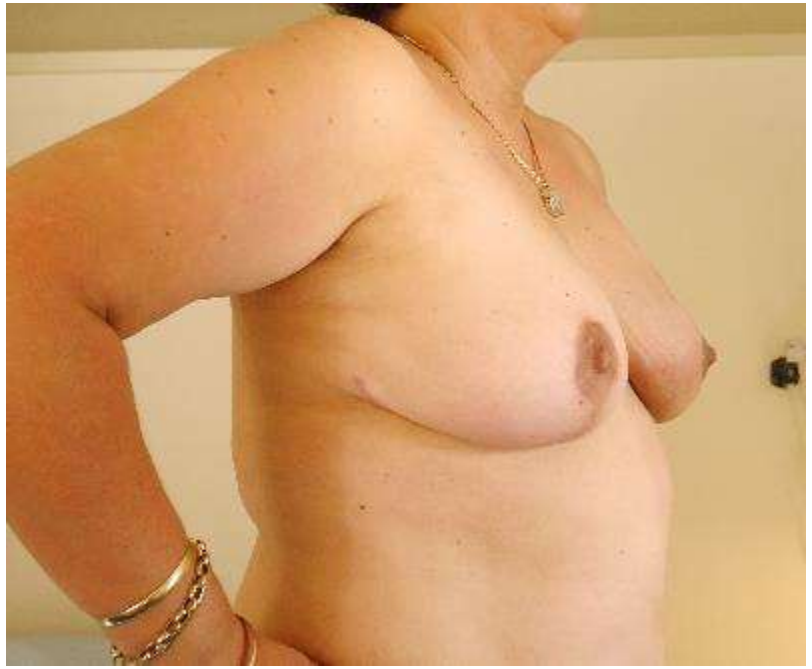


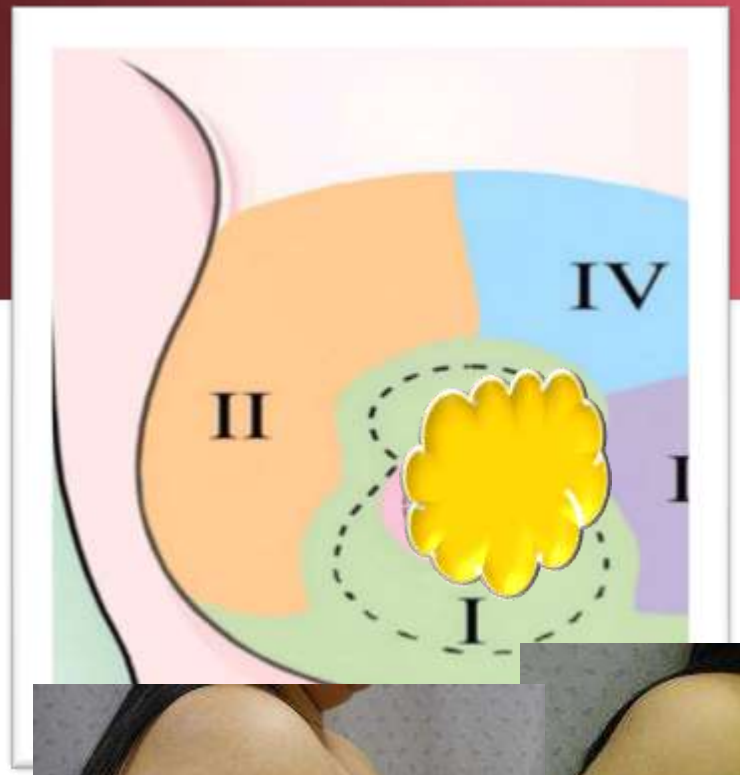


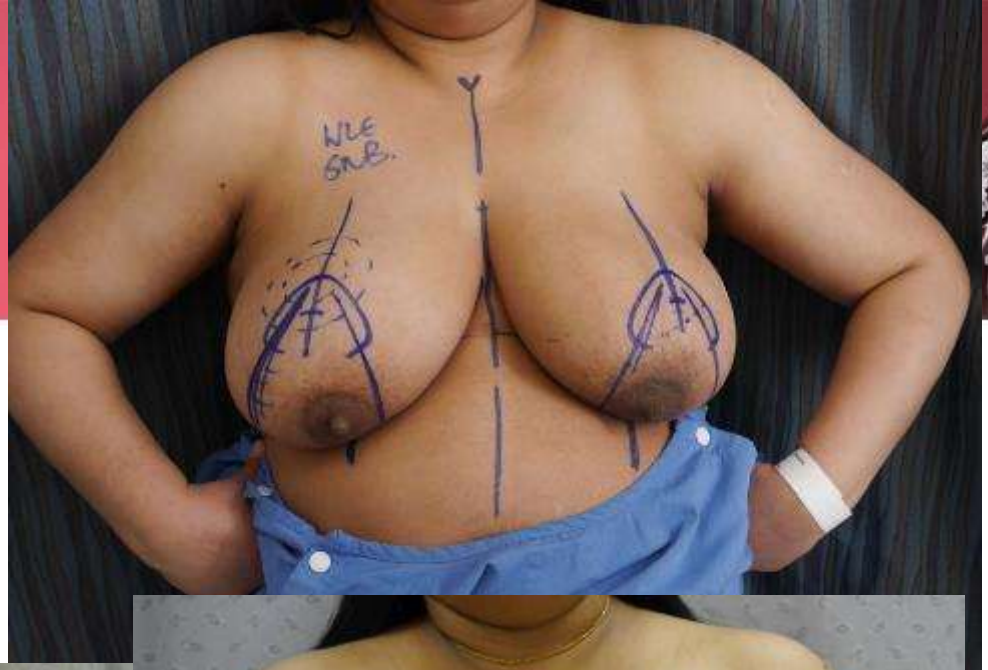


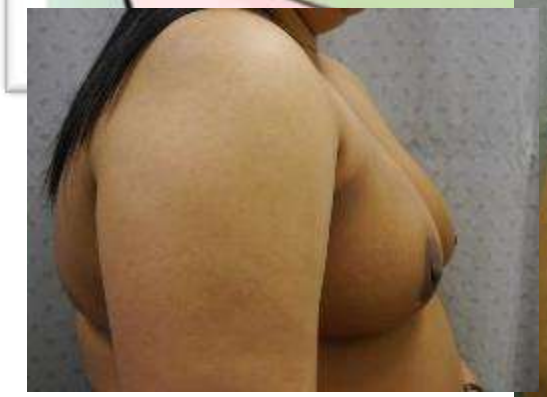


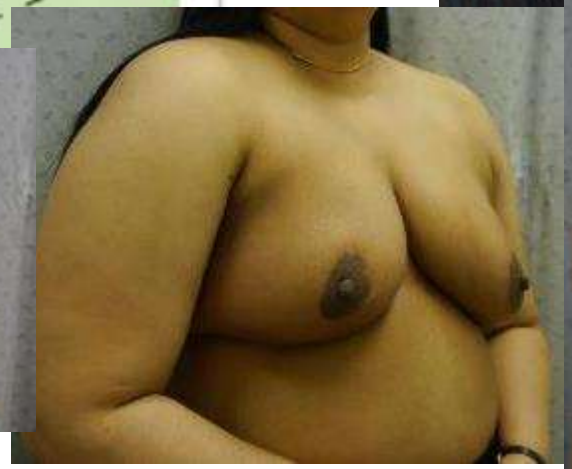


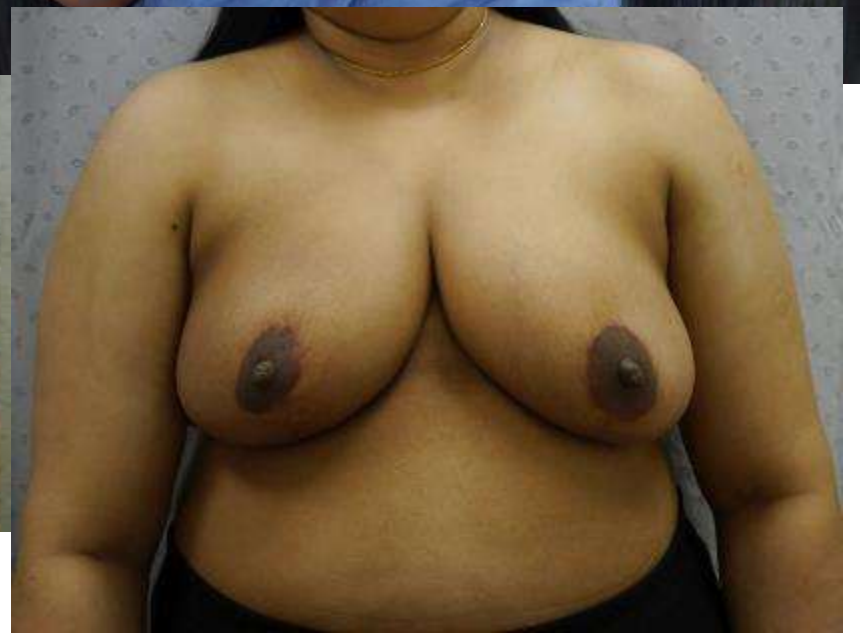




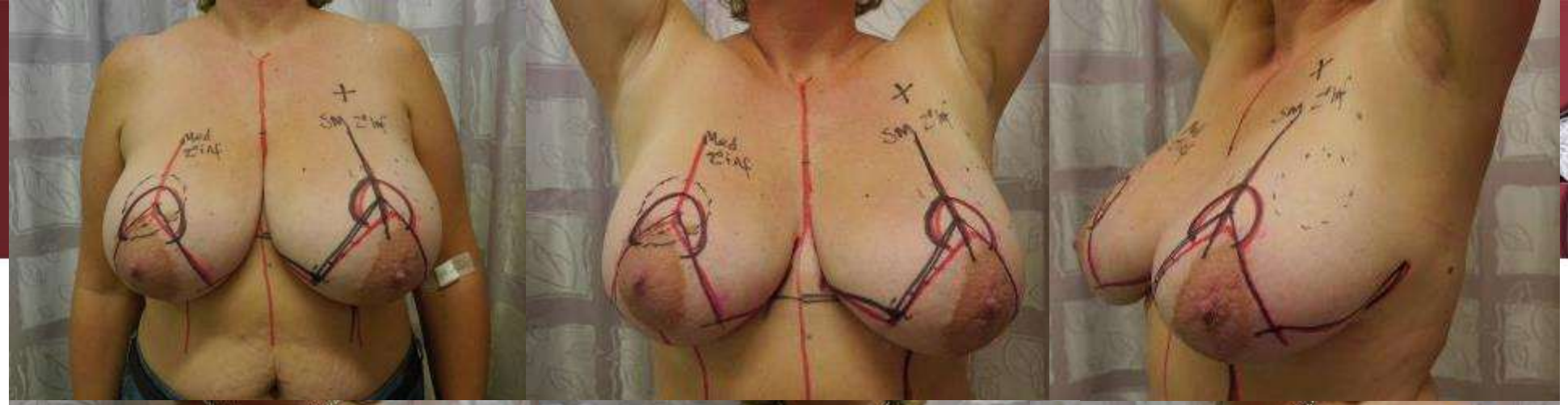


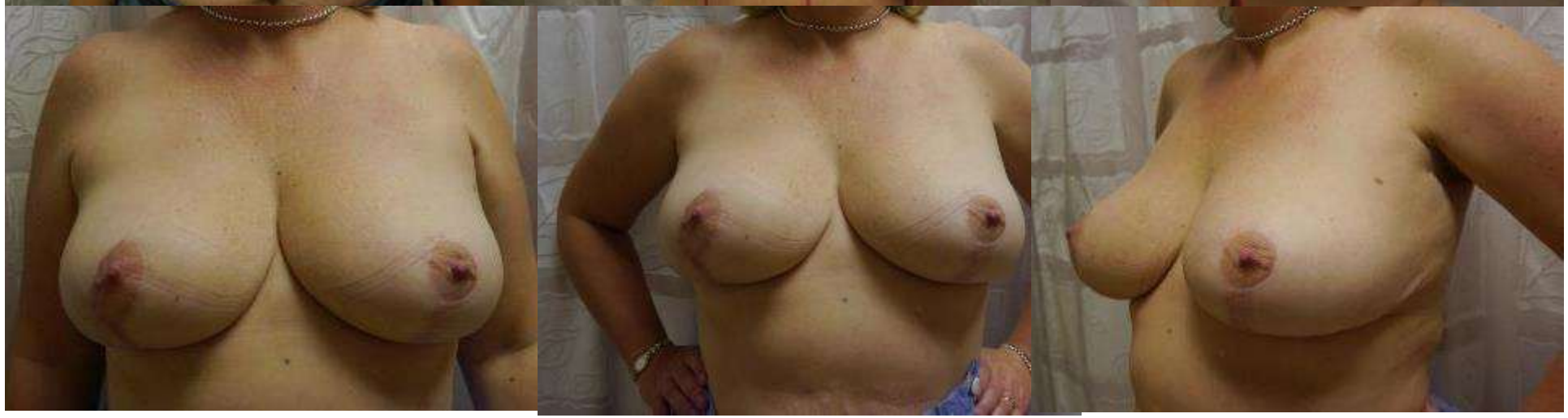




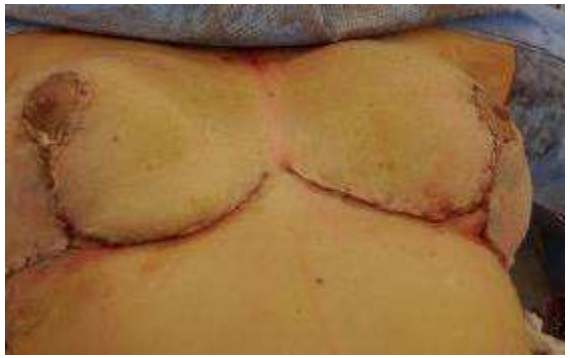


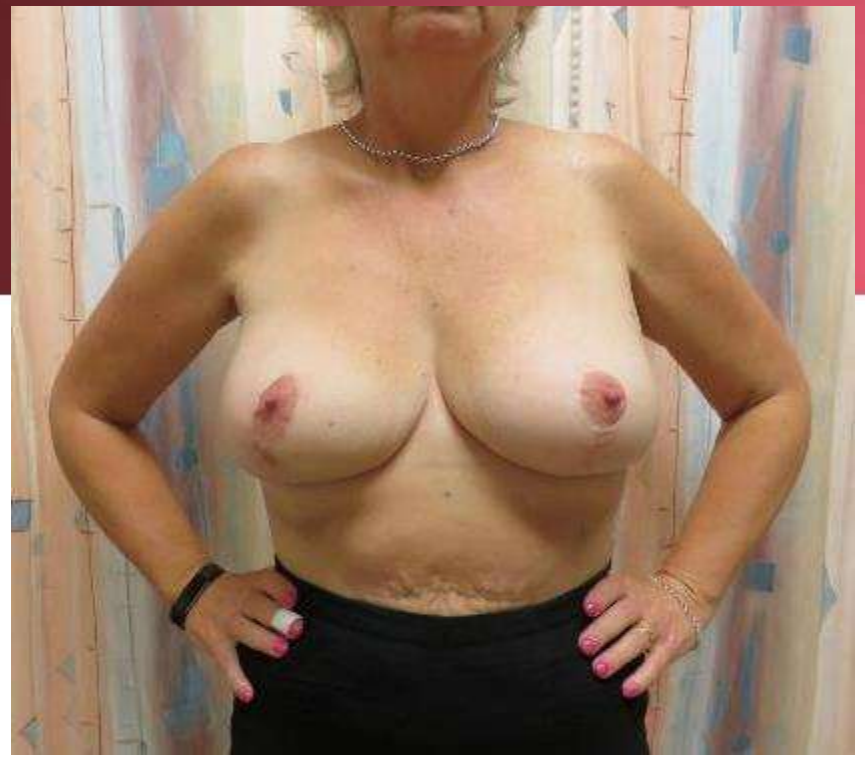
- 45 yr lady
- Palpable mass R 12-1 o’clock
- R WLE & SNB & BTM. WLE=328gm
- Wise pattern, Ext medial pedicle, Total R=567gm, L =540gm
- 31mm gd 1 IDC, ER/PR +, Her 2 -, LVI-, 0/4 nodes
- RT & Endocrine Rx

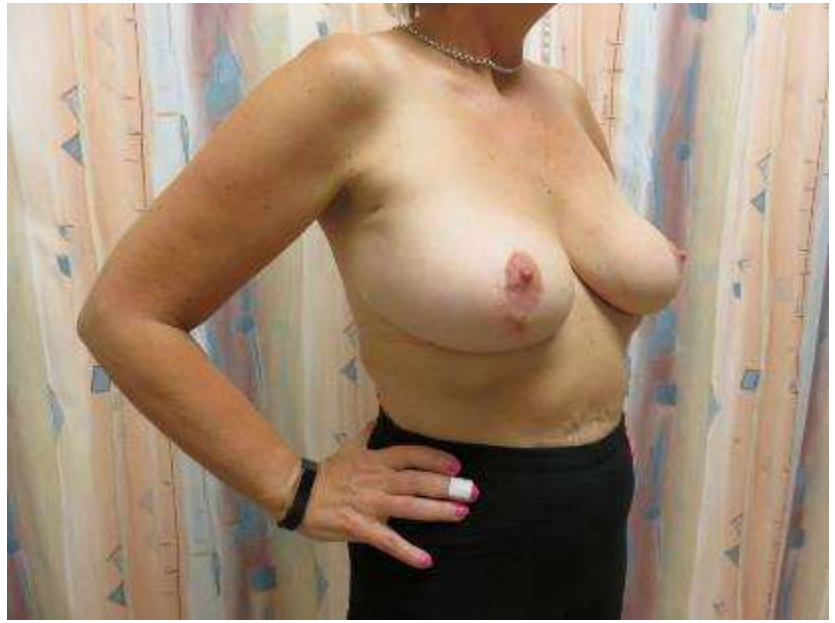


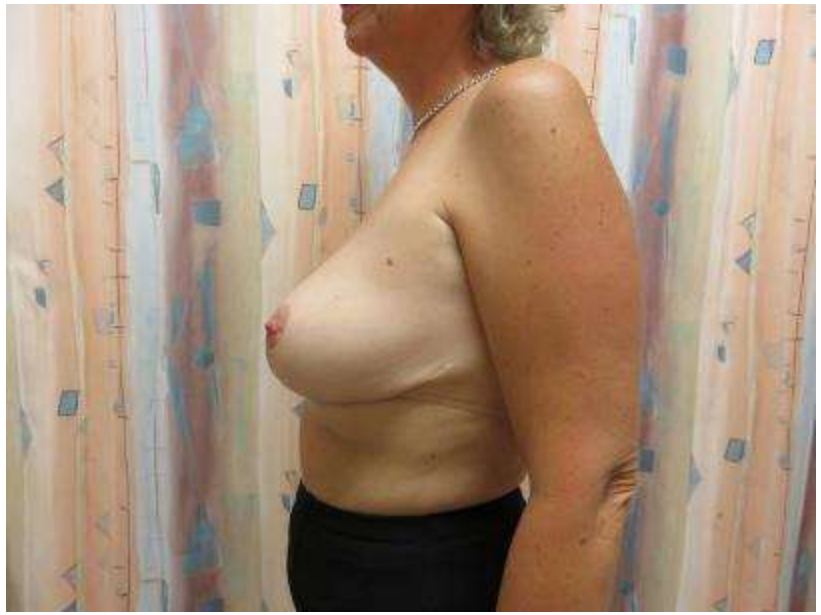


- 50yr lady
- Hx Lymphoma, Mantle RT, bone marrow TxT, in remission
- Screen detected bilat abNs; 10mm L breast 0200, 40mm R 1200
- B/L H/W WLE & SNB; L specimen 247gm, R specimen 259gm
- Both low grade tumours, ER+, Her2-, LVI-, clear margins
- Declines staged risk reducing mastectomy at this stage, prefers surveillance

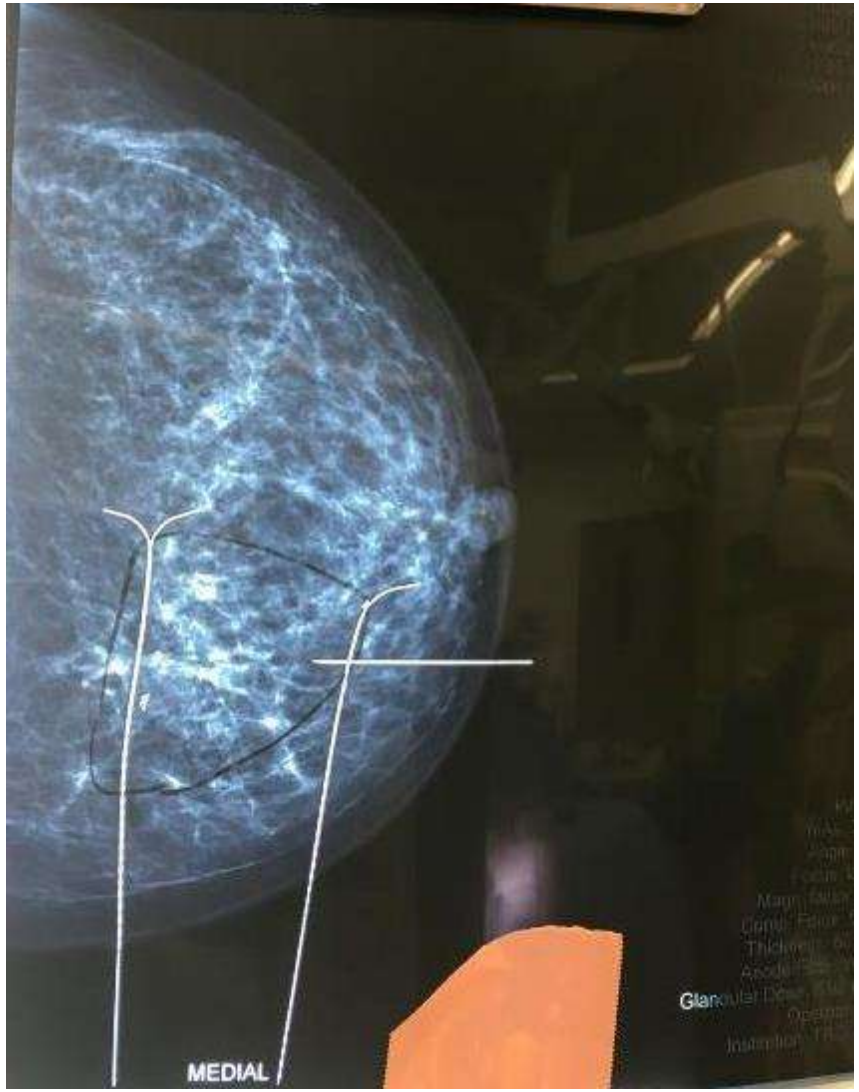


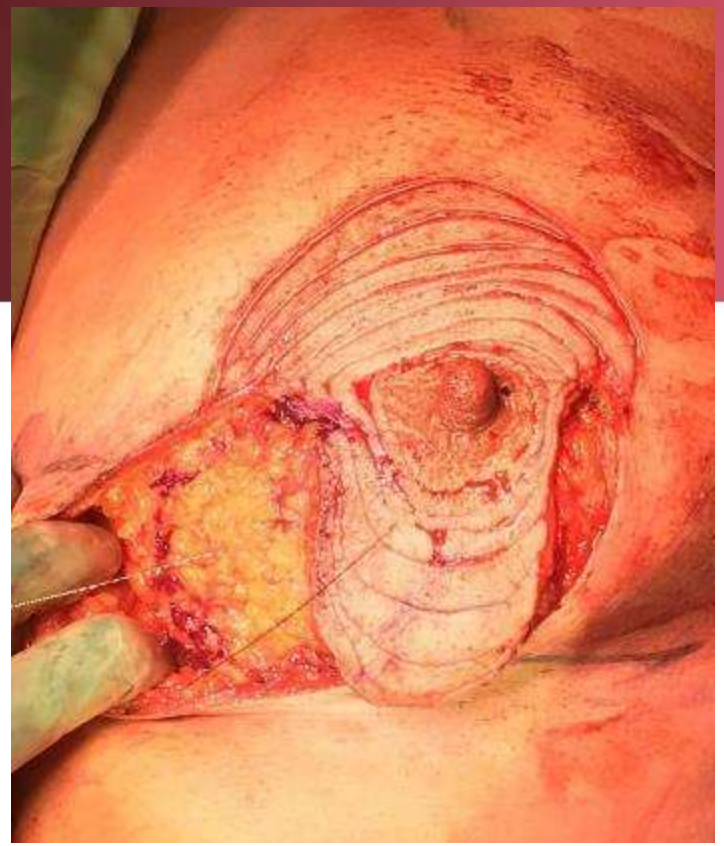


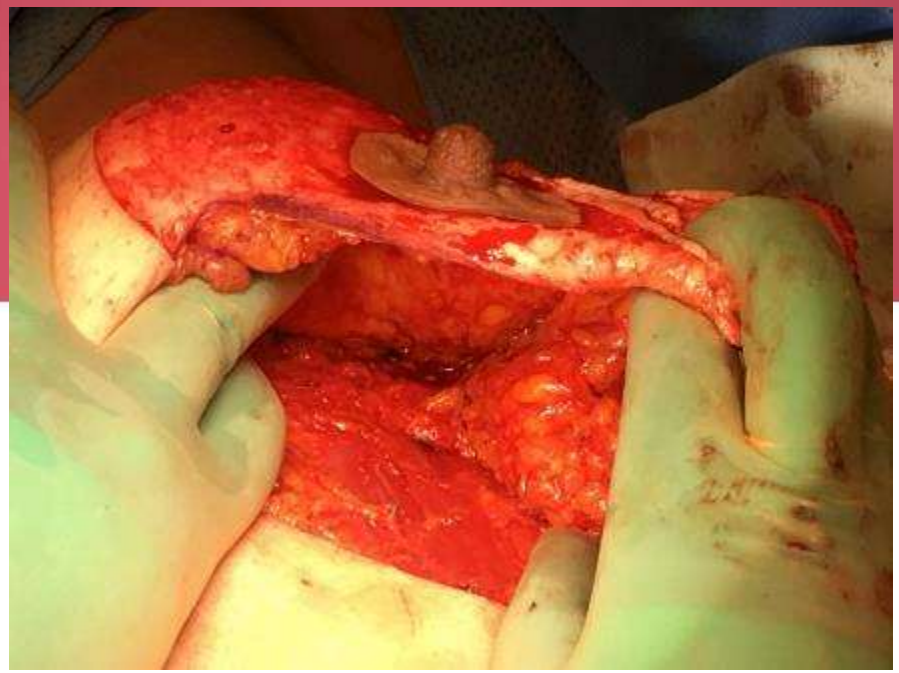


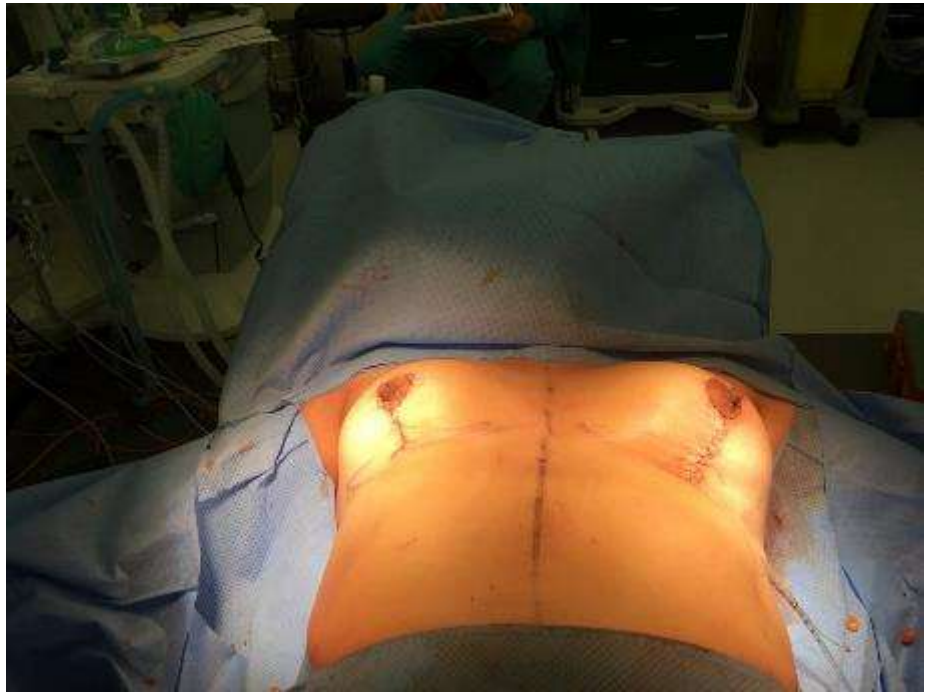


65mm R L-IG DCIS

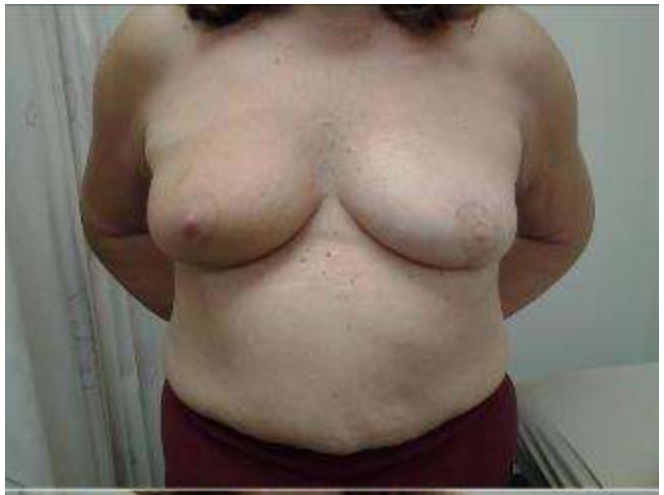


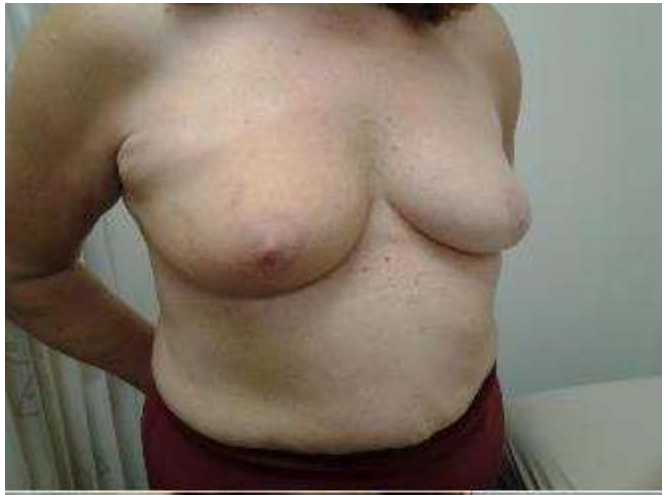


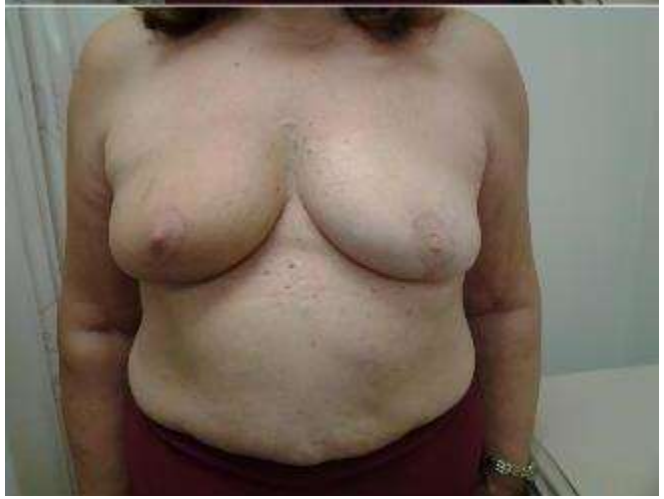


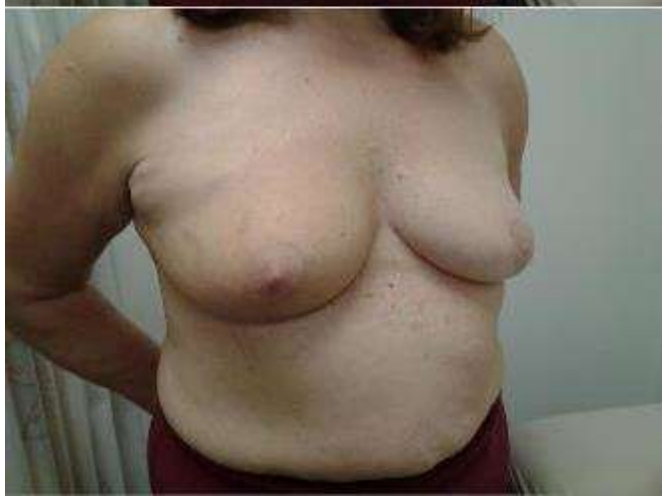


65mm R IG DCIS









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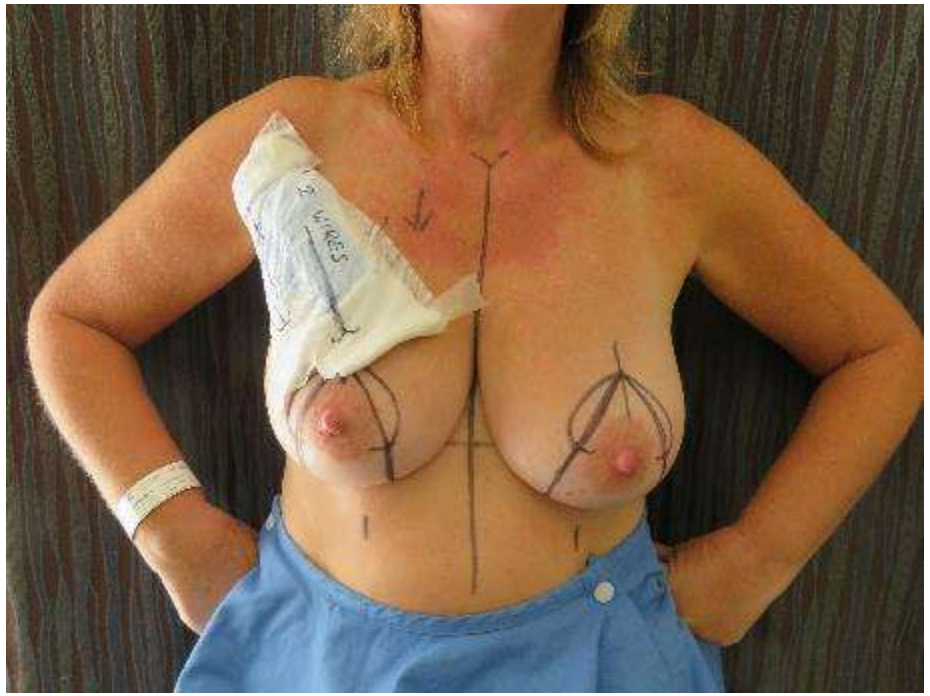

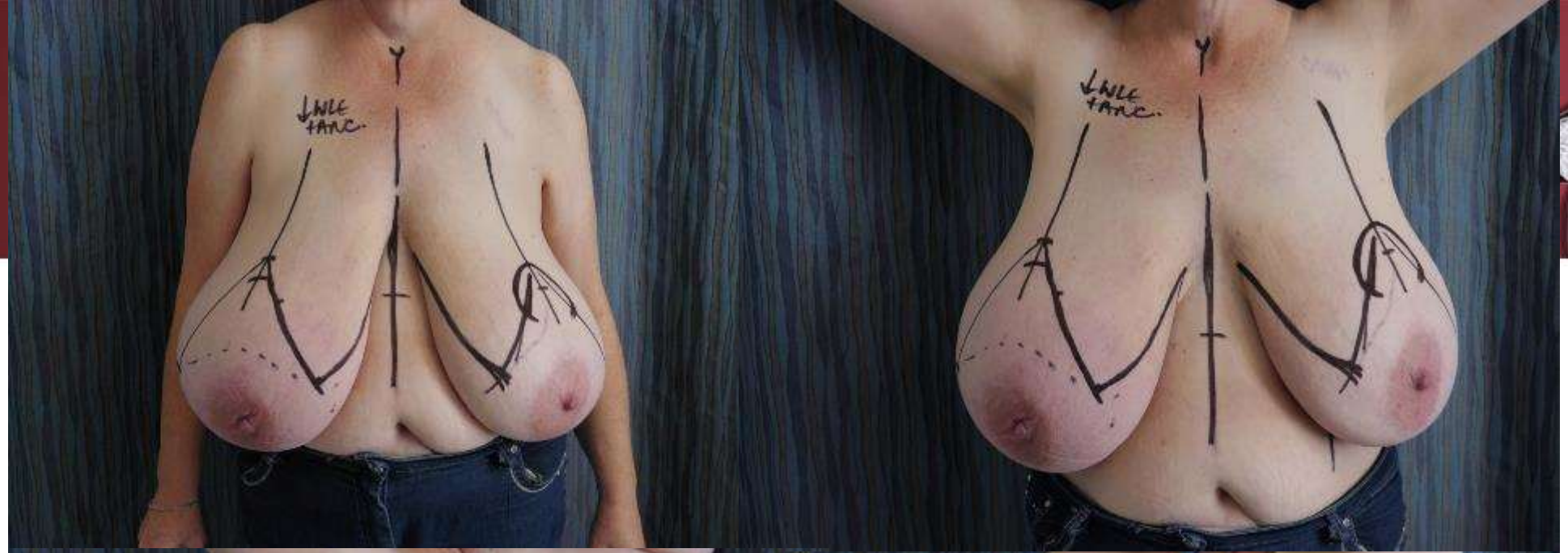

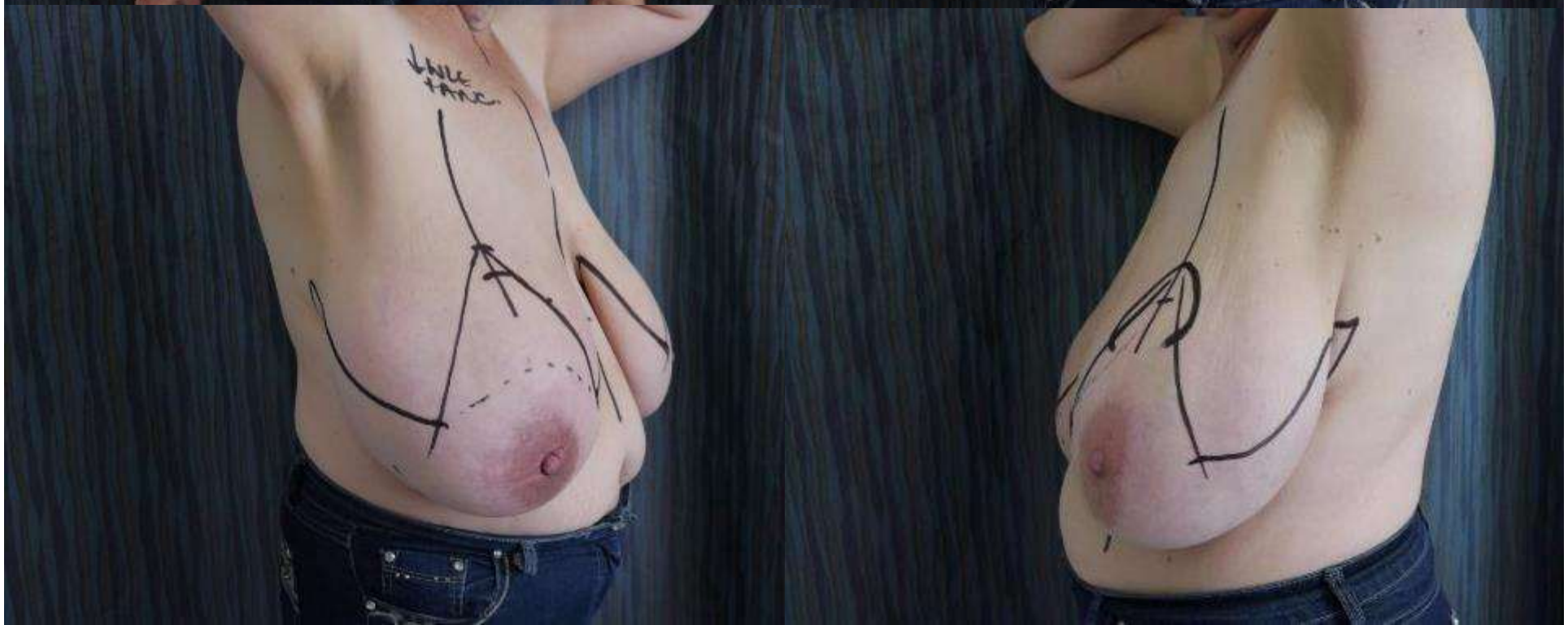


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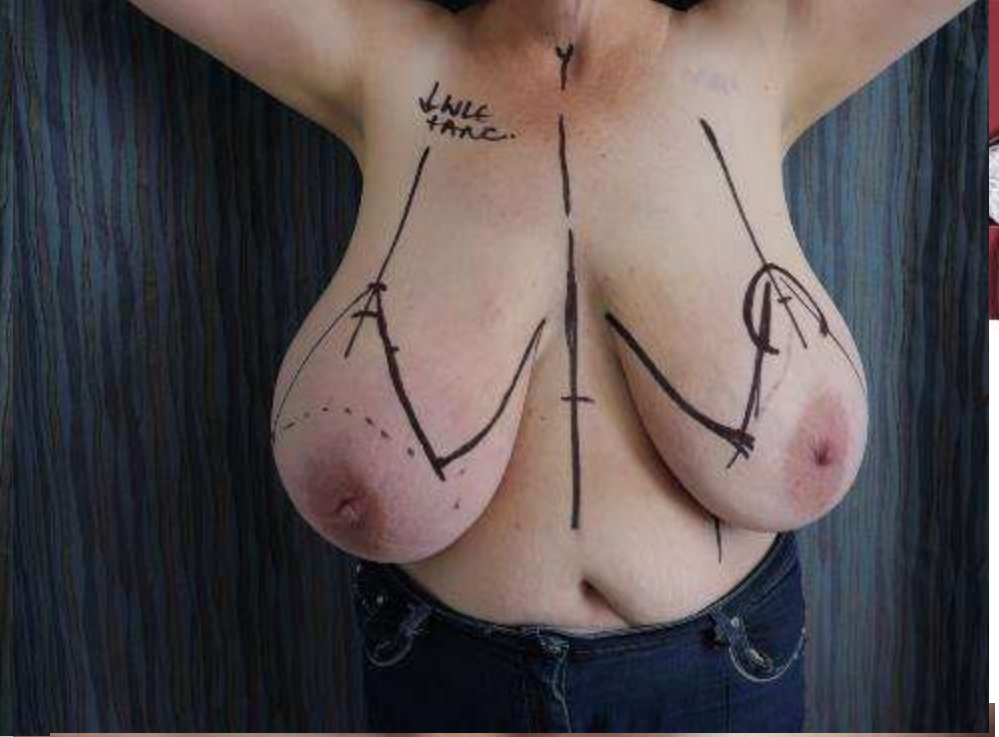
+ANC.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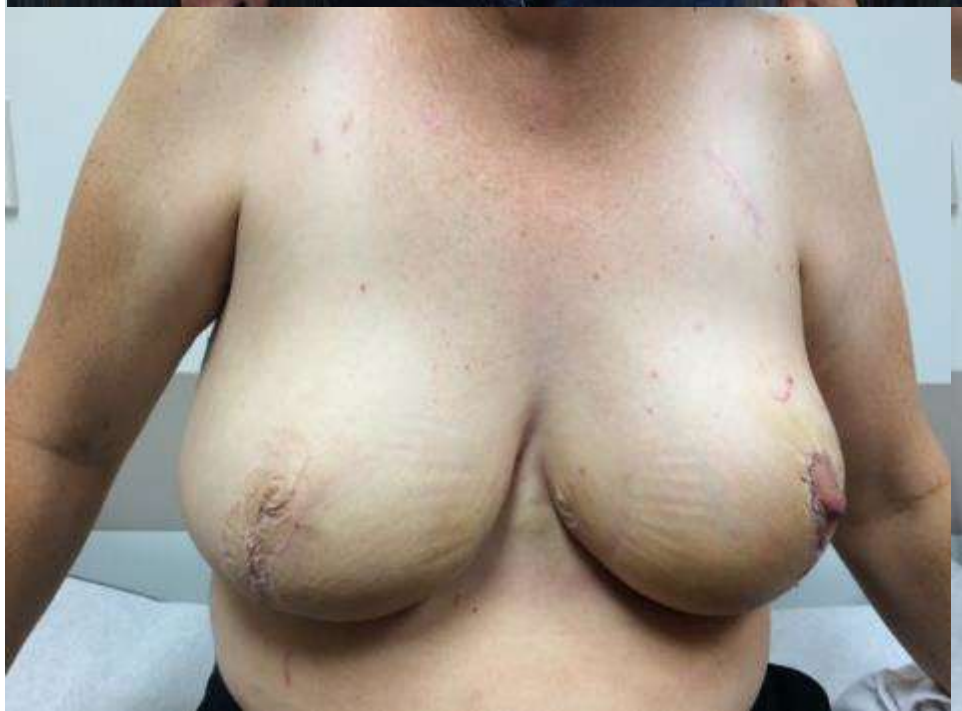
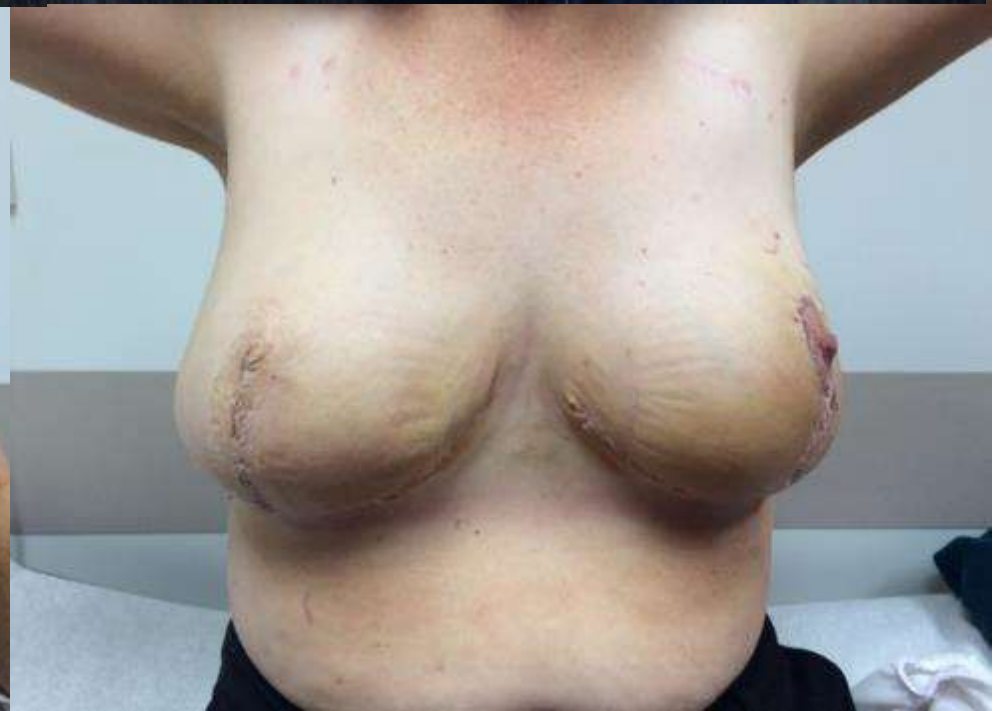
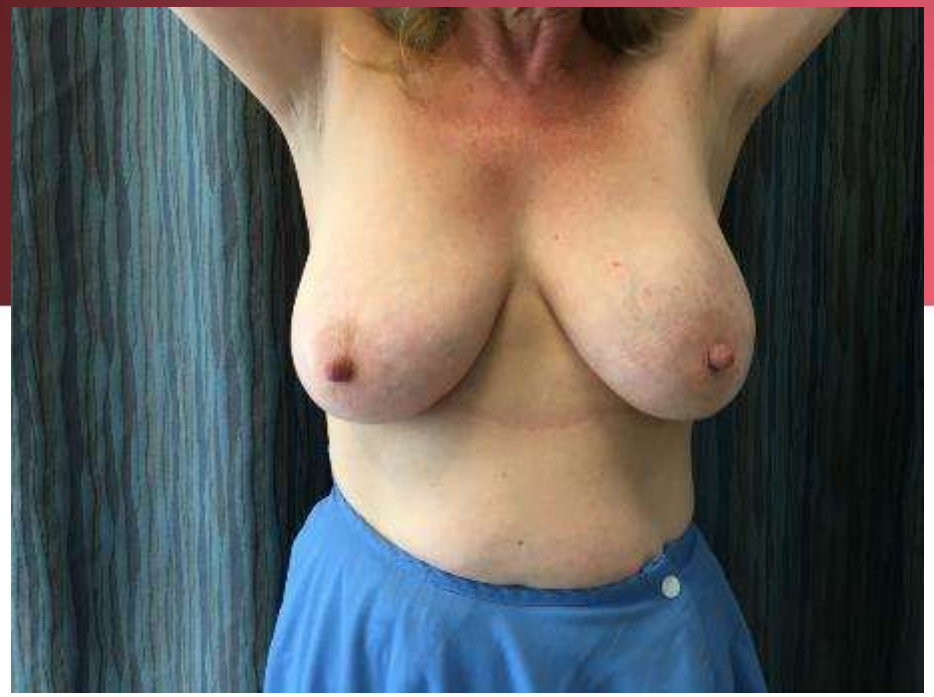
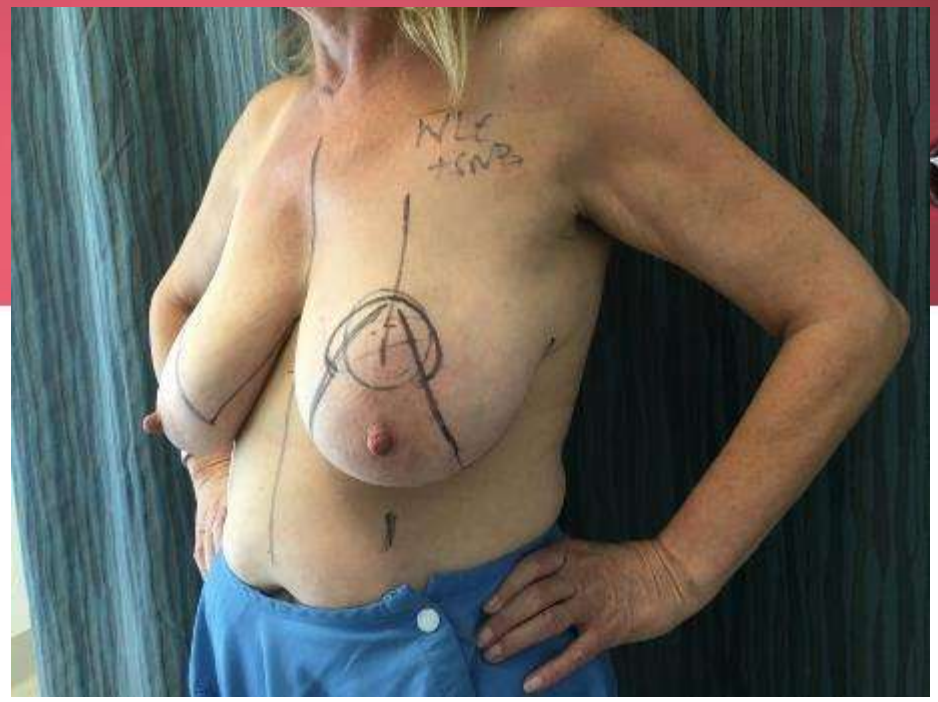
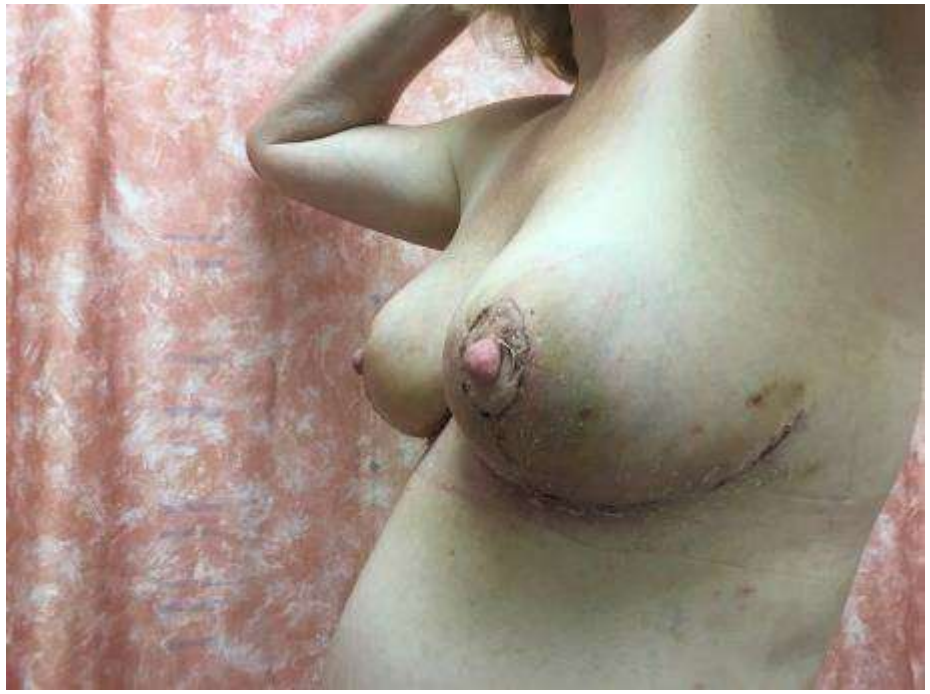
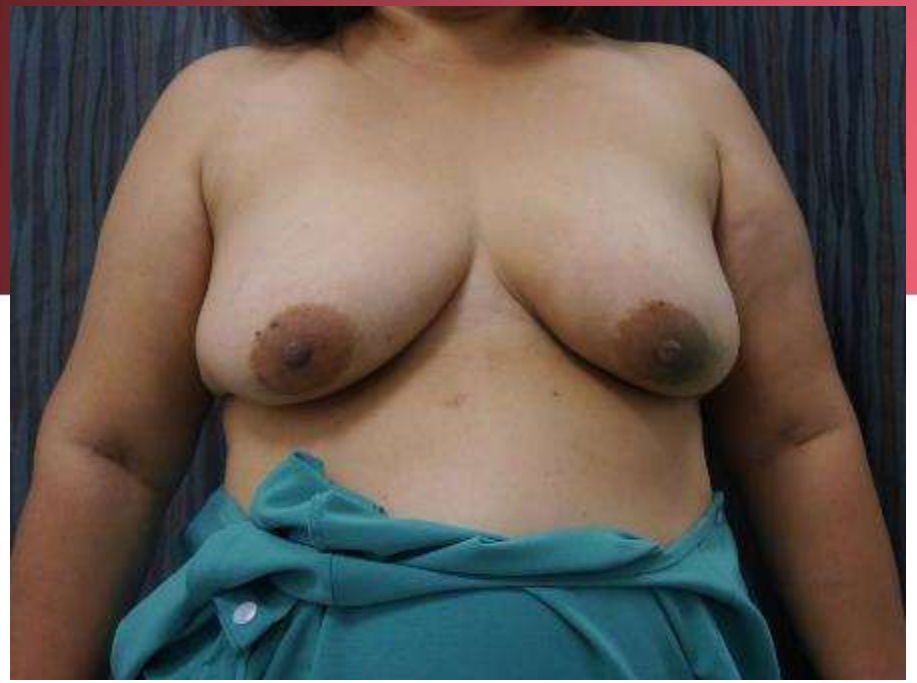


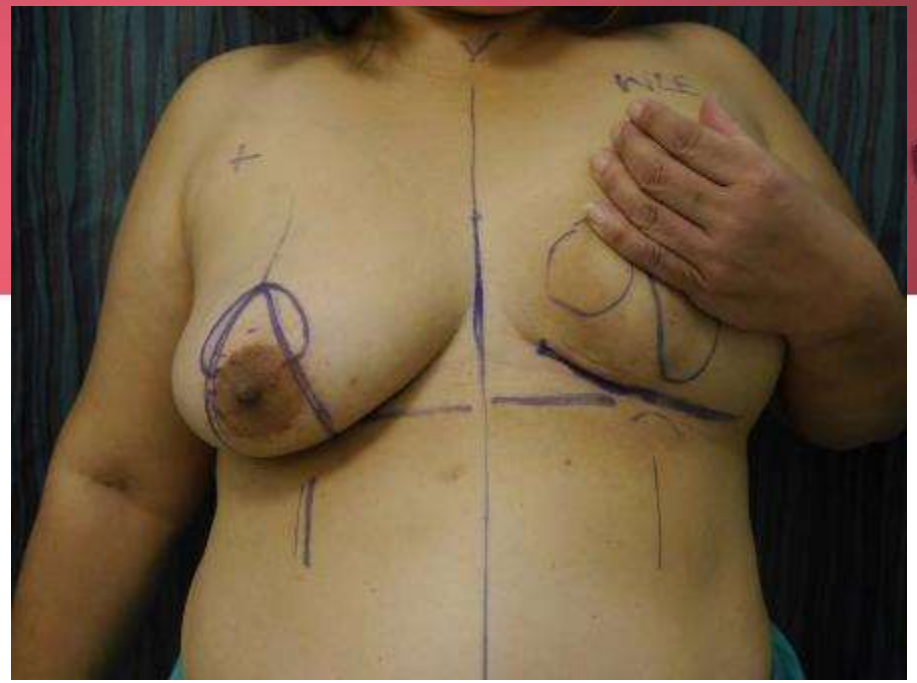


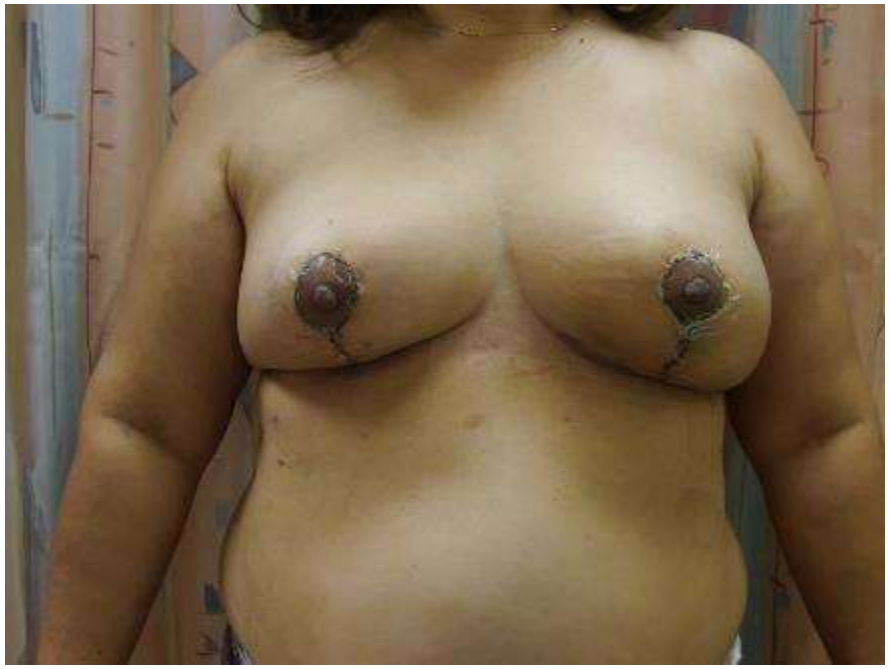


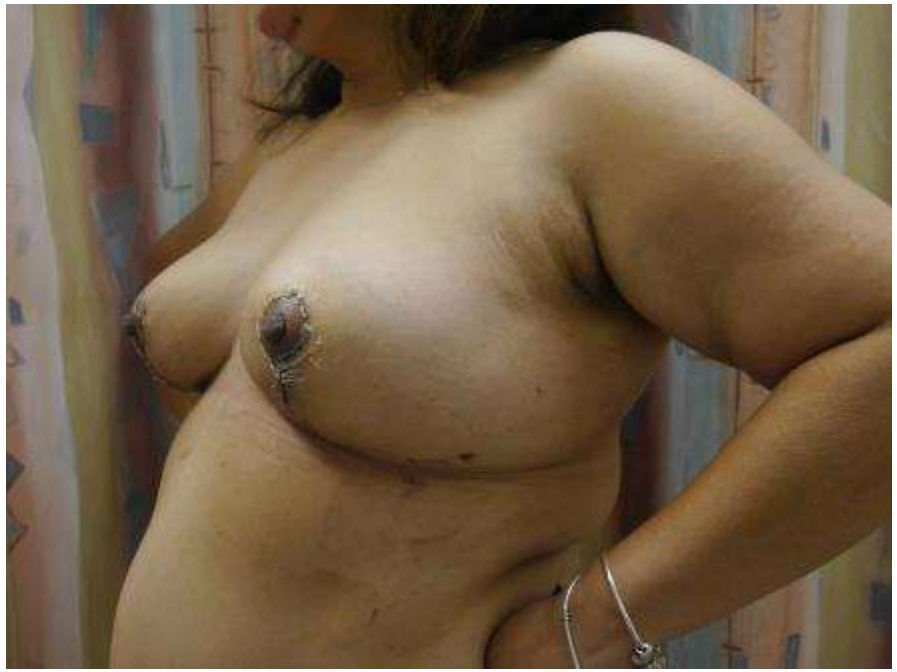




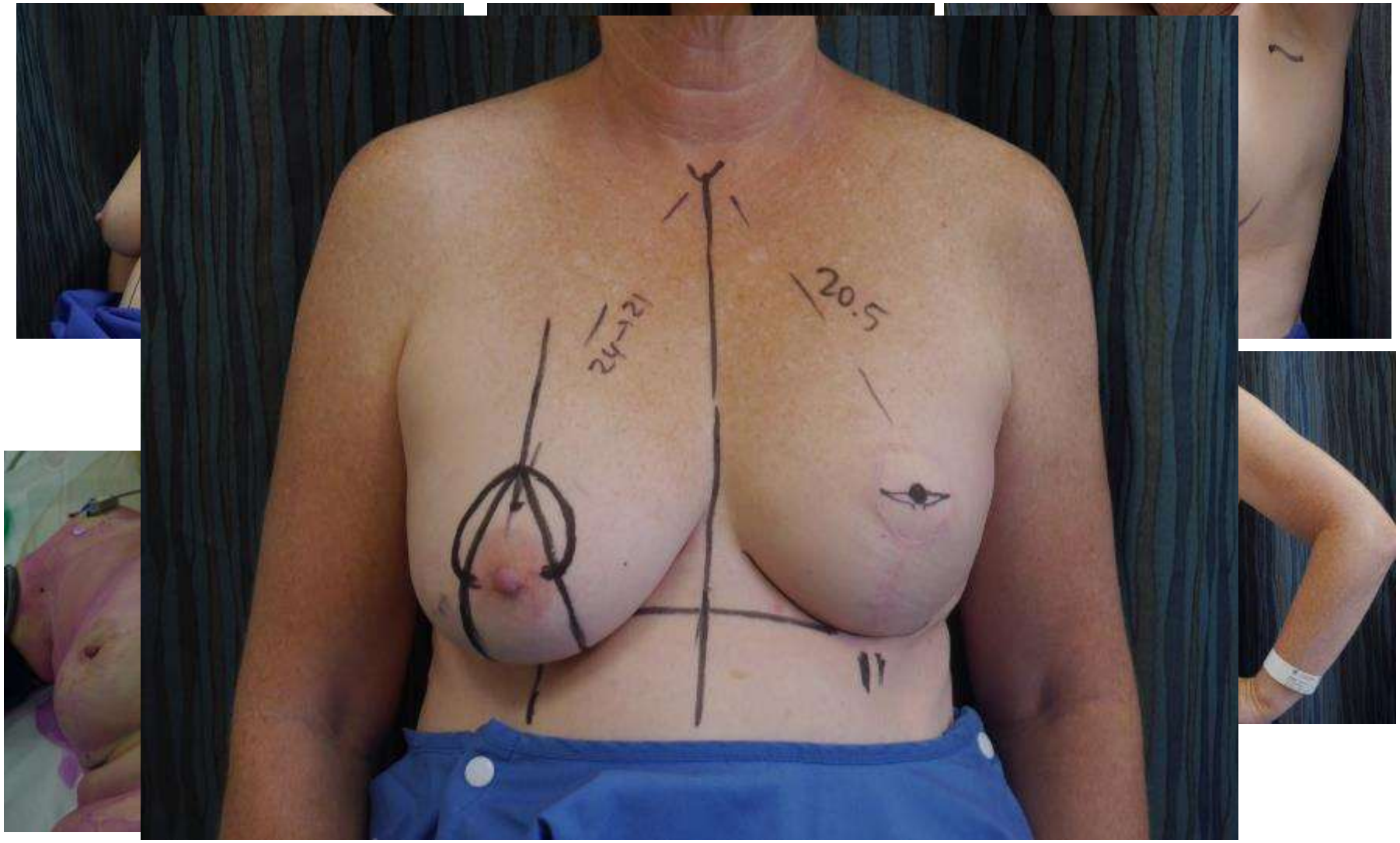


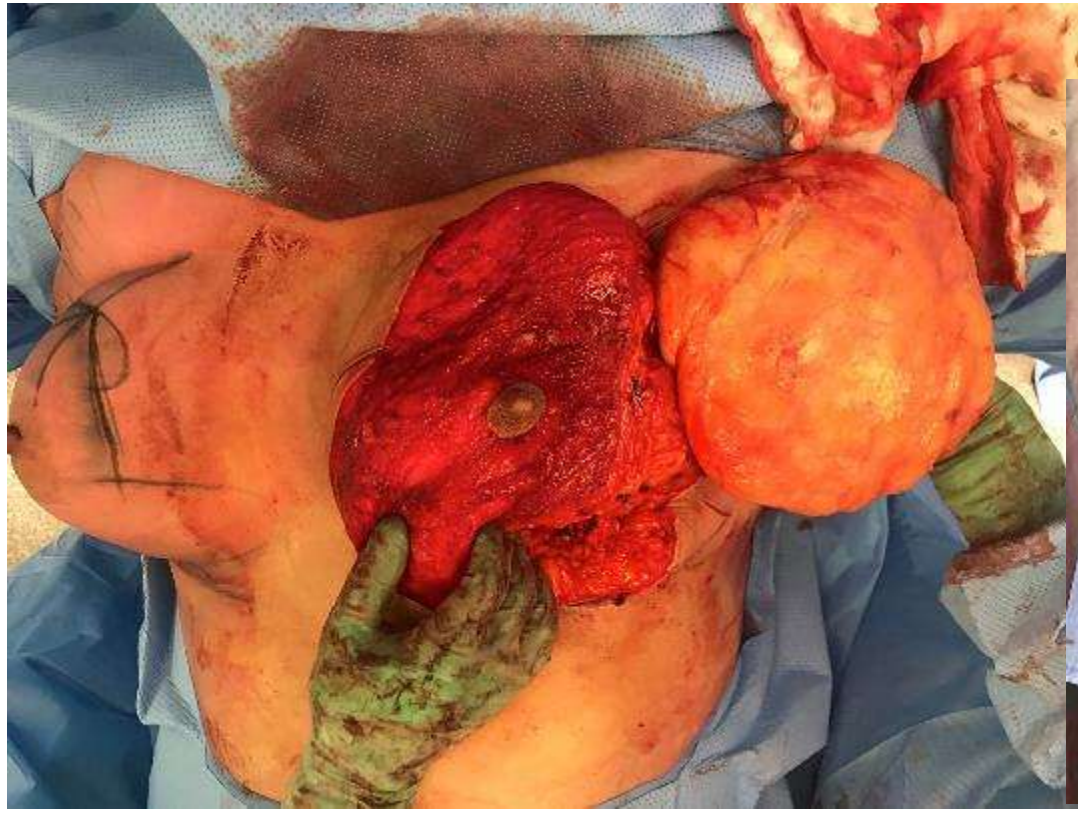


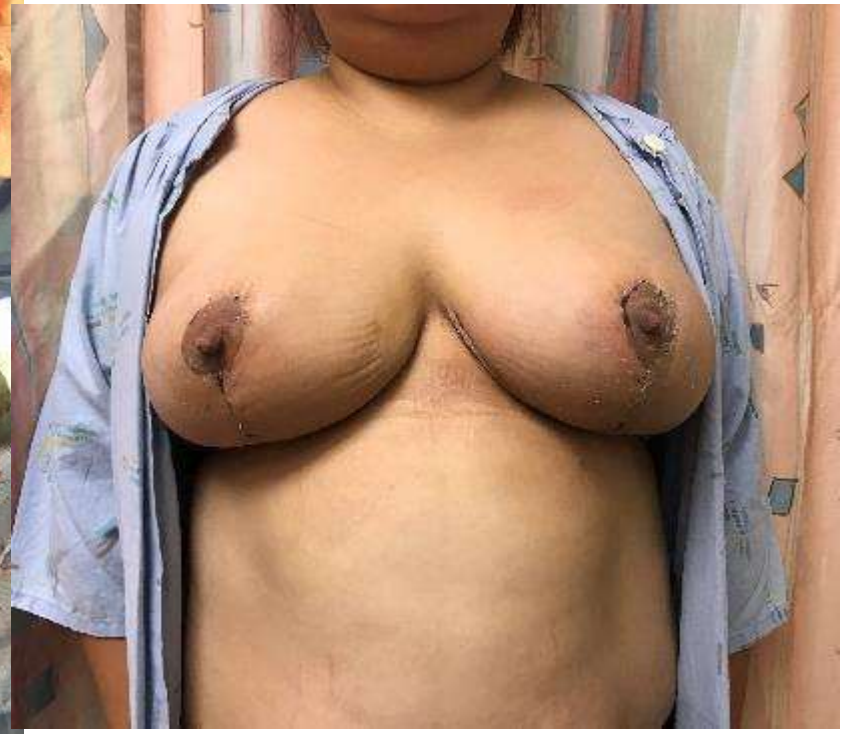




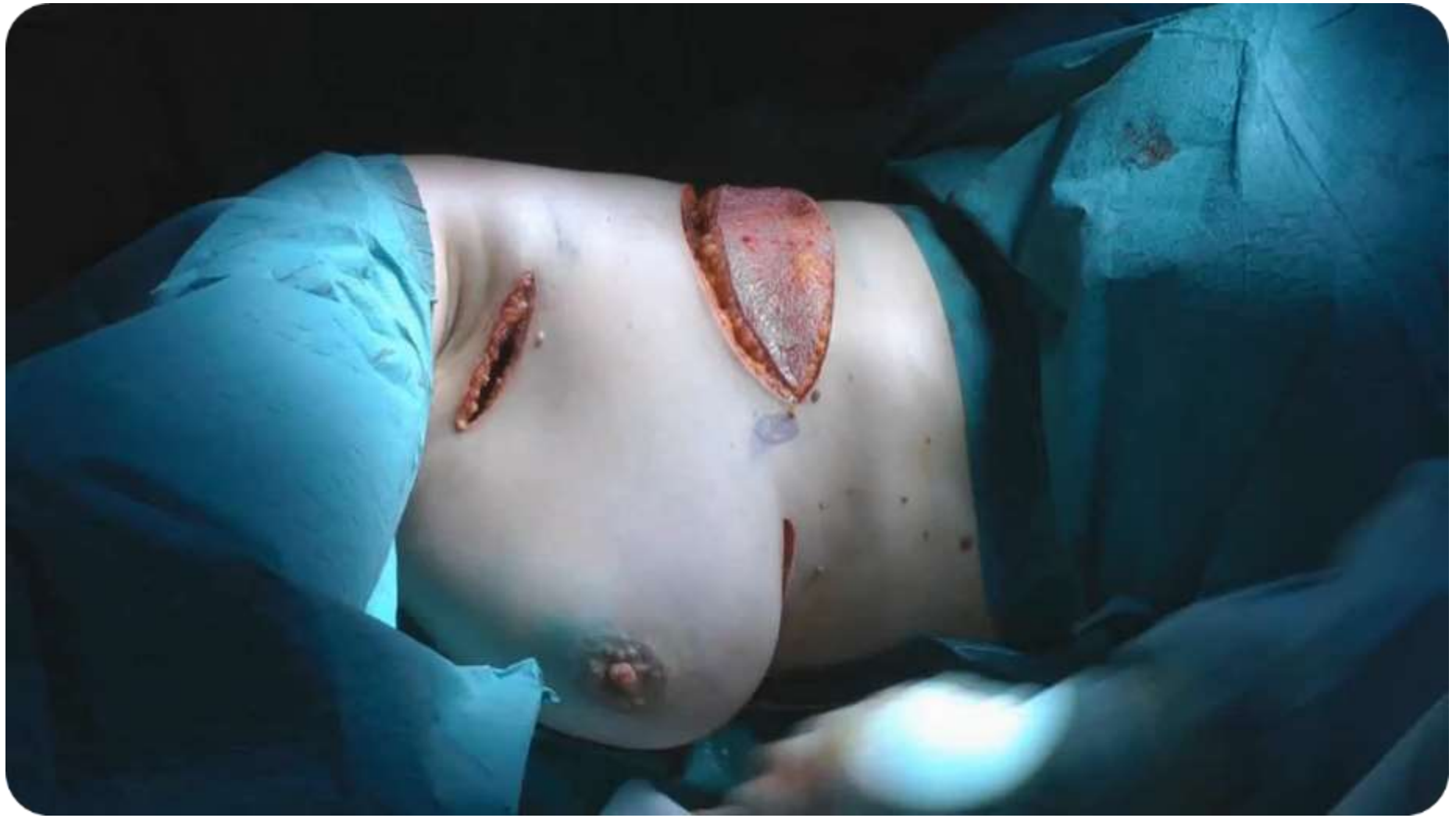
Grisotti flap



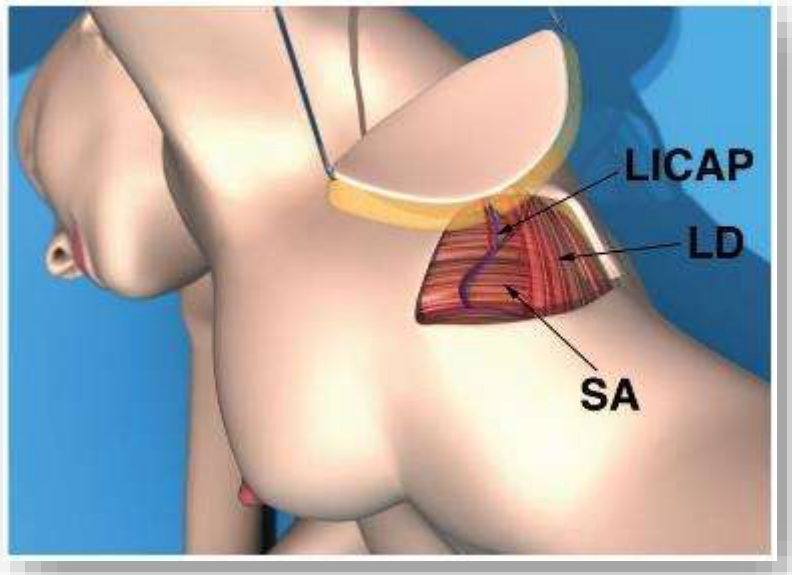


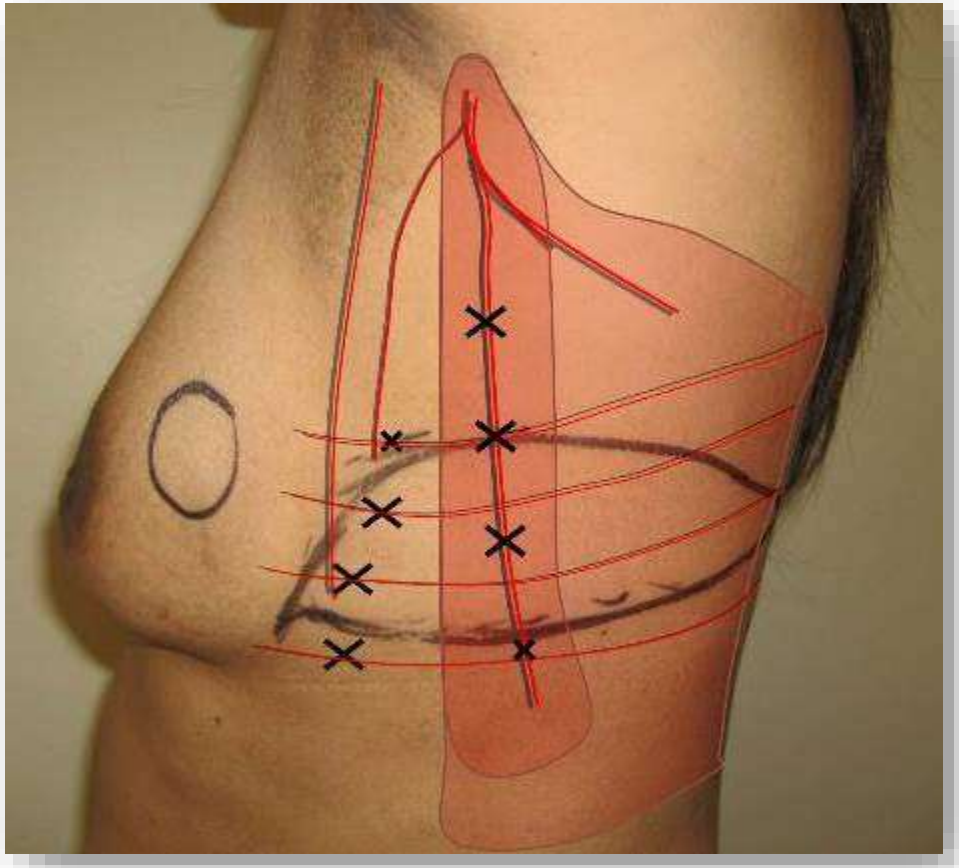


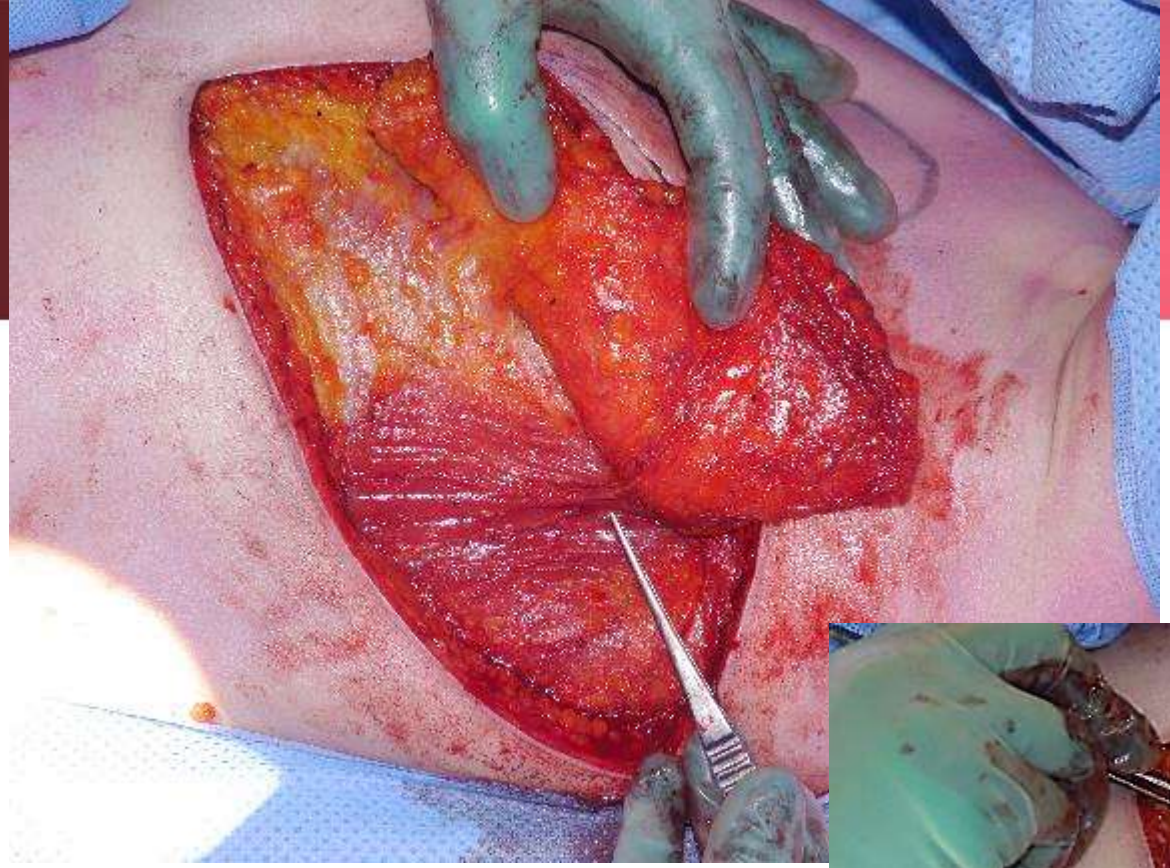
Volume Replacement BCS

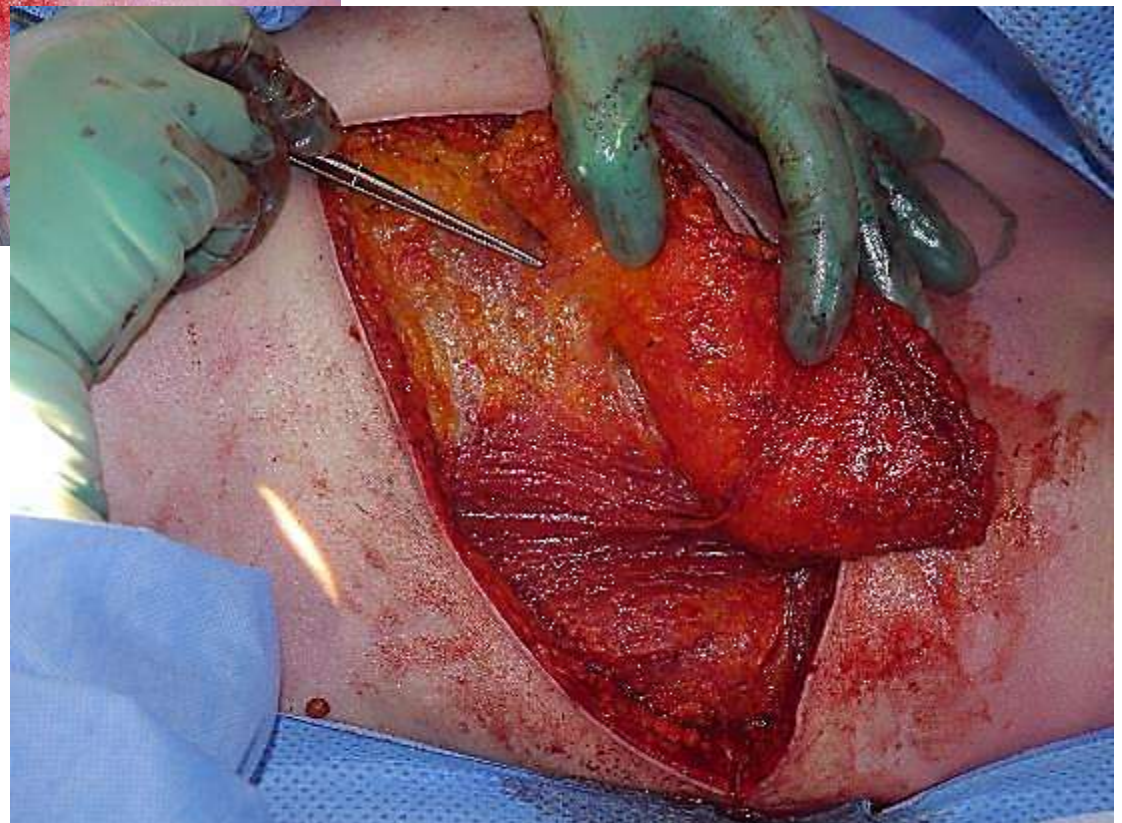


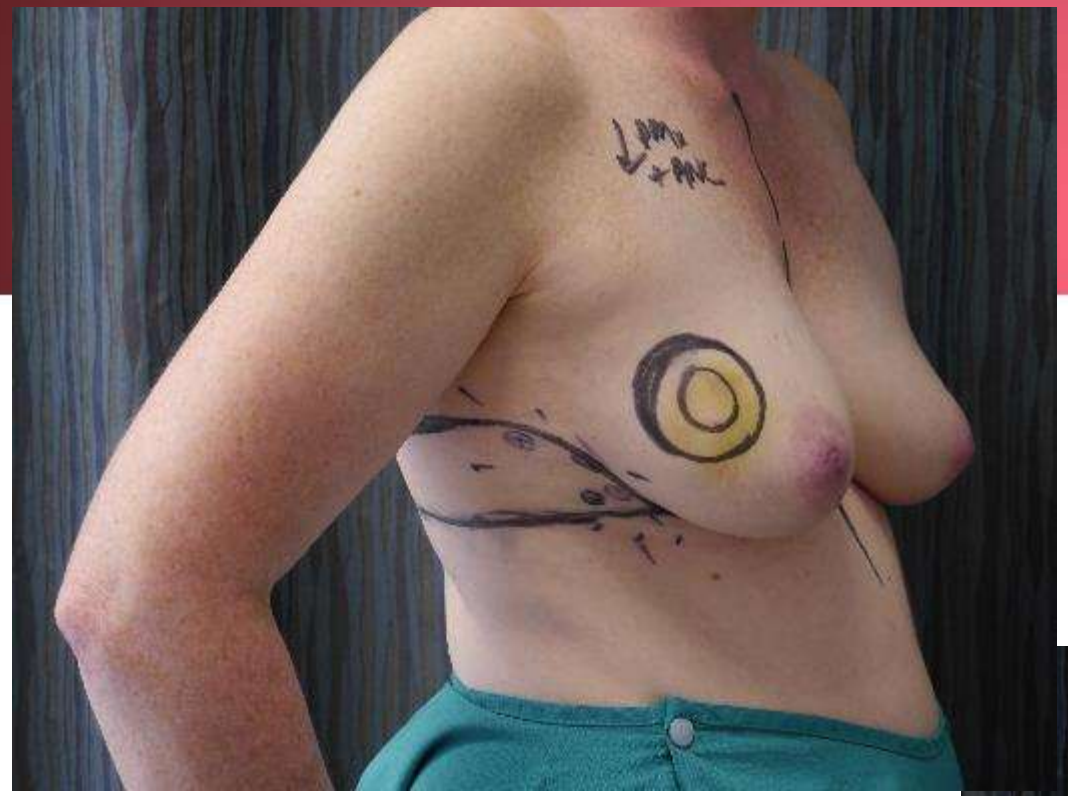
Chest wall perforator flaps

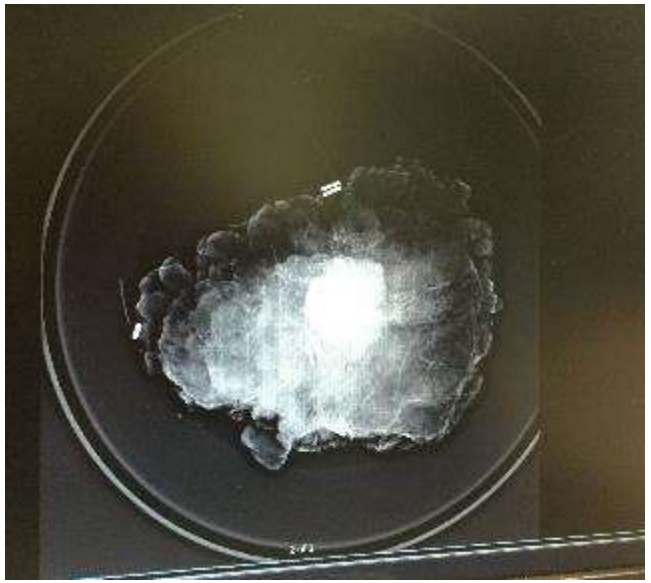


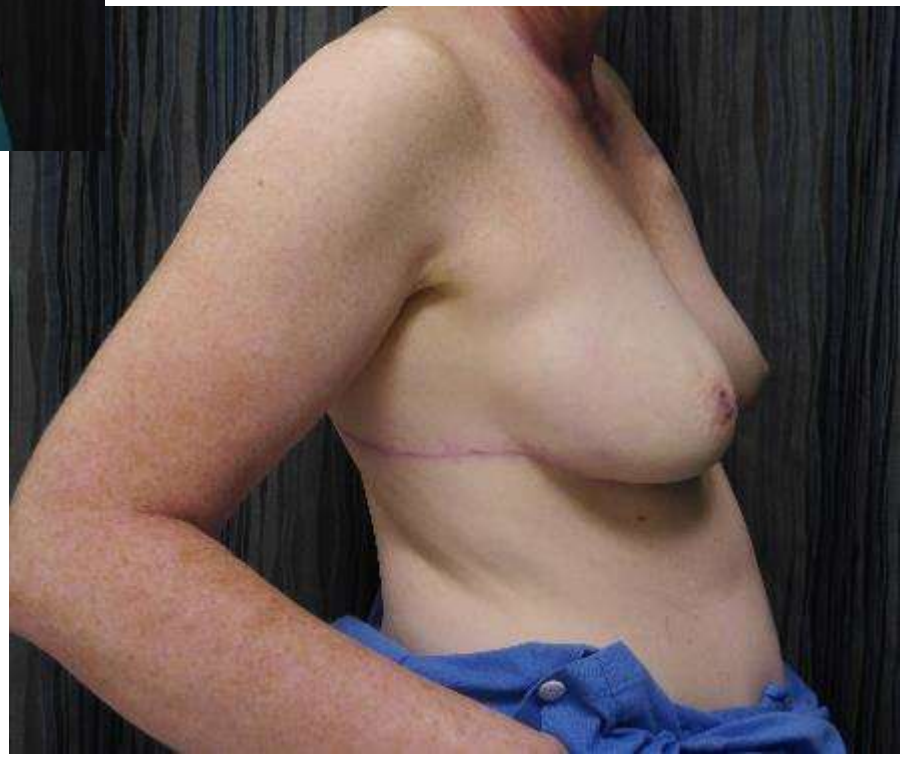




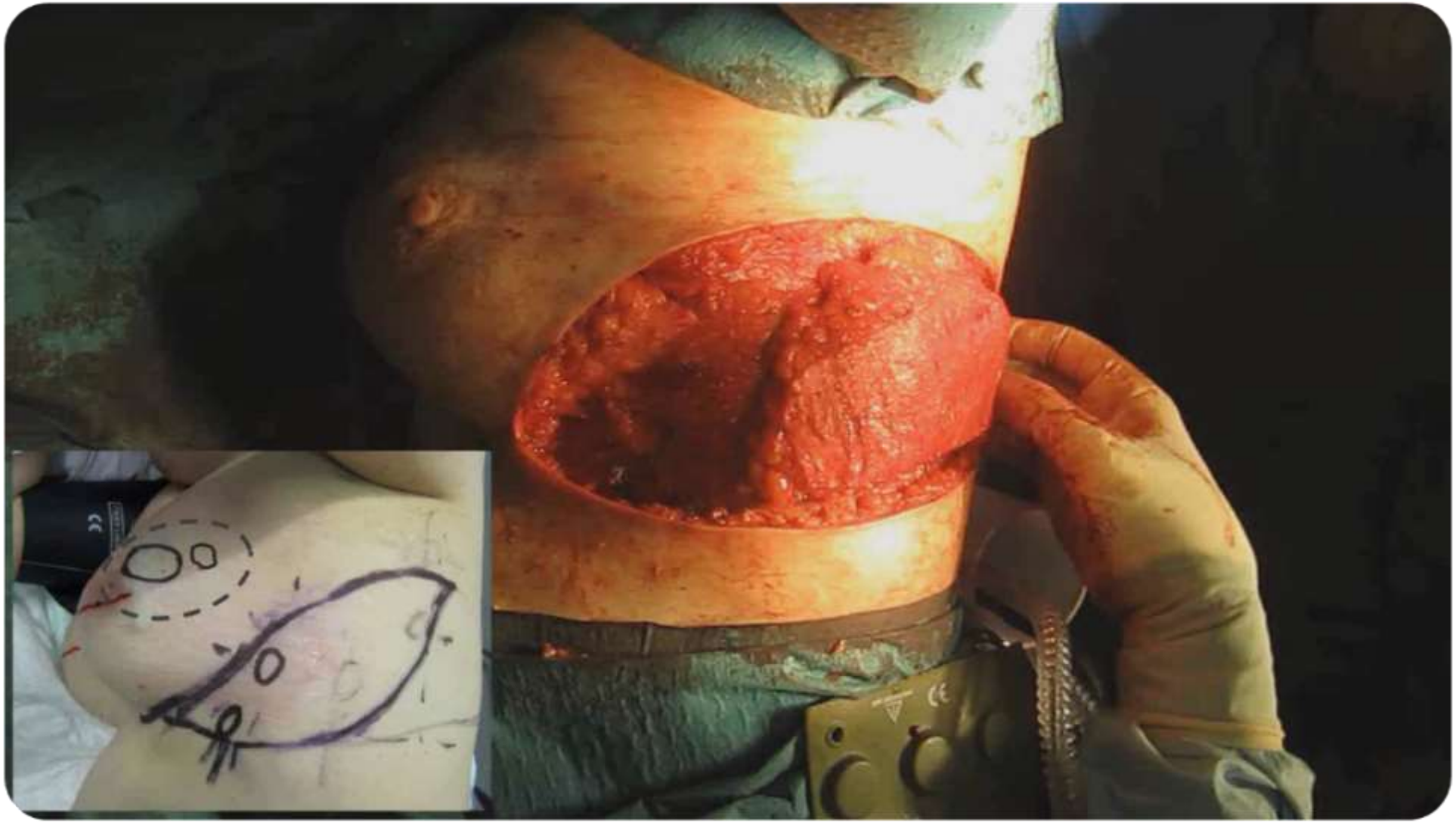


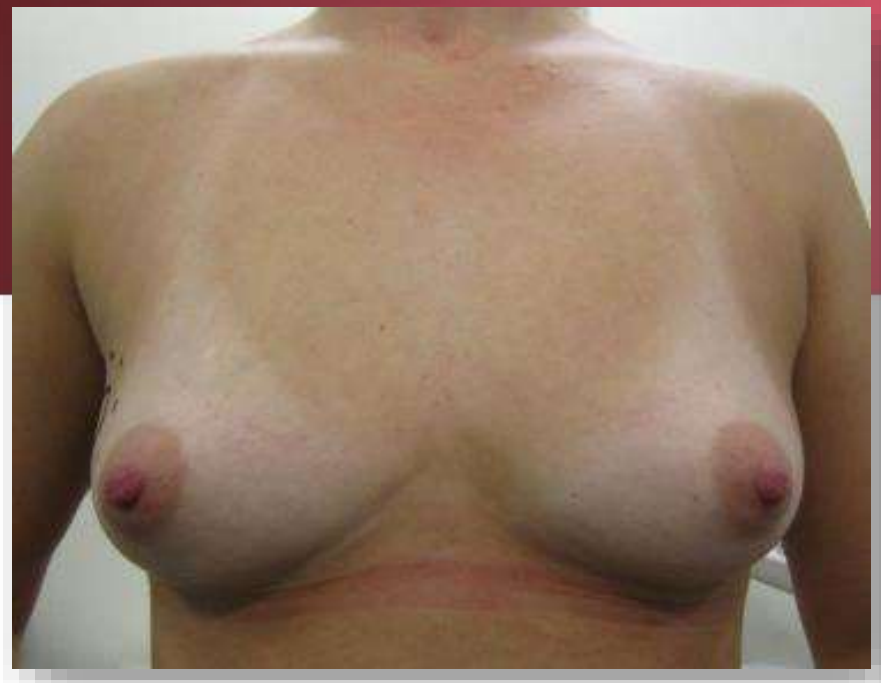


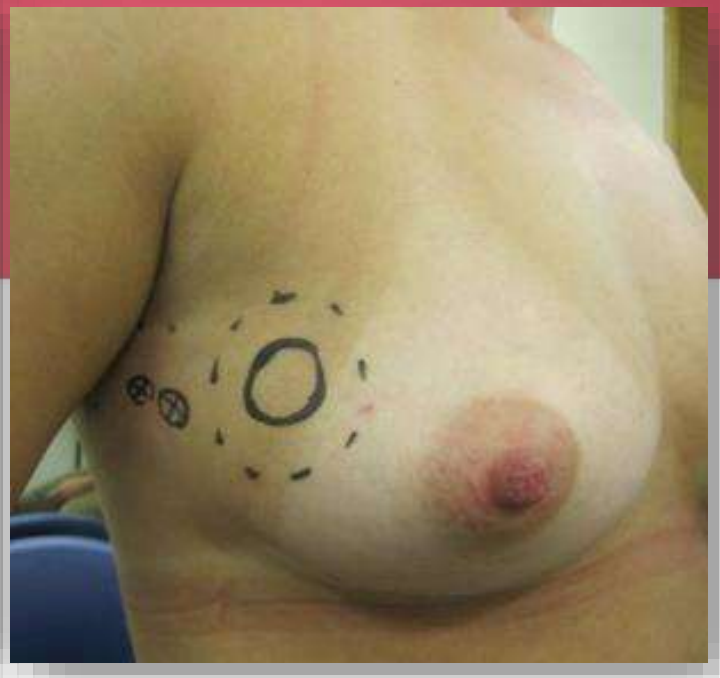


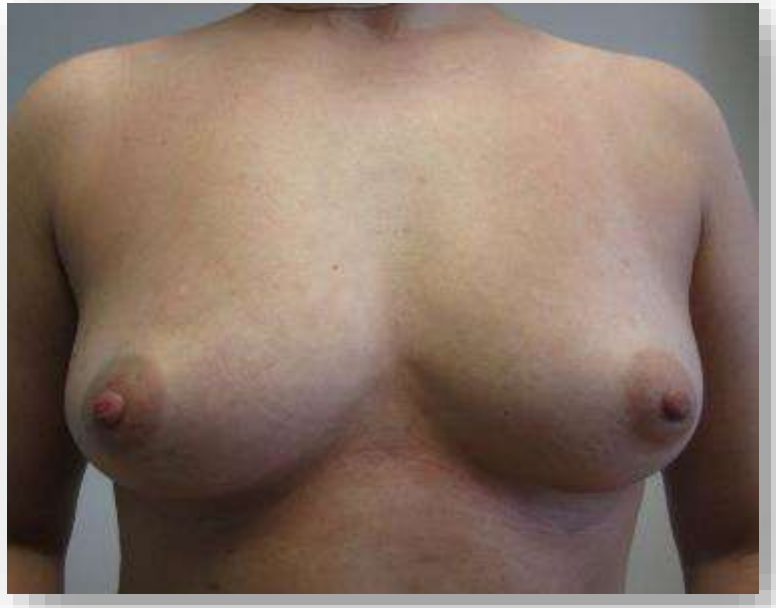


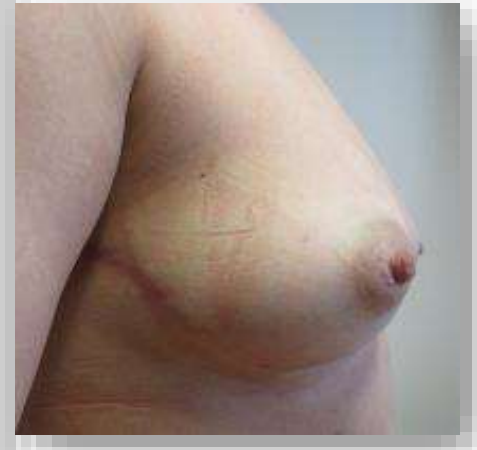
LiCAP Flap

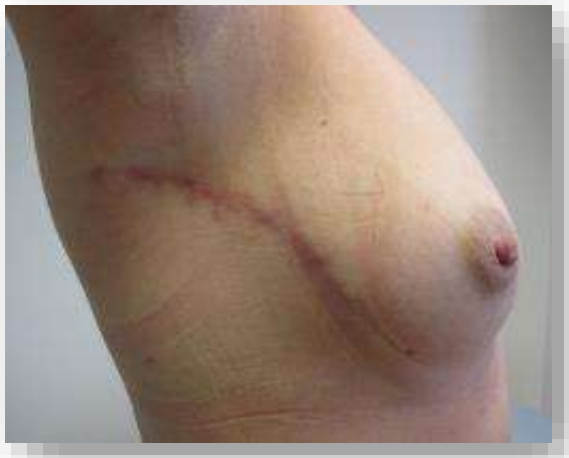


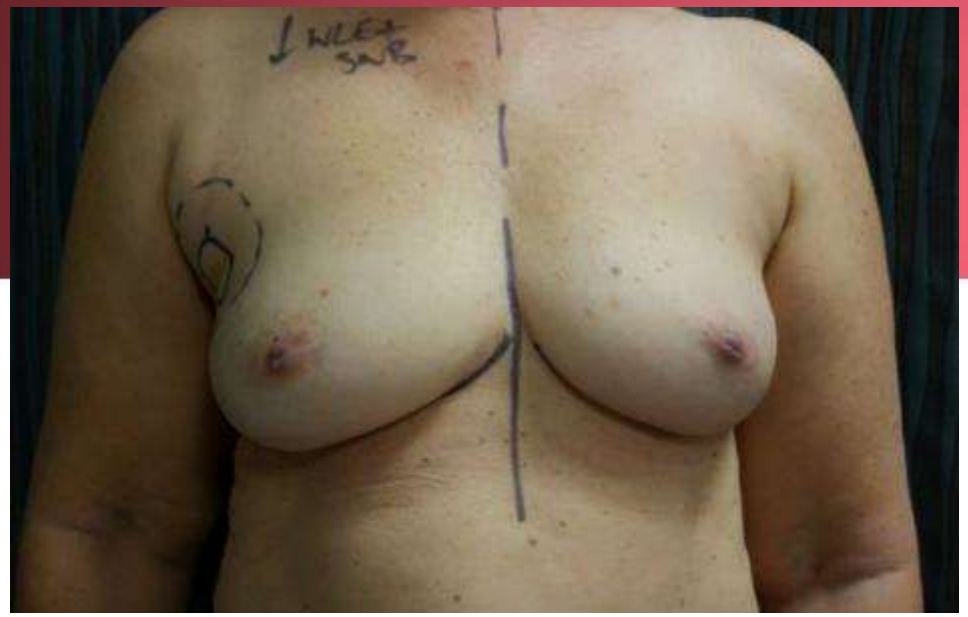


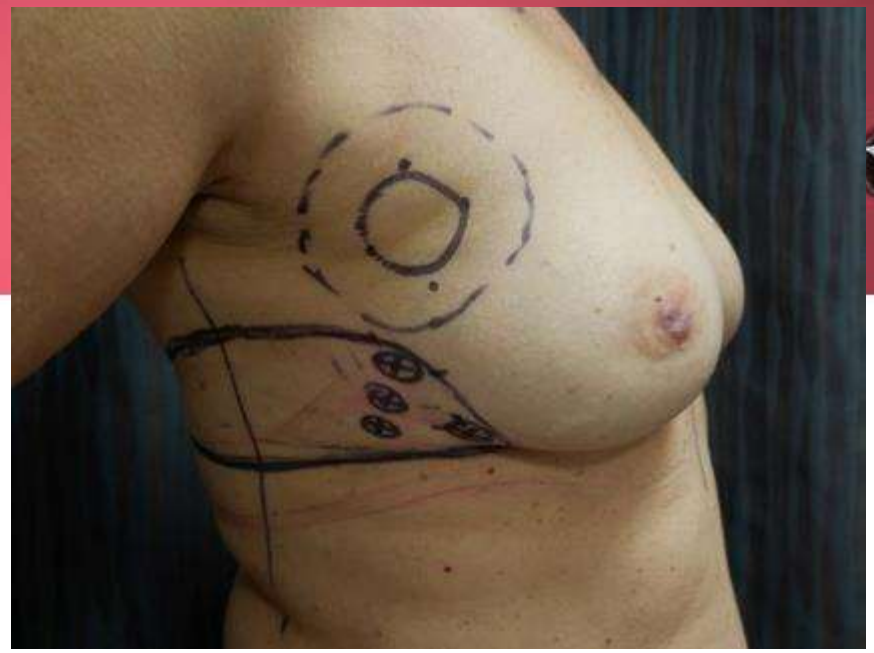


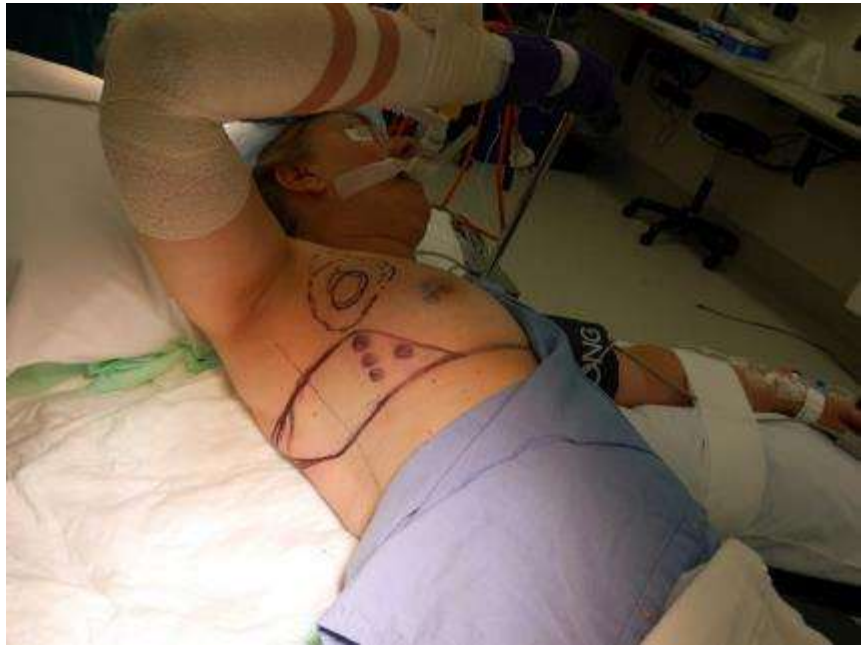


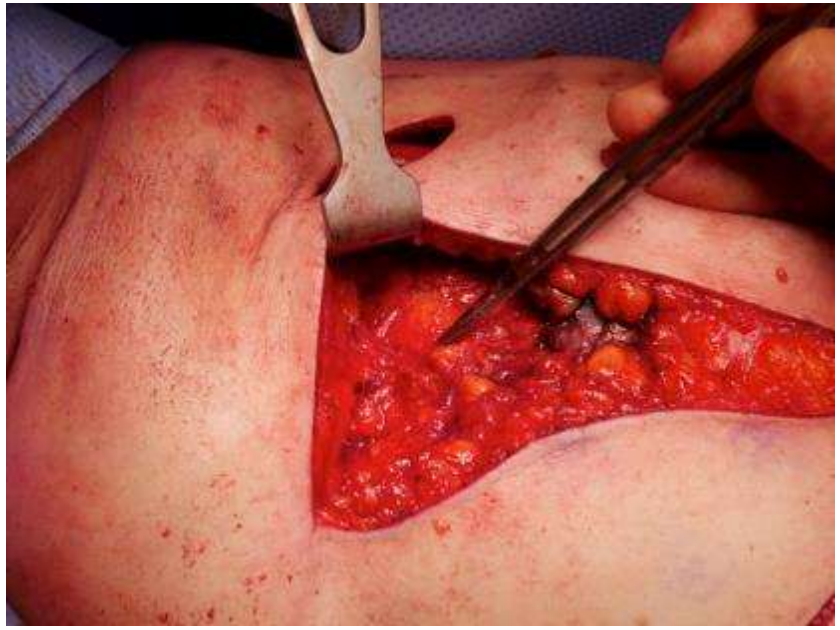


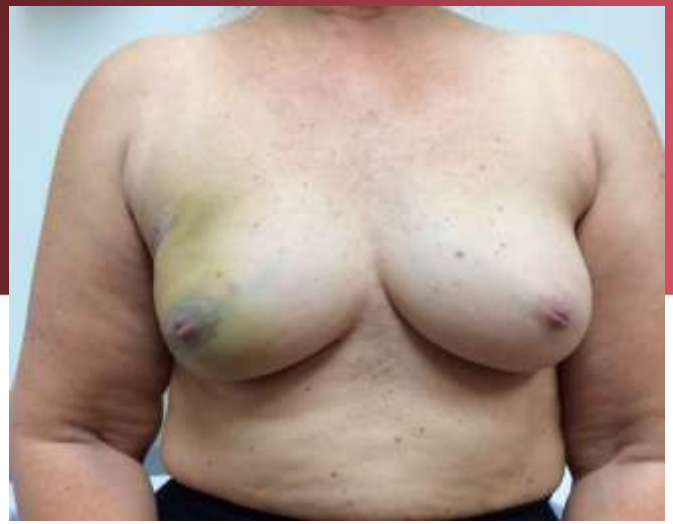
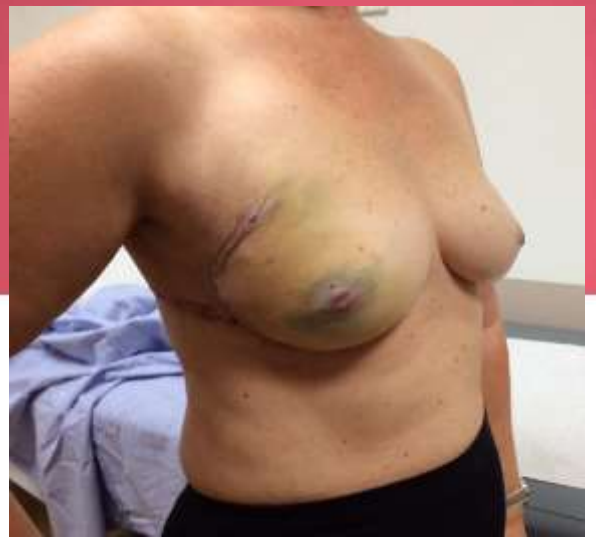
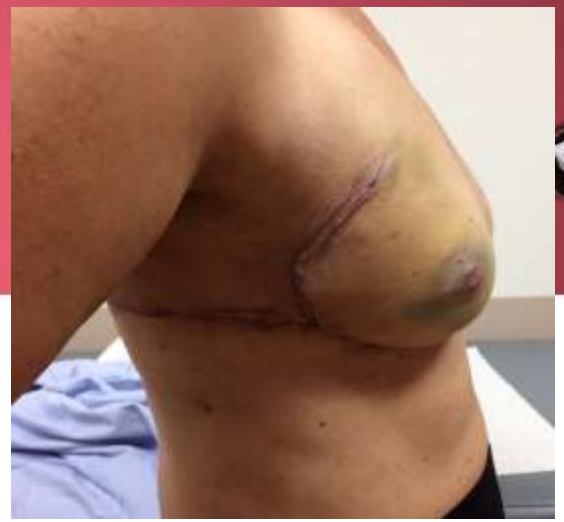
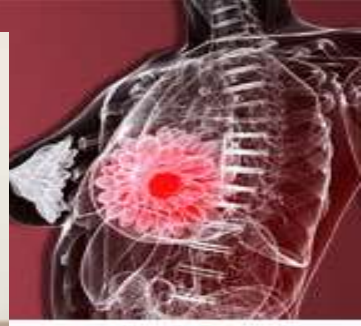
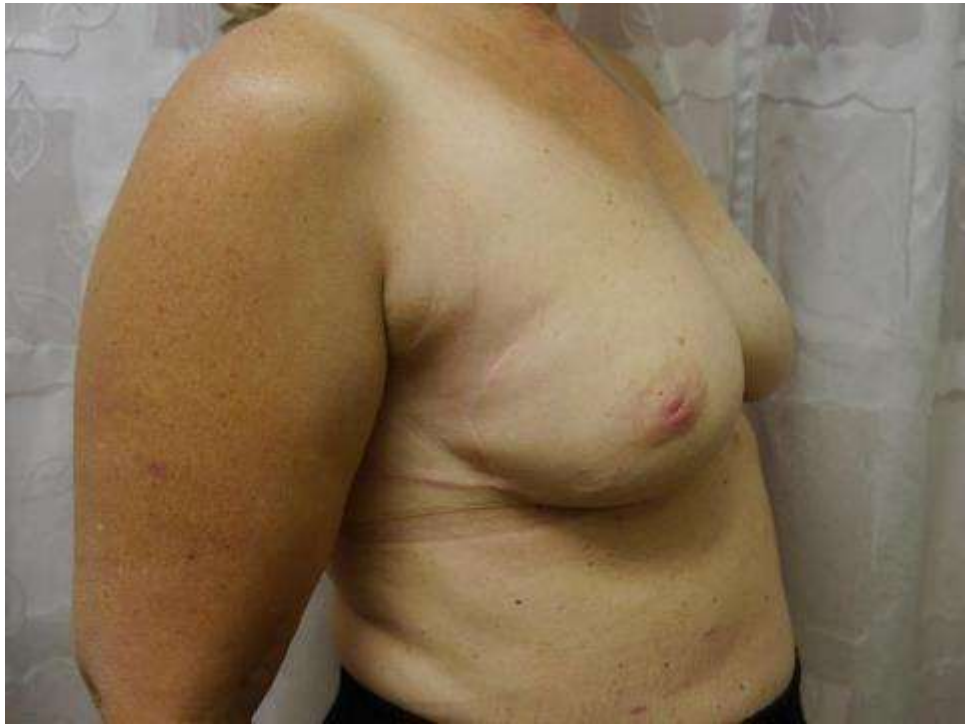


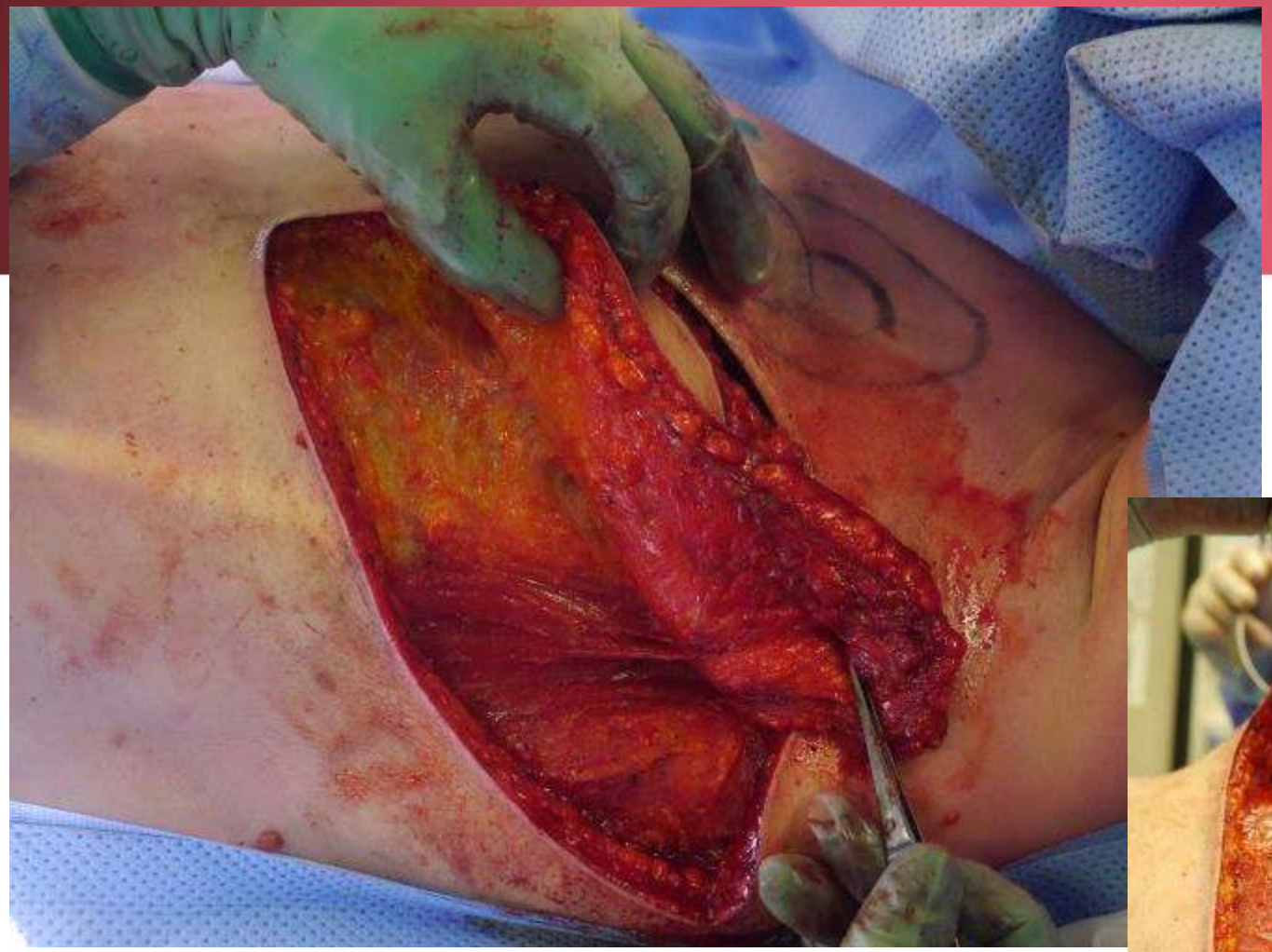


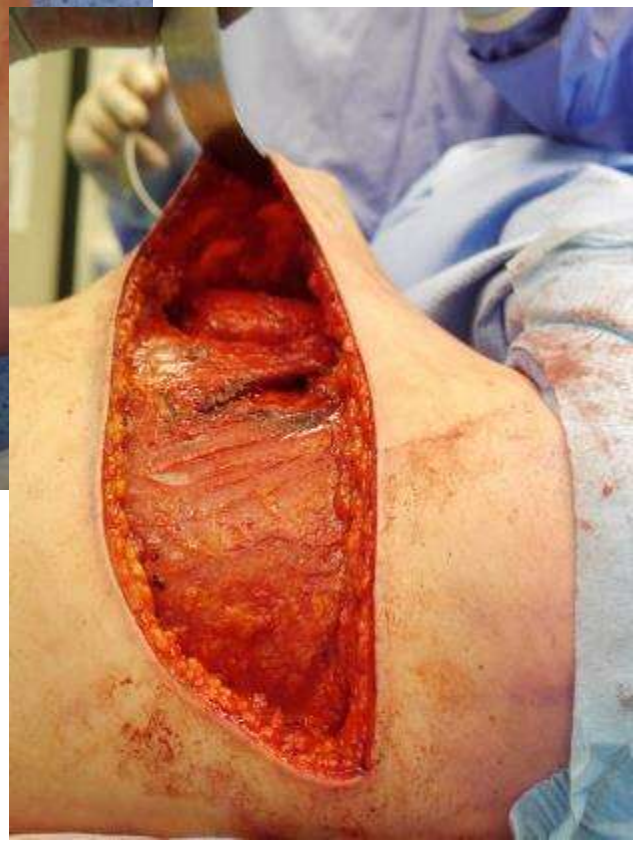


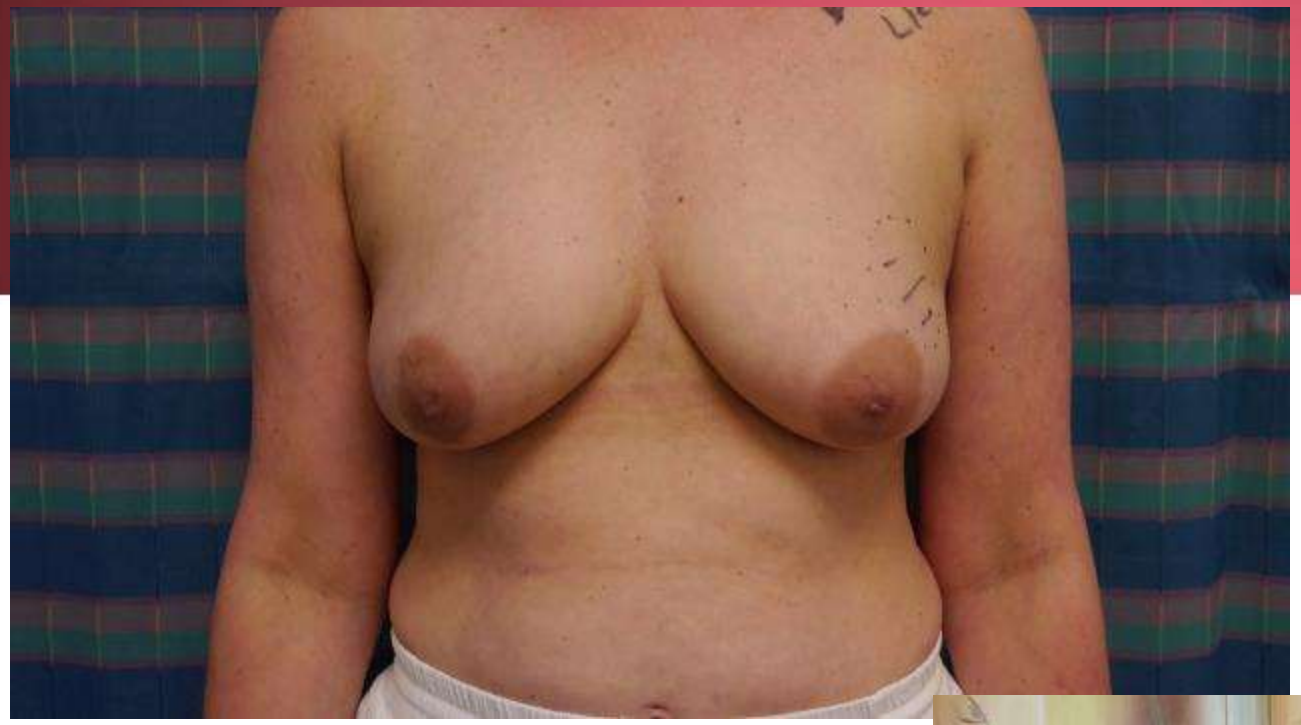


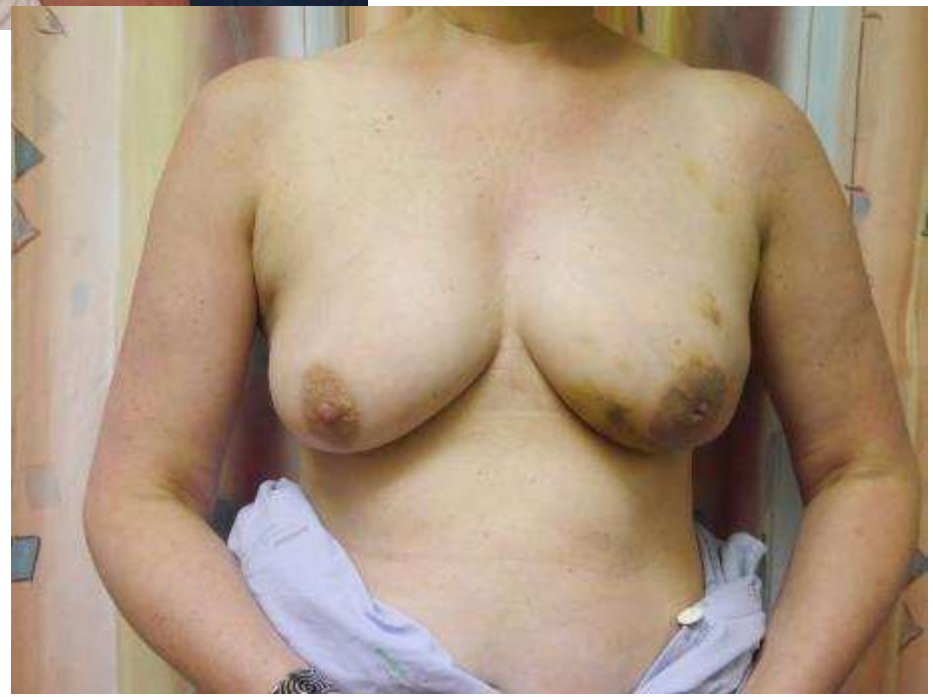


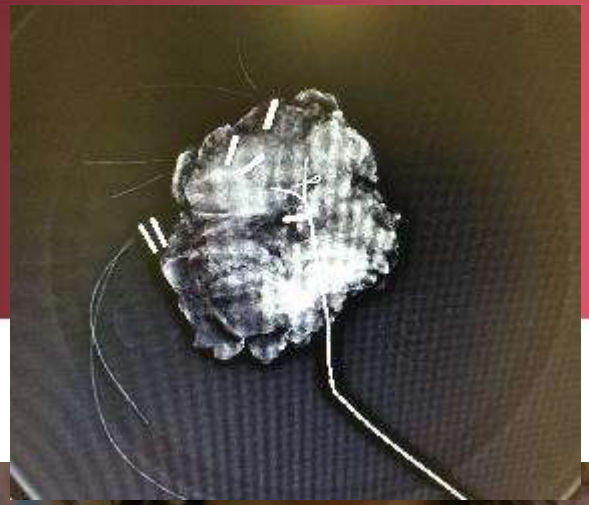






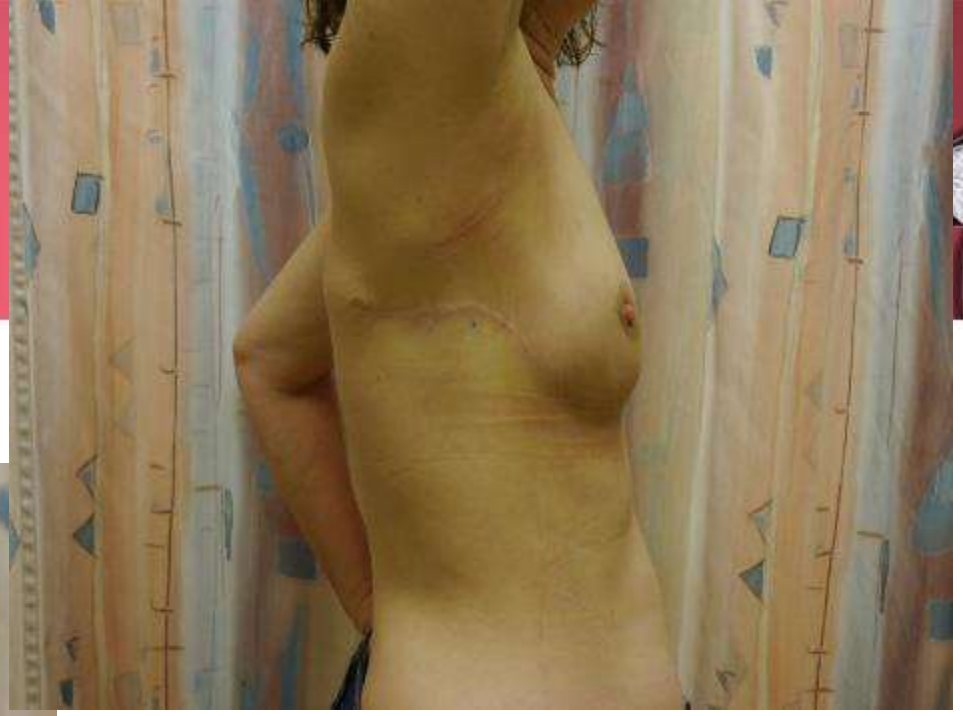


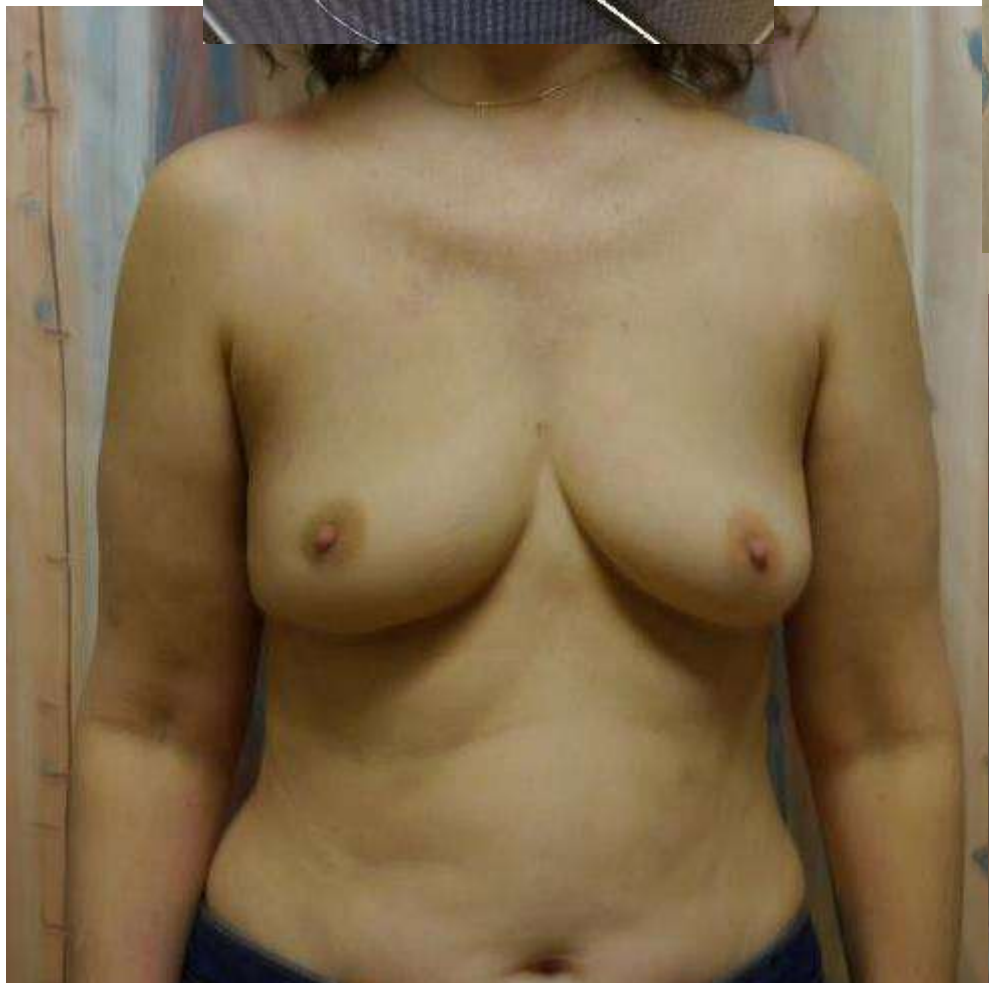


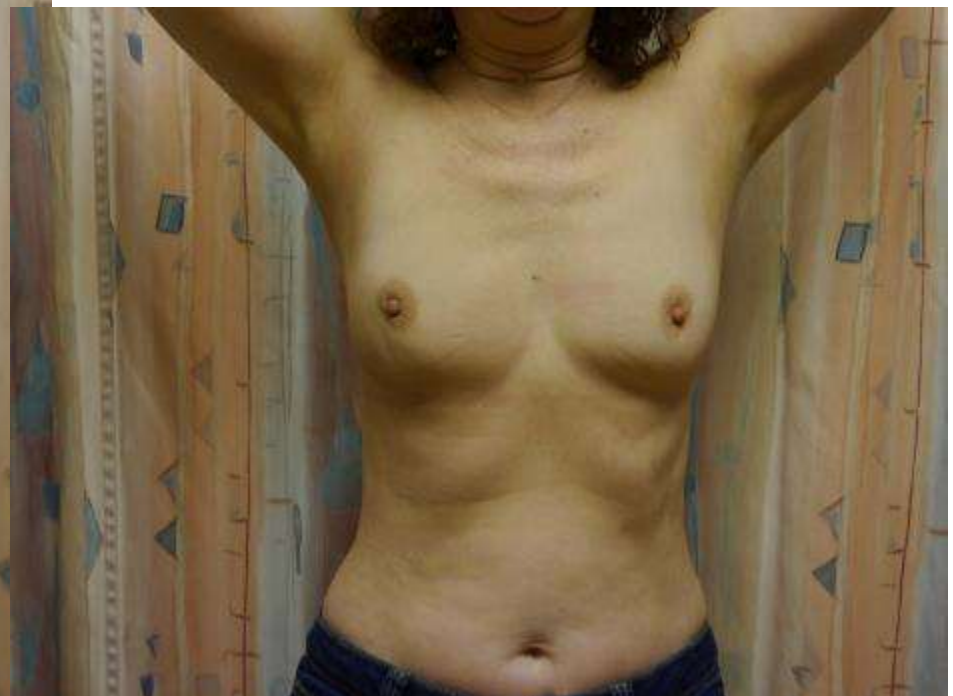


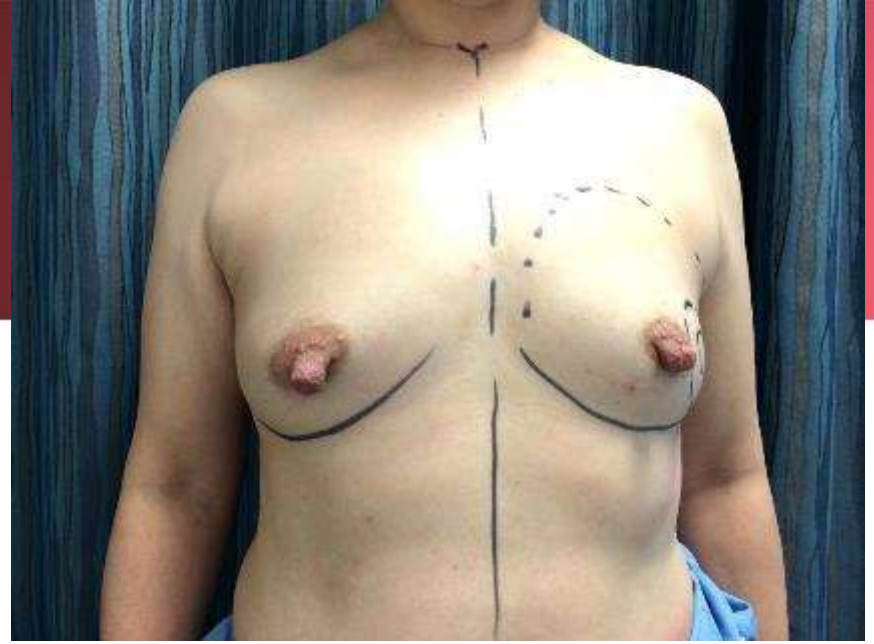


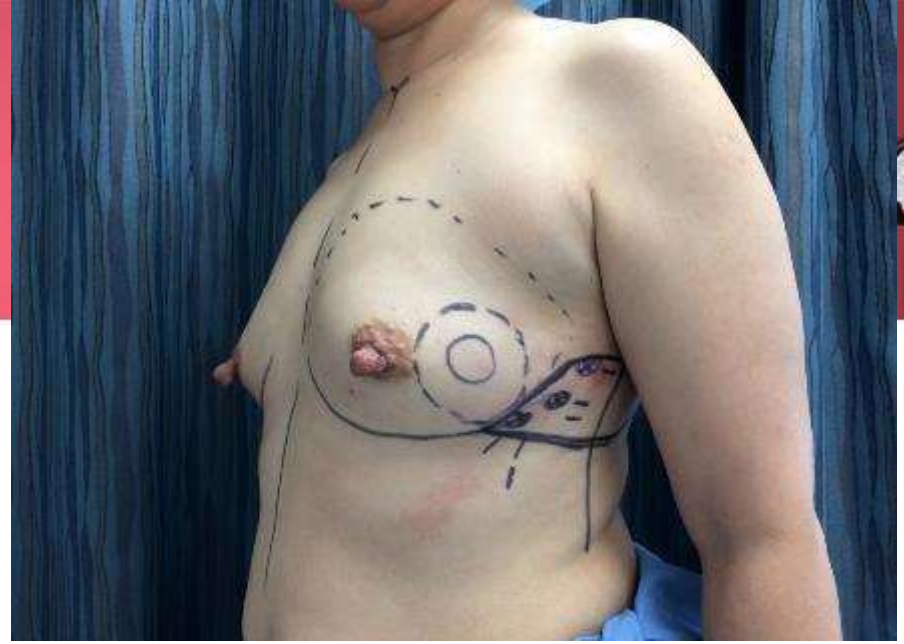


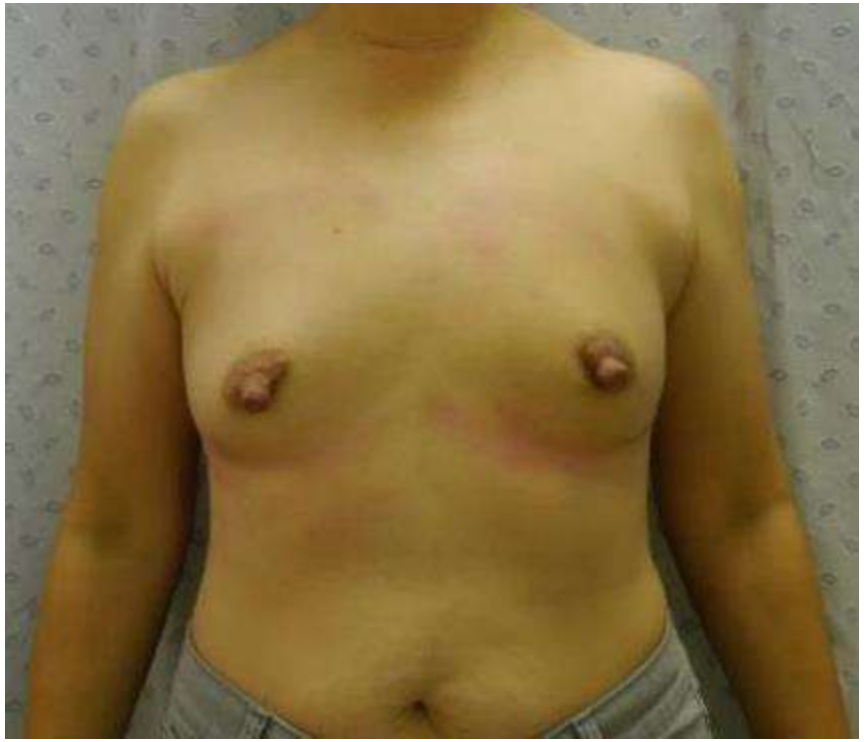


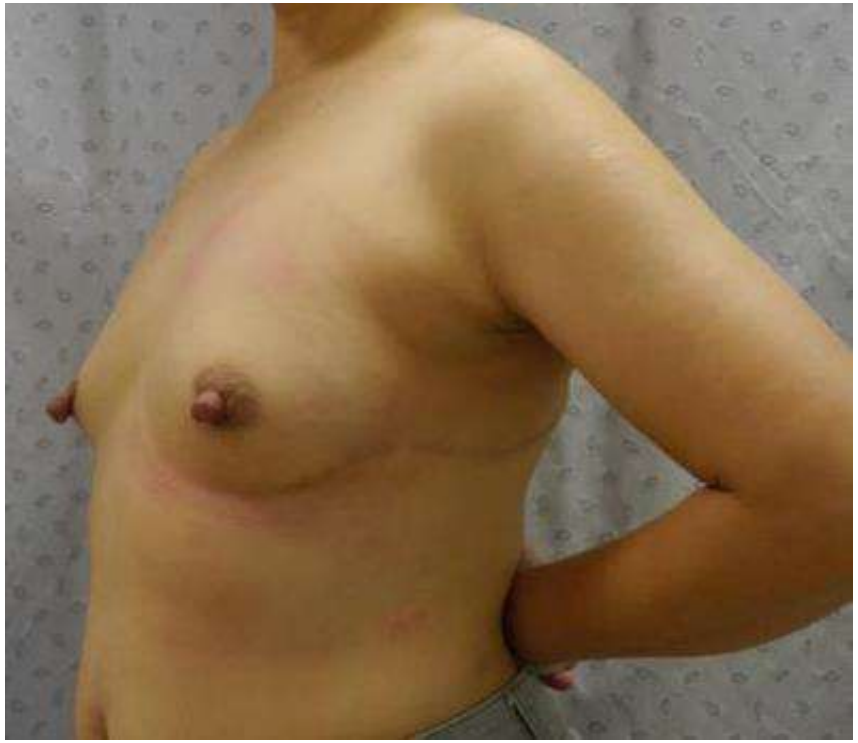




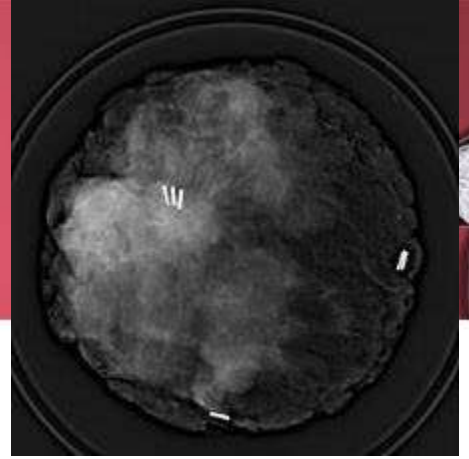




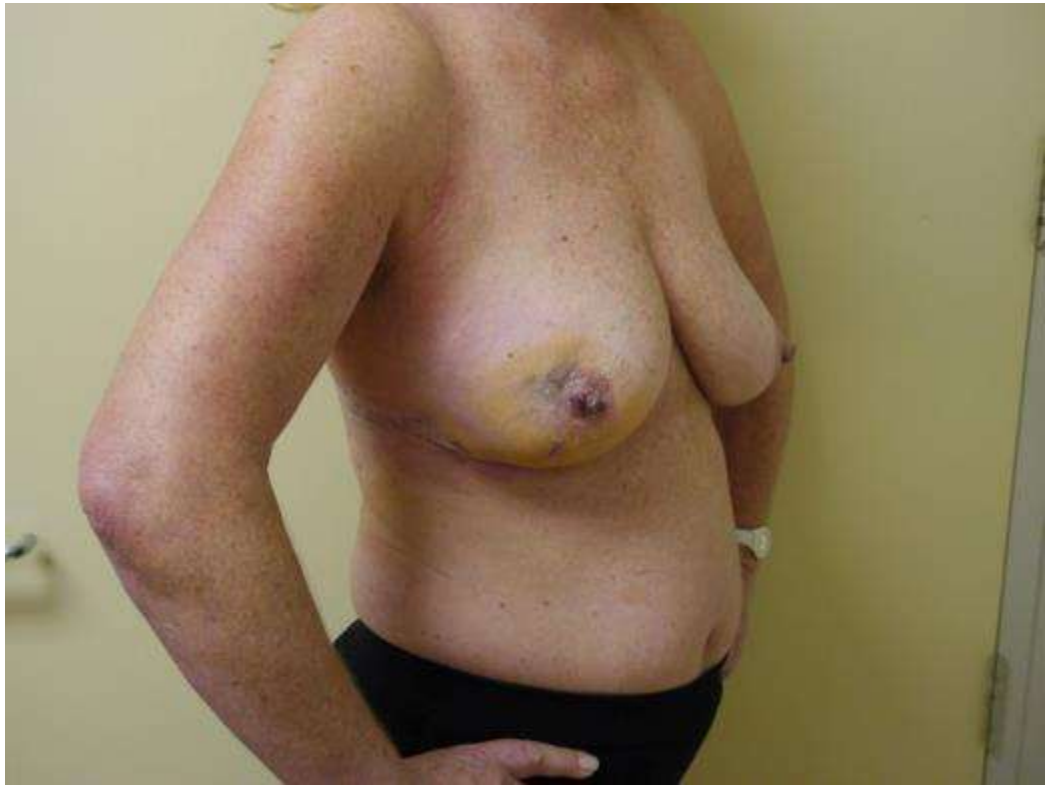


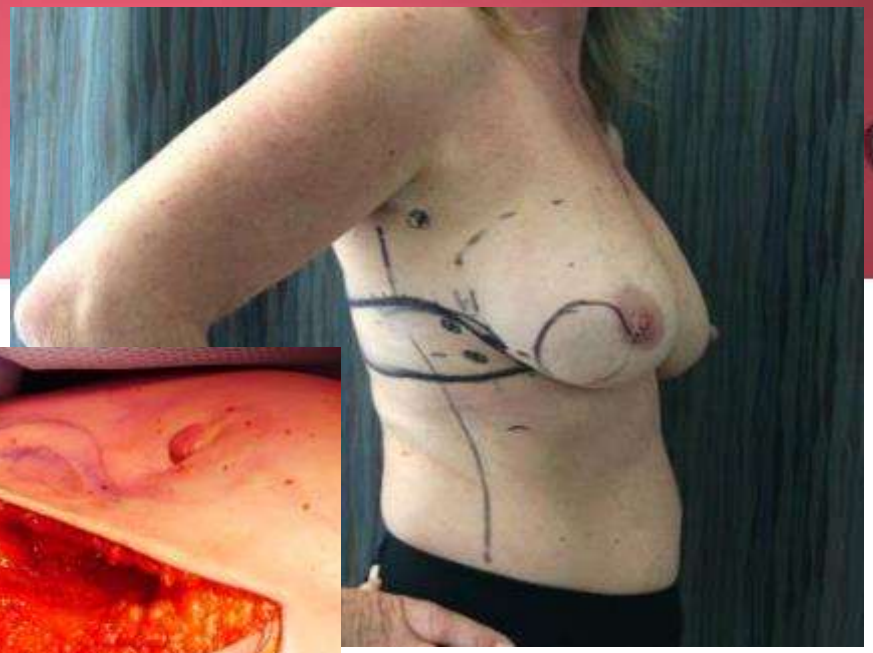


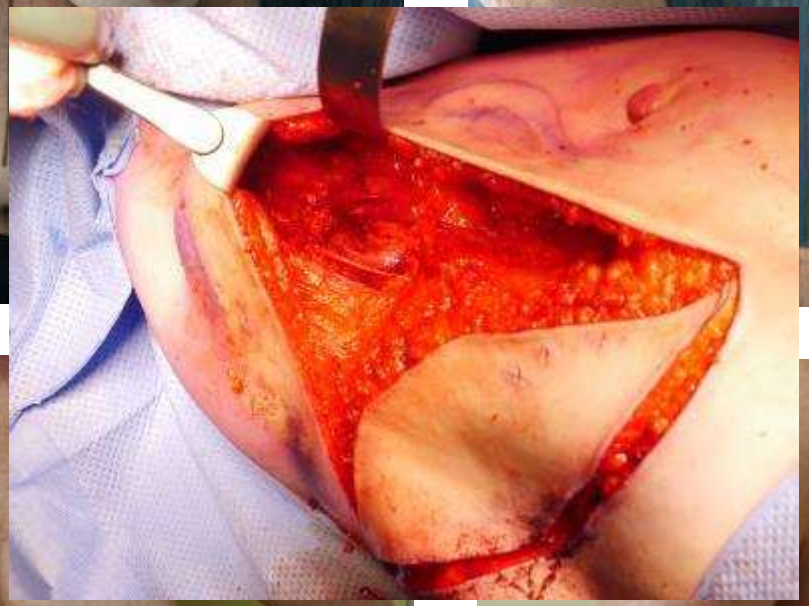
9. Miss JP, 52yrs

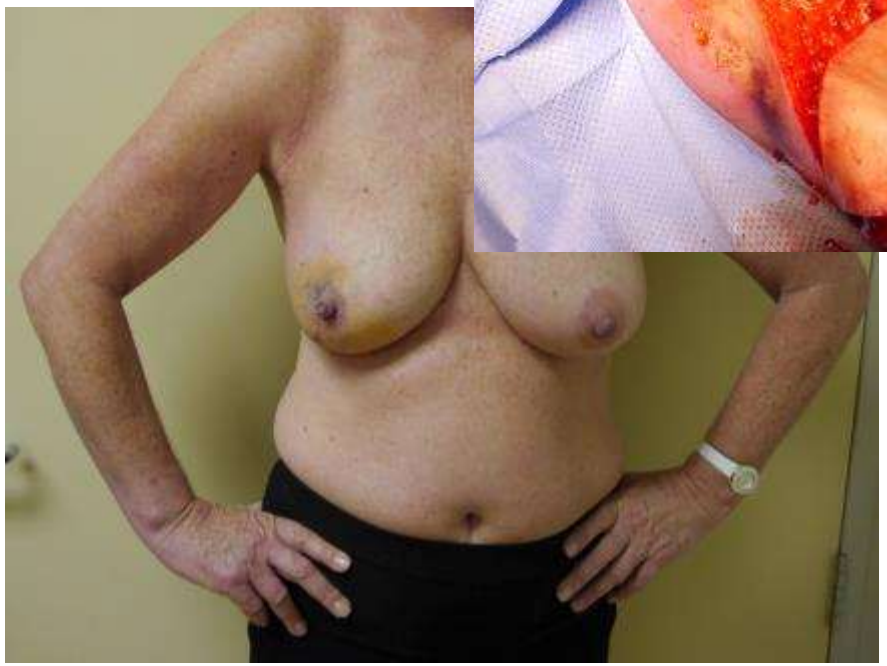


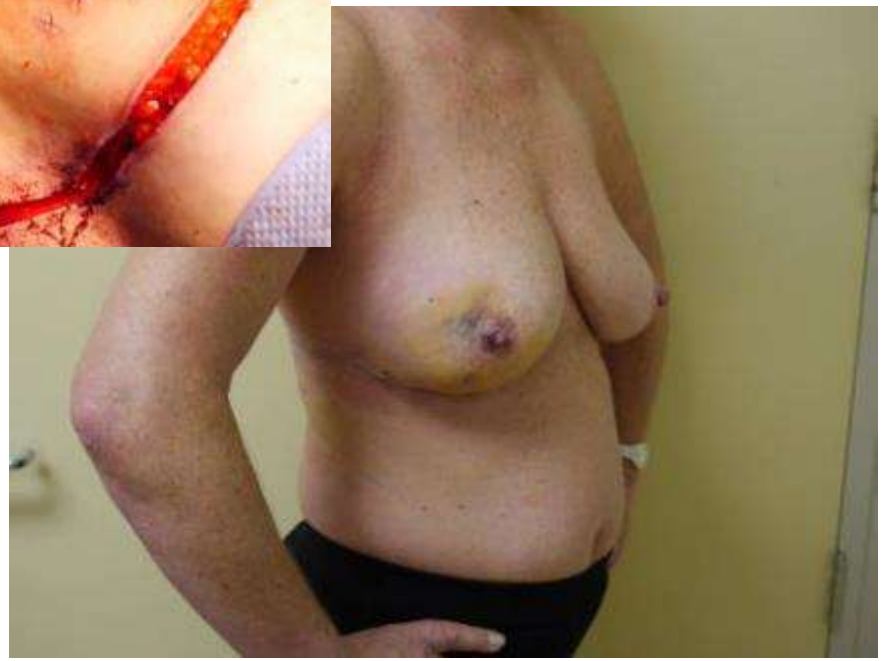
- R 22mm ILC ER+ (100%), PR+
- (90%), HER-2 negative, ¼ SNB intra-op – 1/26 final
- Margins clear
- Declined chemo
- Tamoxifen
- WBRT

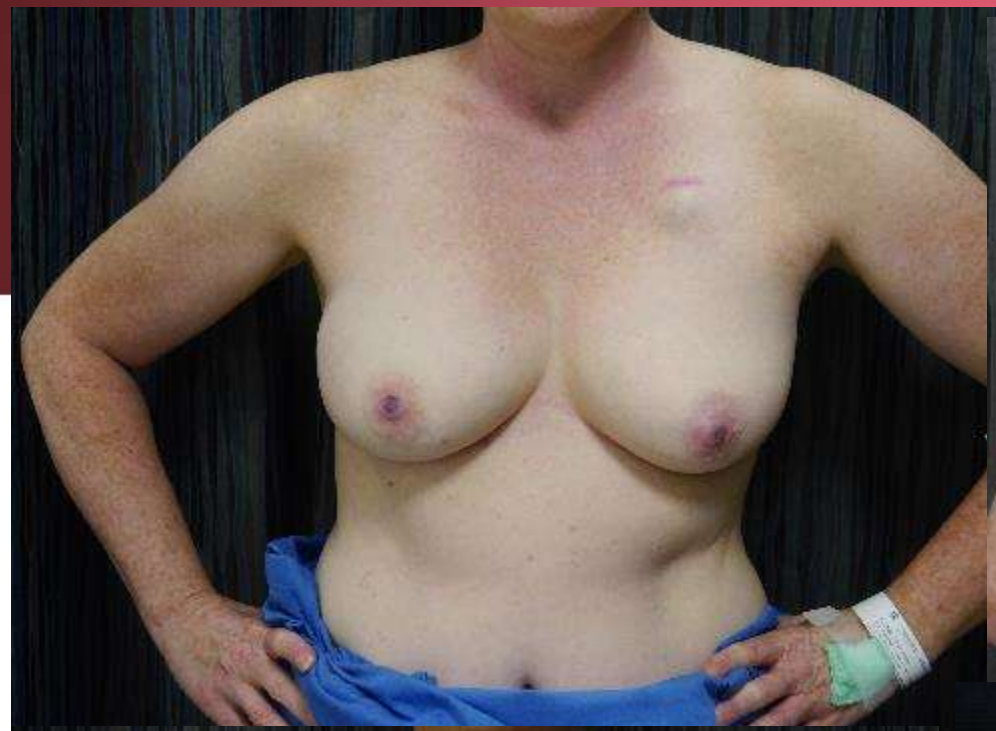


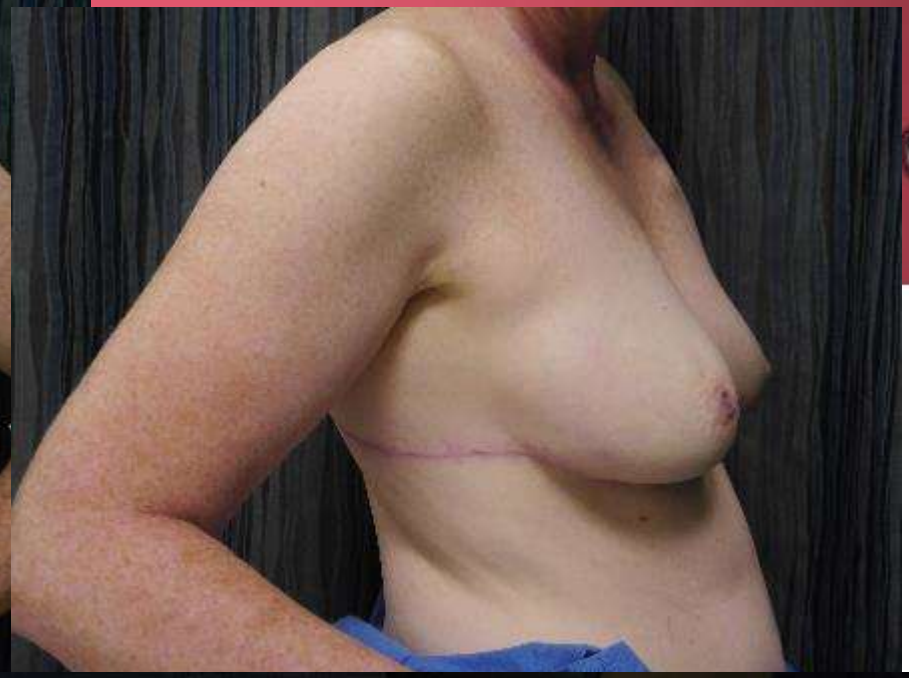


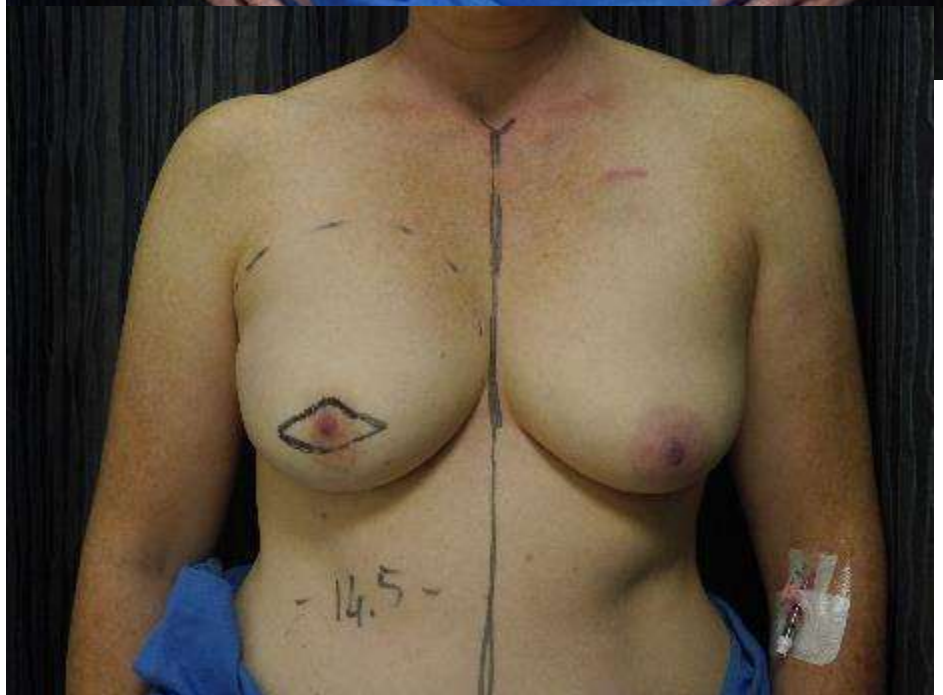








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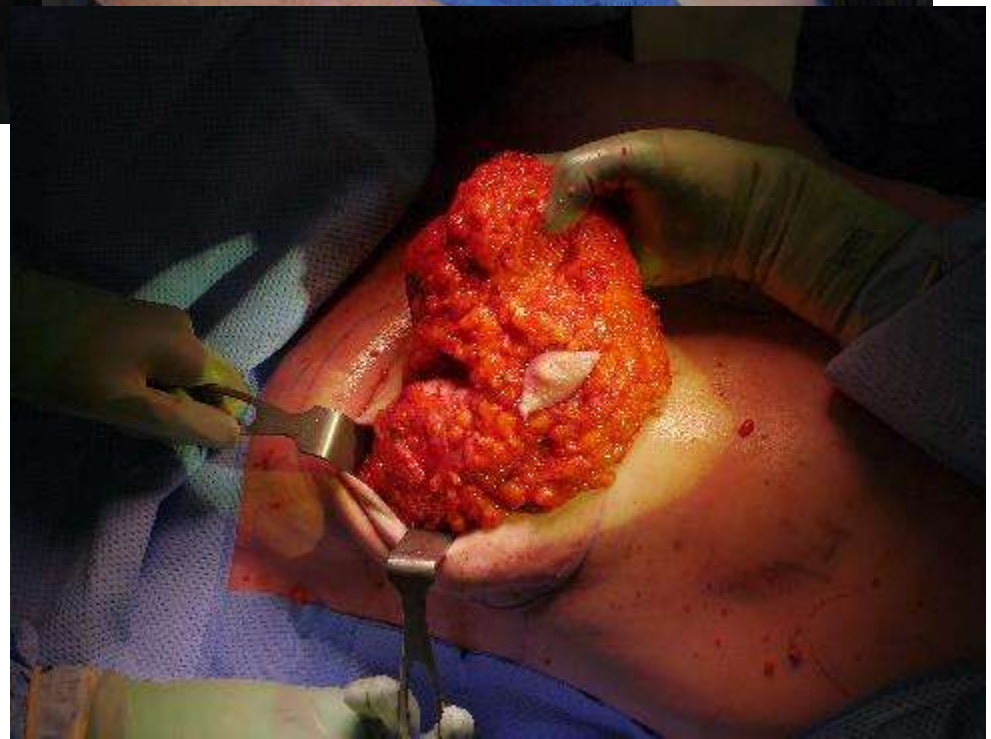
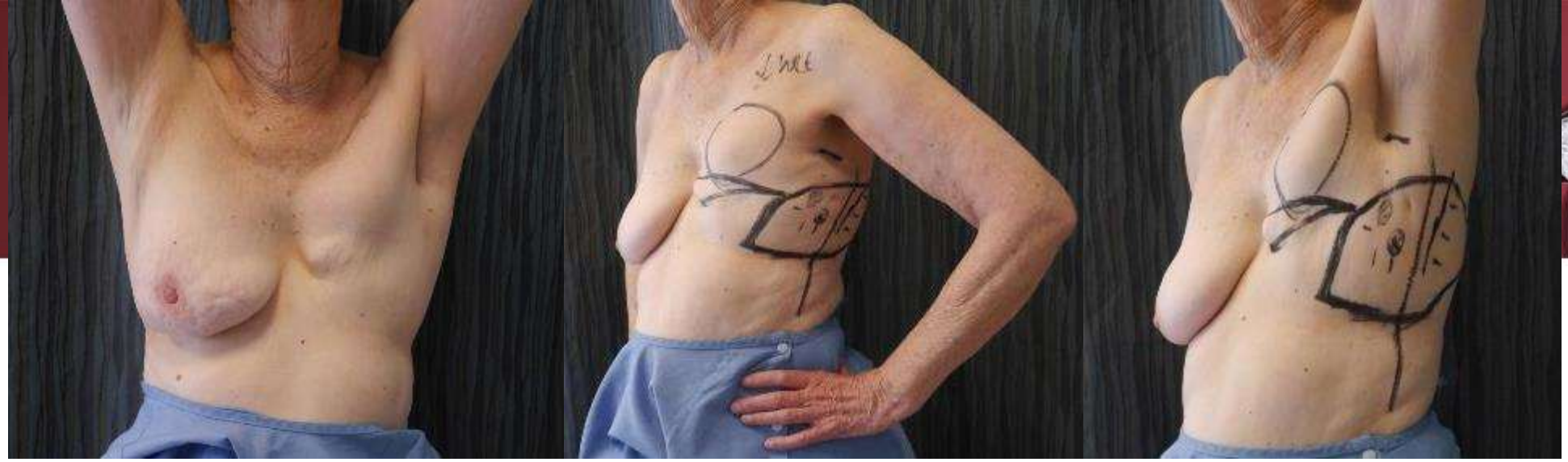
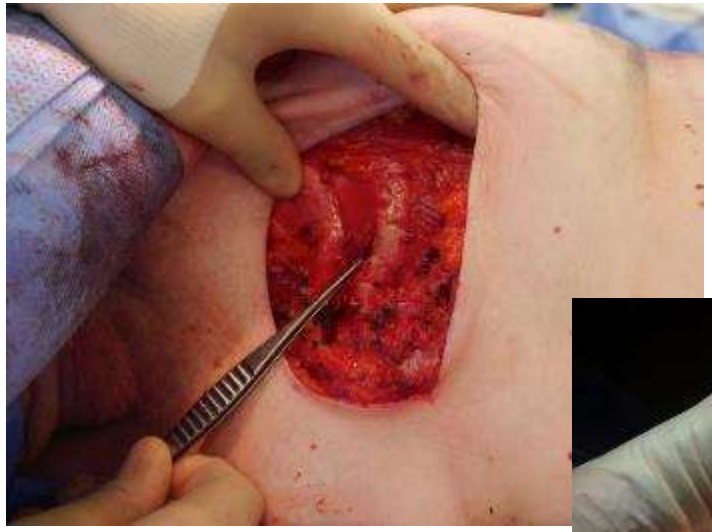
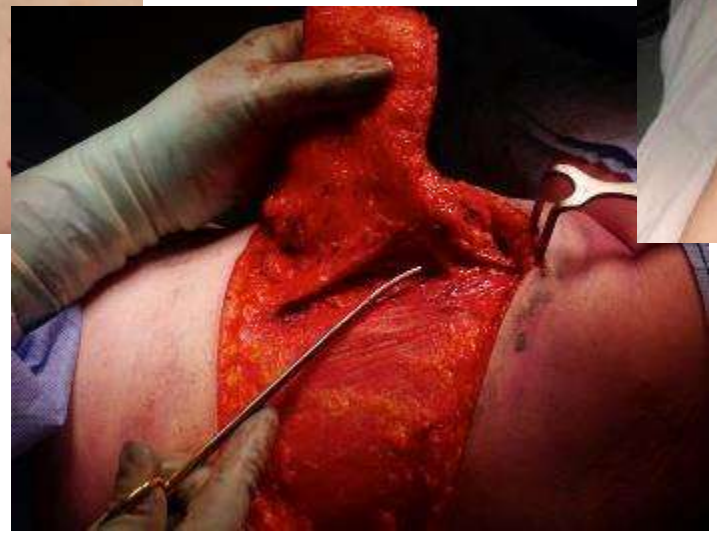
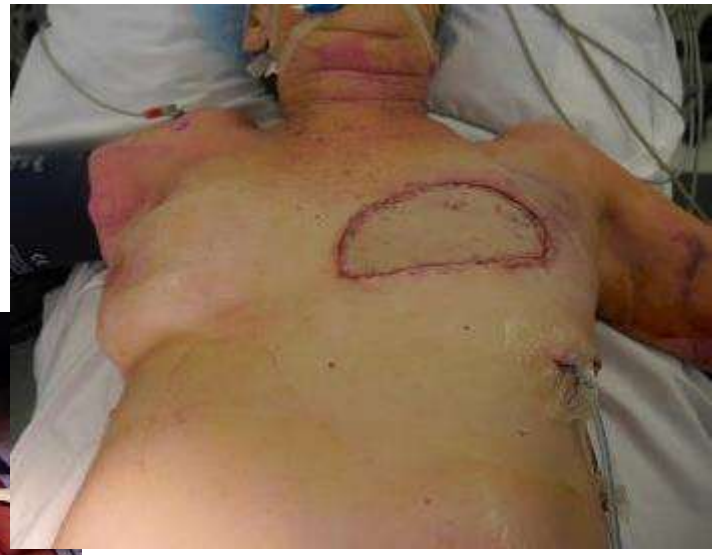










ORIGINAL ARTICLE

Long-term Results After Oncoplastic Surgery for Breast Cancer

A 10-year Follow-up

Krishna B. Clough, MD, Raquel F. D. van la Parra, MD, PhD,* Helene H. Thygesen, PhD,† Eric Levy, MD,* Elisabeth Russ, MD,* Najeeb M. Halabi, PhD,‡ Isabelle Sarfati, MD,* and Claude Nos, MD**

TABLE 1. Patient and Tumor Characteristics

Characteristic	N	%
Mean Age, yrs	57 (median 58, range 20–86)	
Mean radiological tumor size, mm	28.7 (median 25, range 4–150)	
Mean histological tumor size, mm	26 (median 20, range 0–180)	
Focality		
Unifocal	292	83.4
Multifocal	58	16.6
Neoadjuvant therapy		
Yes	73	27.9*
No	189	72.1
Pathological T stage		
pTis	68	19.4
pT1	155	44.3
pT2	109	31.1
pT3	18	5.1
Histology		
Pure DCIS	68	19.4
Invasive ductal carcinoma	239	68.3
Invasive lobular carcinoma	43	12.3
Histologic subtype (invasive)		
Luminal A	166	63.4
Luminal B (Her2 negative)	3	1.1
Luminal B (Her2 positive)	17	6.5
Her2 non luminal	12	4.6
TNBC	62	23.7
missing	2	0.8
SBR grade		
I	41	14.5
II	157	55.7
III	84	29.8
Mean specimen weight, g	177 (median 127, range 40–1540)	
Mean specimen volume, cm^3	331 (median 237, range 30–4031)	
Margins		
Clear	306	87.4
Involved	44	12.6
Nodal status		
N0	248	70.9
N1	76	21.7
N2	26	7.4
Adjuvant chemotherapy		
Yes	111	31.7
No	239	68.3
Adjuvant hormonotherapy		
Yes	240	68.6
No	110	31.4

*Calculated over 262 invasive cancers.

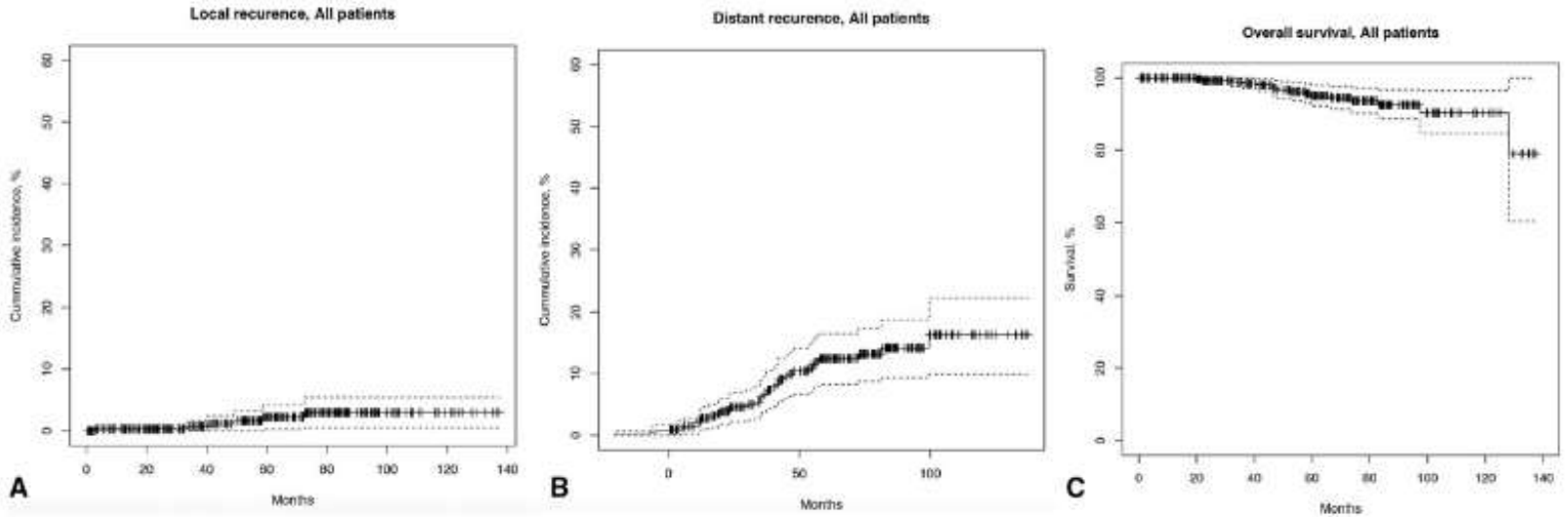
TABLE 2. Level II OPS Techniques Applied to 350 Cases According to the 'Quadrant Per Quadrant Atlas'—Orientation For Left Breast[10]

Tumor Location	Level II OPS Mammoplasty Techniques 2	N (%)
Upper Outer Quadrant	Lateral mammoplasty	144 (41.1)
Lower pole	Superior pedicle	64 (18.3)
Lower outer quadrant	J mammoplasty	44 (12.6)
Lower inner quadrant	LIQ-V mammoplasty	27 (7.7)
Upper pole	Inferior pedicle	28 (8.0)
Upper inner quadrant	Round block	17 (4.9)
Central subareolar	Inverted T or vertical scar mammoplasty with NAC resection	14 (4.0)
Not defined	Other	12 (3.5)
Total		**350 (100)**

TABLE 3. Margin Status and Histology

Margin status	Overall	IDC	DCIS	ILC
Clear	306	214	58	34
Involved	44 (12.6%)	25 (10.5%)	10 (14.7%)	9 (20.9%)
Total	350	239	68	43

DCIS indicates ductal carcinoma in situ; IDC, invasive ductal carcinoma; ILC, invasive lobular carcinoma.


Local recurence, All patients
Cummulative incidence, %
Months
A
Distant recurence, All patients
Cummulative incidence, %
Months
B
Overall survival, All patients
Survival, %
Months
C

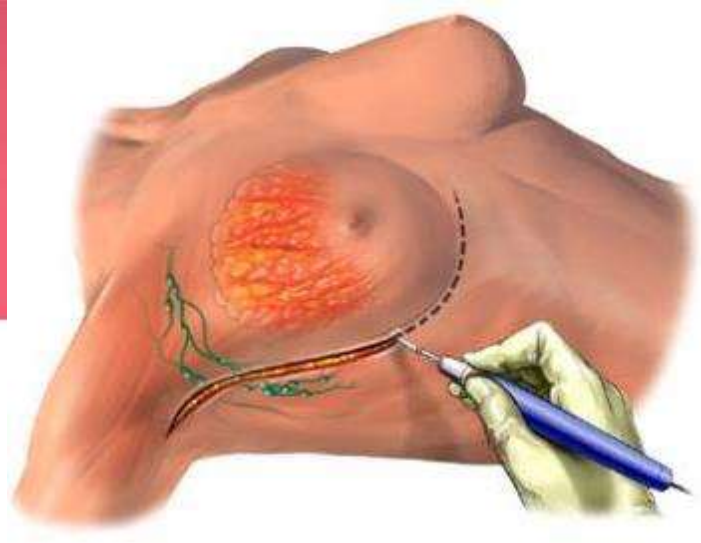
Conclusions

- Despite invasive mean tumour size 23mm & 32mm for DCIS, BCT in 92%
- 2.2% overall 5 year recurrence rate
- *? Protective effect of RT on LRR*
- ‘Breast surgeons should include oncoplastic surgery in the surgical armamentarium for breast cancer treatment, allowing patients a higher breast conservation rate with better cosmetic and functional outcomes’

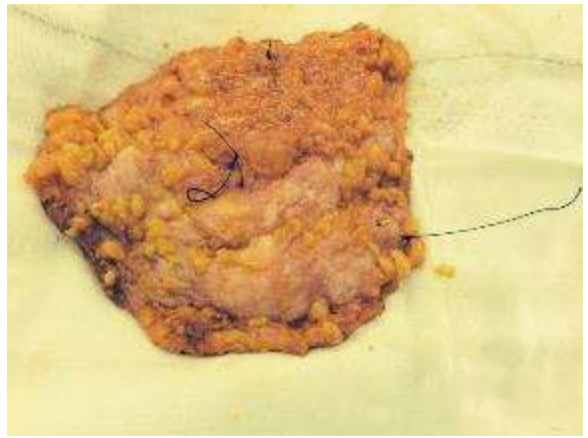
Mastectomy

- Used to treat 35-60% of breast cancers
- Should be sensitive to principles of OPBS; treat malignancy while minimizing impact on QoL
- Many techniques to achieve both
- Contralateral Prophylactic Mastectomy (CPM) ?

Mastectomy



- Simple Mastectomy
- Skin Sparing Mastectomy
- Nipple Sparing Mastectomy



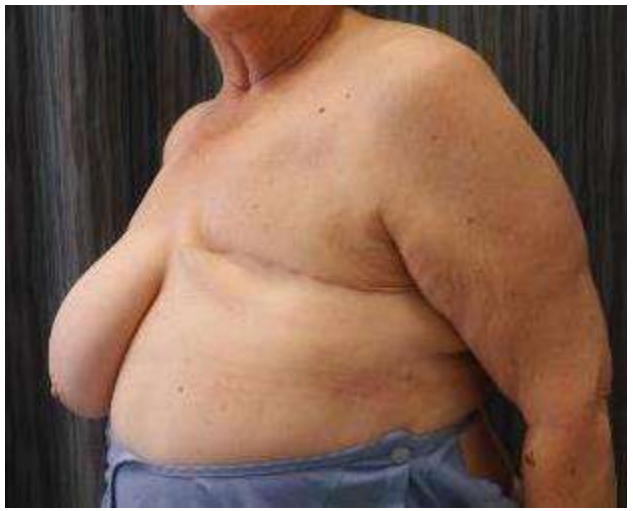
- +/- Reconstruction
  - Immediate/Delayed
  - Autologous (own tissue)
  - Prosthetic (implants); 1->3 Stage

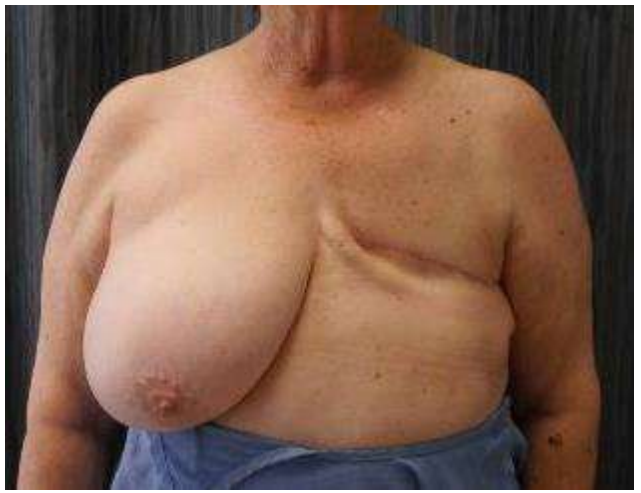
Considerations for Immediate Reconstruction

1. ? Skin excision required – best reconstructions maintain integrity of skin envelope & maintain anatomical boundaries/identity
2. Goal: reduction or augmentation of breast mound
3. Incision; balance of access vs aesthetic result
4. ? NAC excision

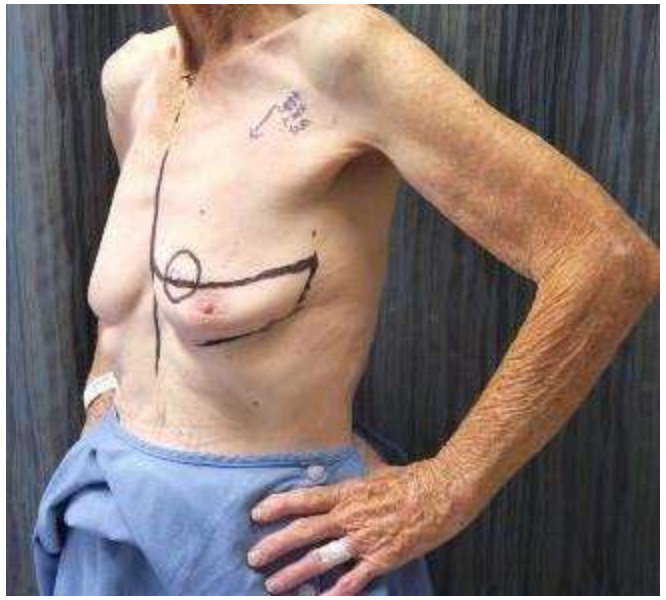
Simple Mx

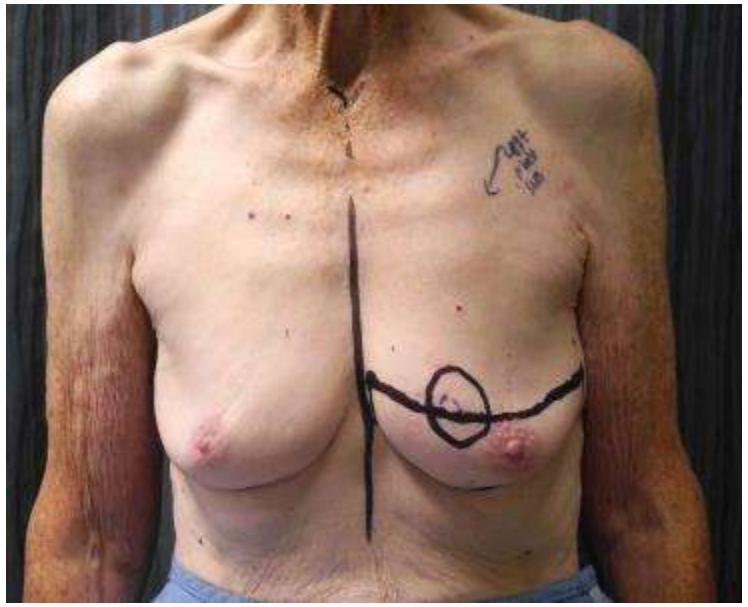
1. Is it desirable to remove skin over the tumour?
2. Is there likely to be a lateral dogear?
3. Would the patient benefit from a contralateral reduction?
4. Is delayed reconstruction planned?

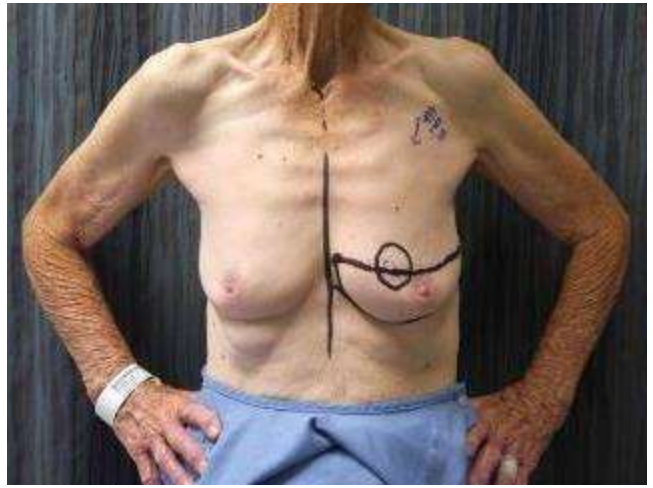




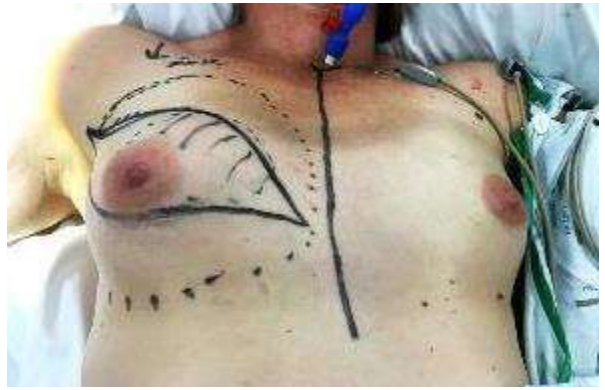
Simple IMF Mastectomy



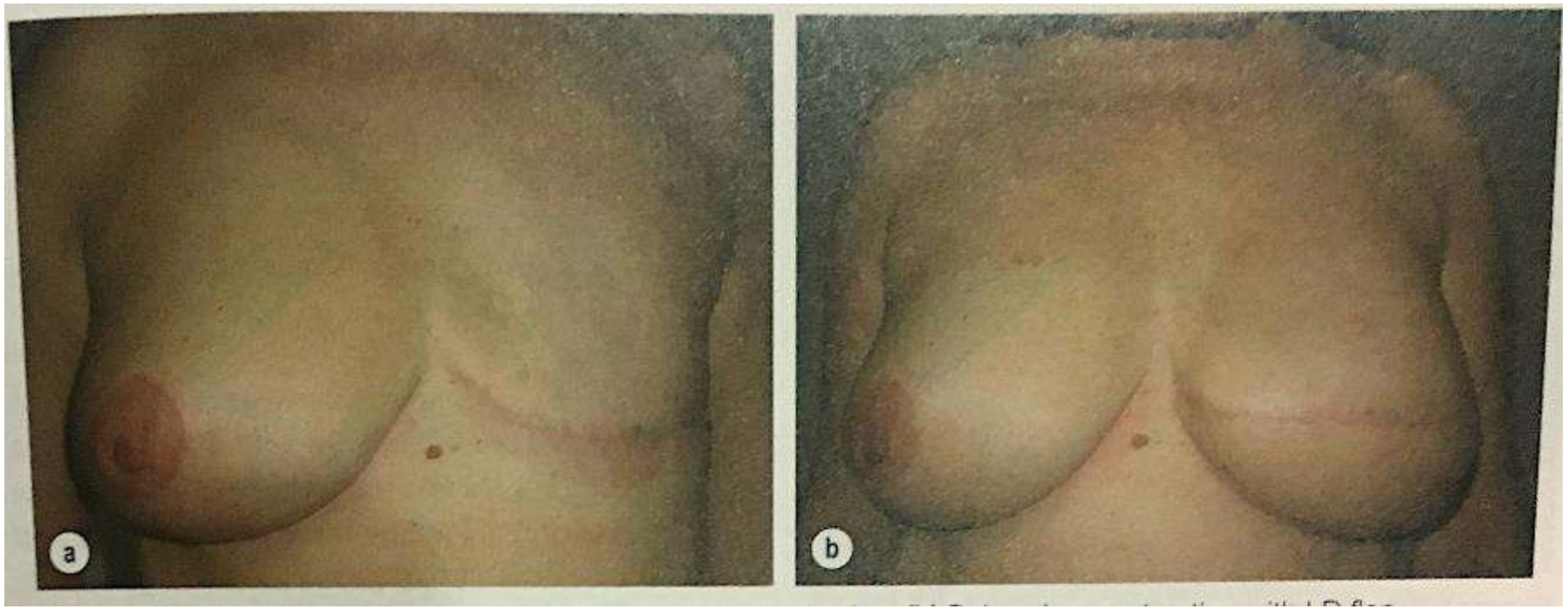




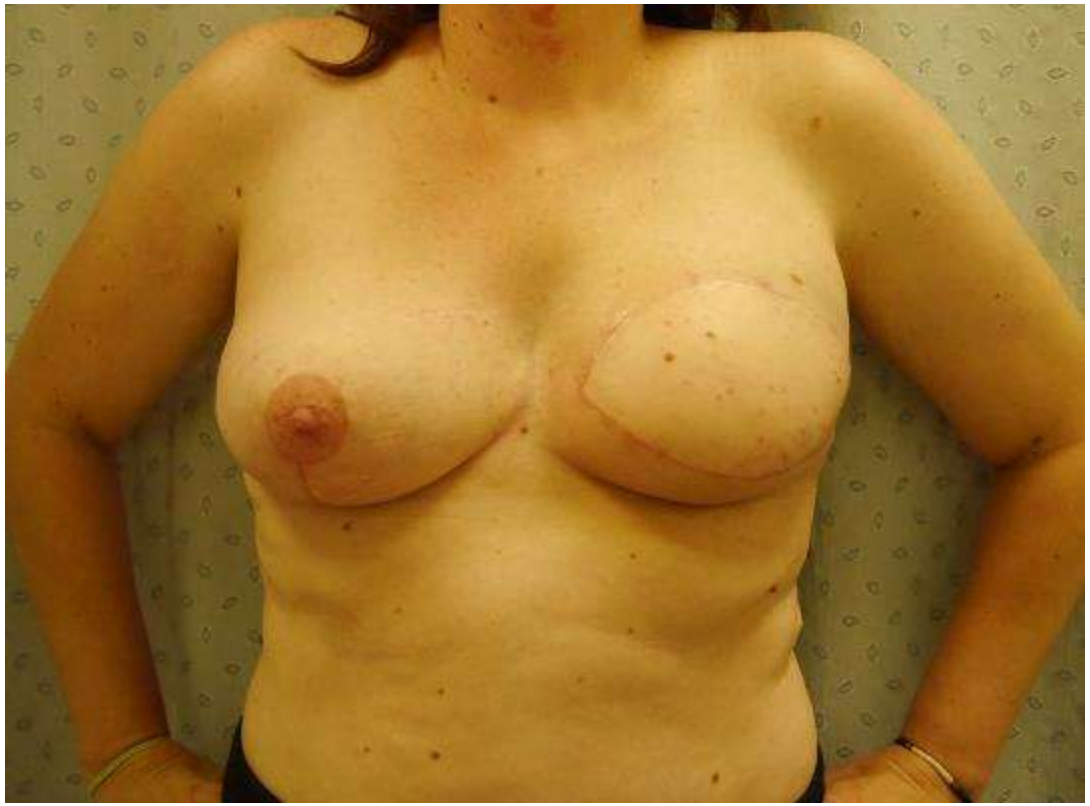
- Examine sitting/standing – predict lateral extent
- EXTENT of scar is important for RT
- Mark any skin needing to be removed over tumour

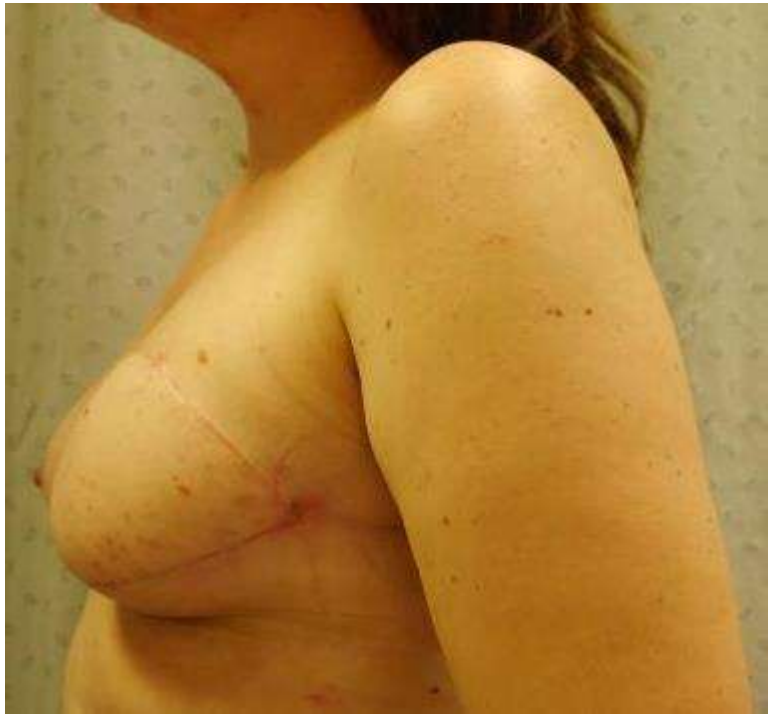


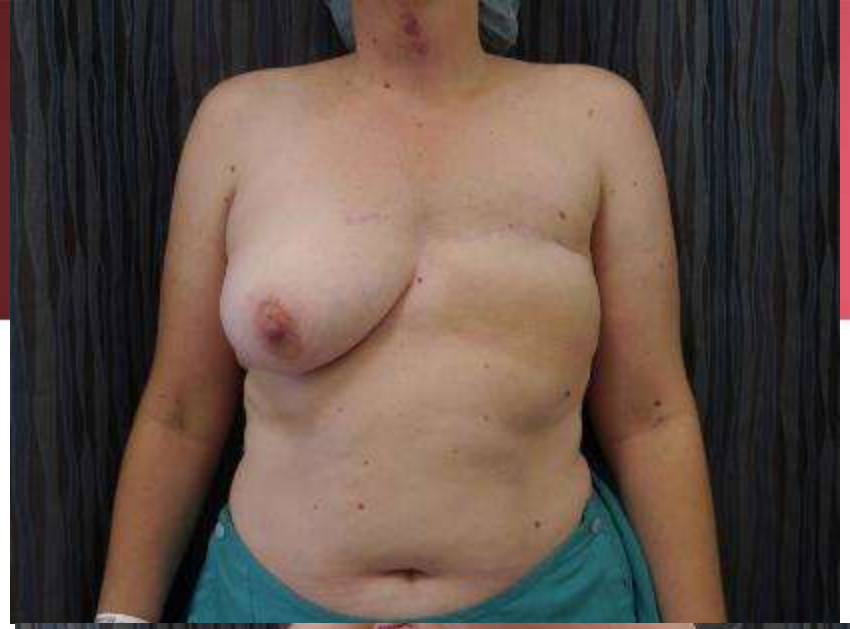
IMF Simple Mx Scar

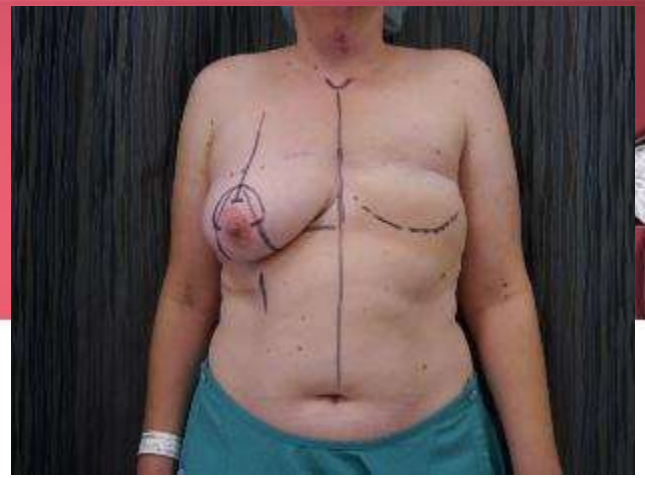


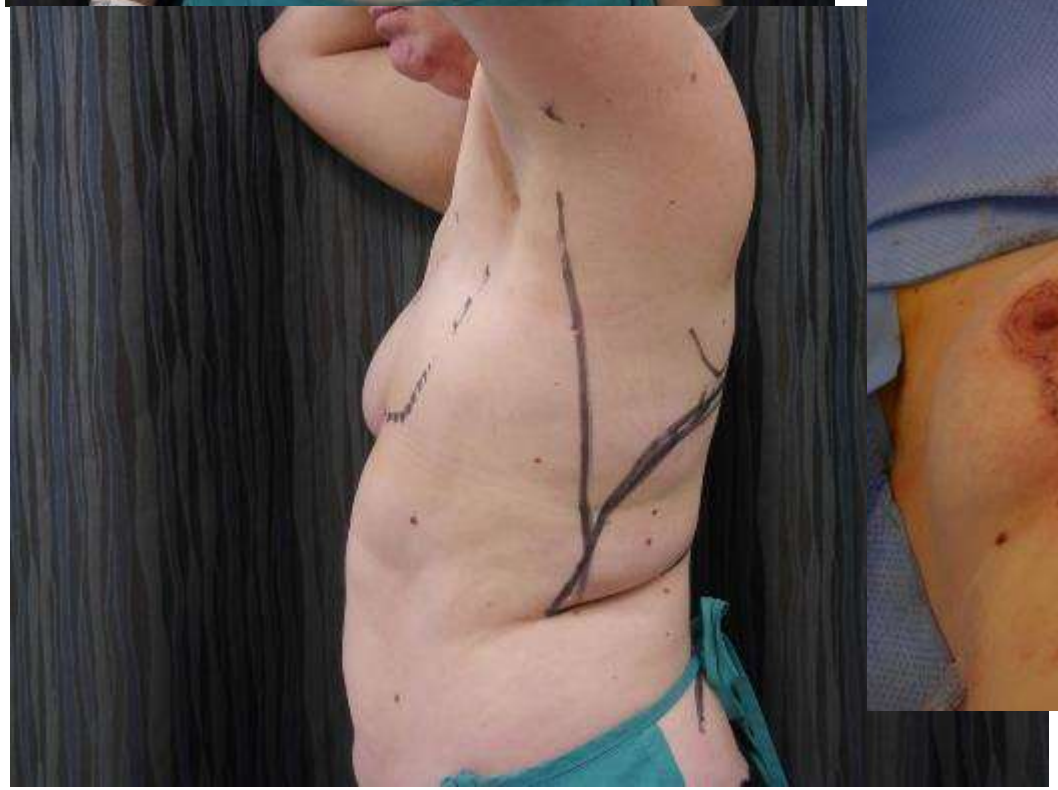
Consider Scar Placement

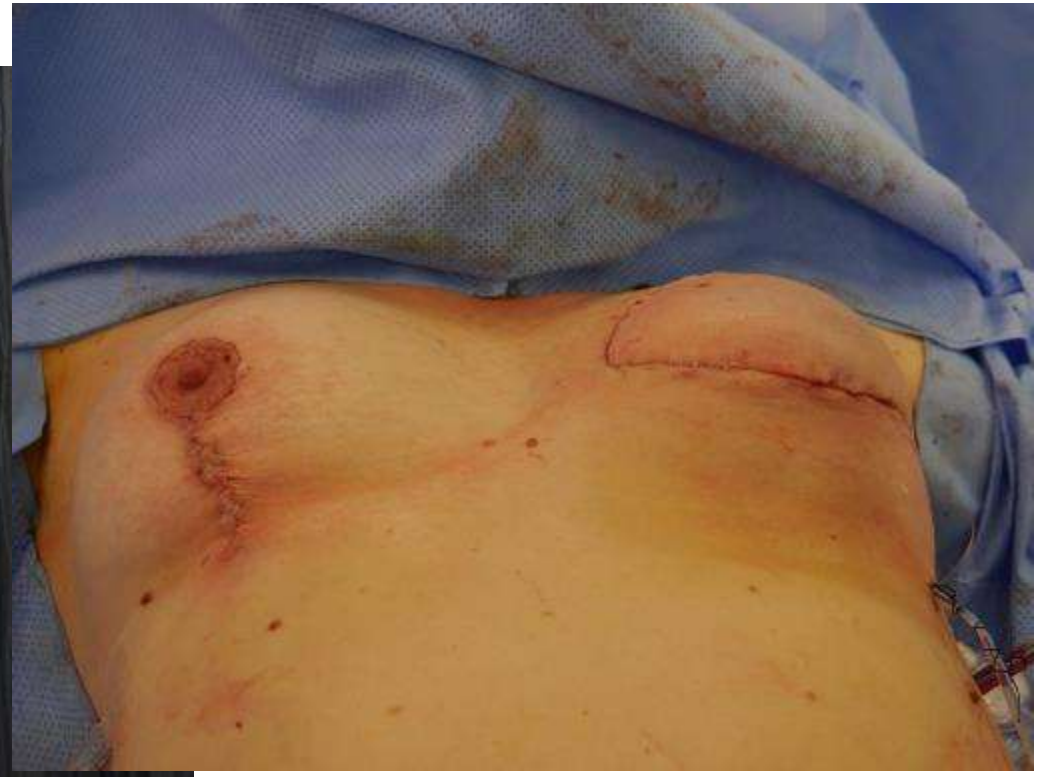




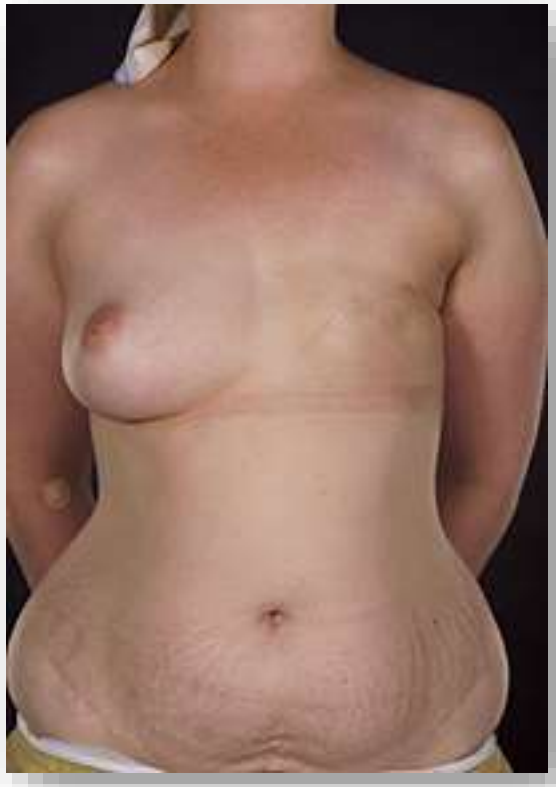


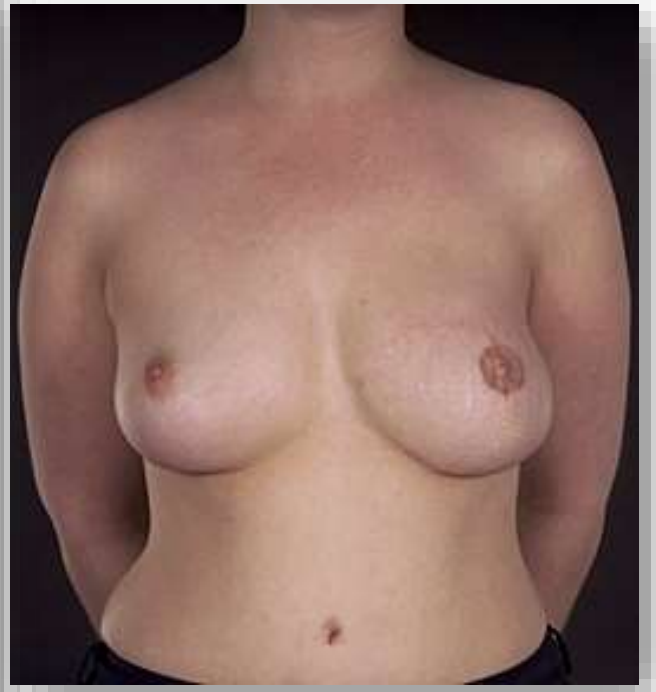




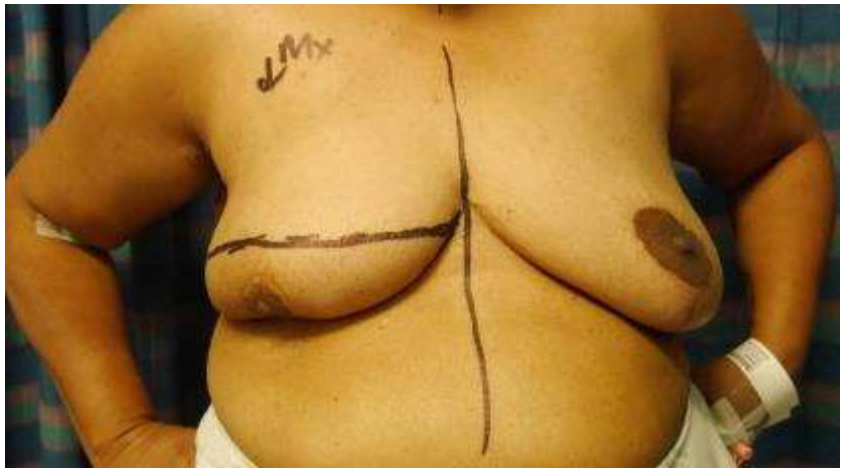


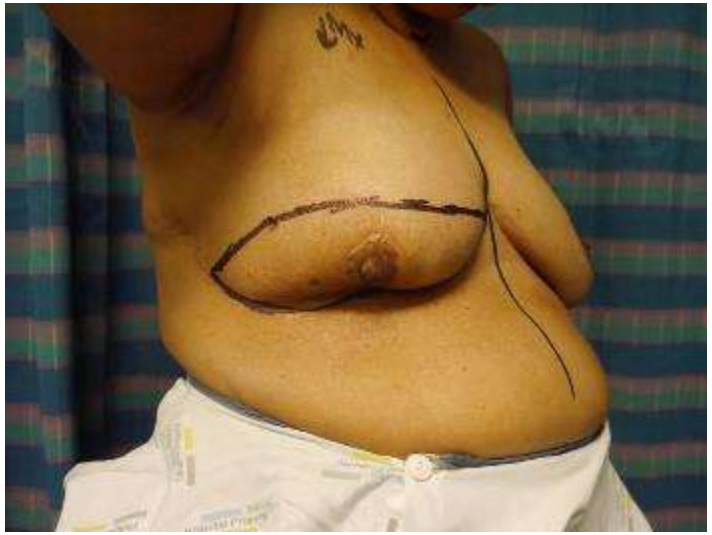
Delayed DIEP





Simple Mx when IBR

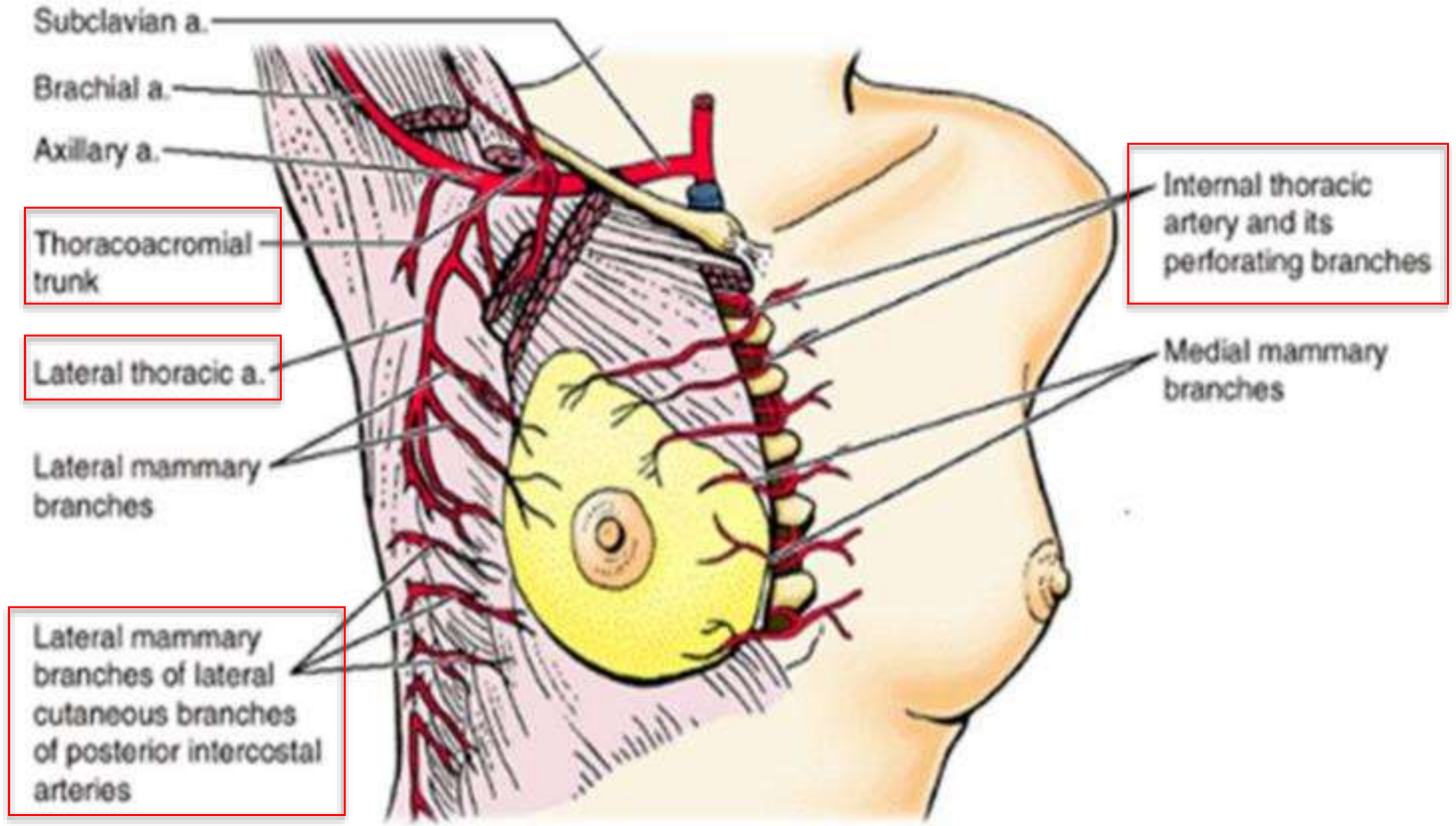


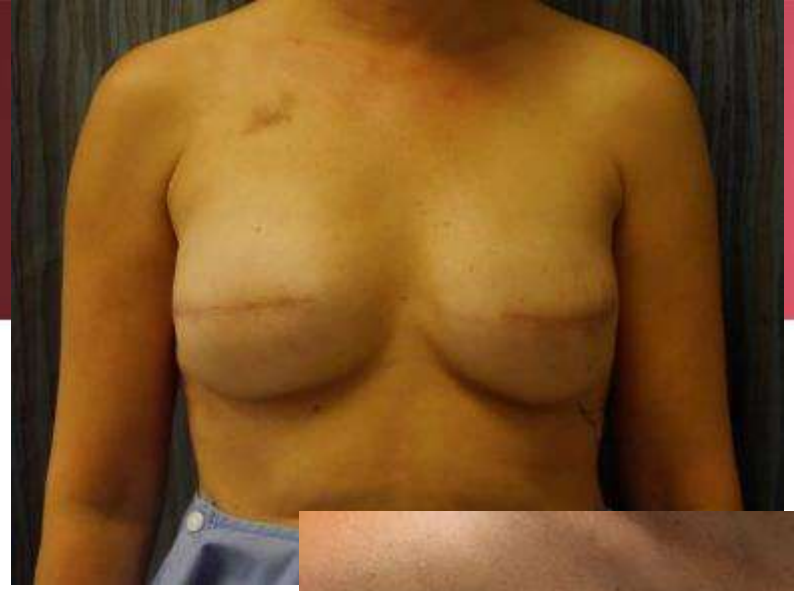


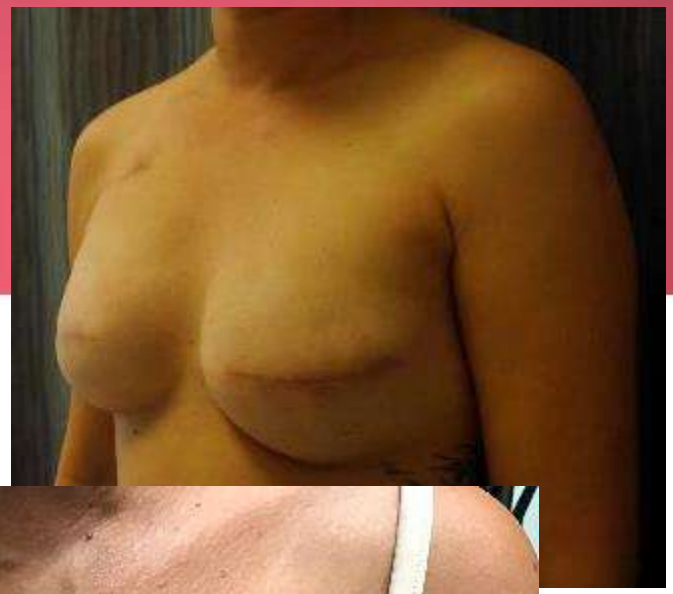
- 2008 - R H/W WLE & SNB for gd 1 T1NO IDC ER+ Her2-
- 2012 - R IBR– R WLE & SNB & BTM (Private)
- Post-op scarring and fibrosis R breast, painful
- Requests simple Mx without reconstruction

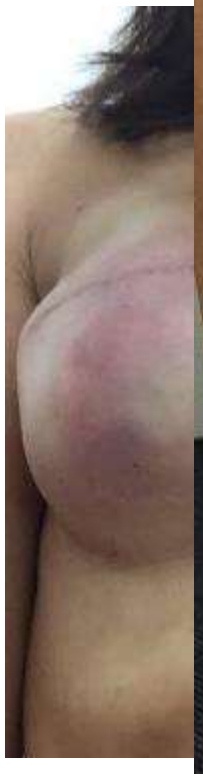
Breast Anatomy

Arterial Supply to the Breast

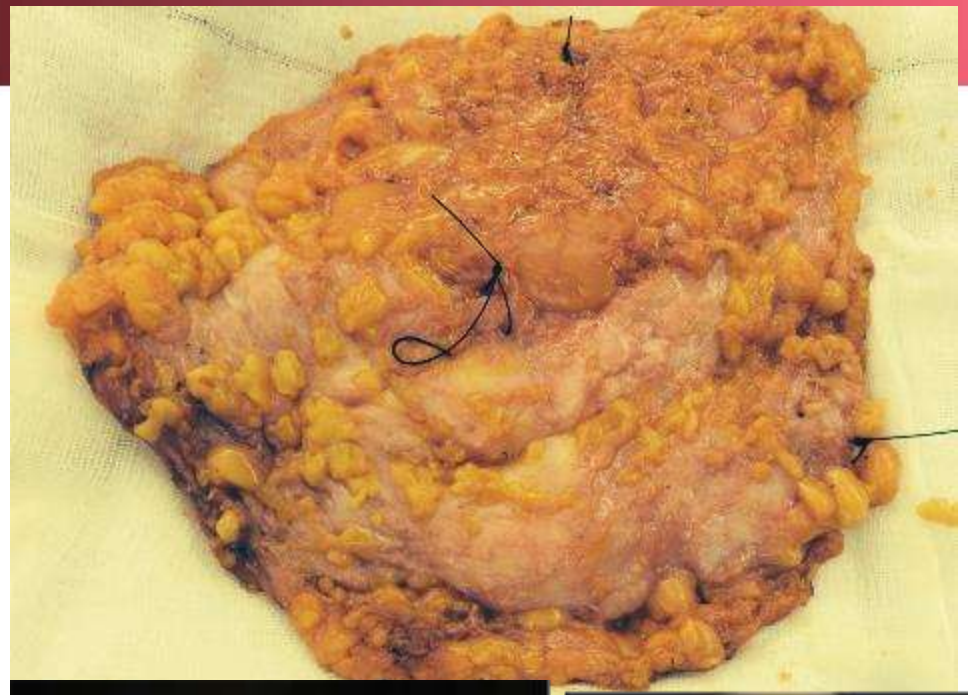


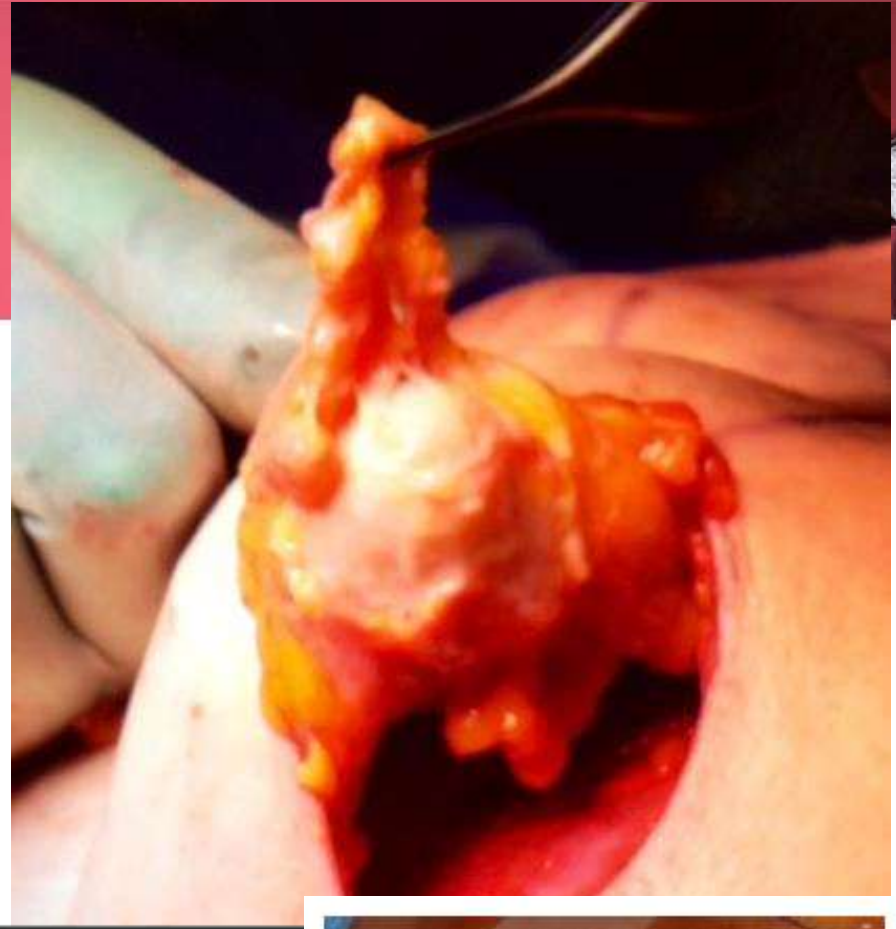


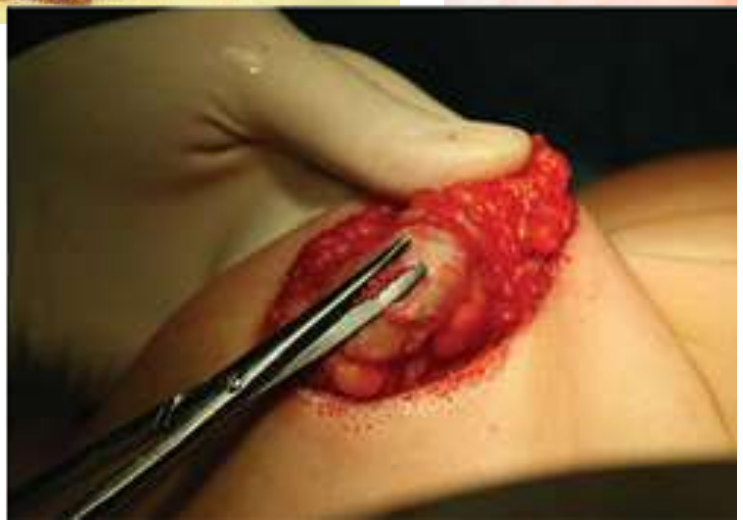


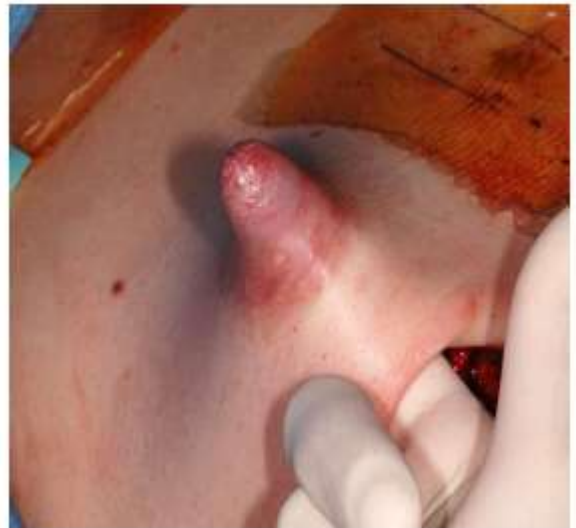


NSM









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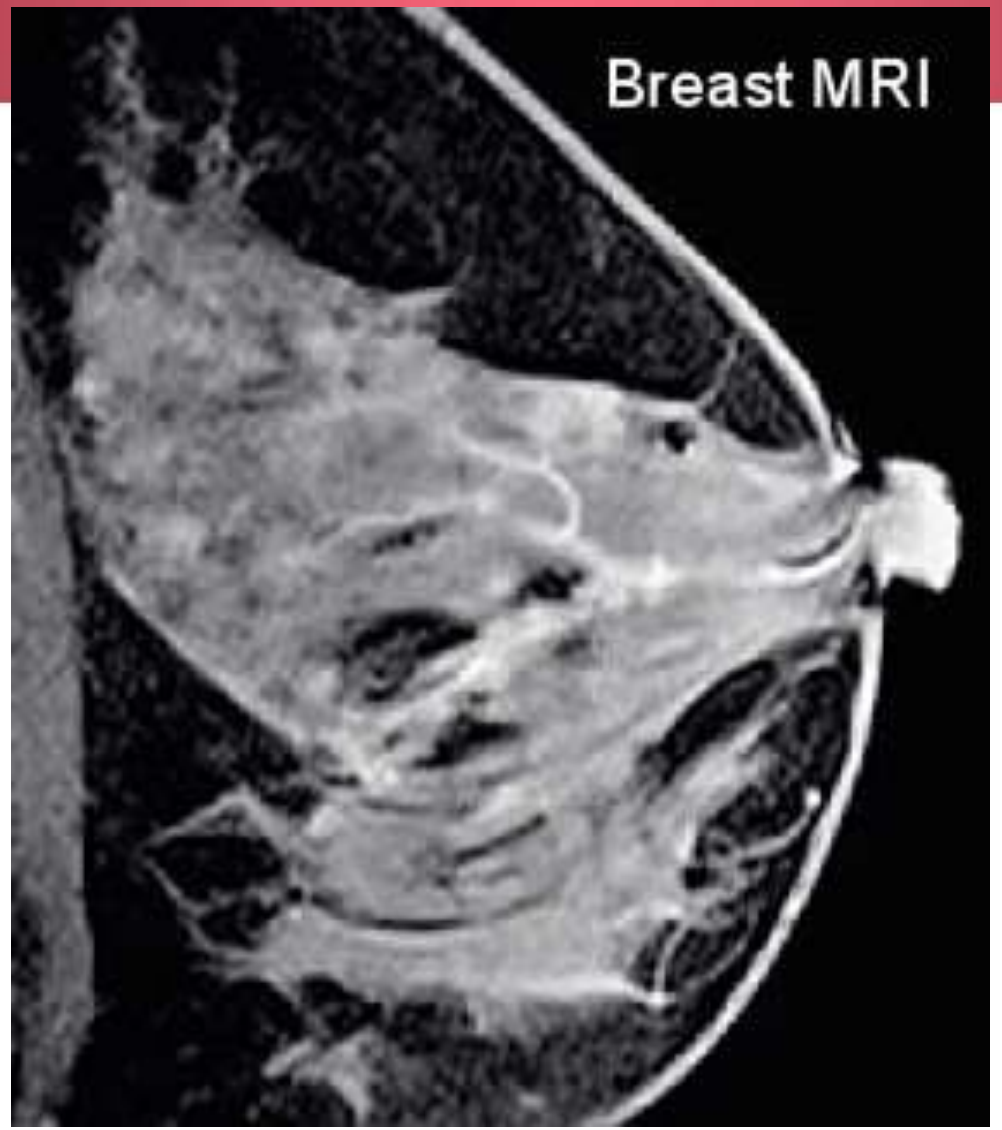


Oncological Outcome - LRR

Table 3. Locoregional Recurrence and Distant Metastasis Data by Study

Reference	No. of Procedures	Follow-Up (mo)	Locoregional Recurrence *	Distant Metastasis
Garwood et al., 2009[44]	106	Median, 13; range, 1–65	1	2
Denewer and Farouk, 2007[33]	41	Median, 7.9; range, 4–11	0	1
Margulies et al., 2005[46]	50	Mean, 7.9; range 0.2–20.2	0	—
Palmieri et al., 2005[48]	25	Mean, 21; range, 6–52	0	—
Mustonen et al., 2004[47]	34	Mean, 45.6; range, 28.8–69.6	4	0
Verheyden, 1998[51]	30	Mean, 75.5; range, 3–126	0	0
Boneti et al., 2011[32]	281	Mean, 25.3; range, 3–102	7	—
Wagner et al., 2012[40]	54	Median, 15; range, 1–29	0	1
Warren Peled et al., 2012[41]	657	Median, 28; range, 3–116	4	8
Kneubil et al., 2012[35]	948	Median, 64; range, 18–113	10	—
Lohsiriwat et al., 2013[25]	934	Median, 64; range, 18–113	0	—
Gerber et al., 2009[17]	60	NR	7	14
Harness et al., 2011[18]	60	Mean, 18.5; range, 6–62	1	—
Petit et al., 2009[14]	1001	Median, 20; range, 1–69	14	36
Benediktsson and Perbeck, 2008[6]	272	Median, 156; mean, 135.6; range, 2.4–210	52	44
Caruso et al., 2006[20]	51	Mean, 66; range, 9–140	1	5
de Alcantara Filho et al., 2011[22]	353	Median, 10.38; range, 0–109	0	1
Kim et al., 2010[24]	152	Median, 60	3	13
Sookhan et al., 2008[27]	20	Mean, 10.8	0	0
Regolo et al., 2008[26]	102	Mean, 16	0	0
Voltura et al., 2008[29]	51	Mean, 18; range, 2–68	2	—
Jensen et al., 2012[34]	149	Median, 60.2; range, 12–144	3	1
Paepke et al., 2009[15]	109	Median, 34; range, 20–54	1	2
Spear et al., 2011[4]	162	Mean, 36.5; range, 5–243	0	1
Garcia-Etienne et al., 2009[14]	42	Median, 10.5; range, 0.4–56.4	0	NR
Spear et al., 2012[52]	24	Mean, 13	0	0
Mosahebi et al., 2007[9]	61	Mean, 48; range, 8–109	0	6
Yang et al., 2012[28]	92	Mean, 18.1; range, 5–34	0	—
Total	6003	0.2–210	110 (1.8%)	135 (2.2%)

NR, not reported.

Nipple Necrosis by Incision

Table 7. Combined Mastectomy Incision Choice and Necrosis Rate of Included Studies

Mastectomy Incision	No. of Procedures	No. of Necroses	Necrosis Rate
Radial (straight, lateral, vertical)	249	22	8.83%
Periareolar/circumareolar (+/– omega, inferolateral or superolateral extension)	146	26	17.81%
Inframammary	110	10	9.09%
Mastopexy (incision contained within previous mastopexy or reduction scar)	21	1	4.76%
Transareolar	11	9	81.82%

NSM, Rusby et al

- 345 articles reviewed
- LR after therapeutic NSM <5%
- <1% cancer in retained nipple after risk reducing NSM
- Partial necrosis up to 16%, full necrosis up to 8%

Rusby, J. E., Smith, B. L., & Gui, G. P. H. (**2010**). Nipple-sparing mastectomy. ***British journal of surgery***, *97*(3), 305-316.

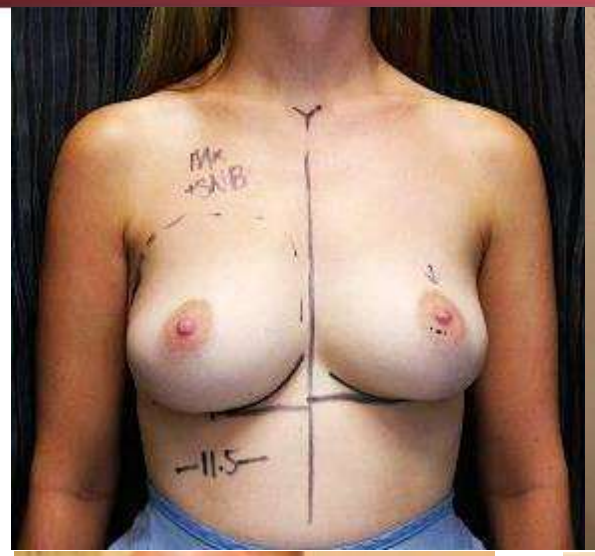
Conclusions

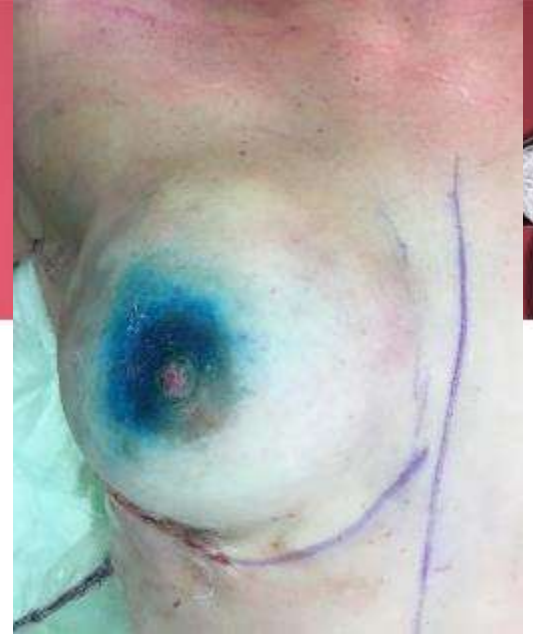
- NSM always appropriate in risk reduction; patients may wish to remove nipples for technical reasons/aesthetics but no reason to for risk reduction
- NSM oncologically safe ***in appropriately selected patients*** provided anatomy respected
- Complication rate and ‘nipple necrosis’ (loose definition) affected by incision choice and recon selection

CPM

- Usually ***NOT*** required
- Contralateral BC risk <0.5%/yr
- In genetic breast cancer, consider dealing with cancer breast first, then CPM + recon; minimise delay to adjuvant Rx *OR* ? NACT

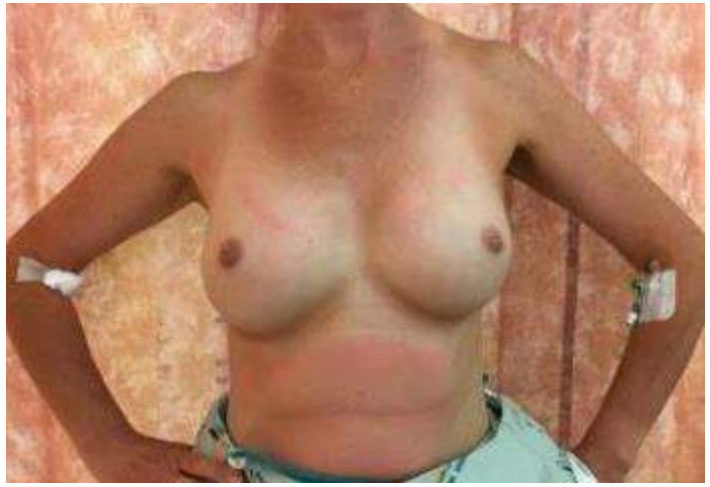
NSM DTI – MX125-370g

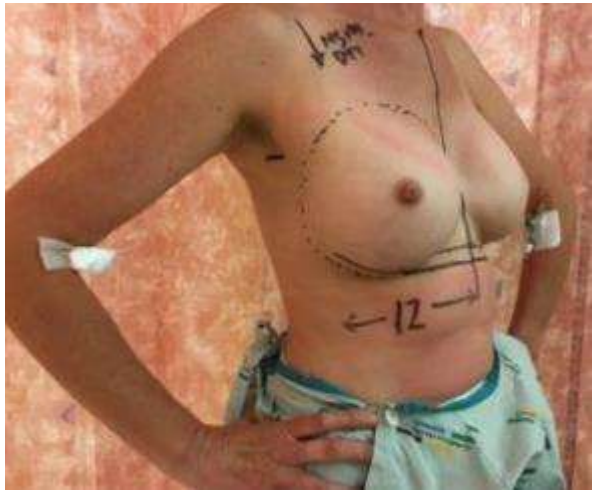


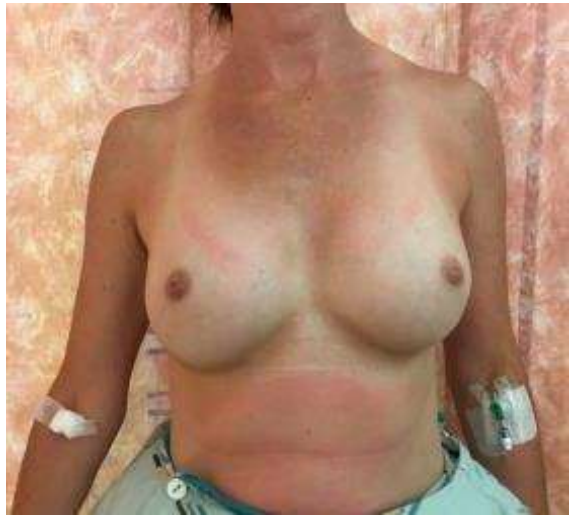


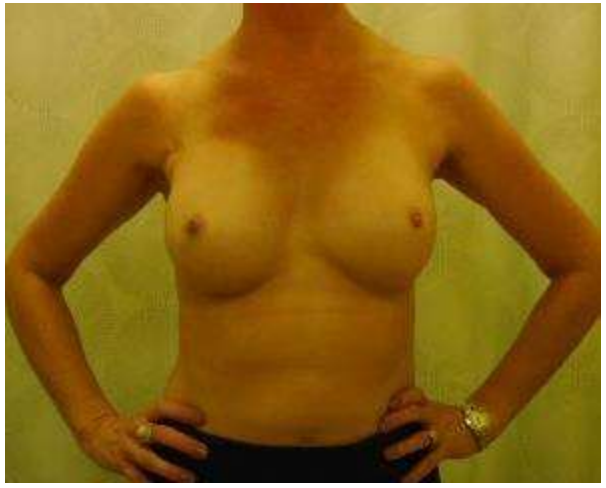
- 32yr nurse
- R breast mass
- 35gm DCIS upper outer quadrant
- Clear margins
- Hydrodissection
- DTI TigR mesh
- Clear margins

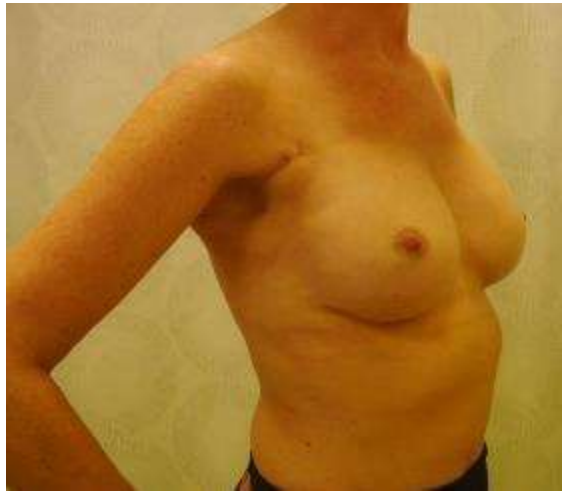
R Therapeutic NSM MX125 370.
Previous augmentation

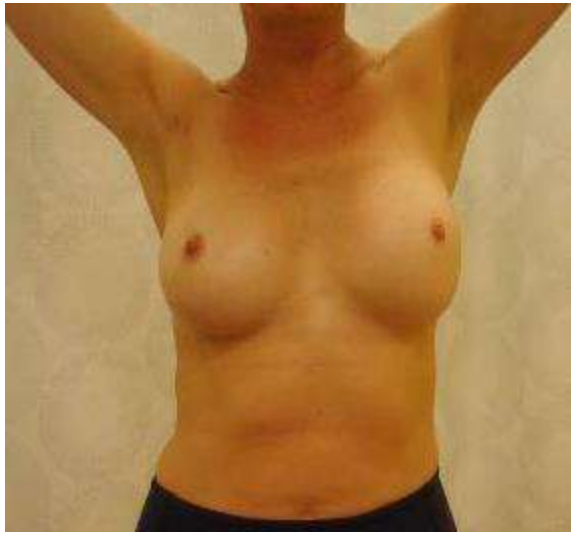


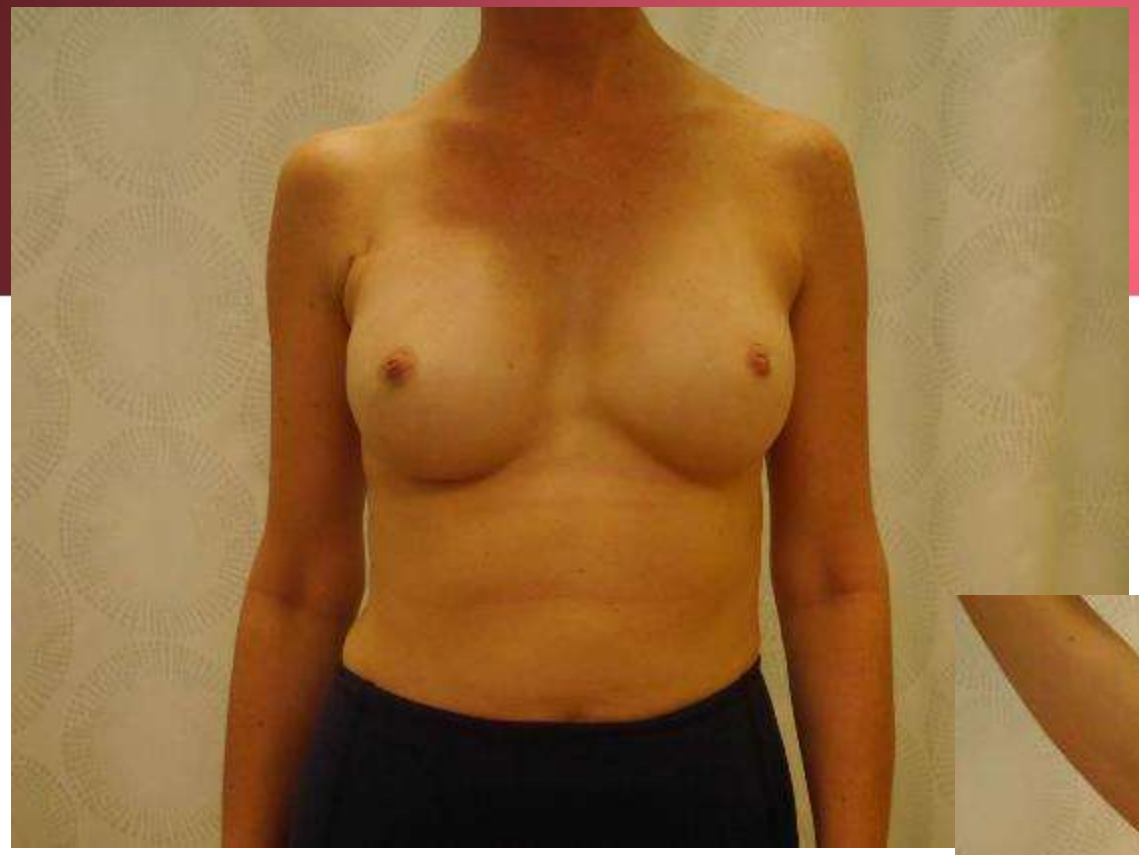


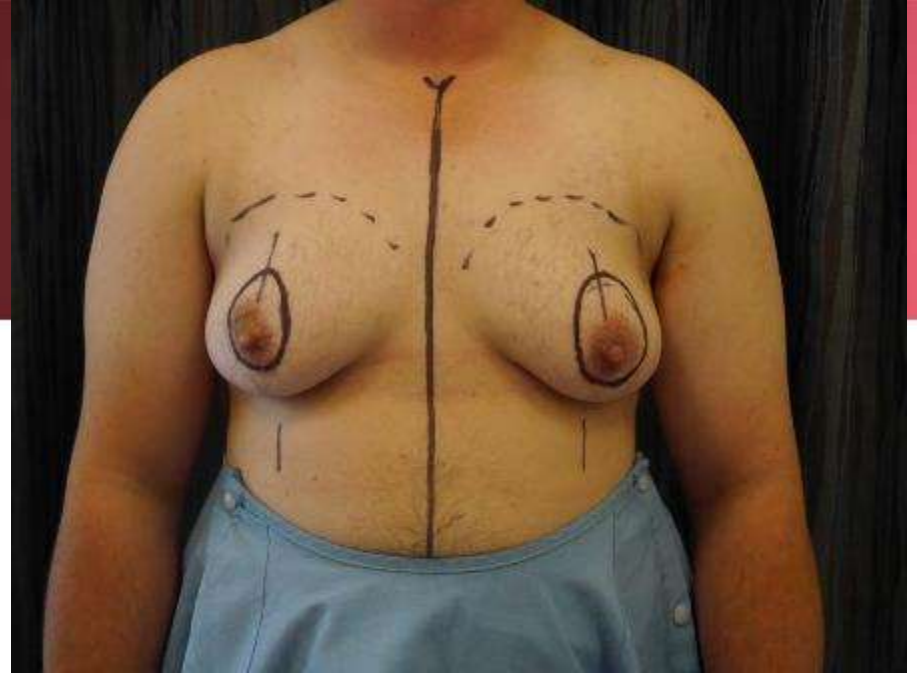


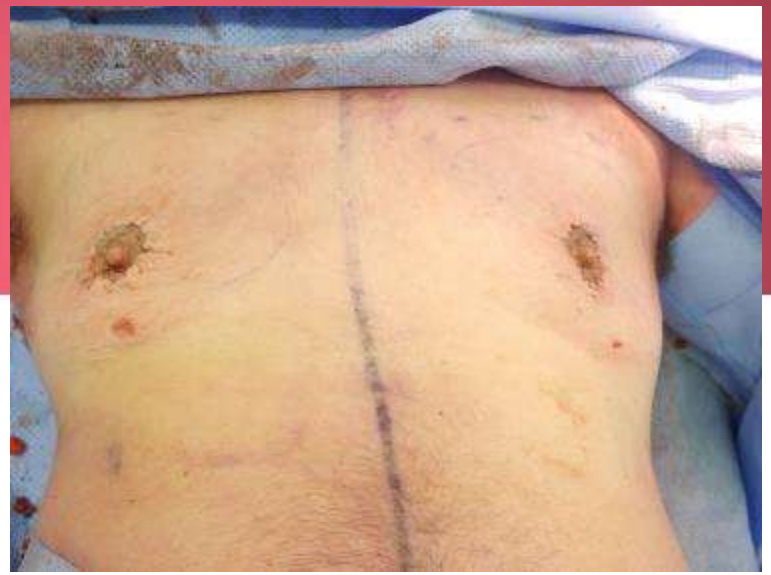


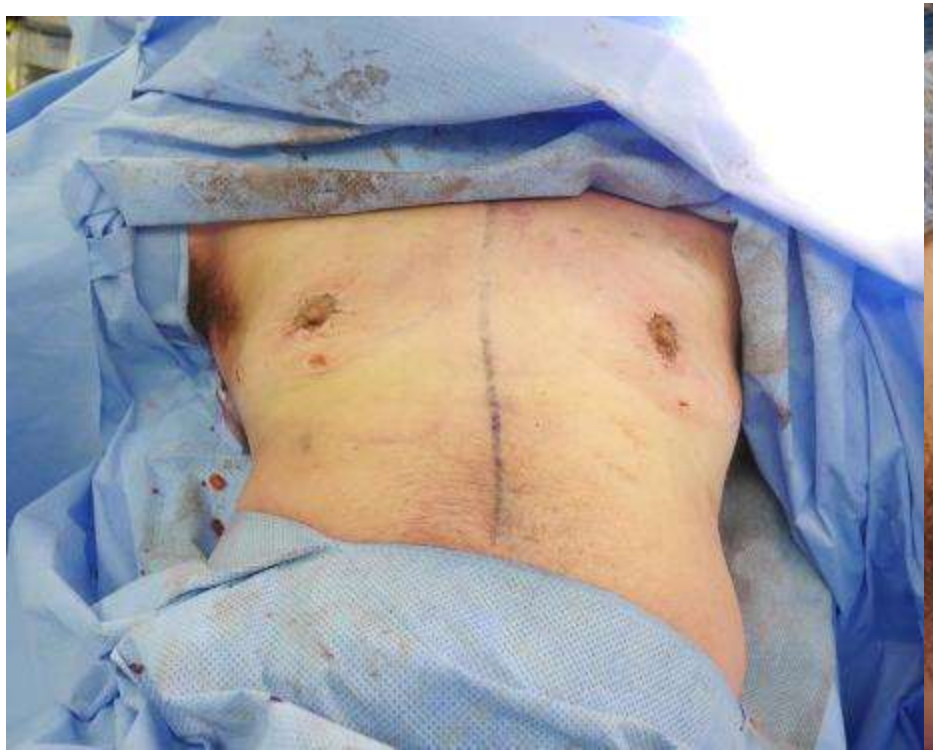


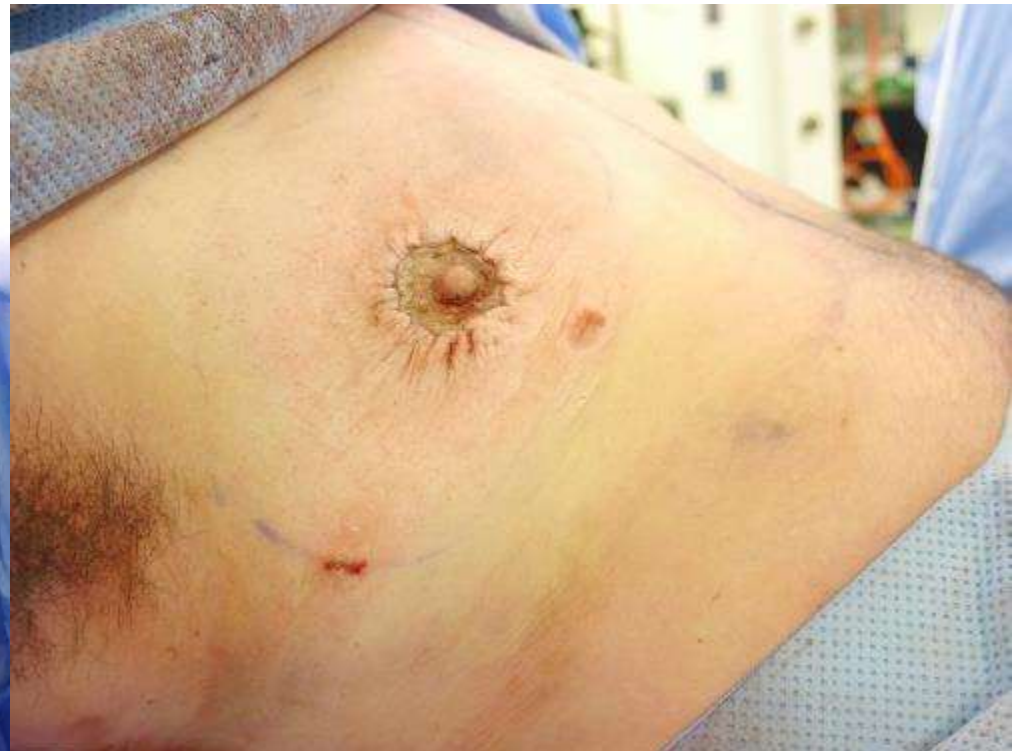


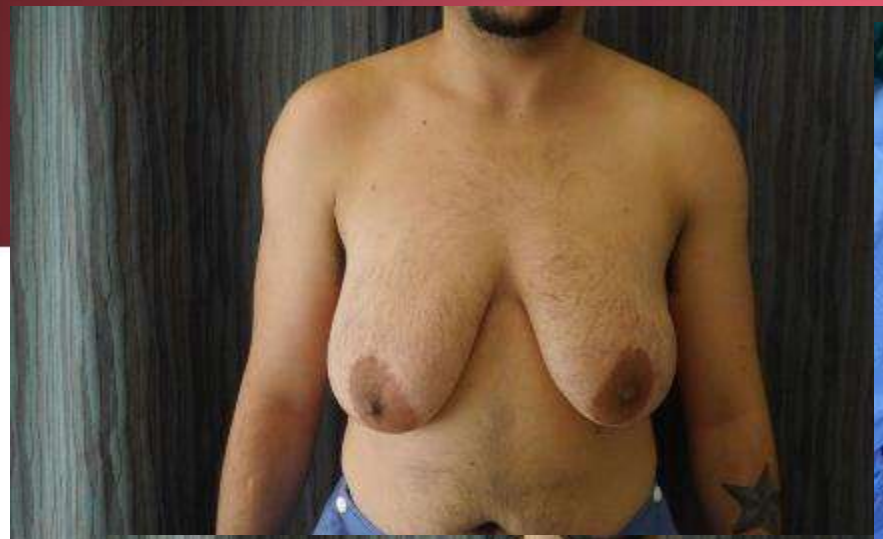


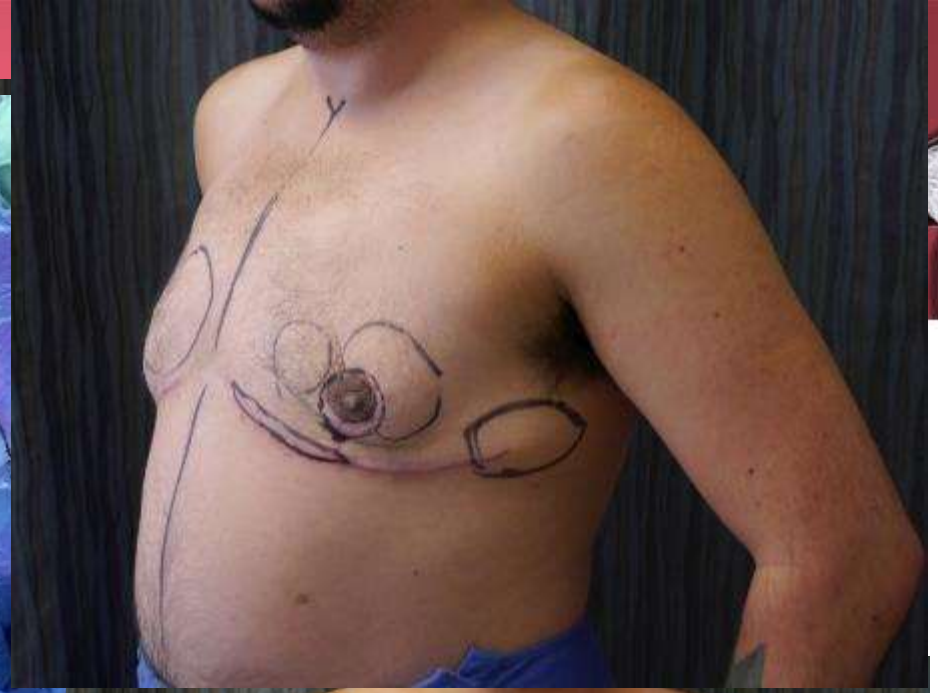


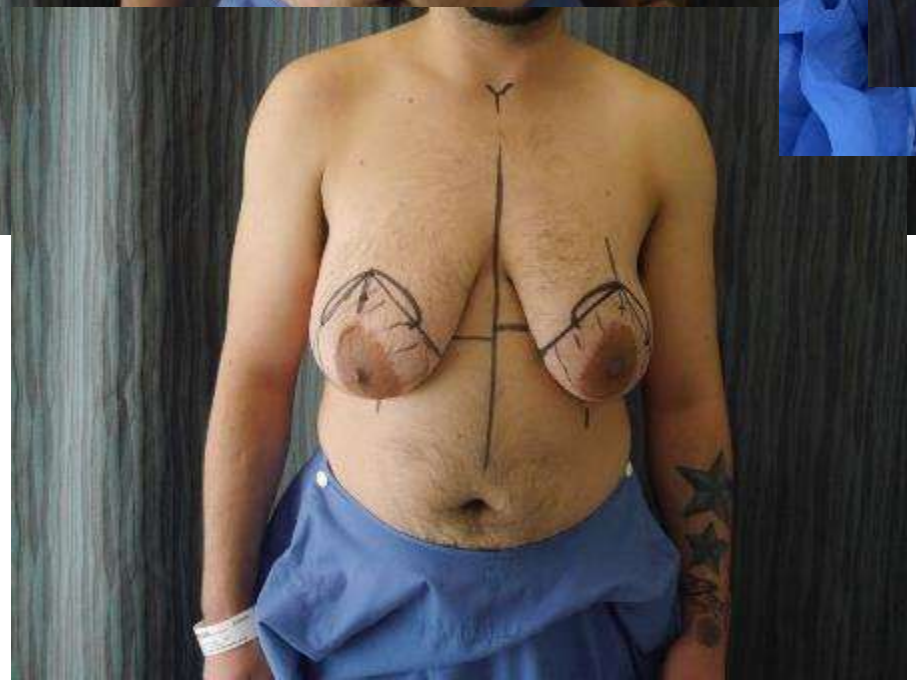


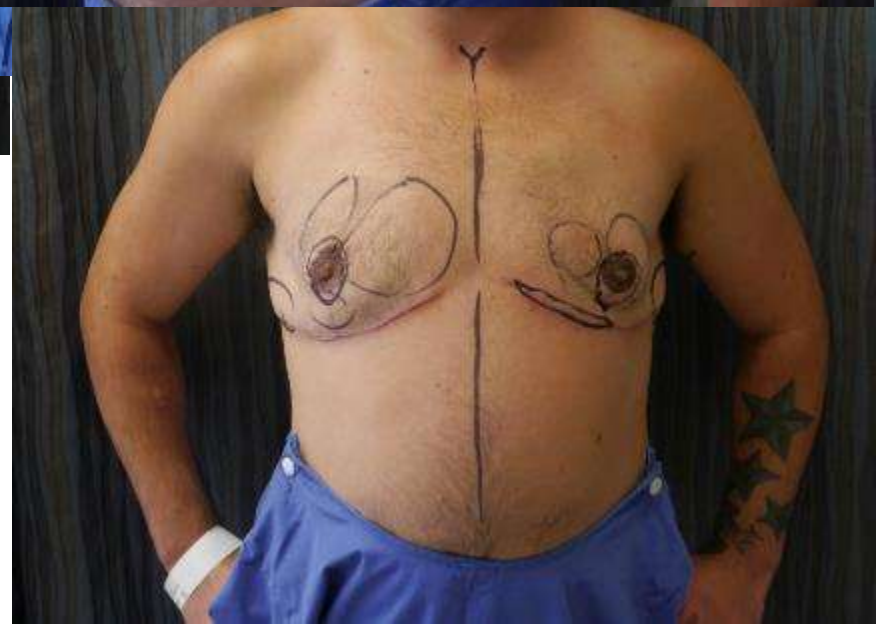












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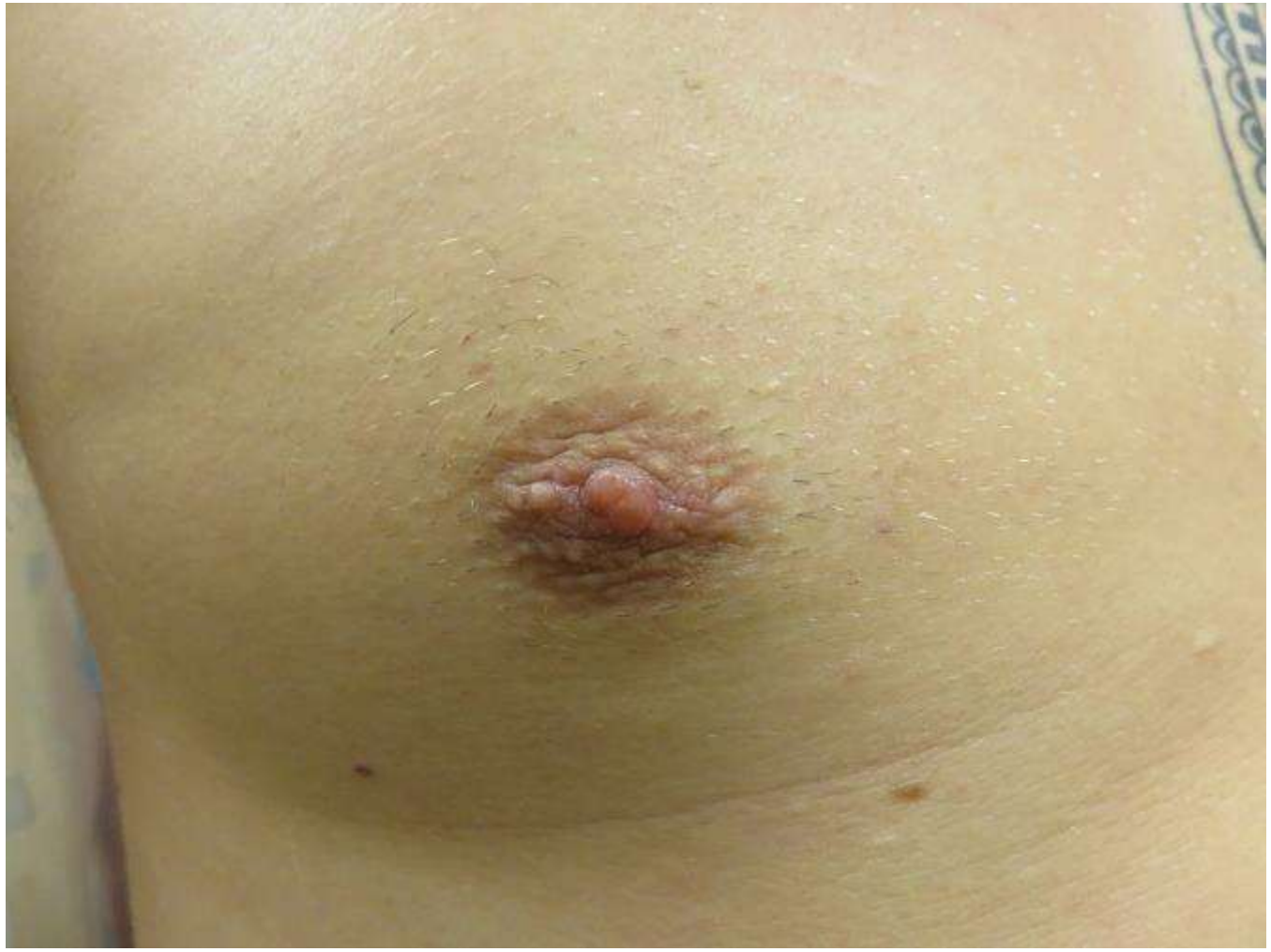

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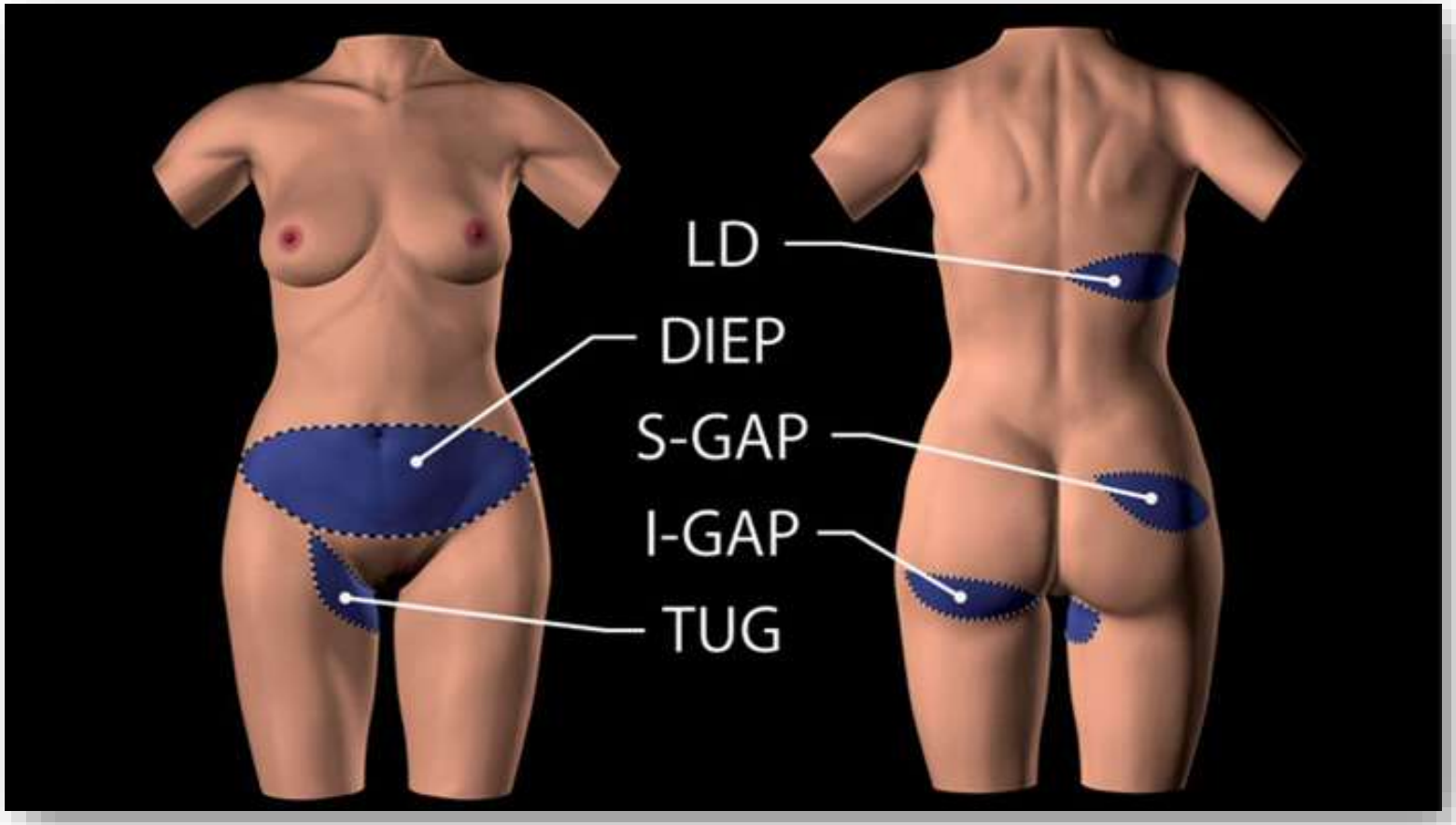
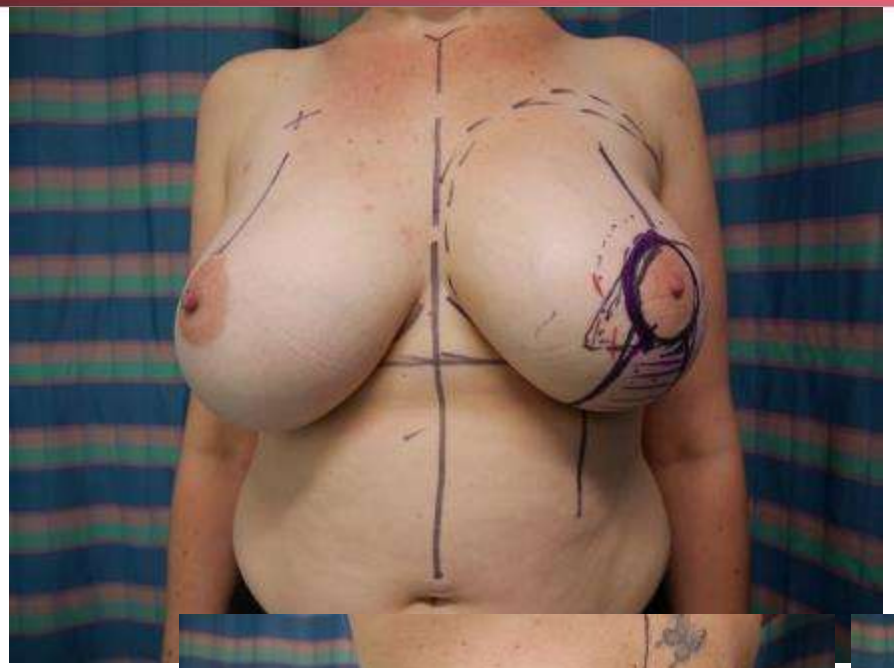
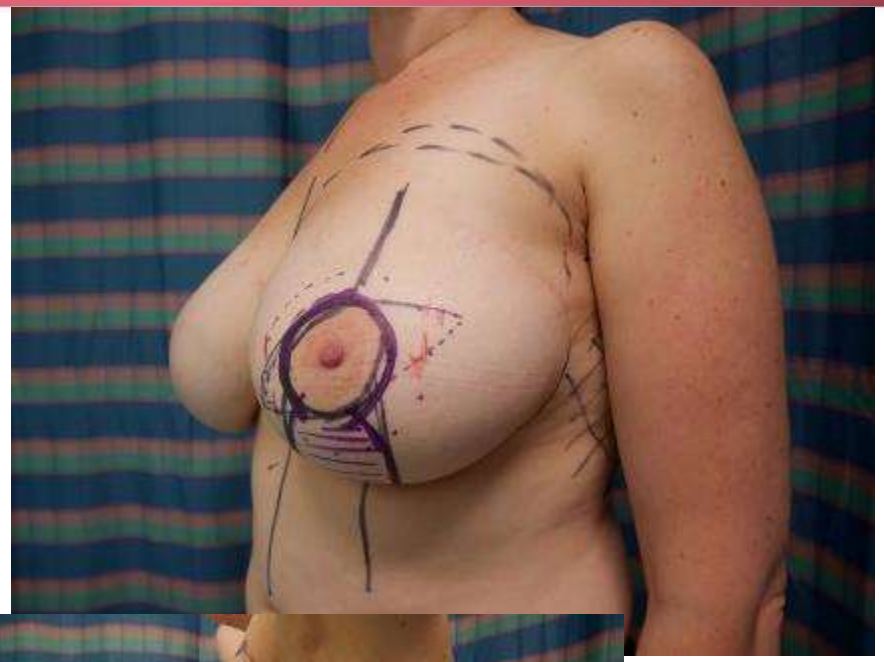
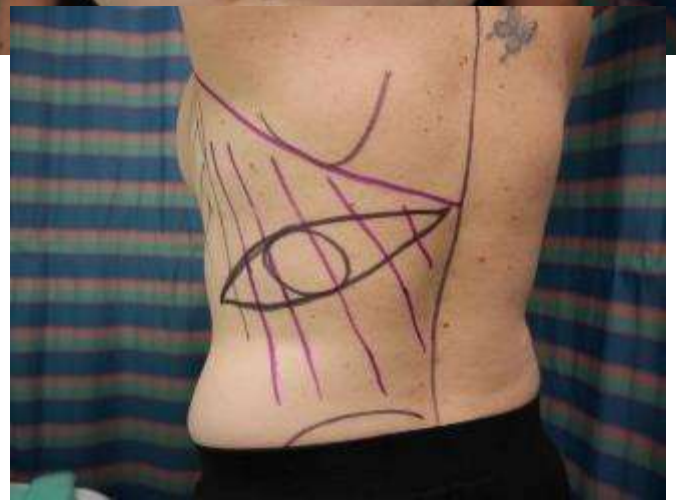
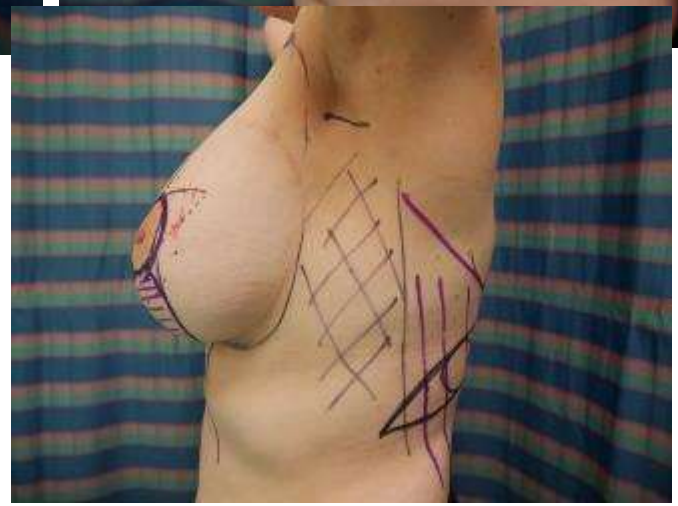


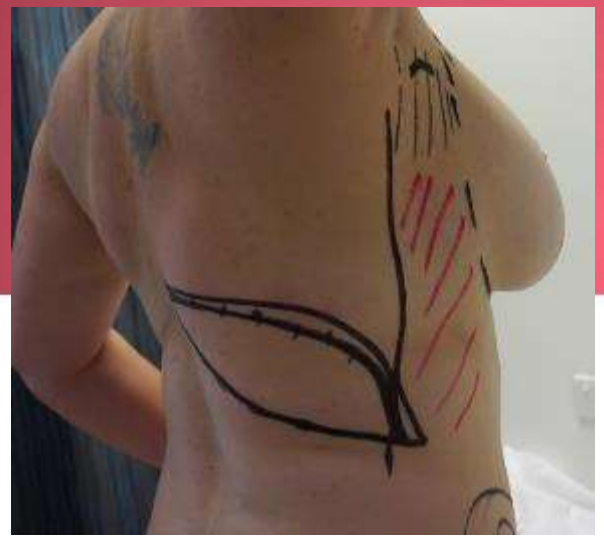
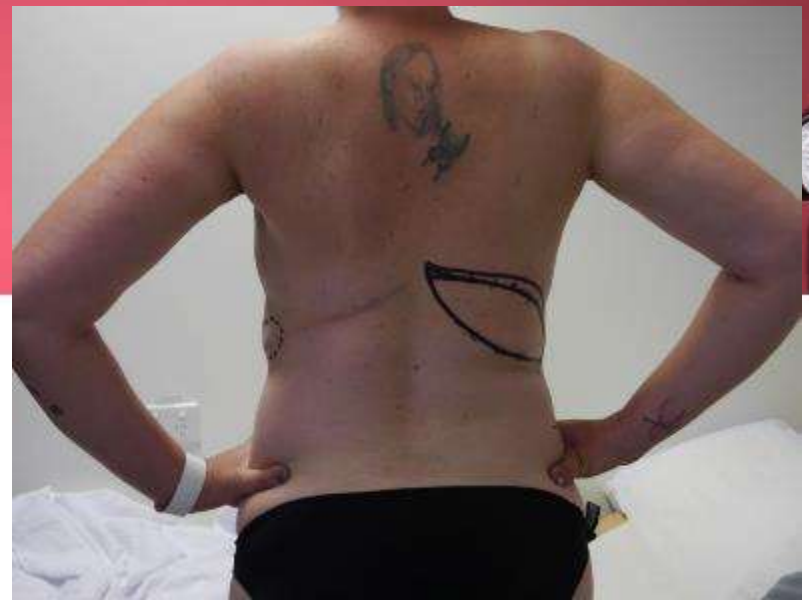
LD Flap - Planning

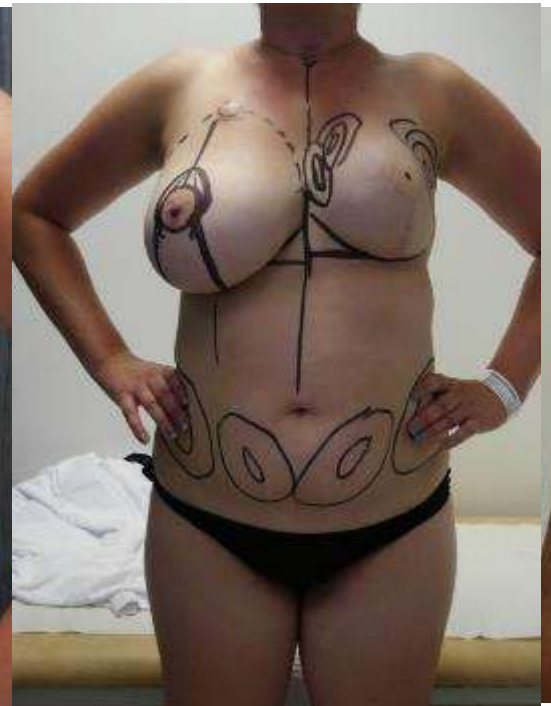
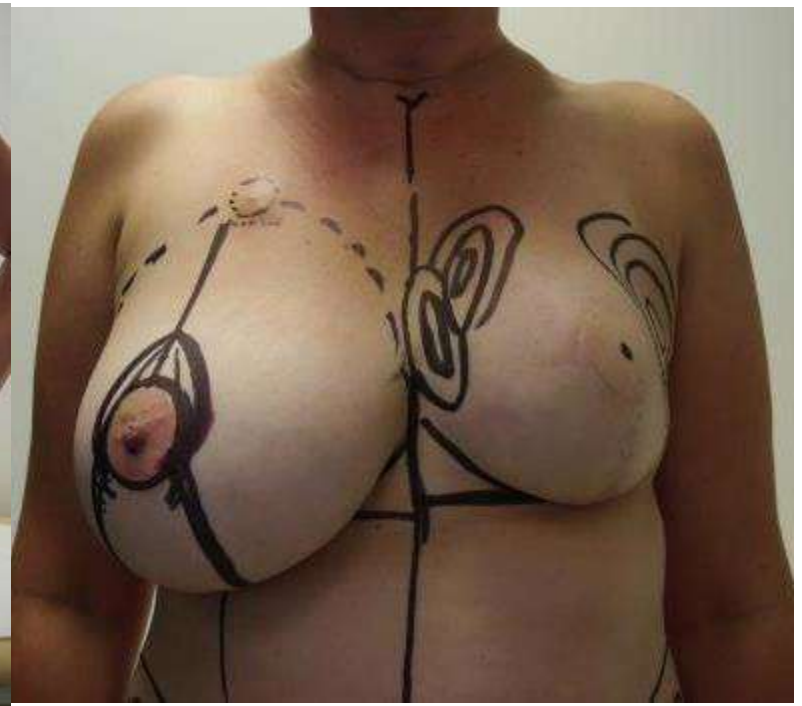




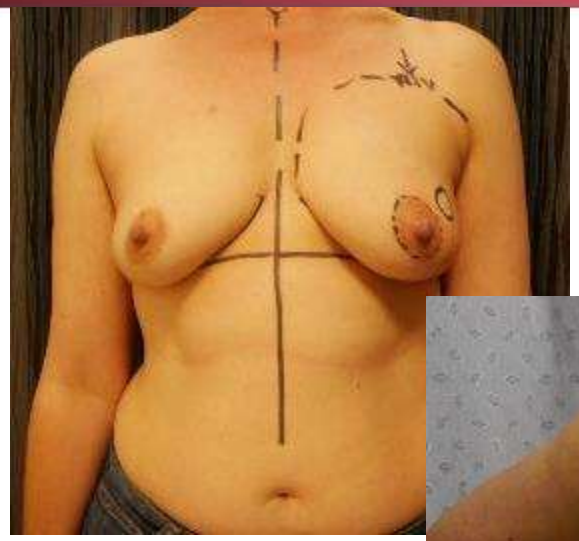


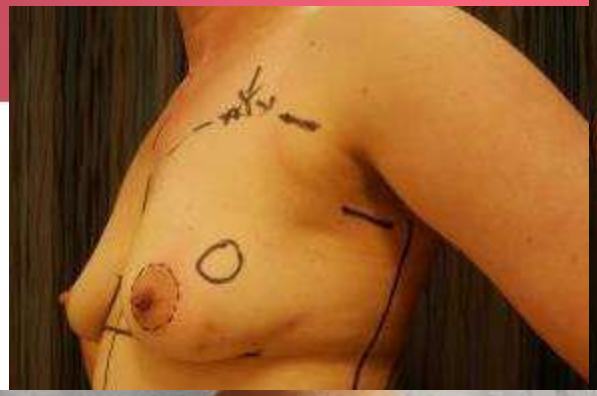


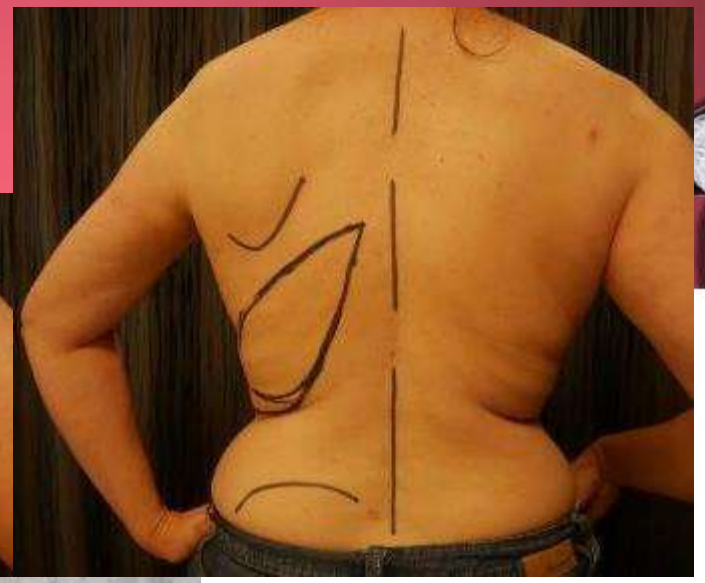




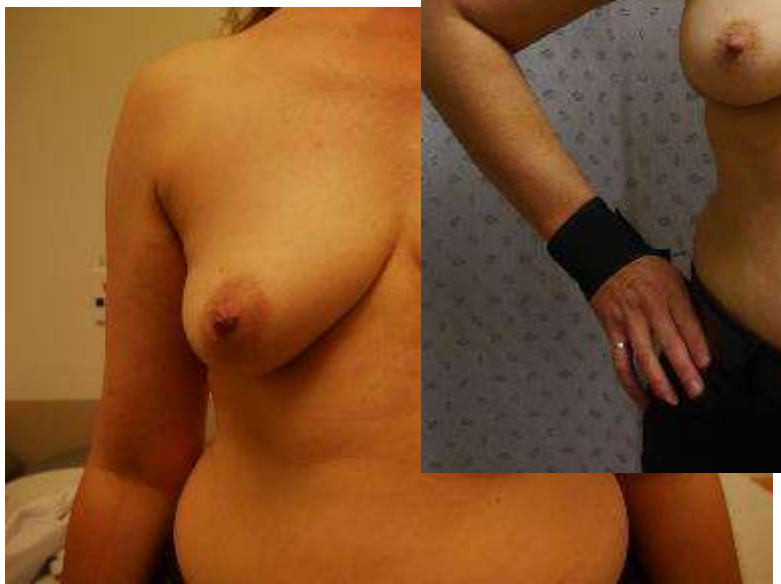




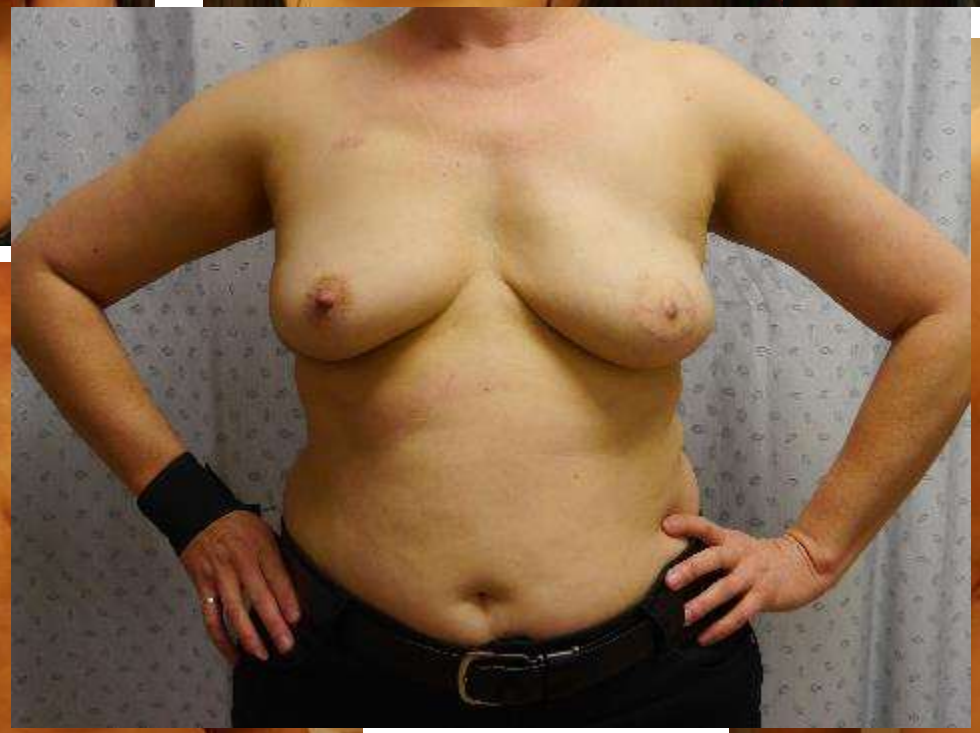
Immediate LD

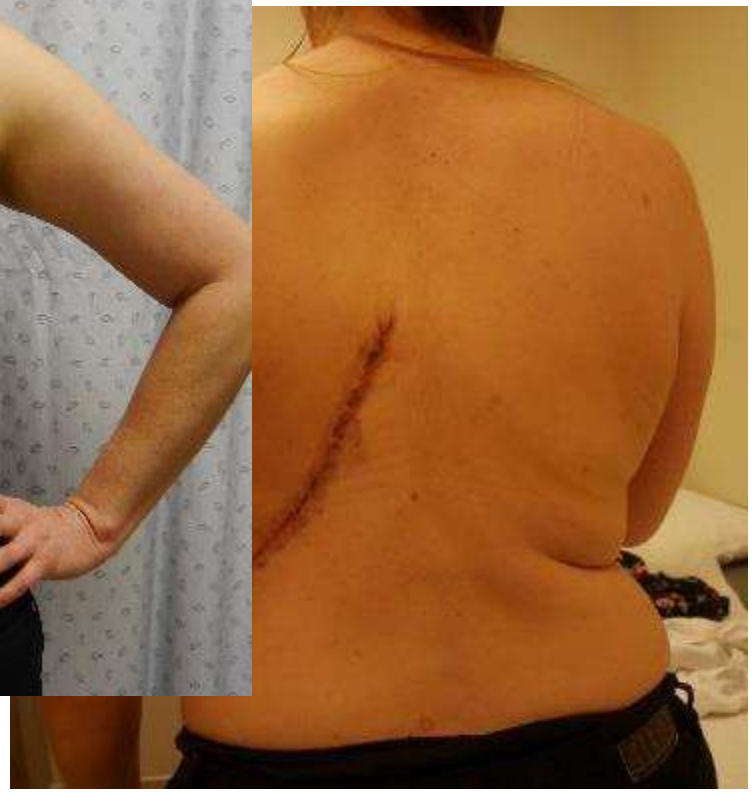


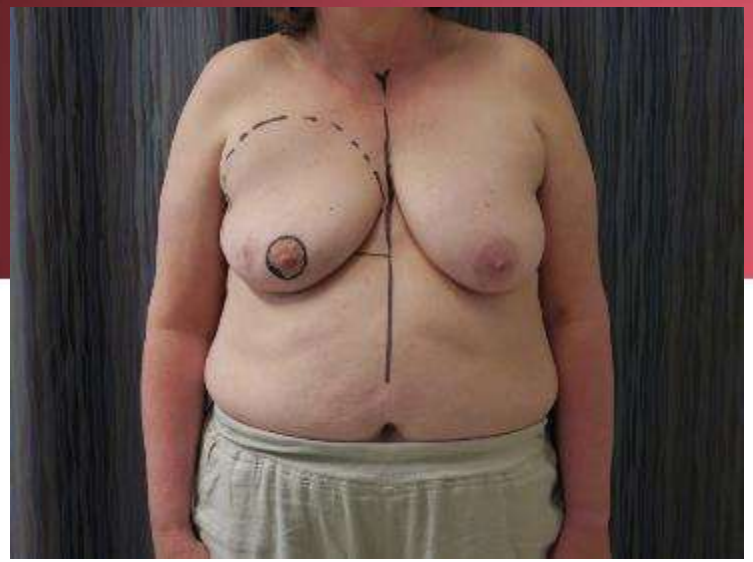


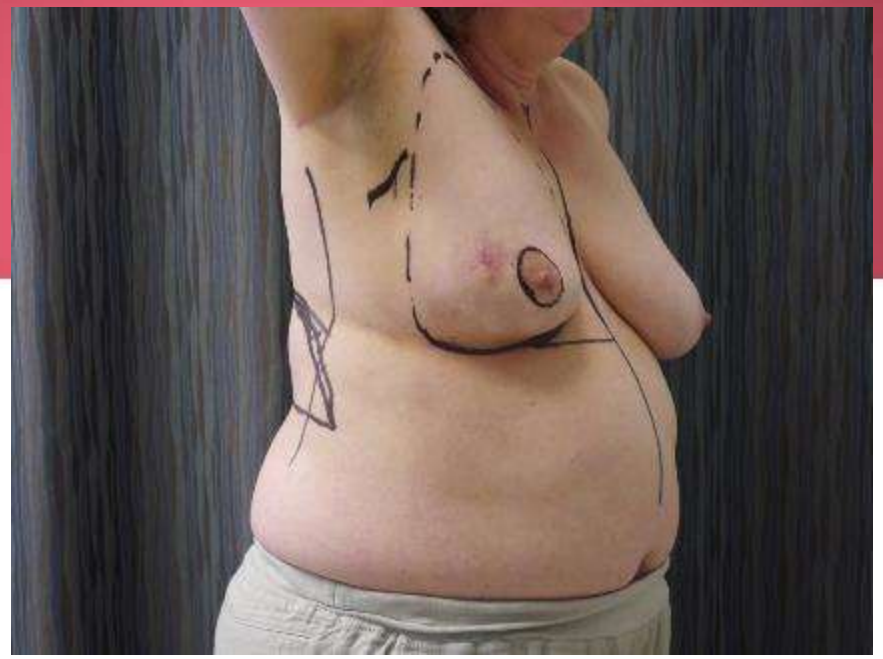


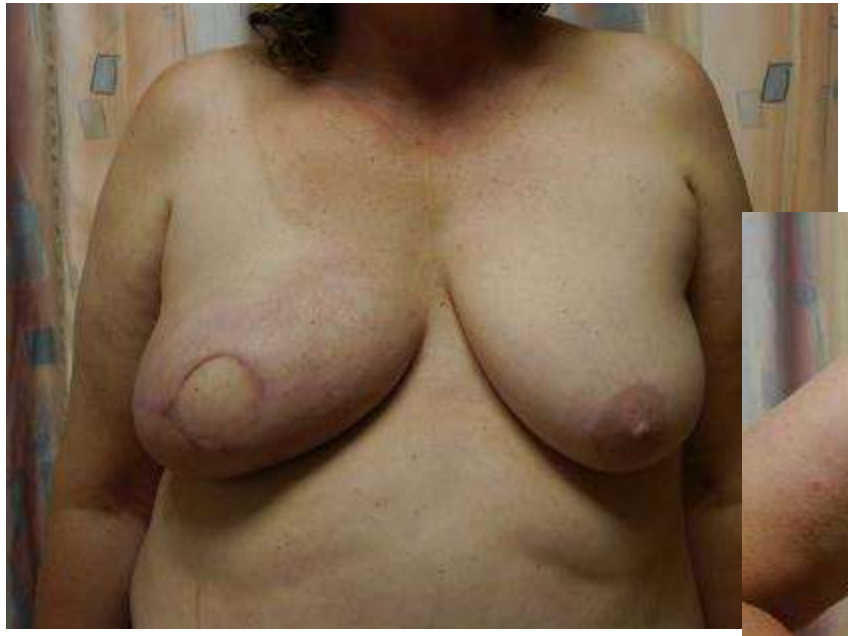


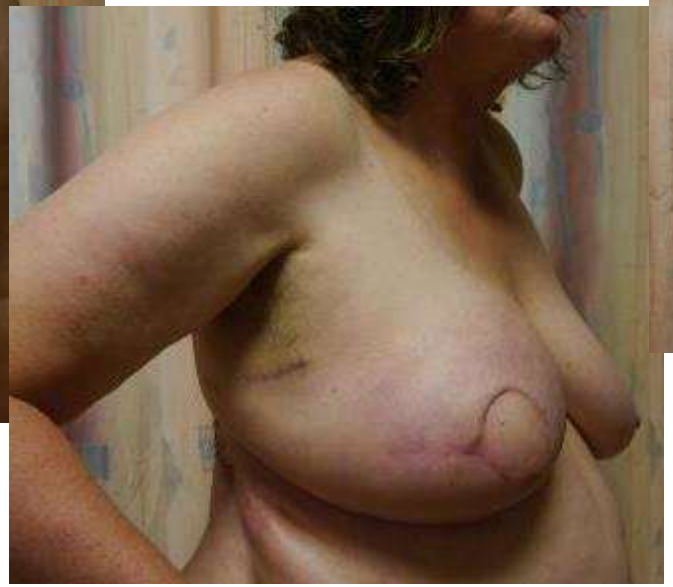


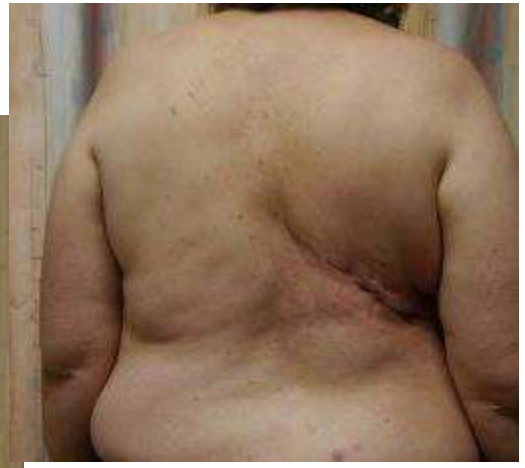




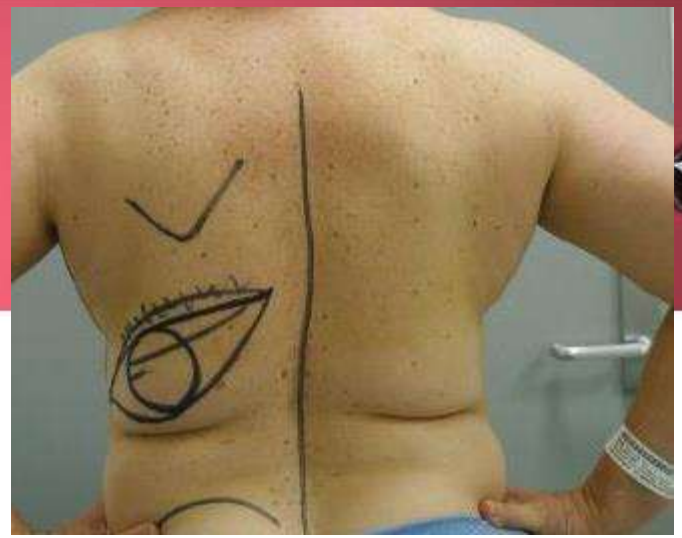


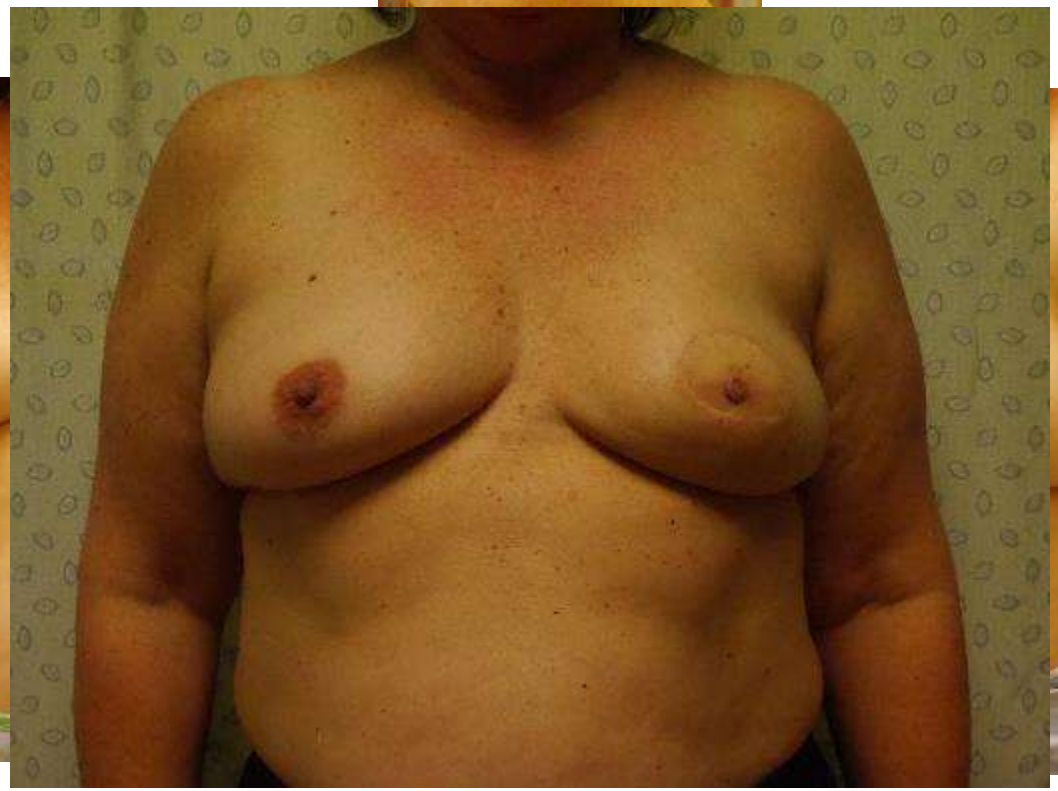
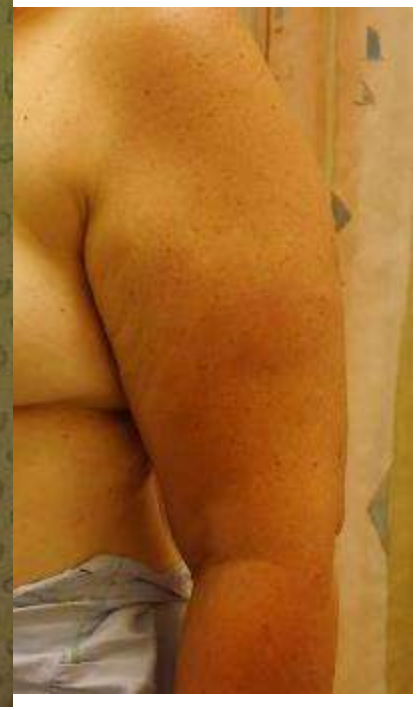


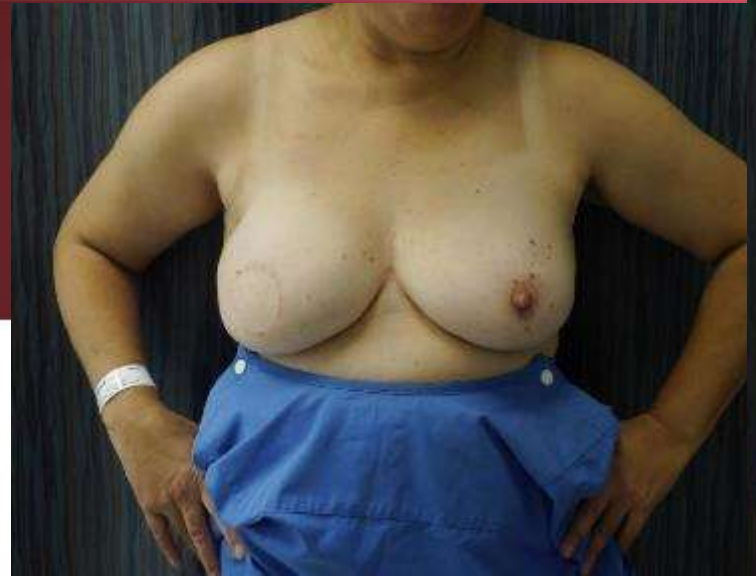
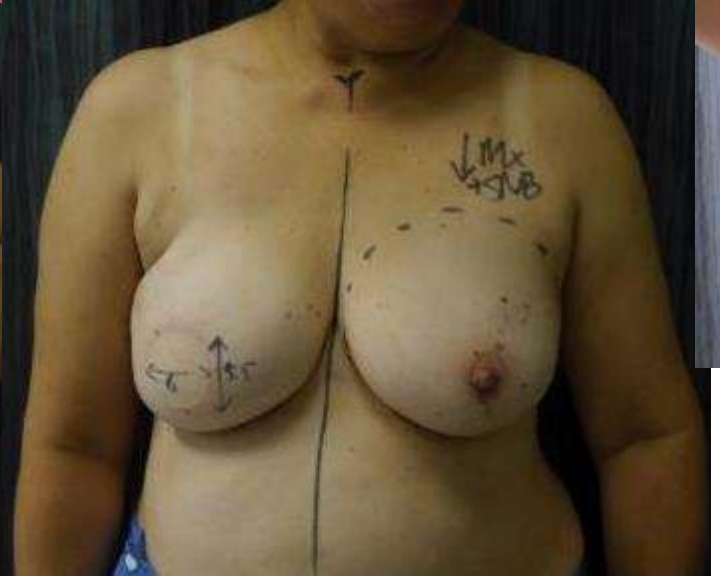
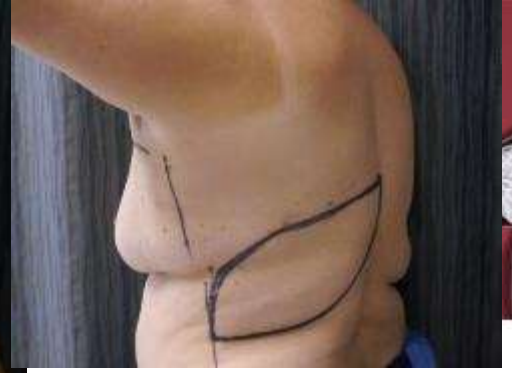


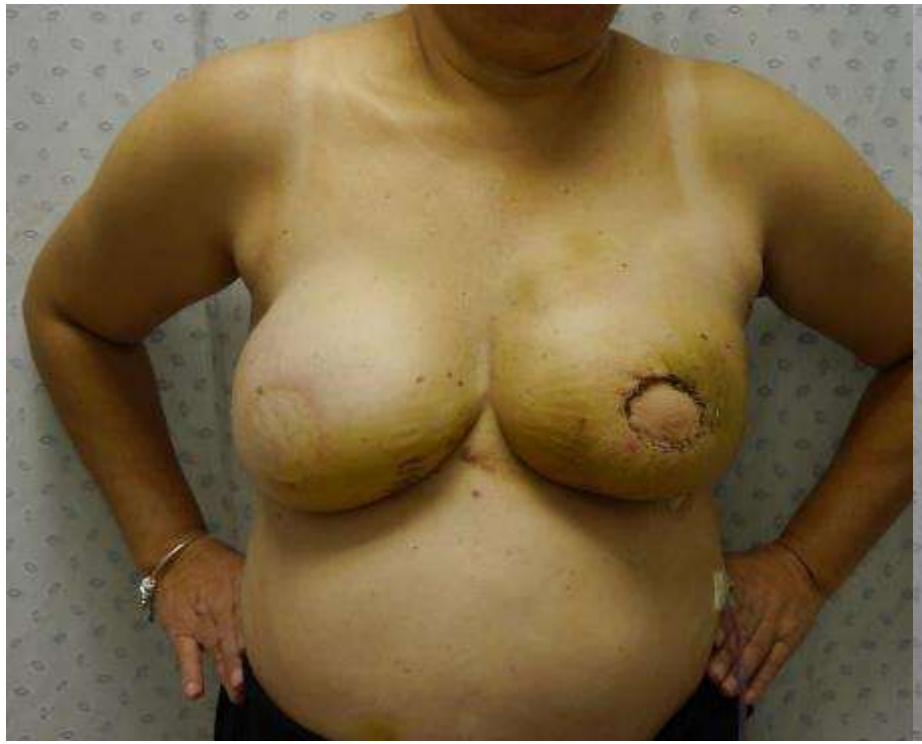
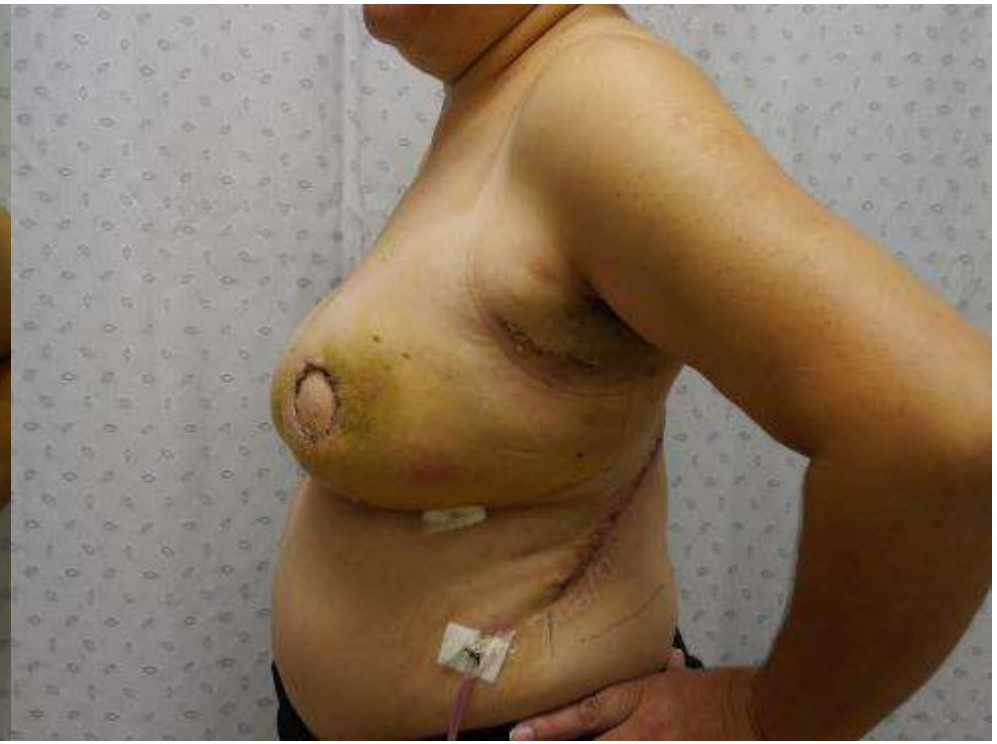


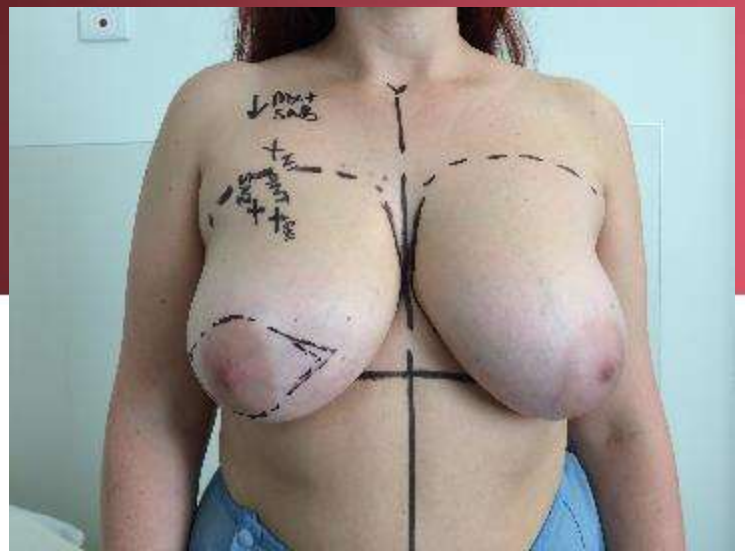


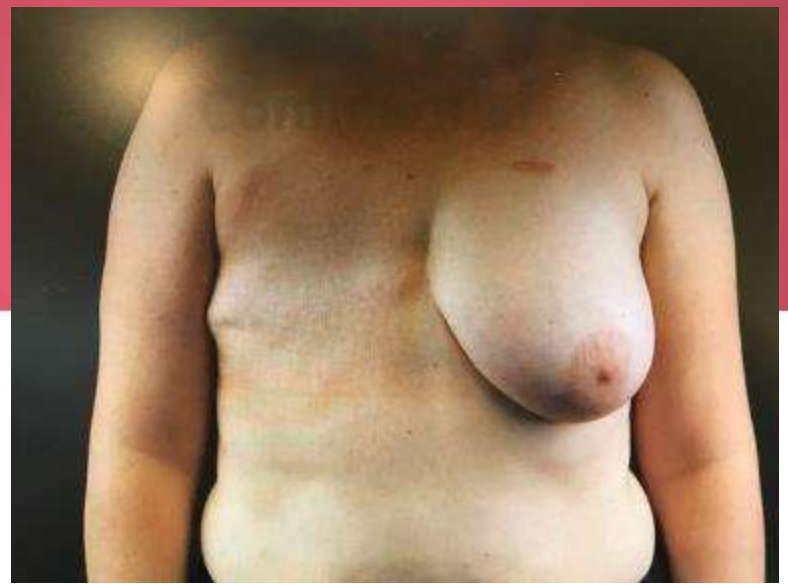


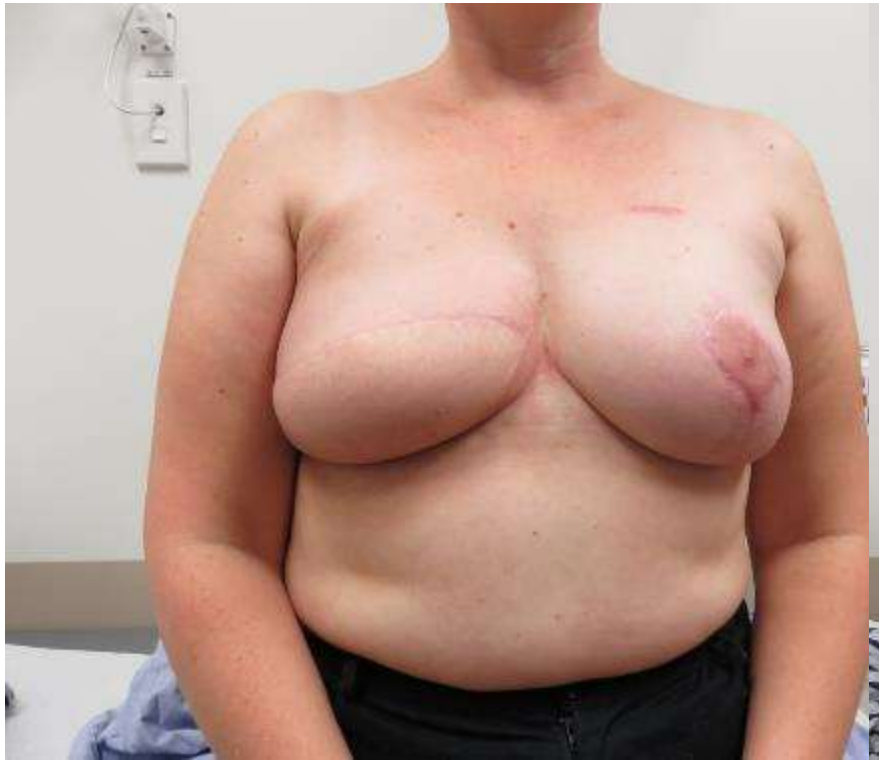




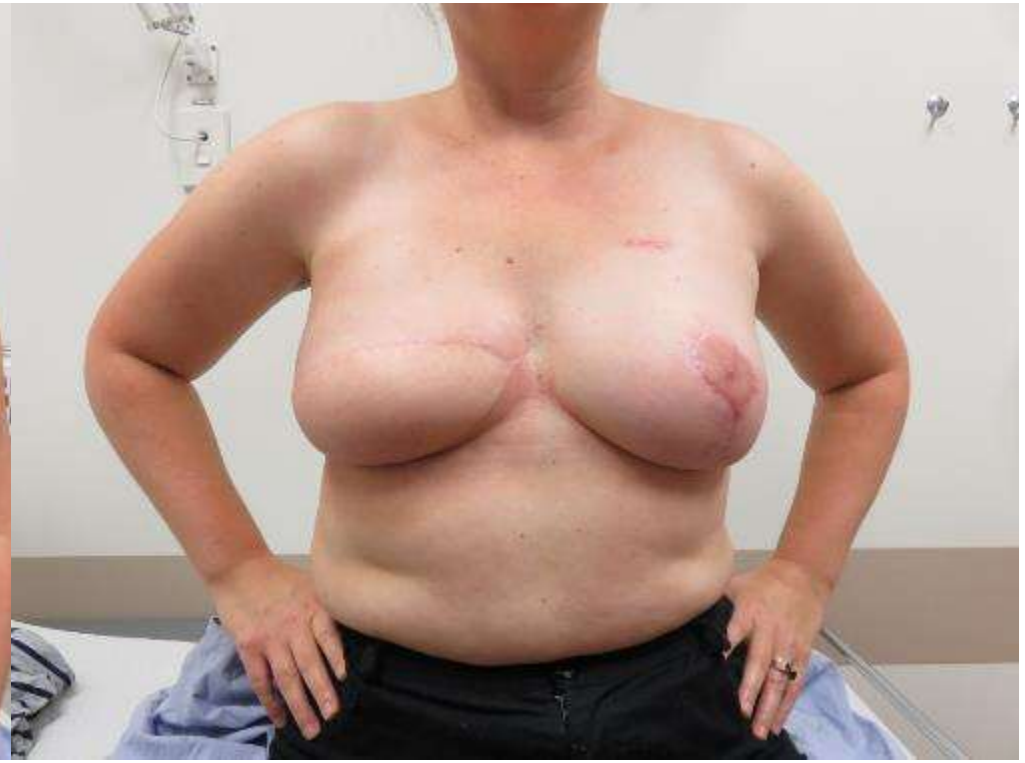




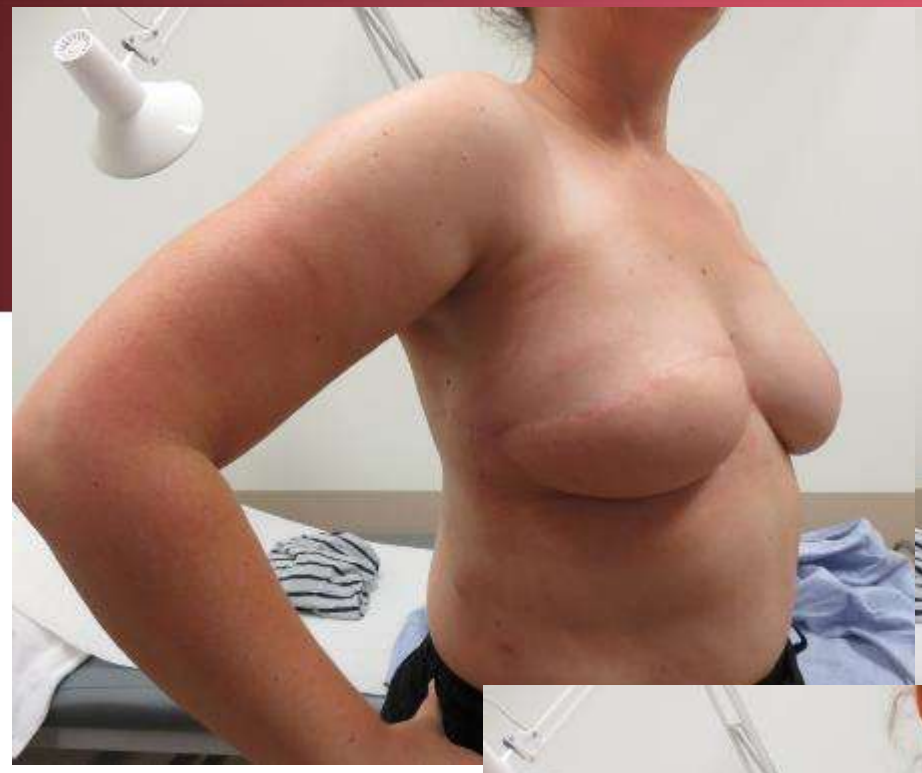



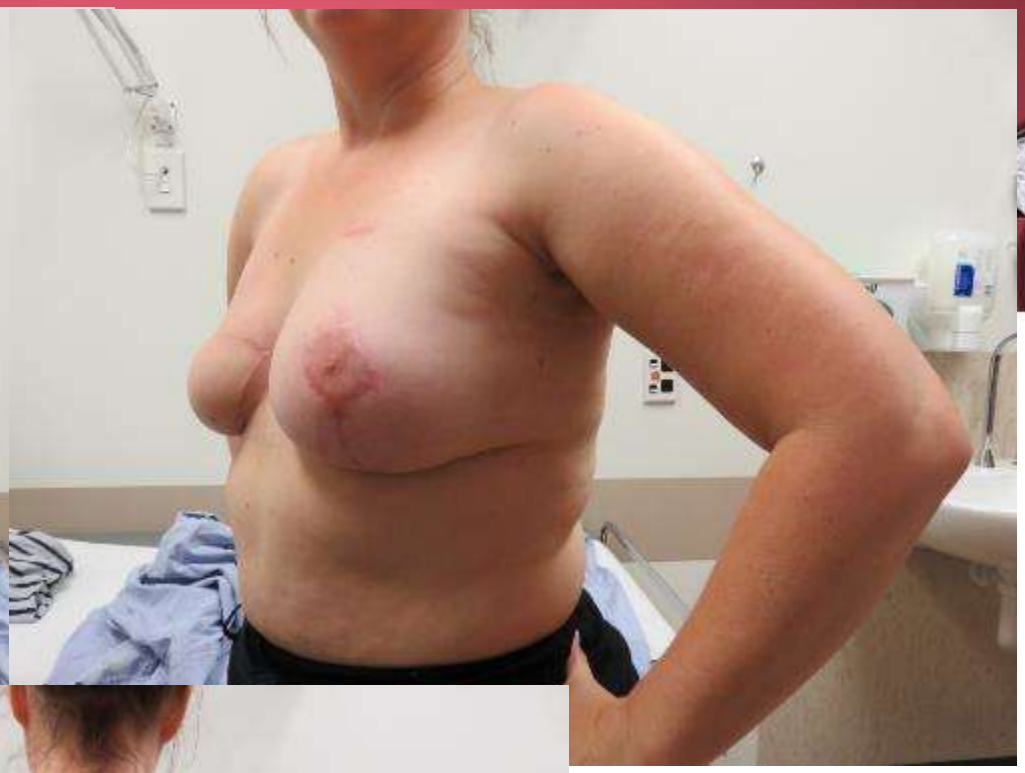


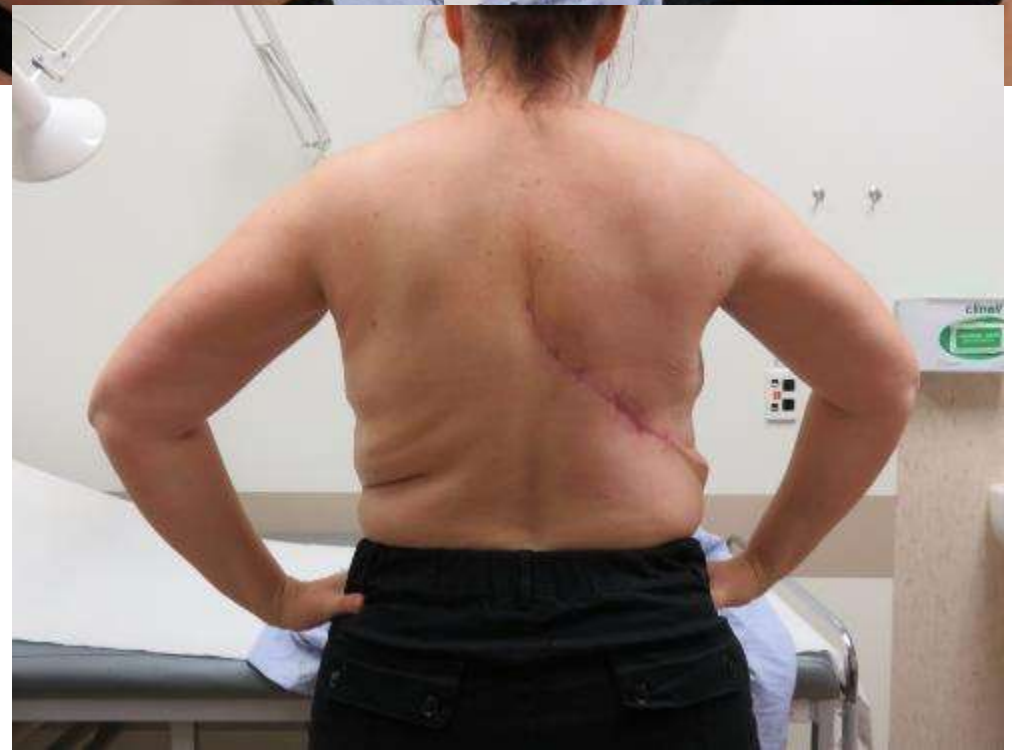


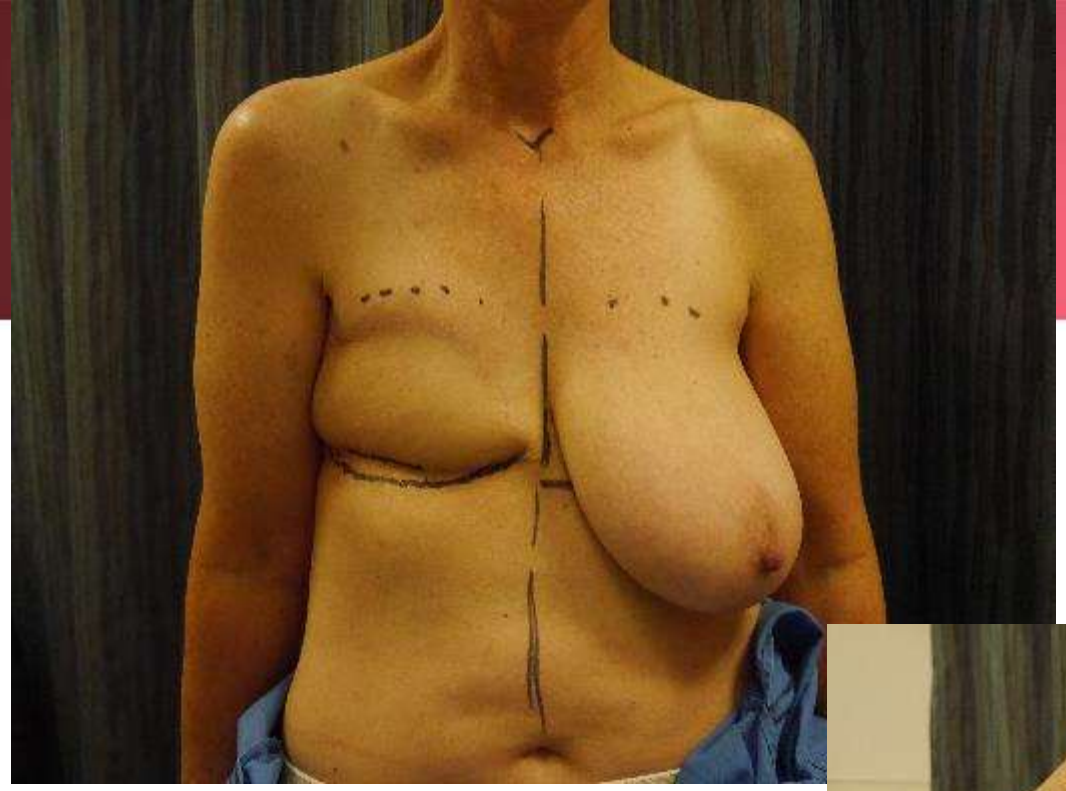


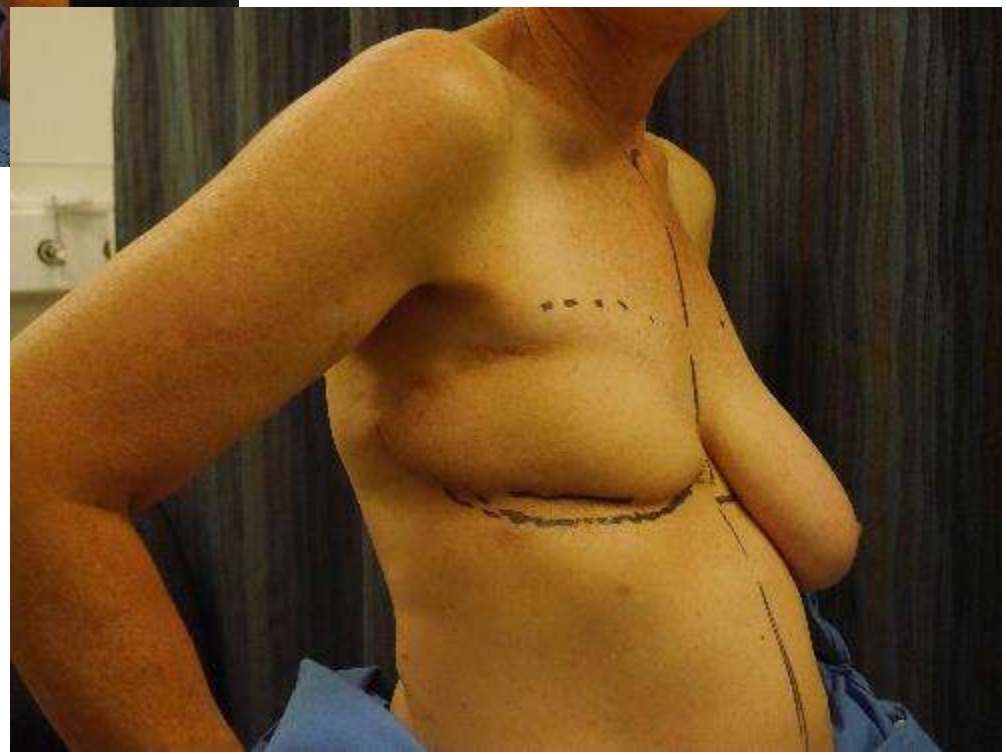


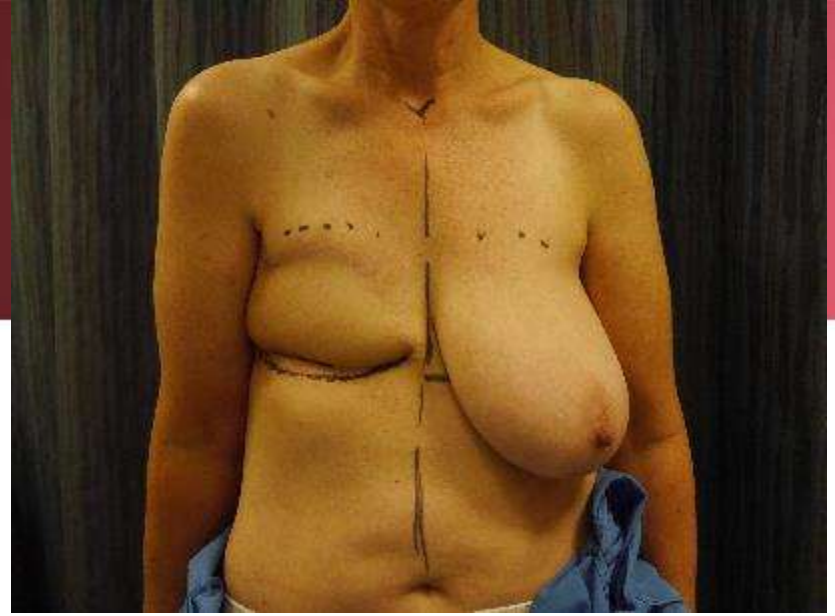


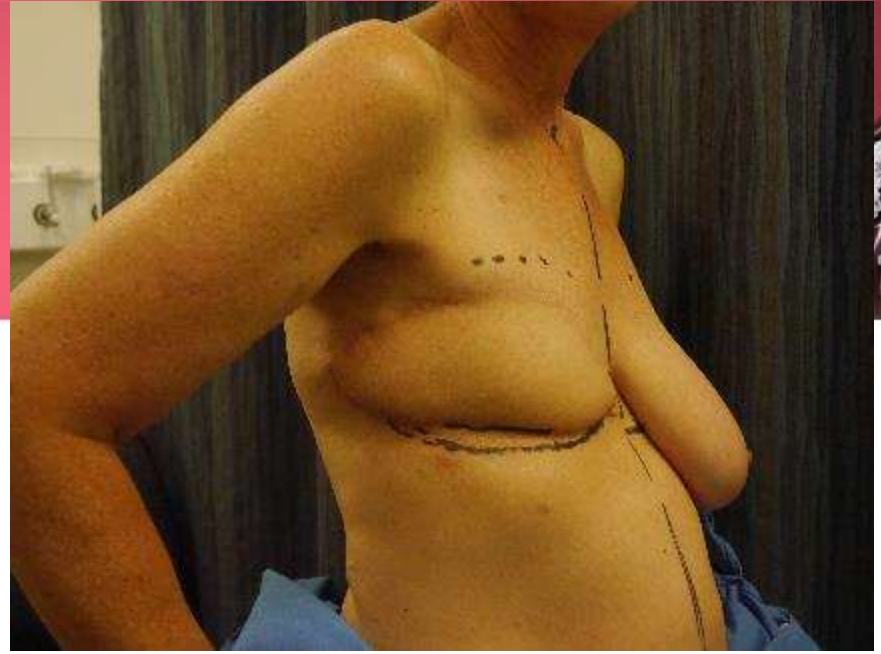


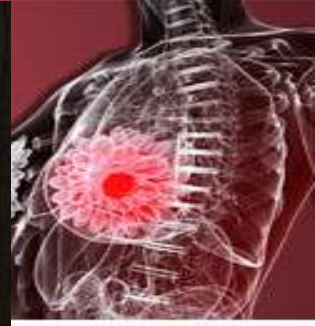


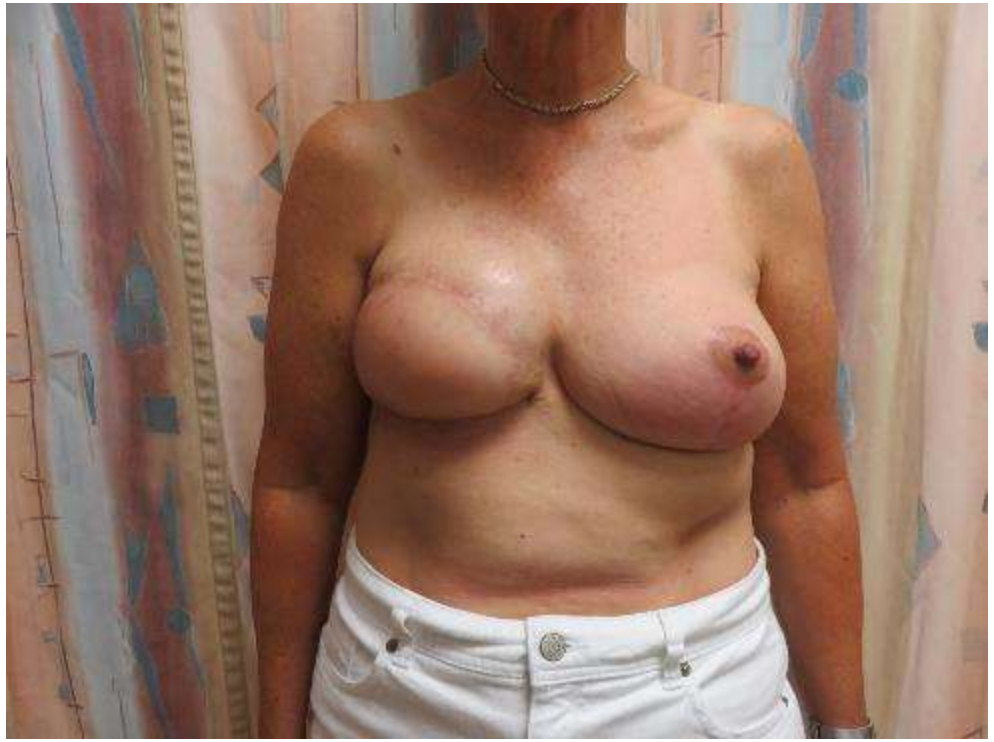


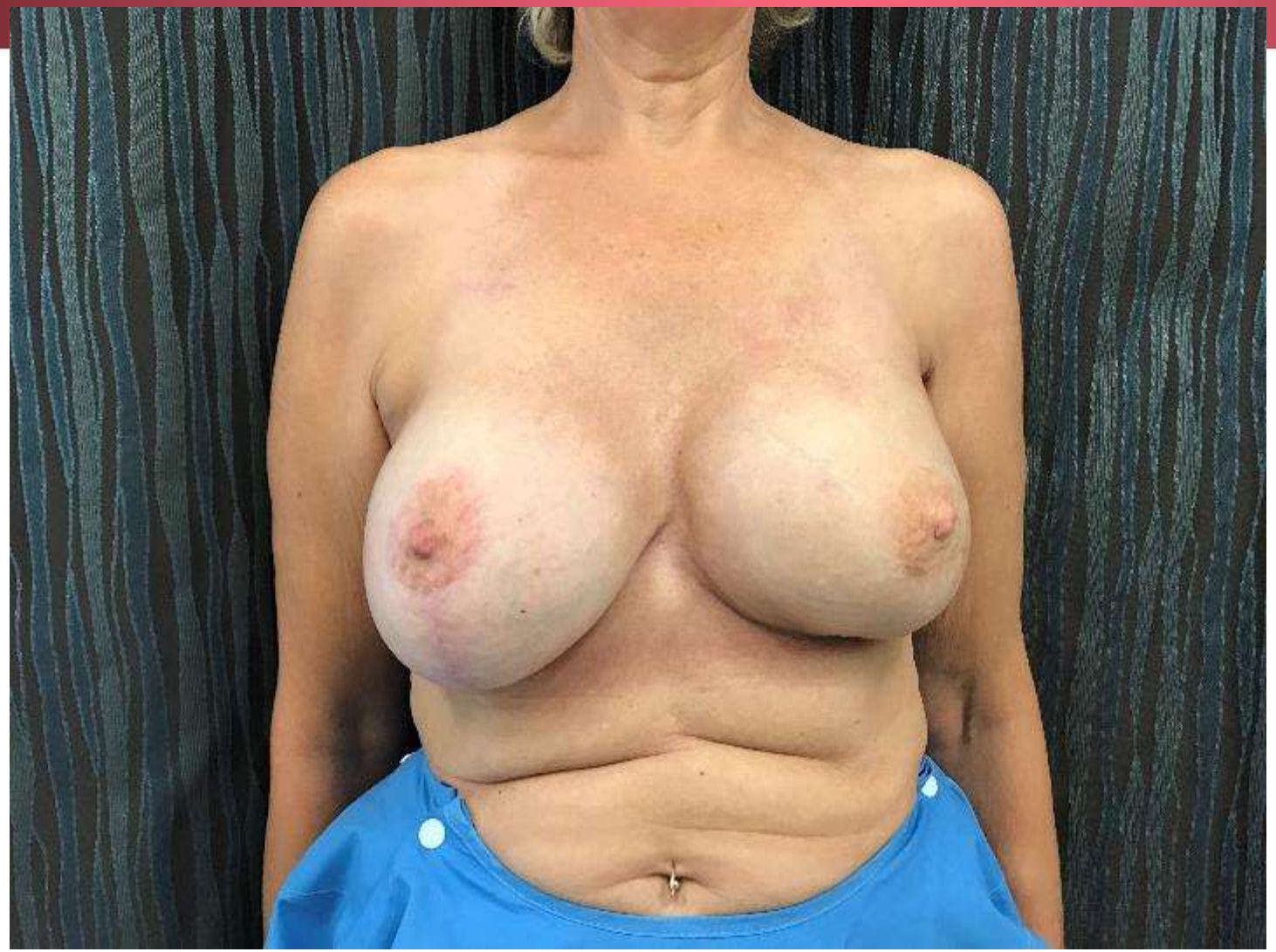


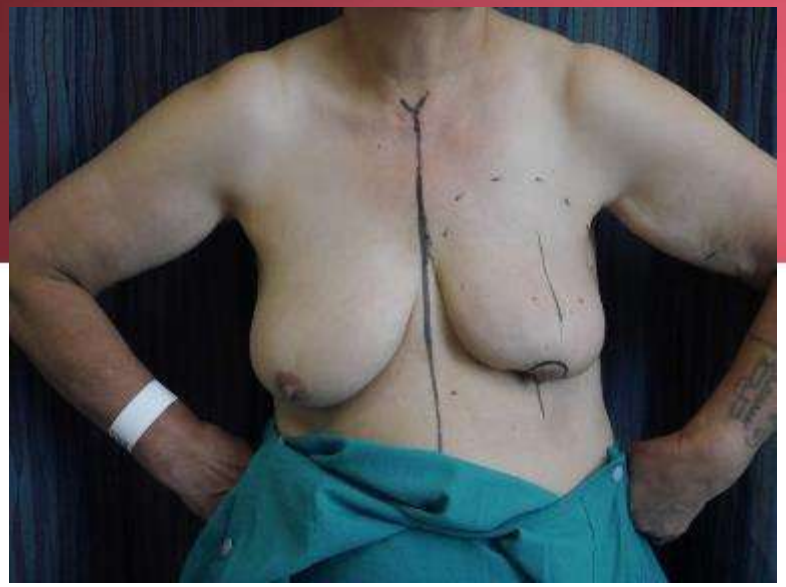


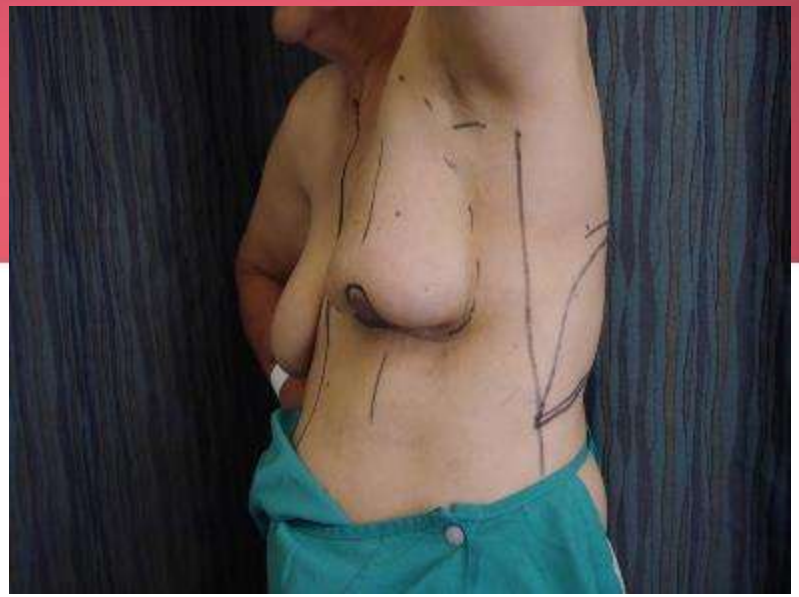


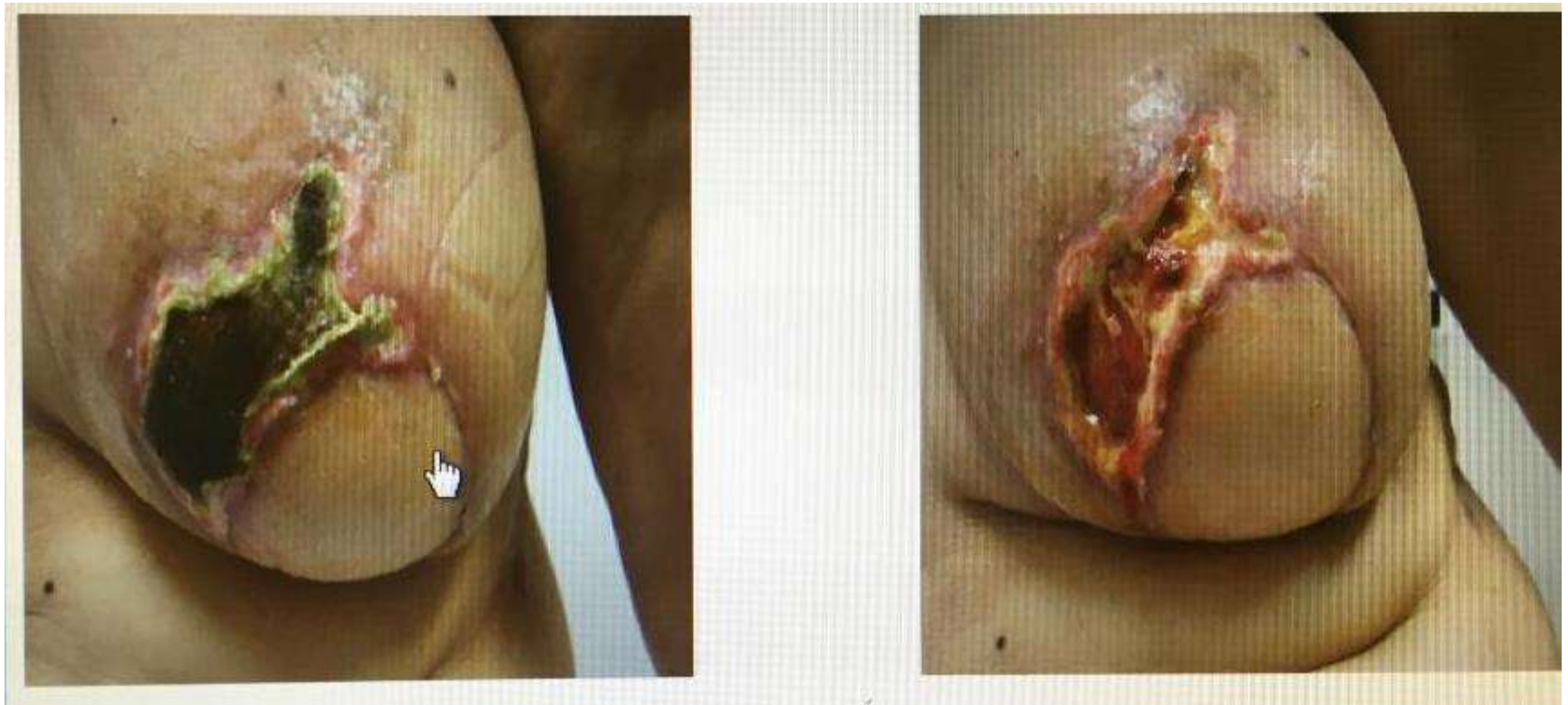




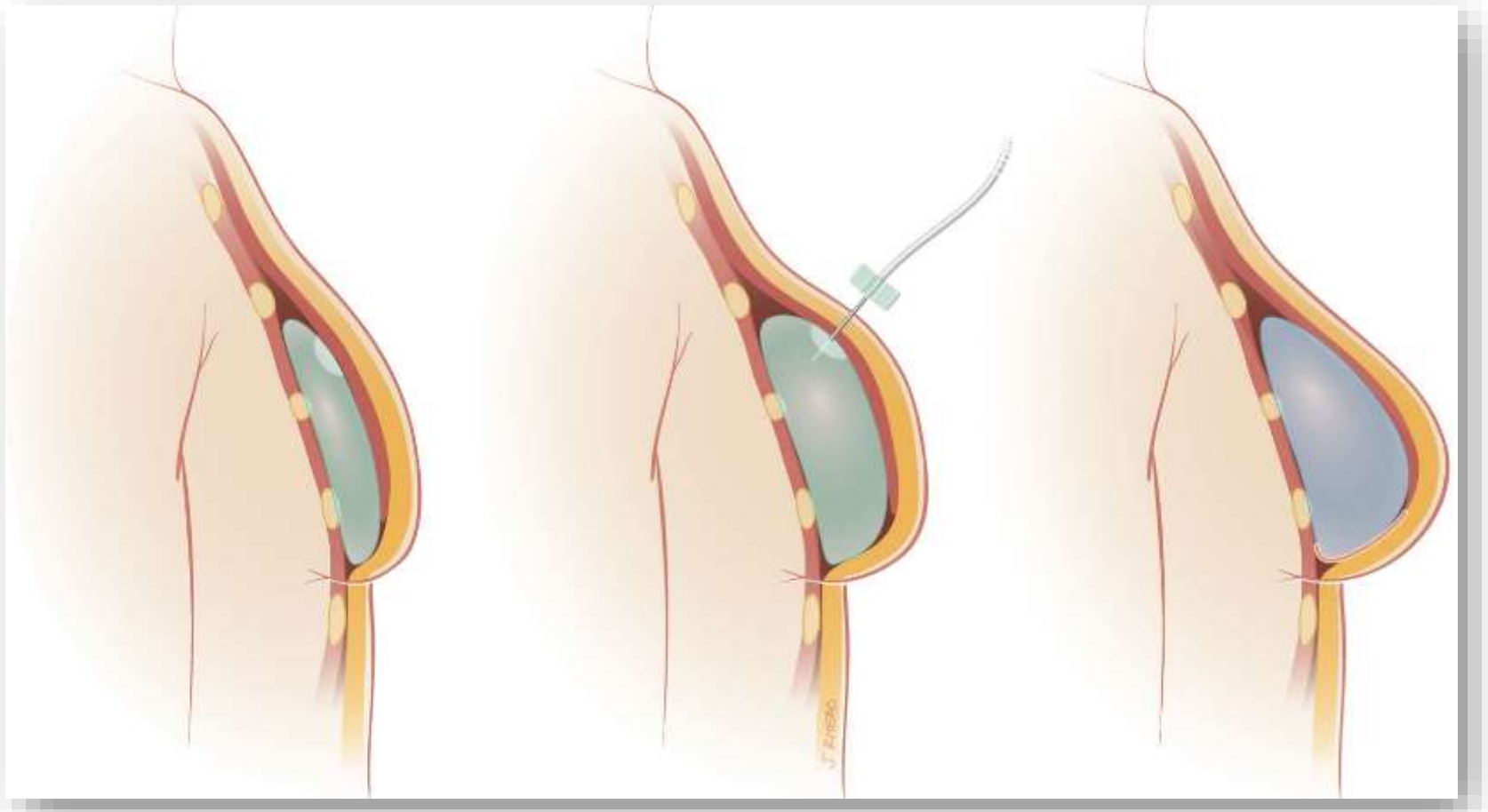


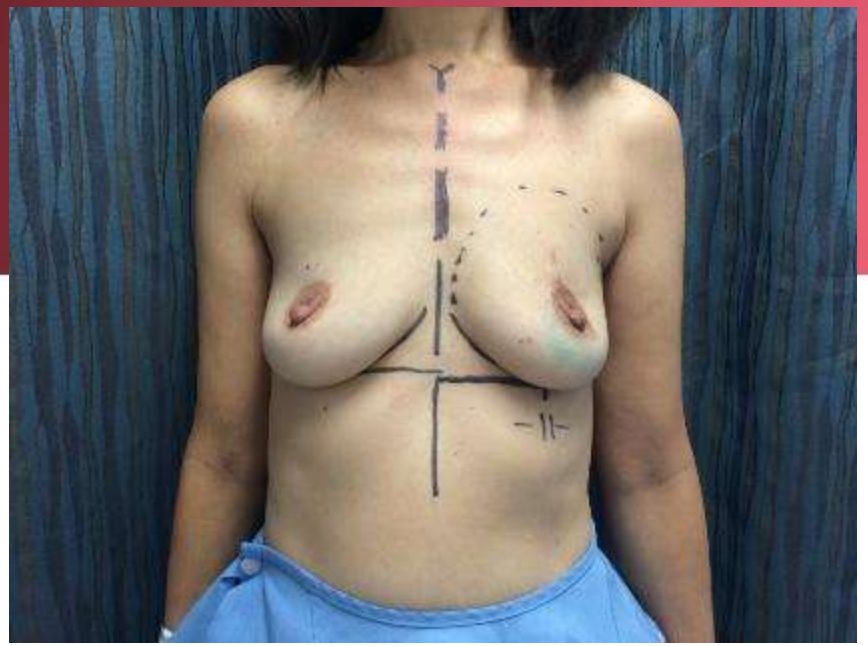


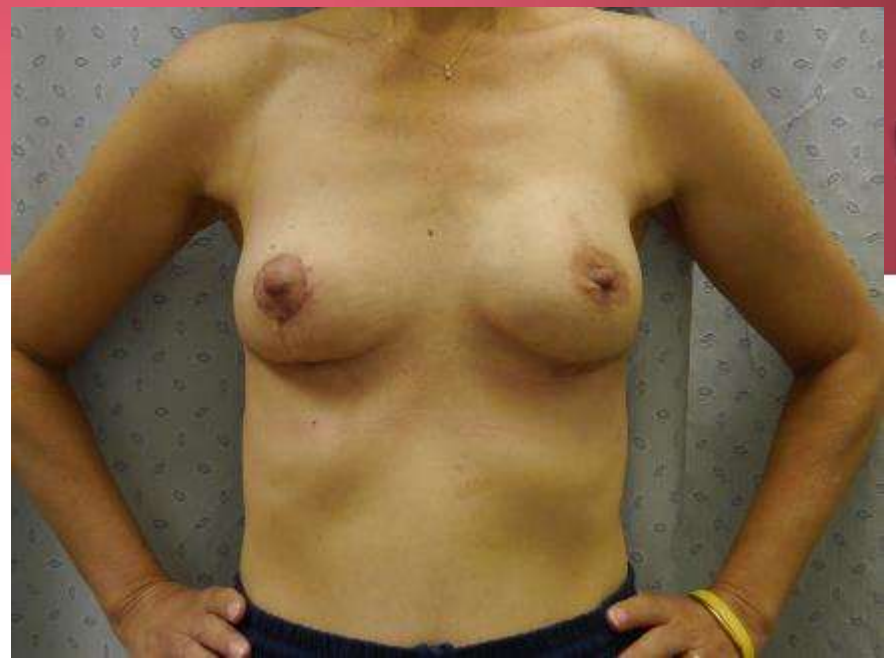


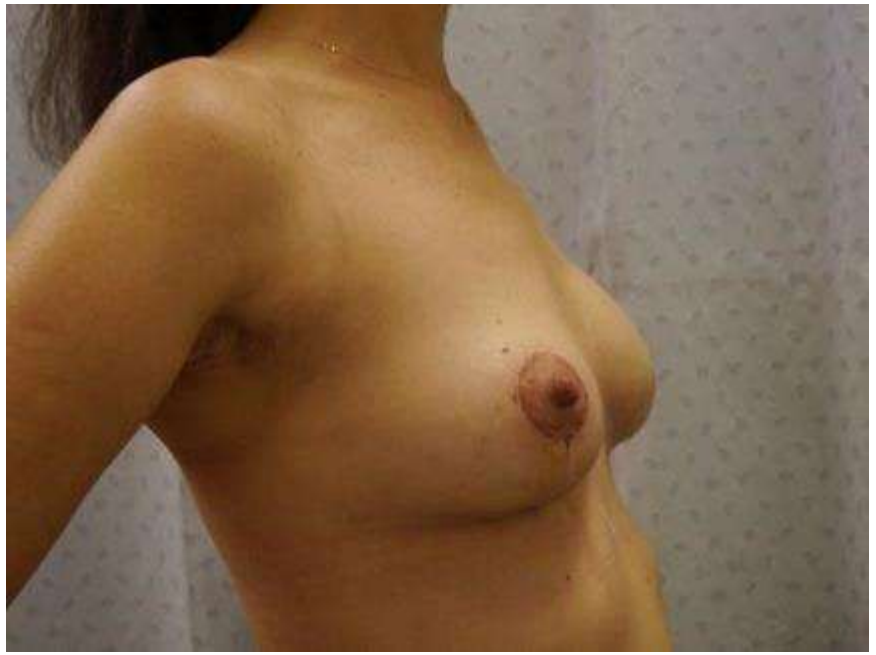


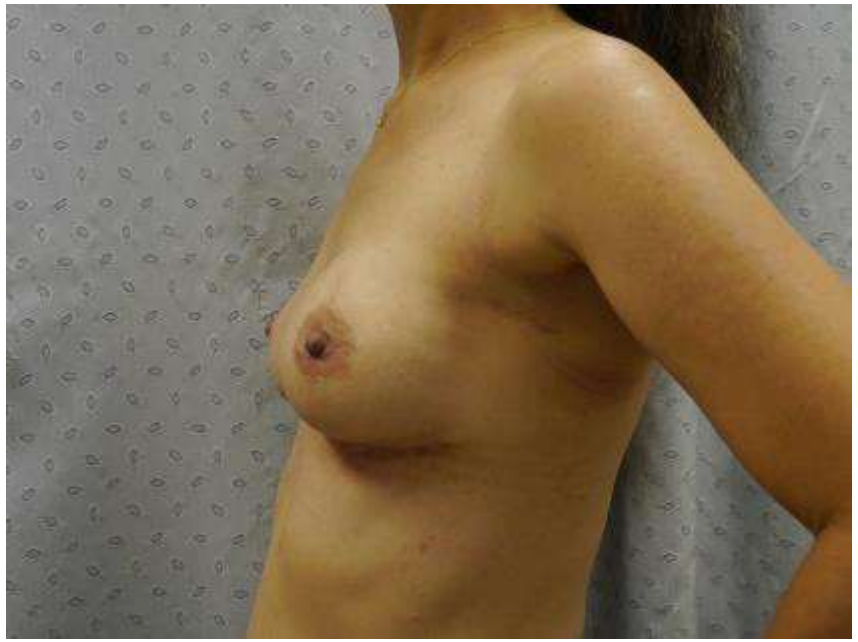
Implant Reconstruction

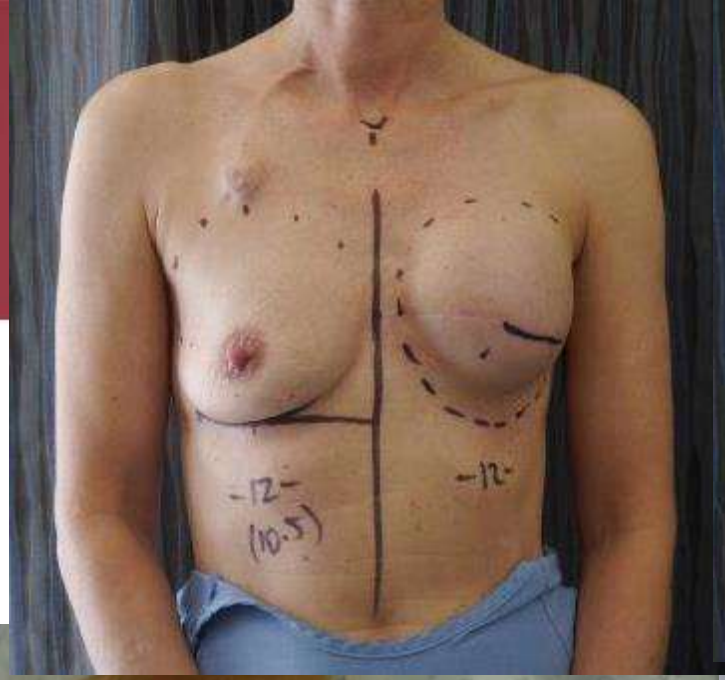








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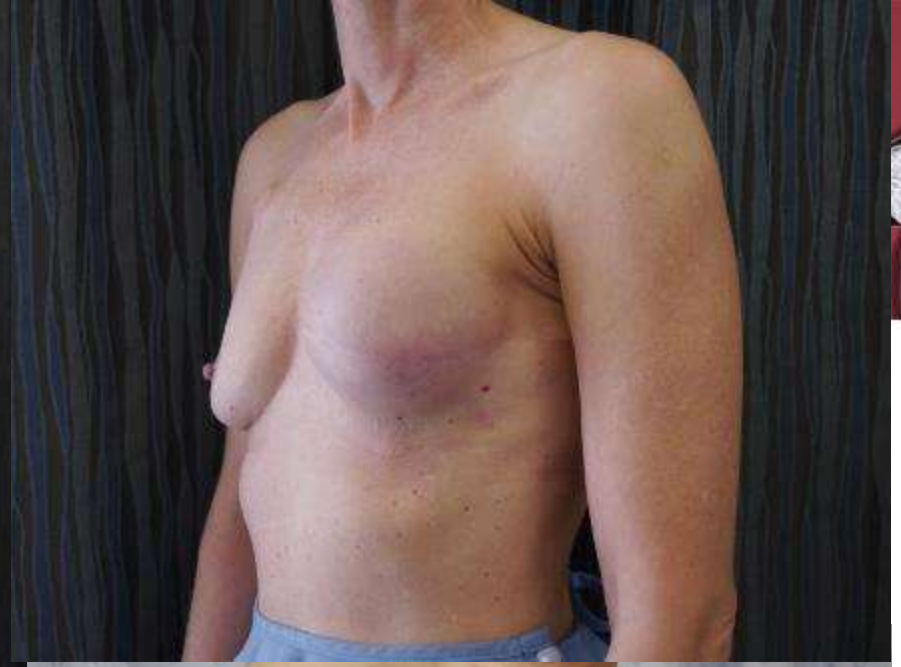
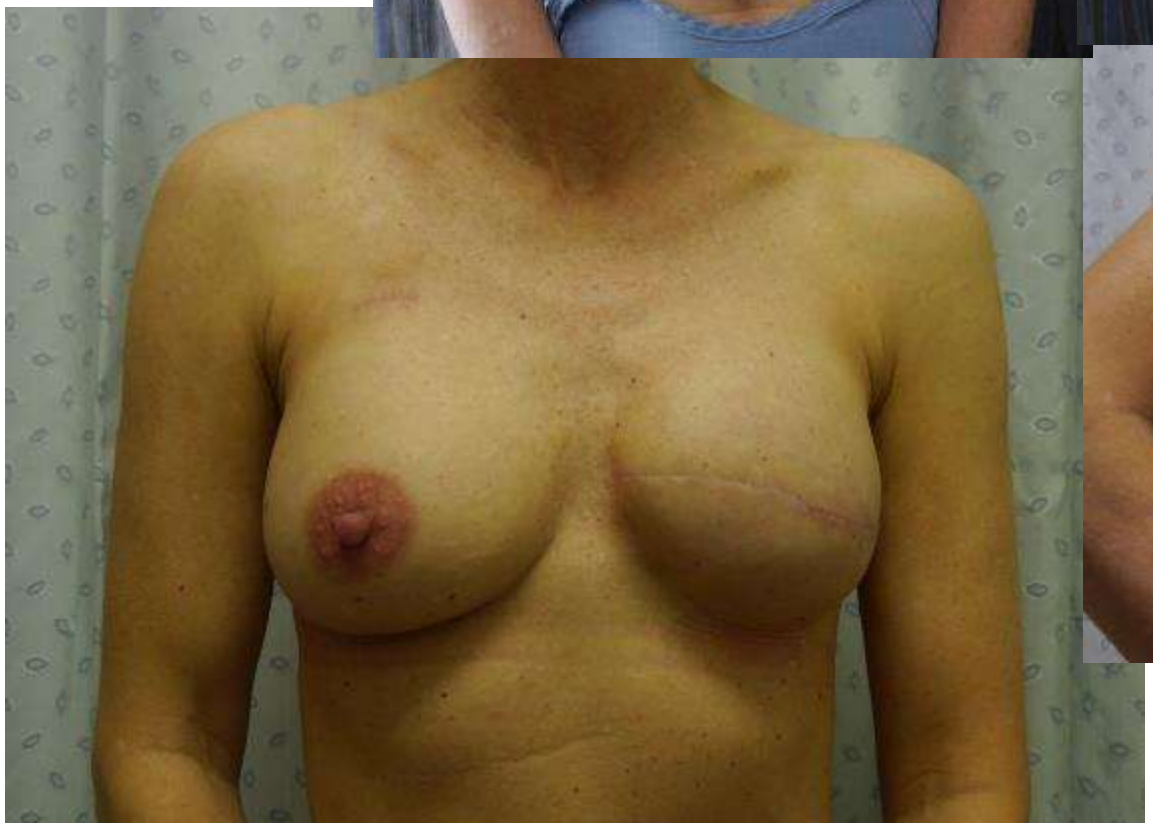
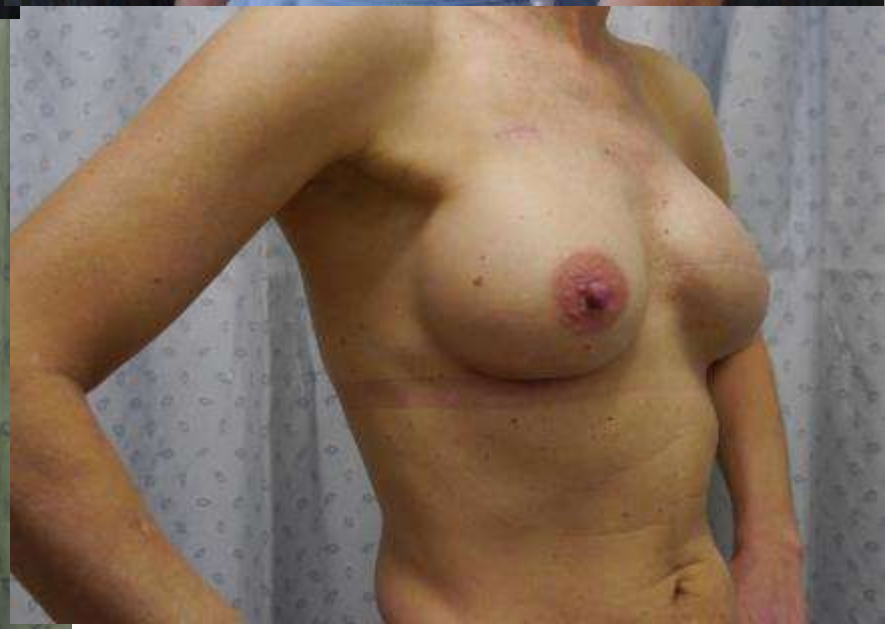
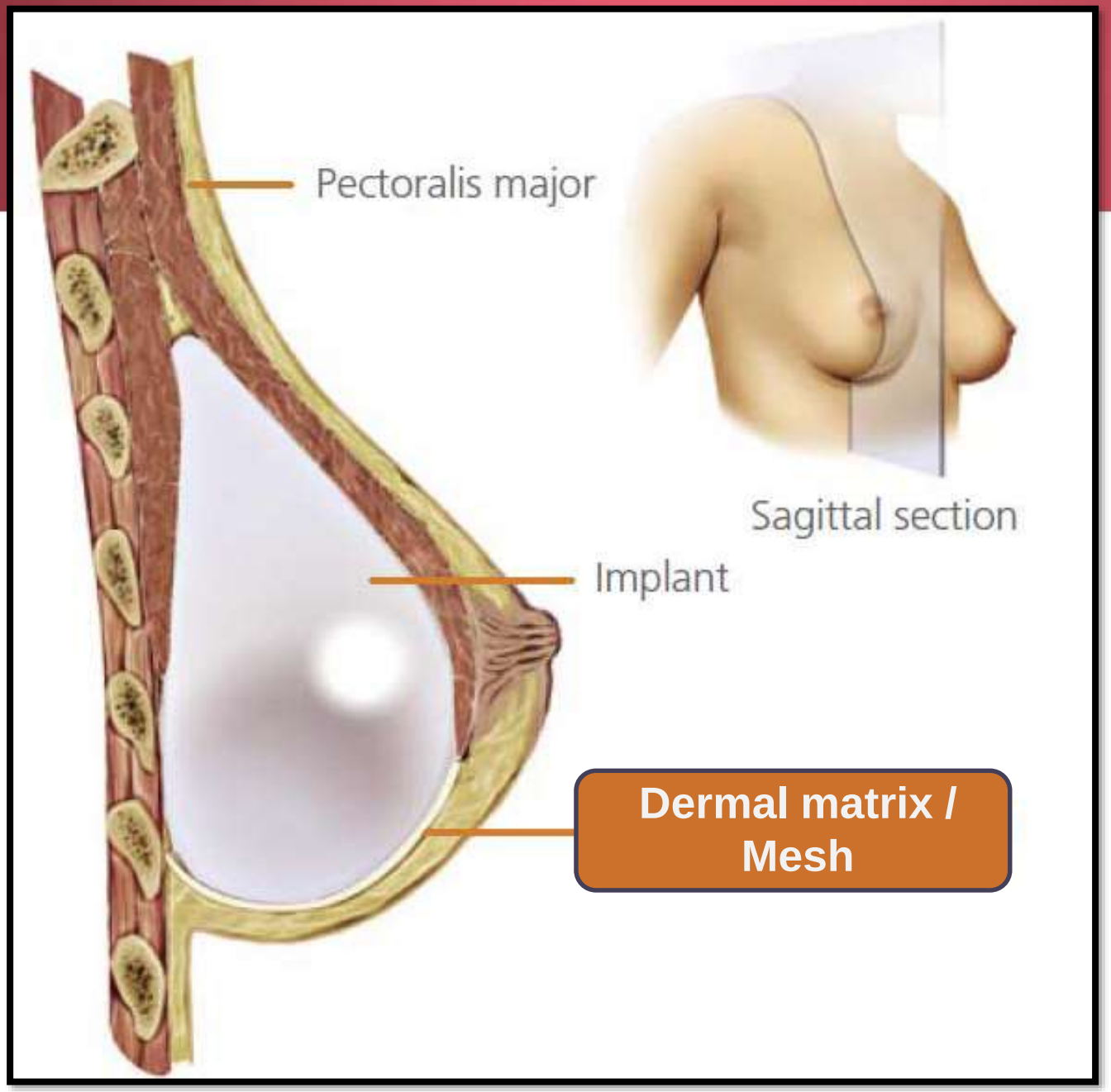
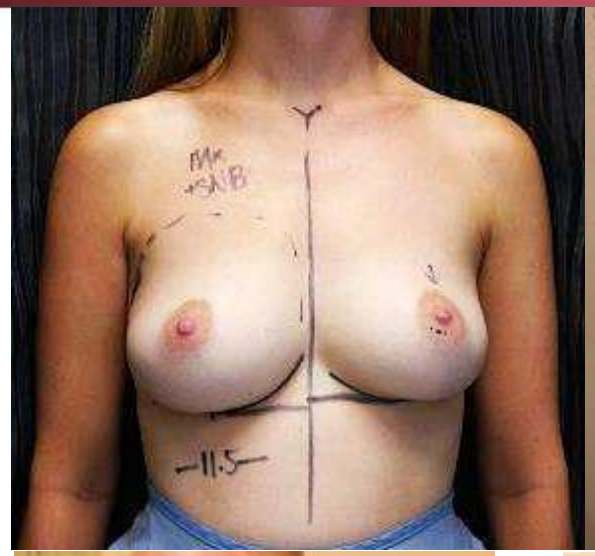


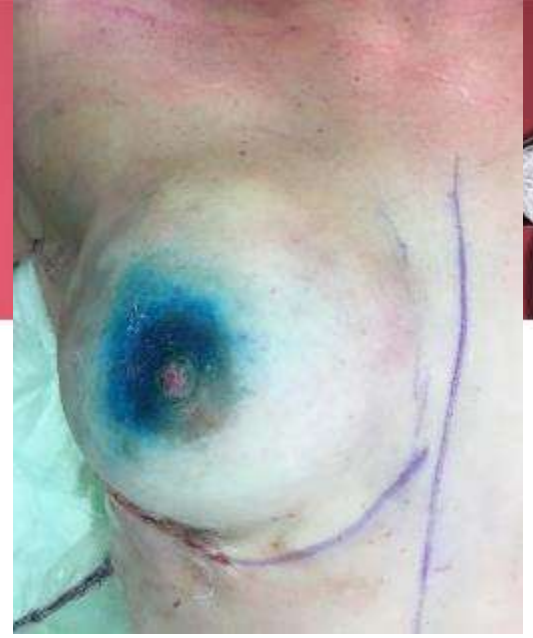




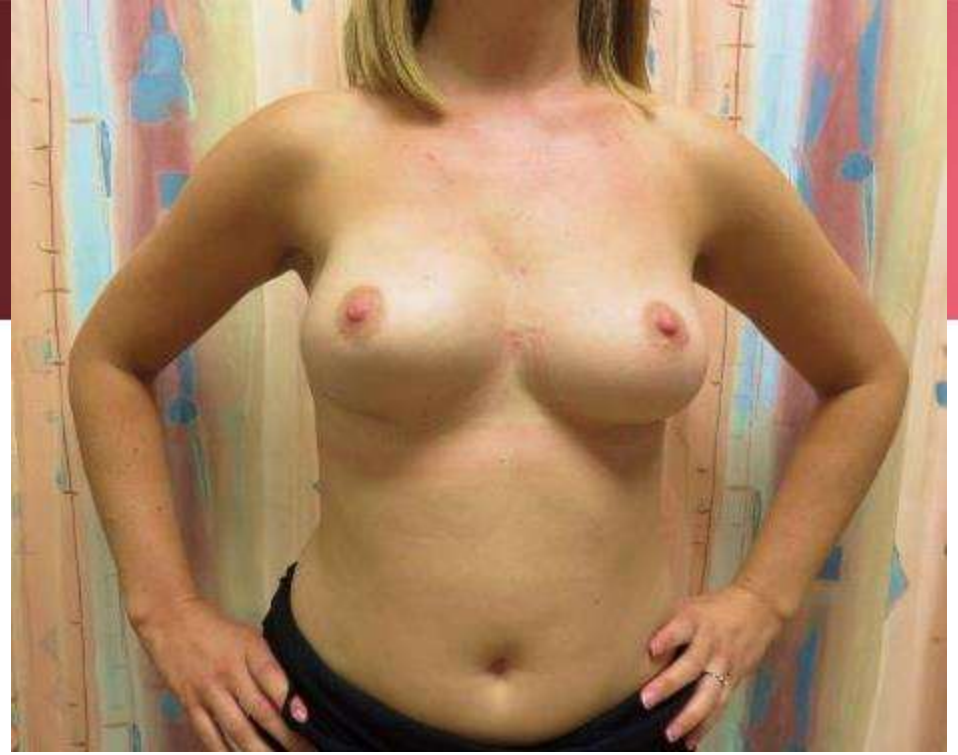
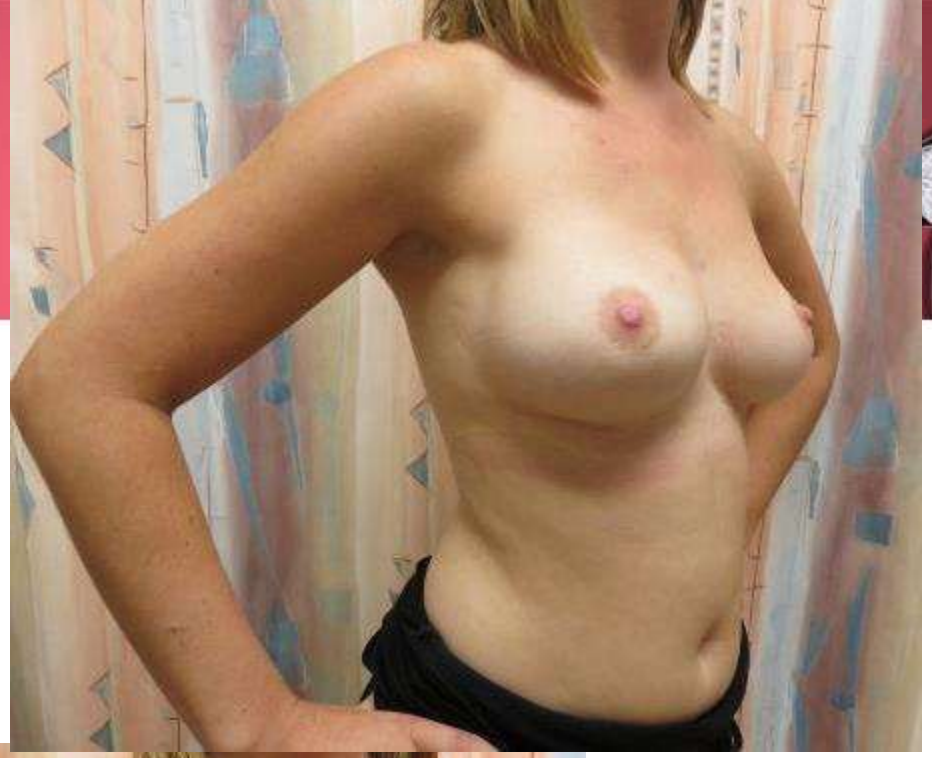

Pectoralis major
Sagittal section
Implant
Dermal matrix / Mesh

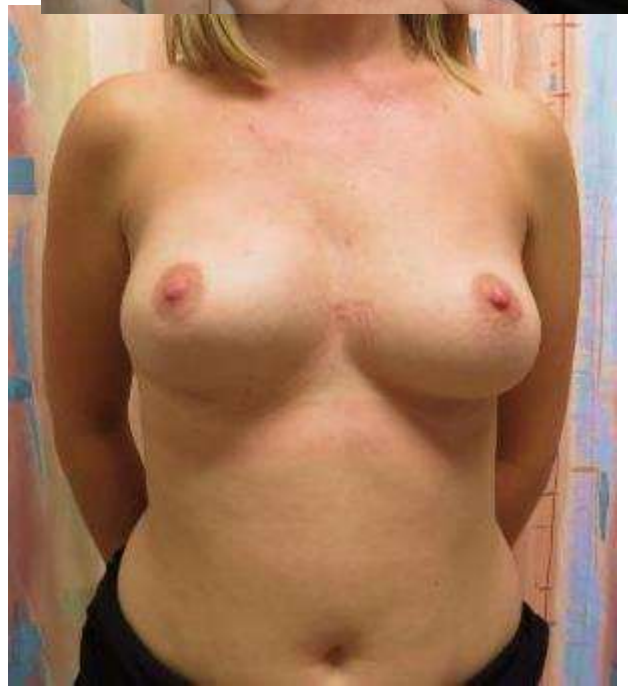
NSM DTI – MX125-370g



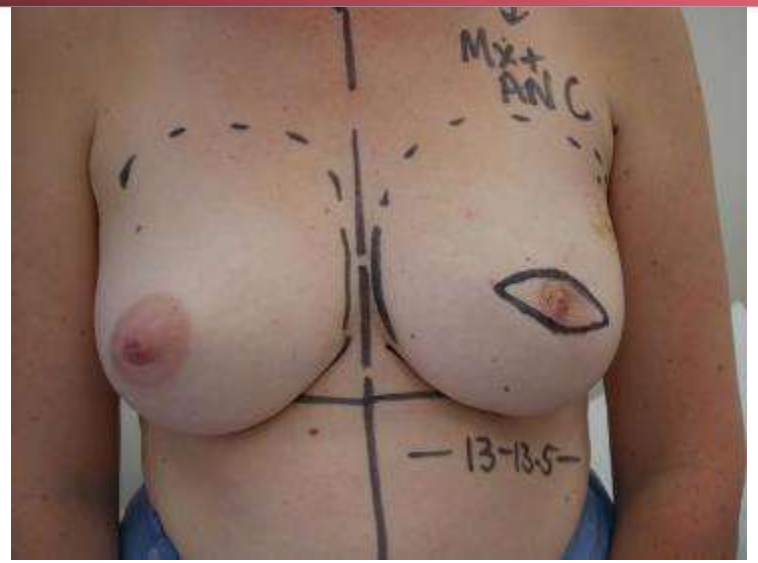


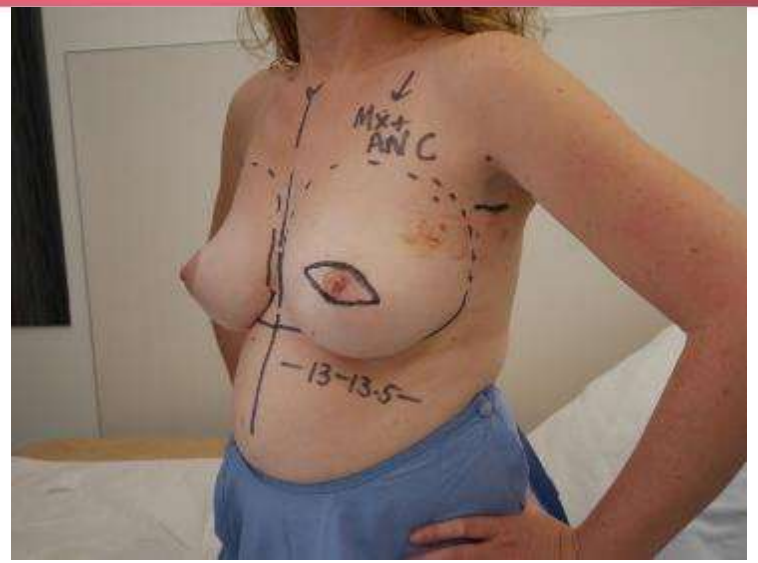
- 32yr nurse
- R breast mass
- 35gm DCIS upper outer quadrant
- Clear margins
- Hydrodissection
- DTI TigR mesh
- Clear margins

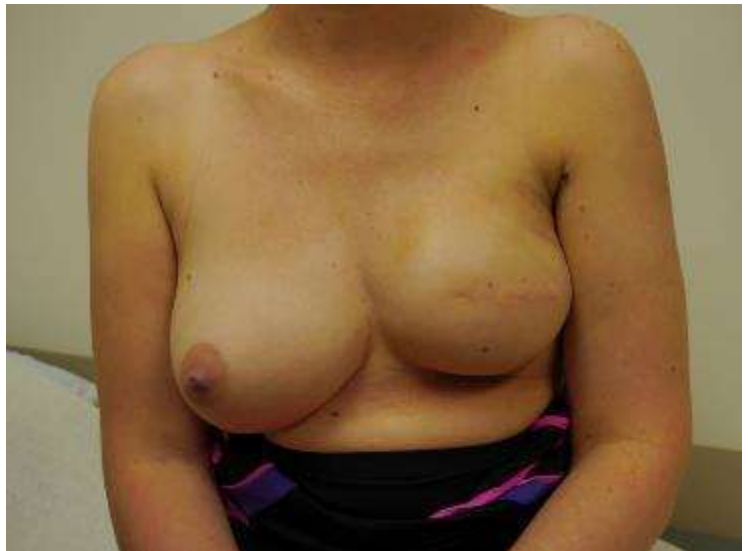



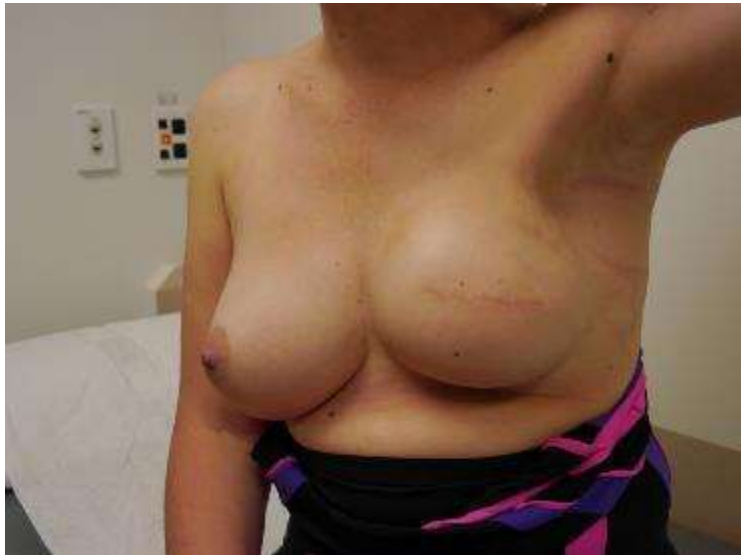



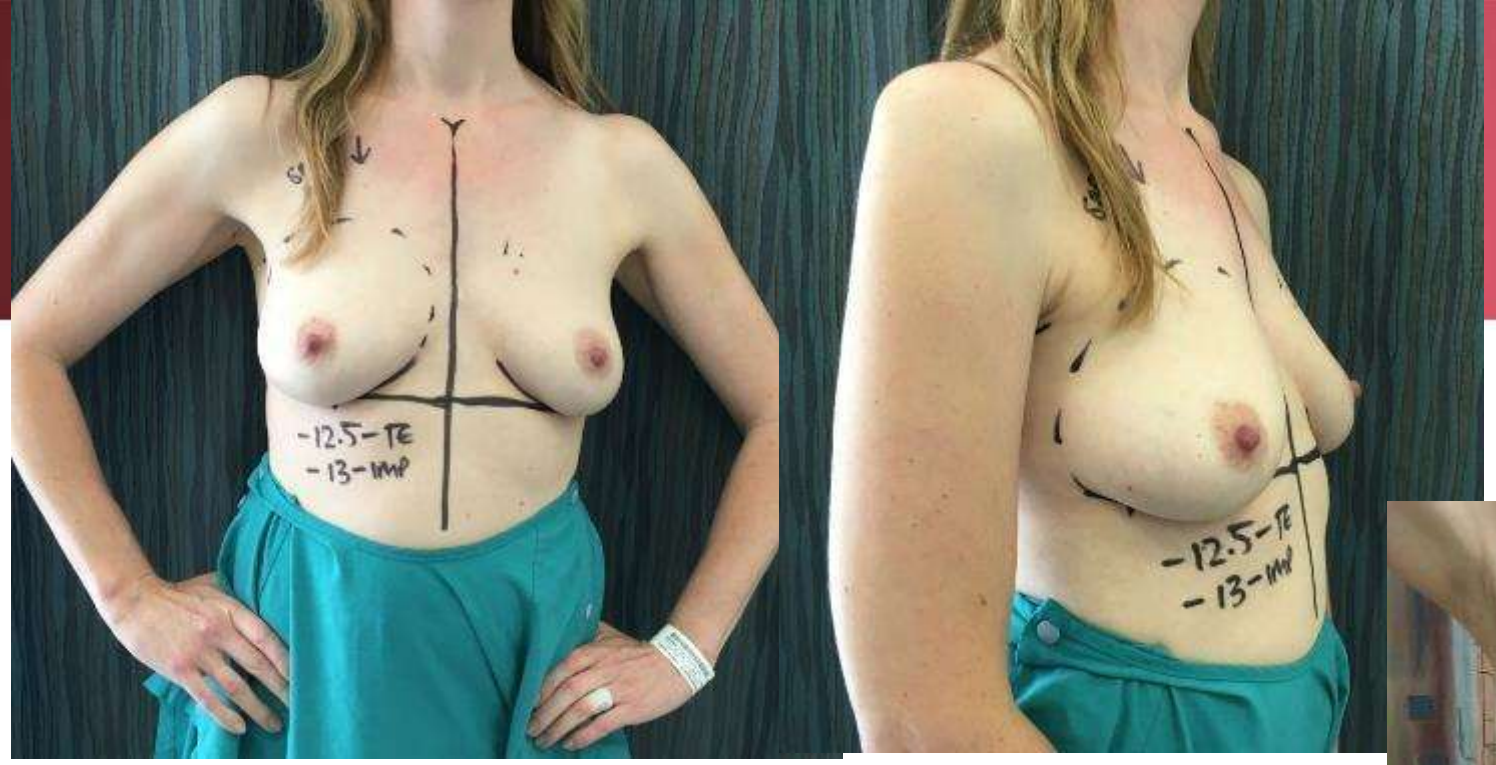
DTI w Biological mesh







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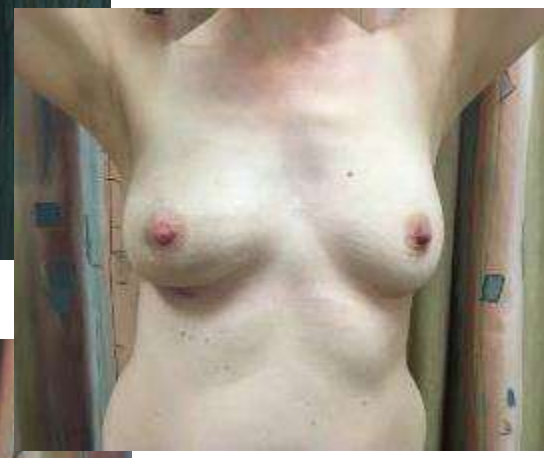
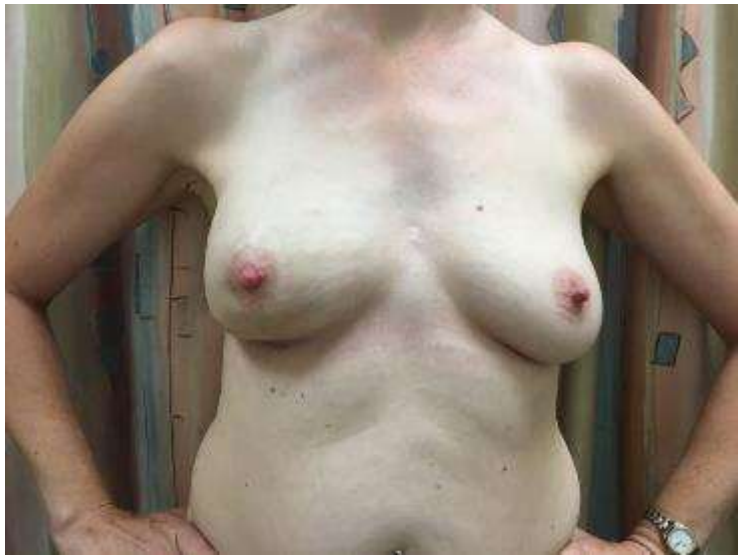
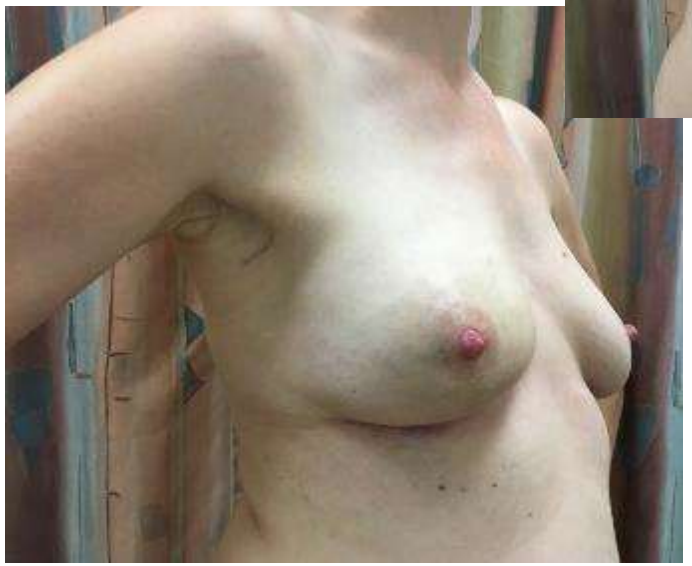
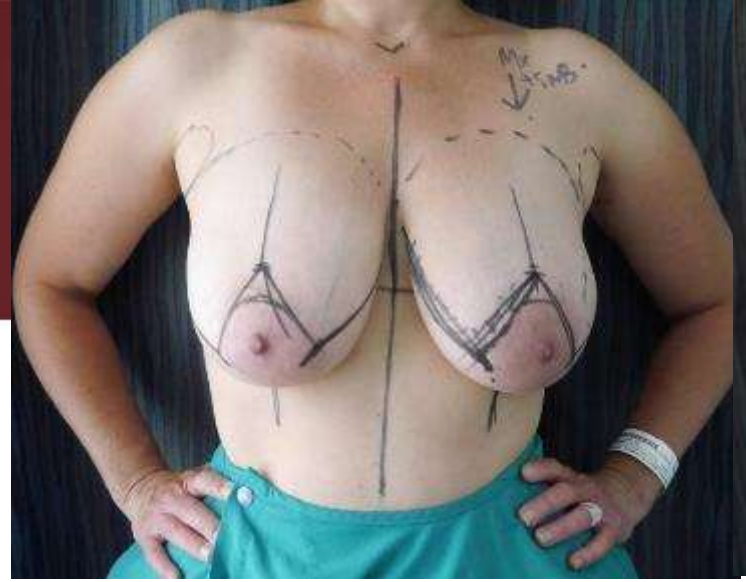
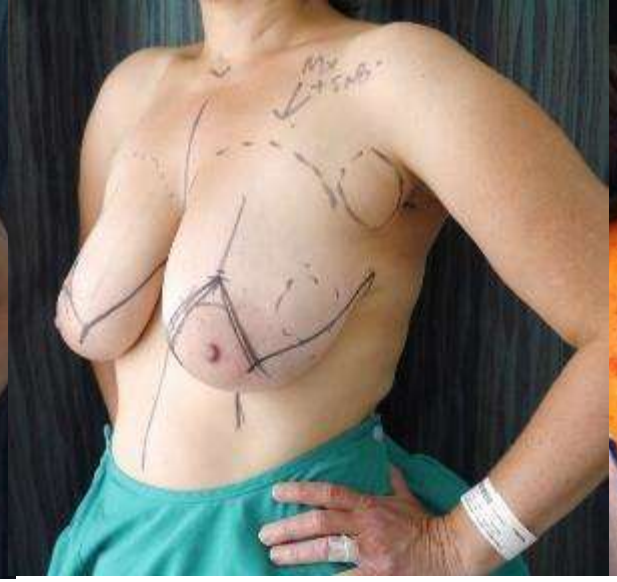
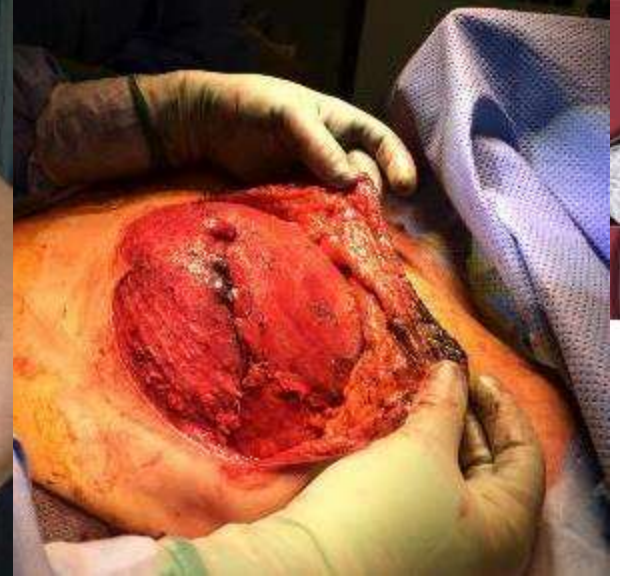
-13-IMP

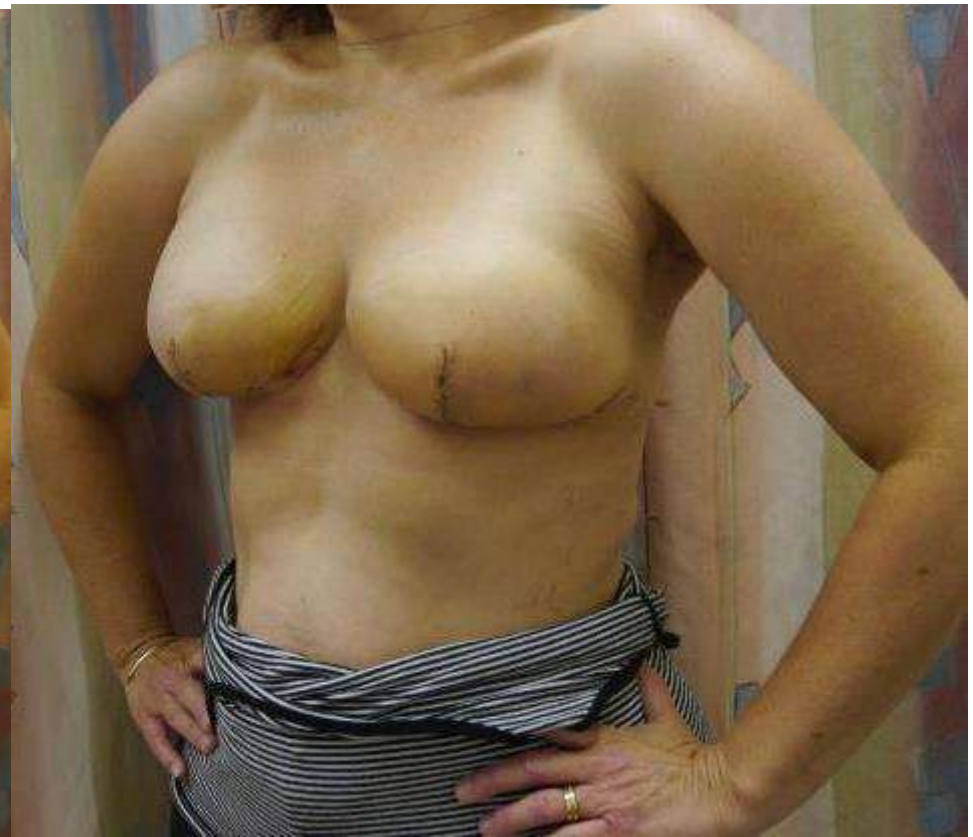
-12.5-TE
-13-IMP

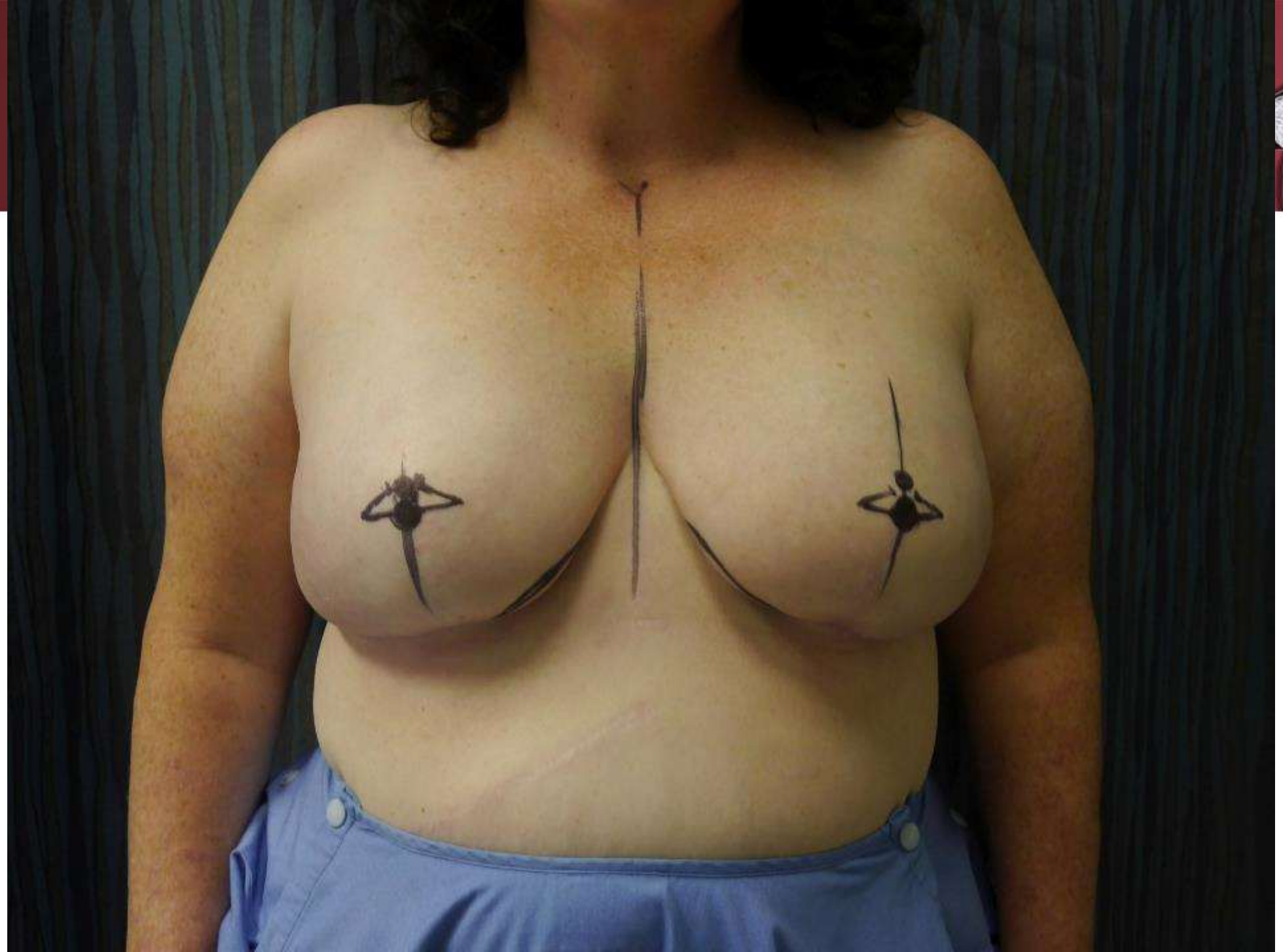




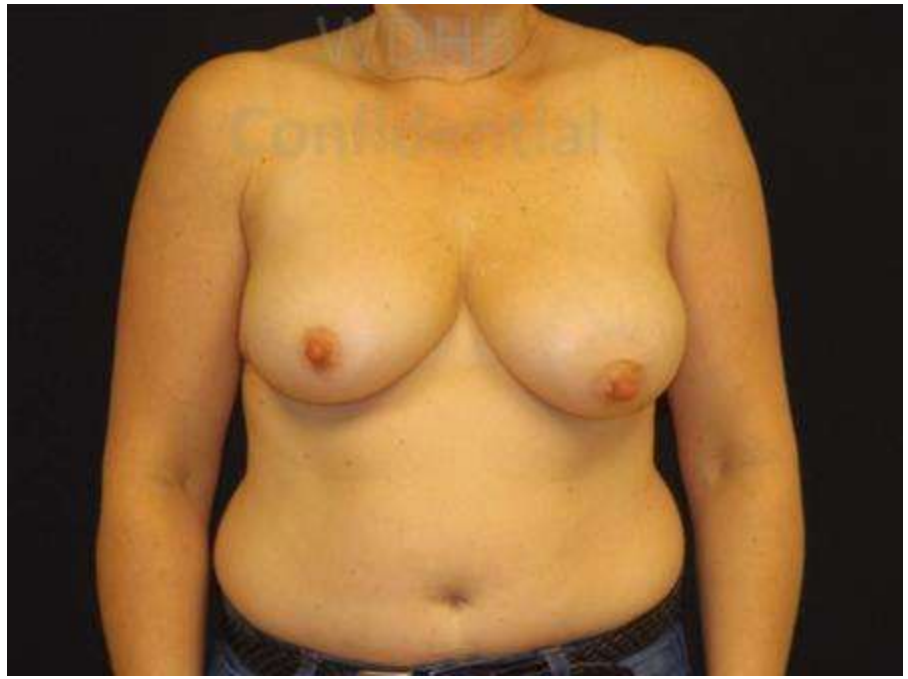


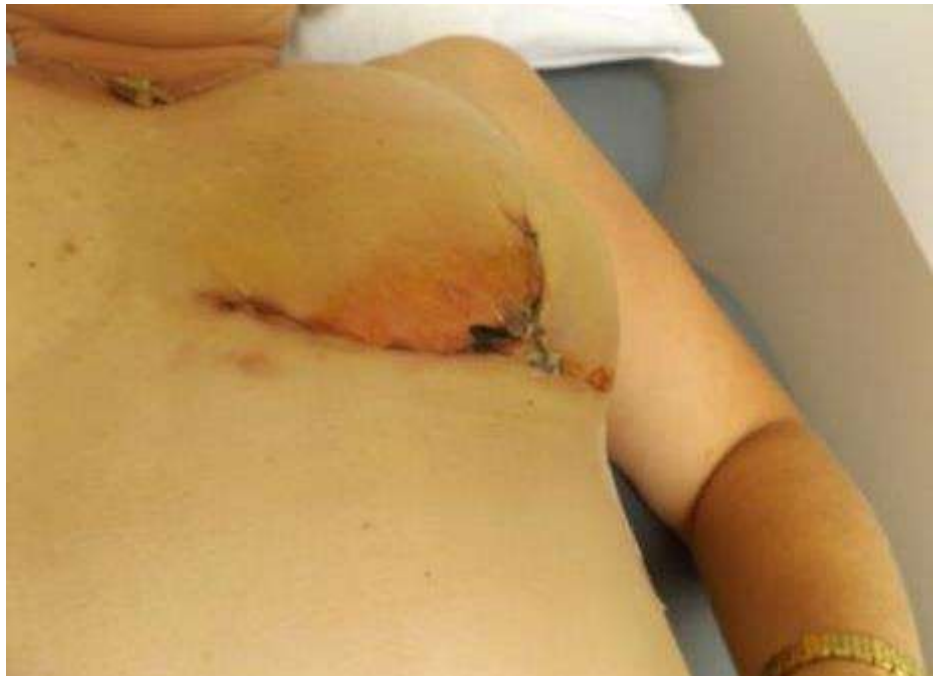




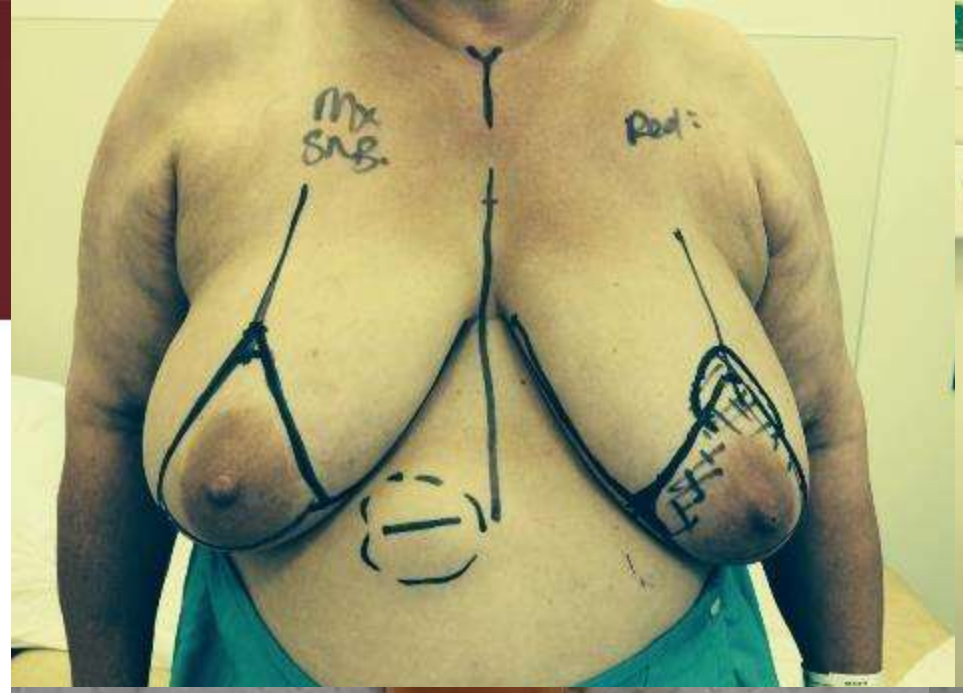





SSMx Wise pattern & TE



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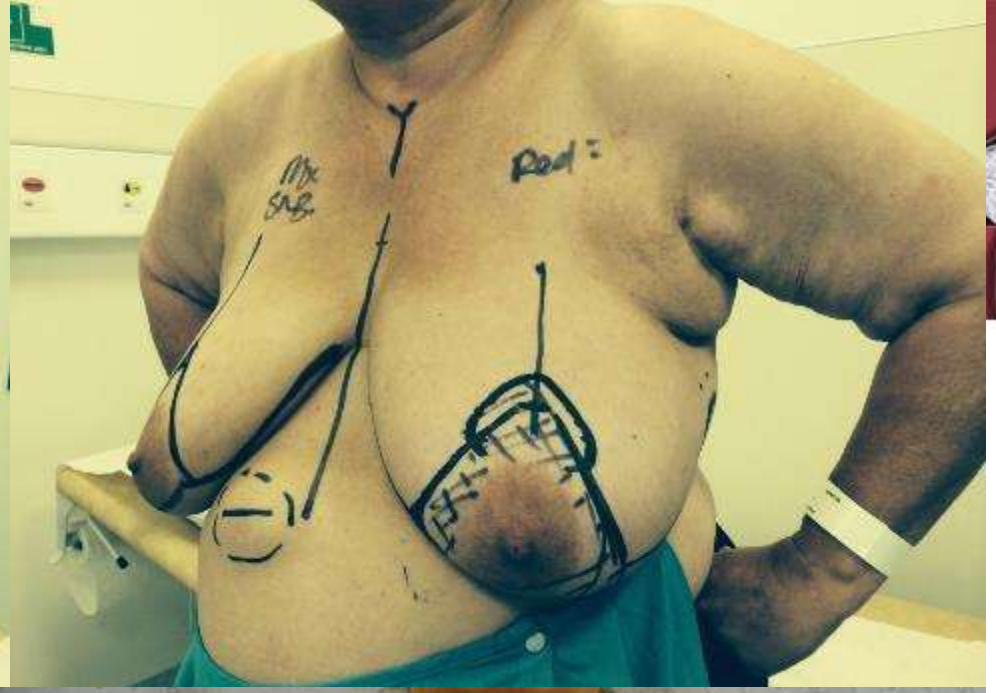
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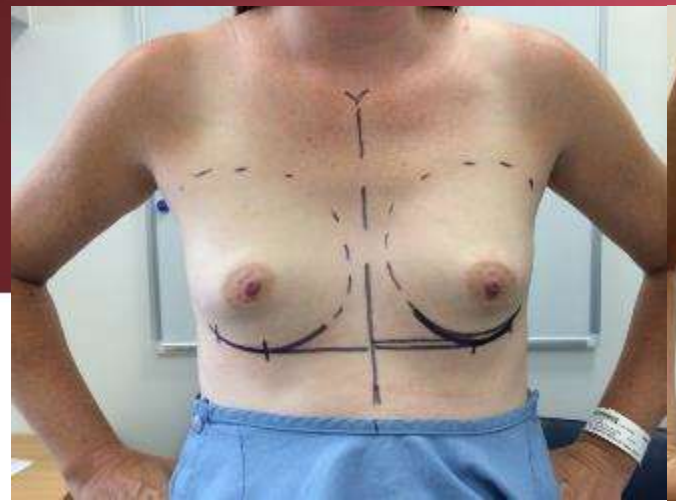
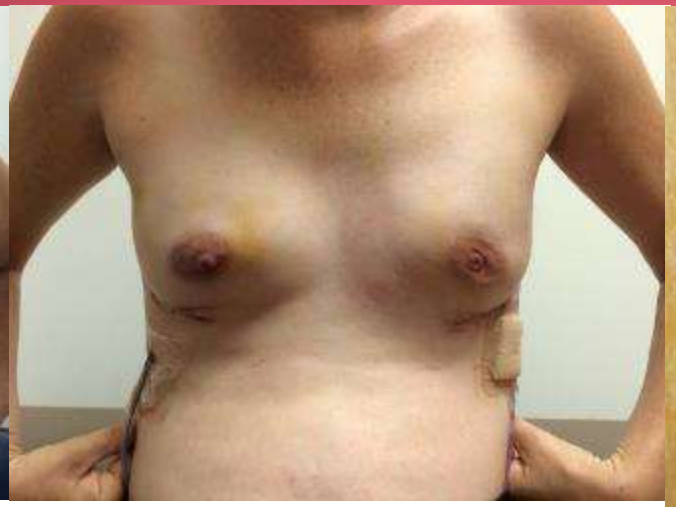
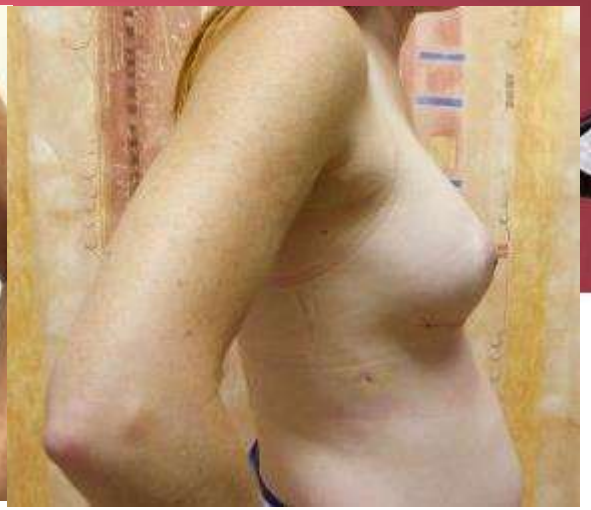
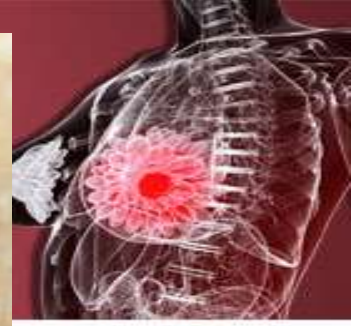
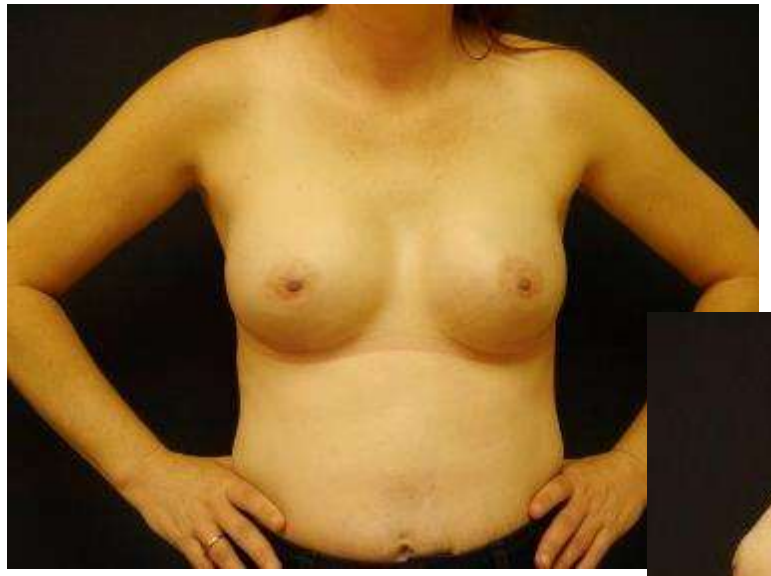
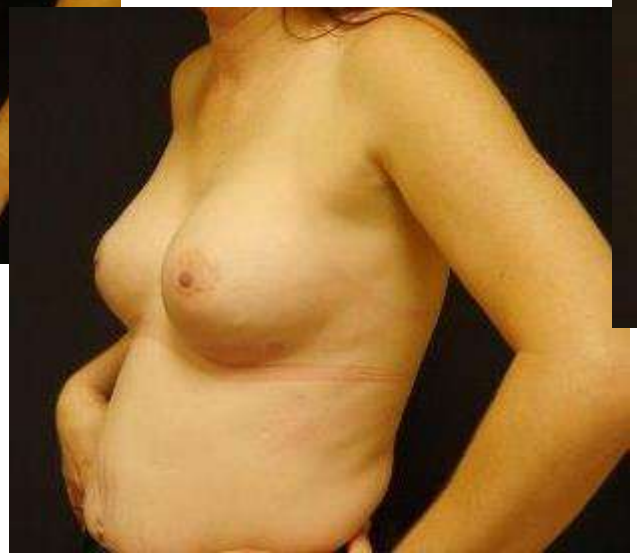
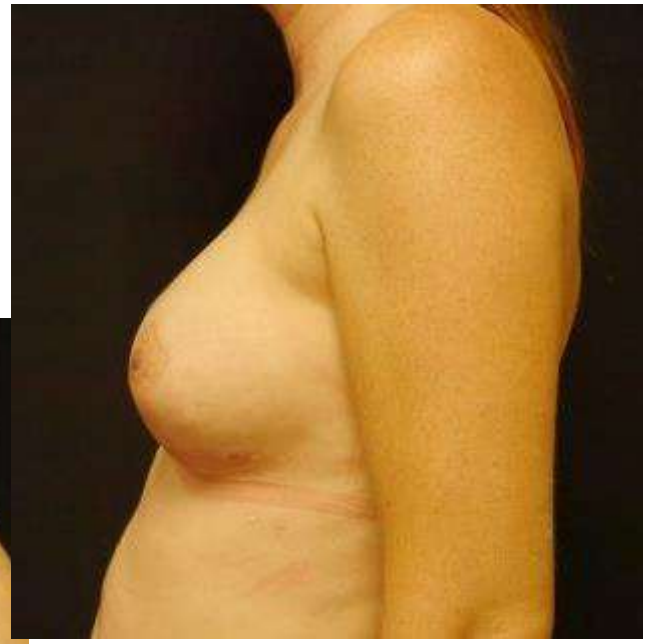
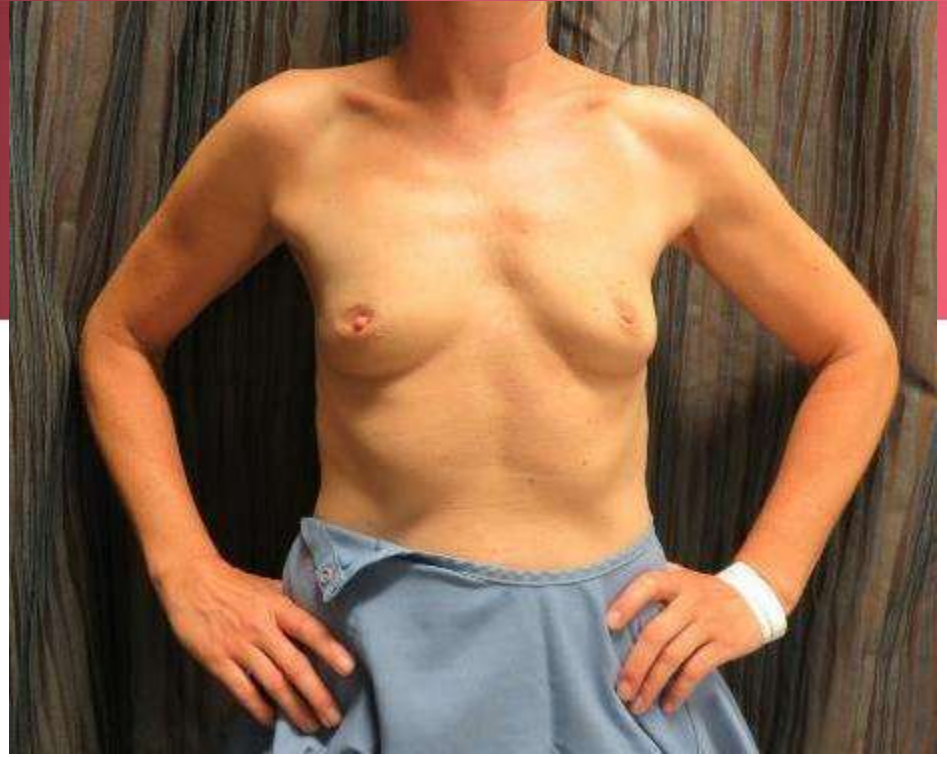
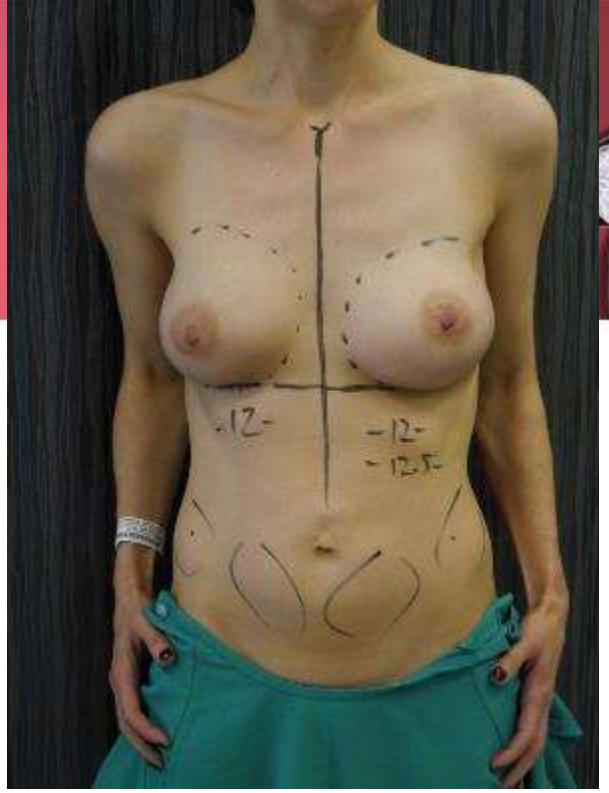
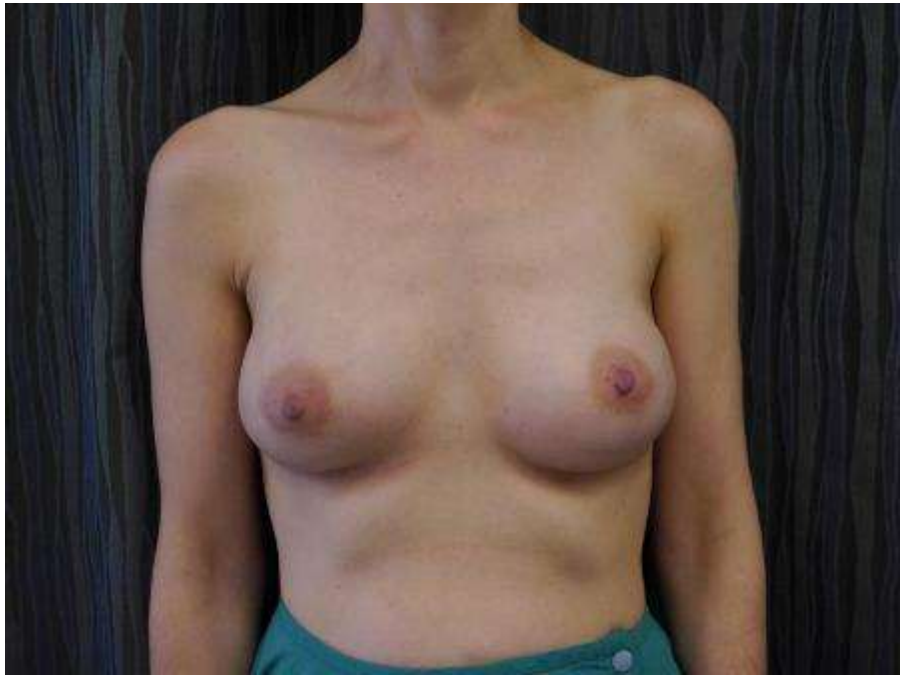
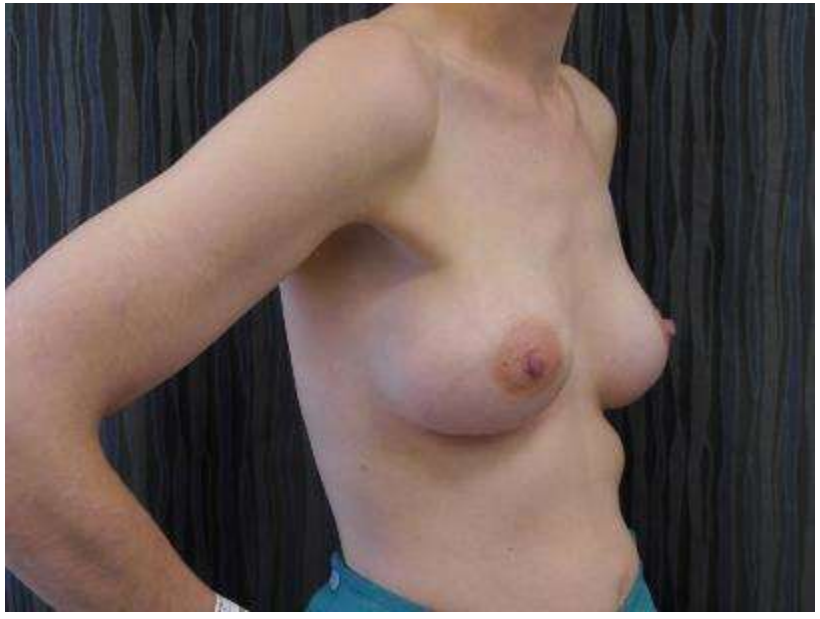
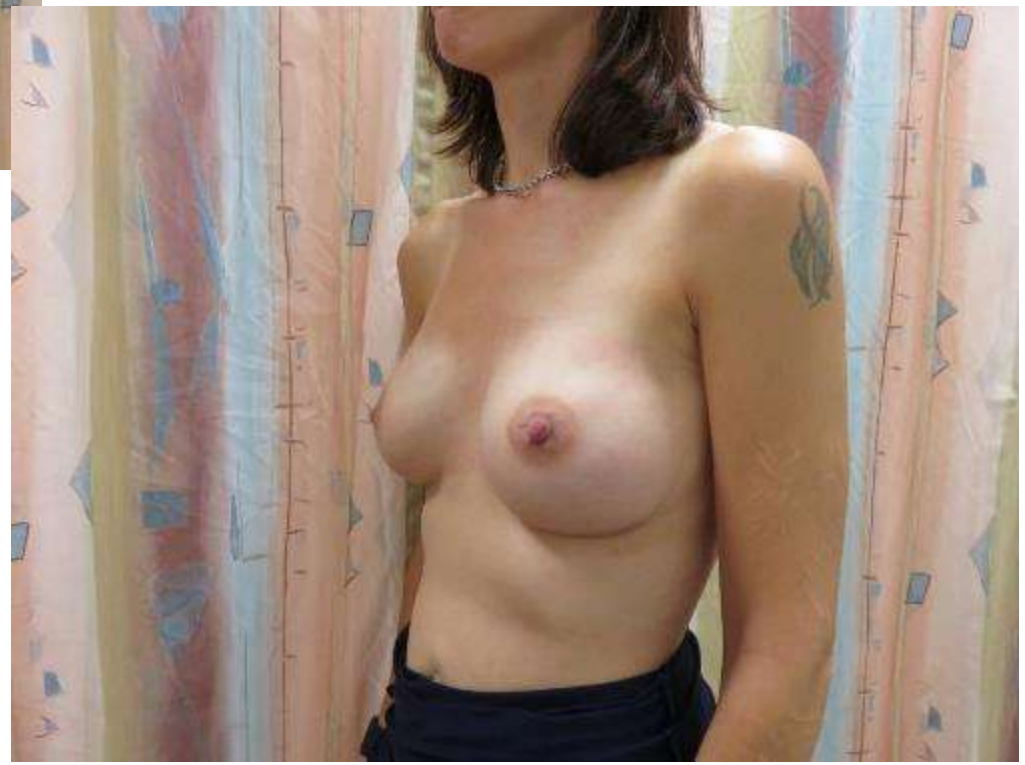








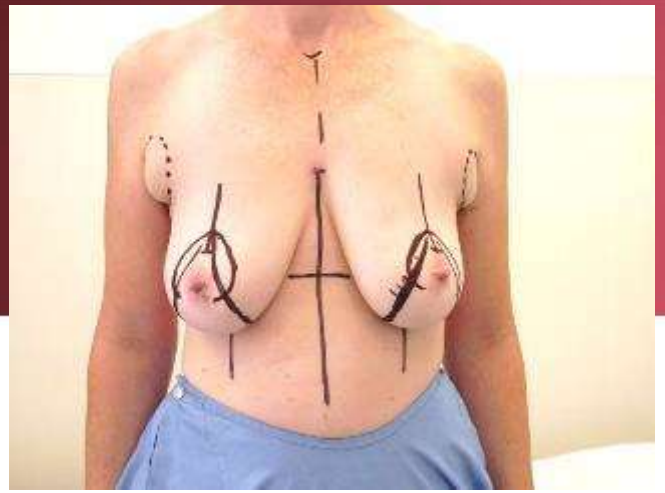


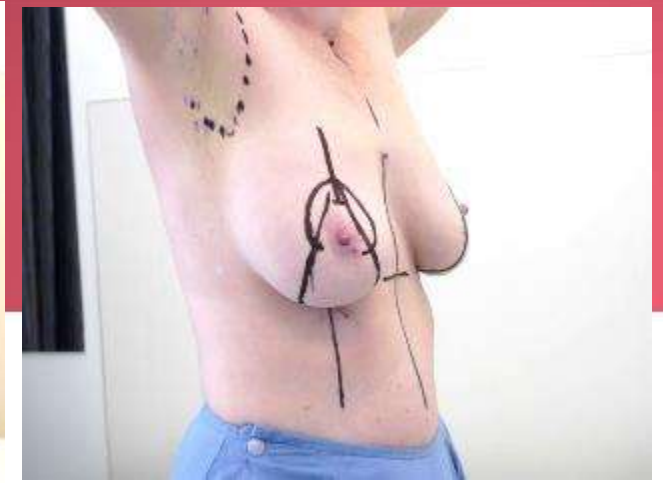


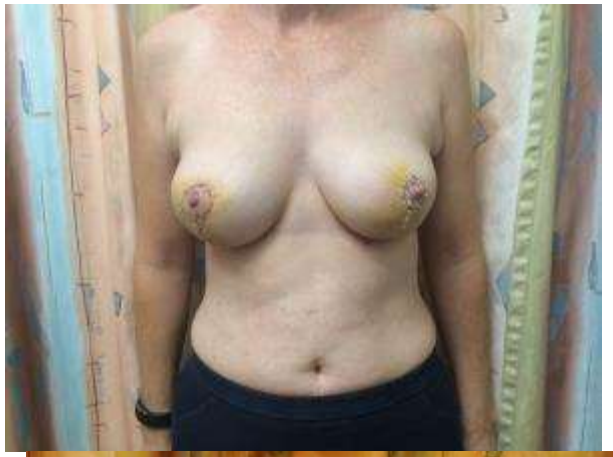


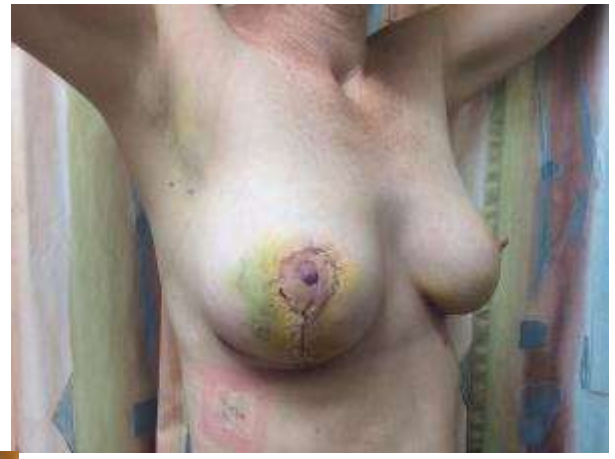


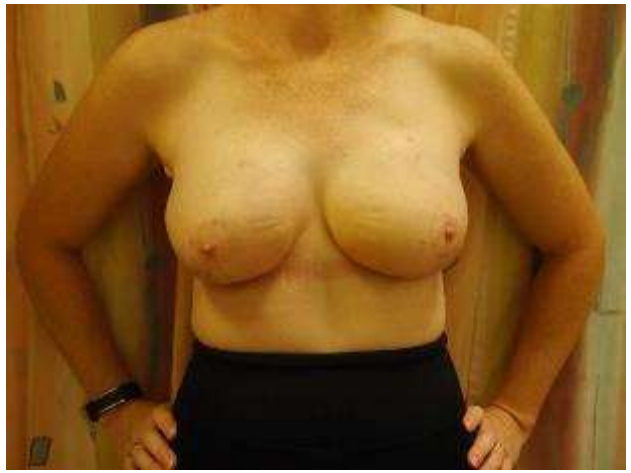


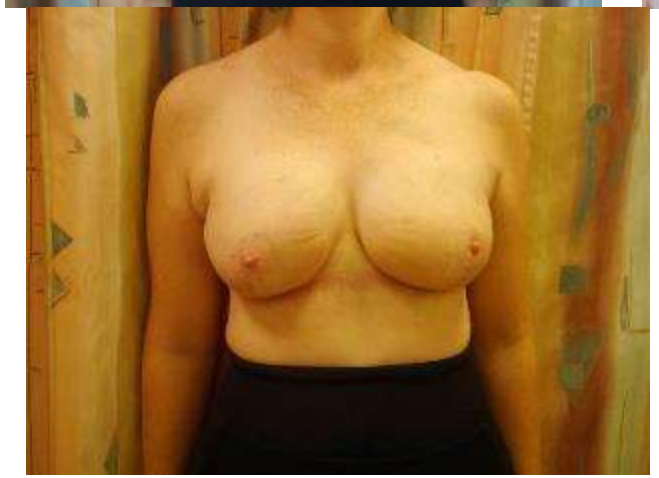




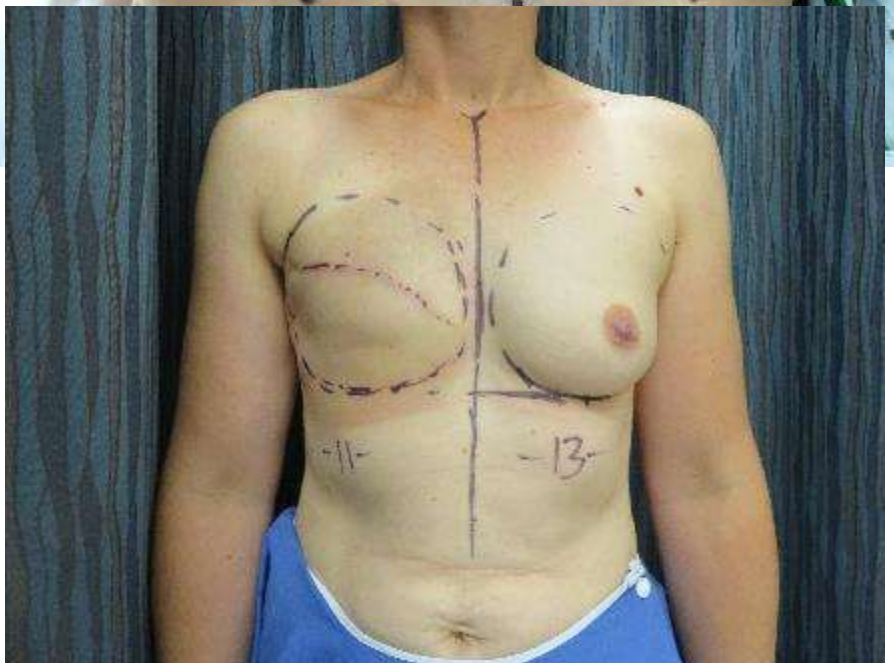


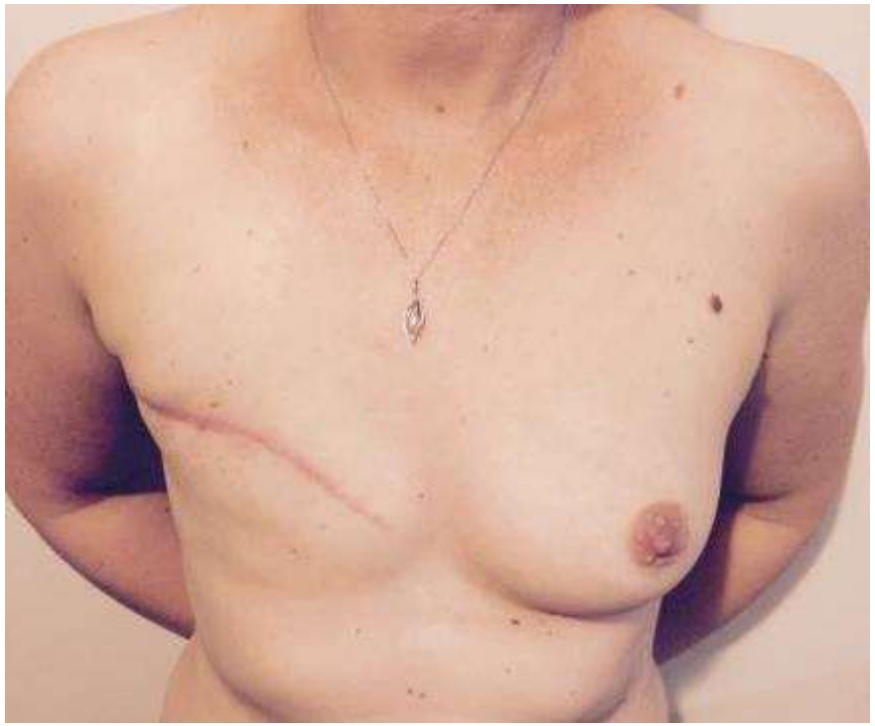


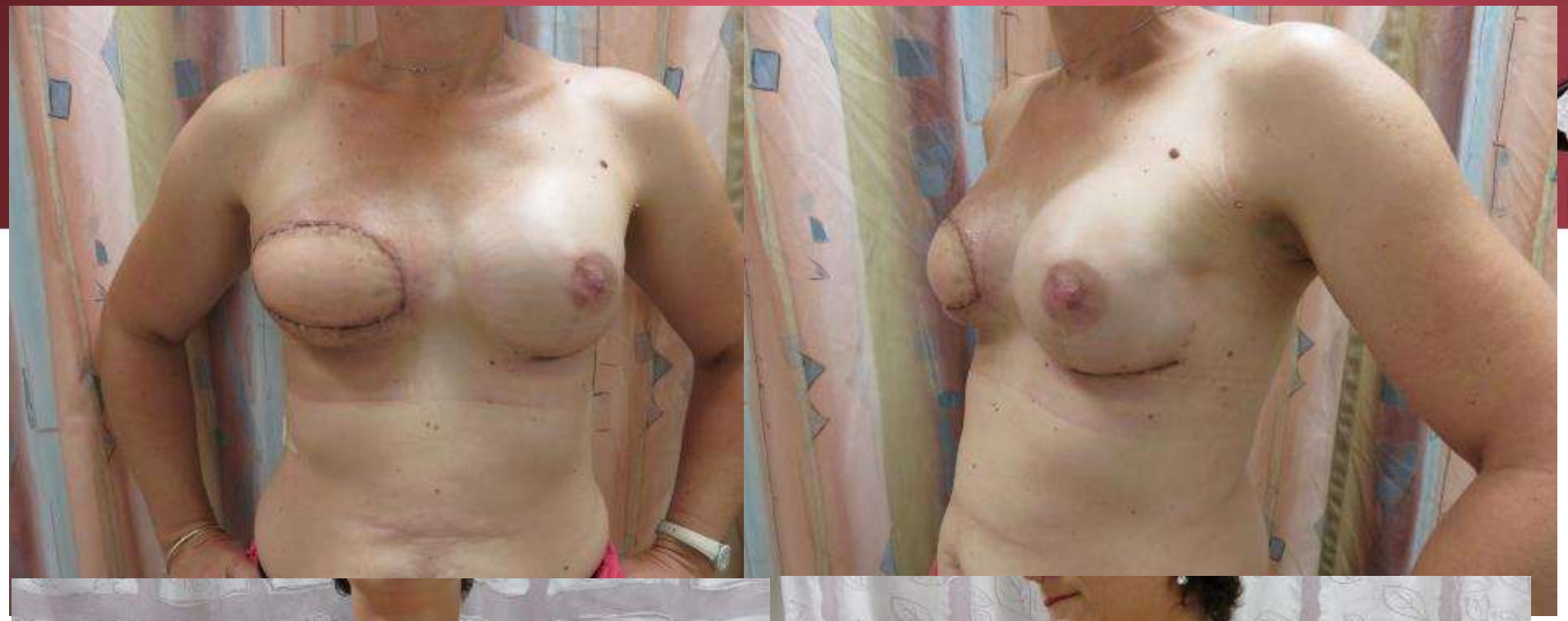


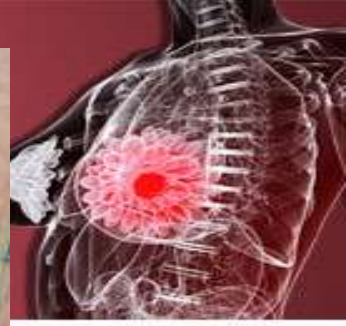


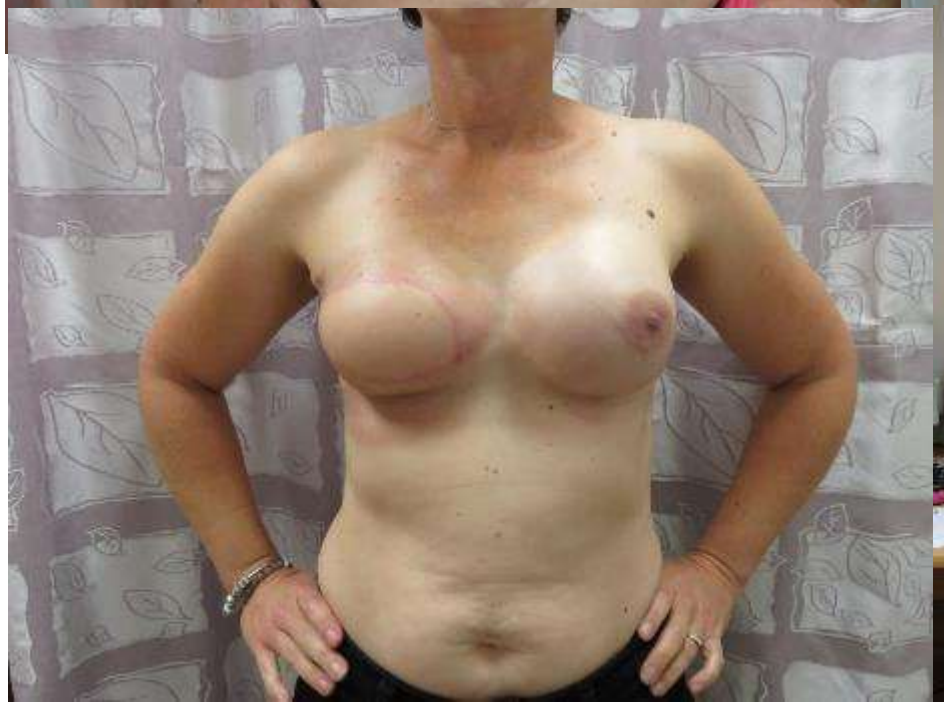
Modification for tumour margins

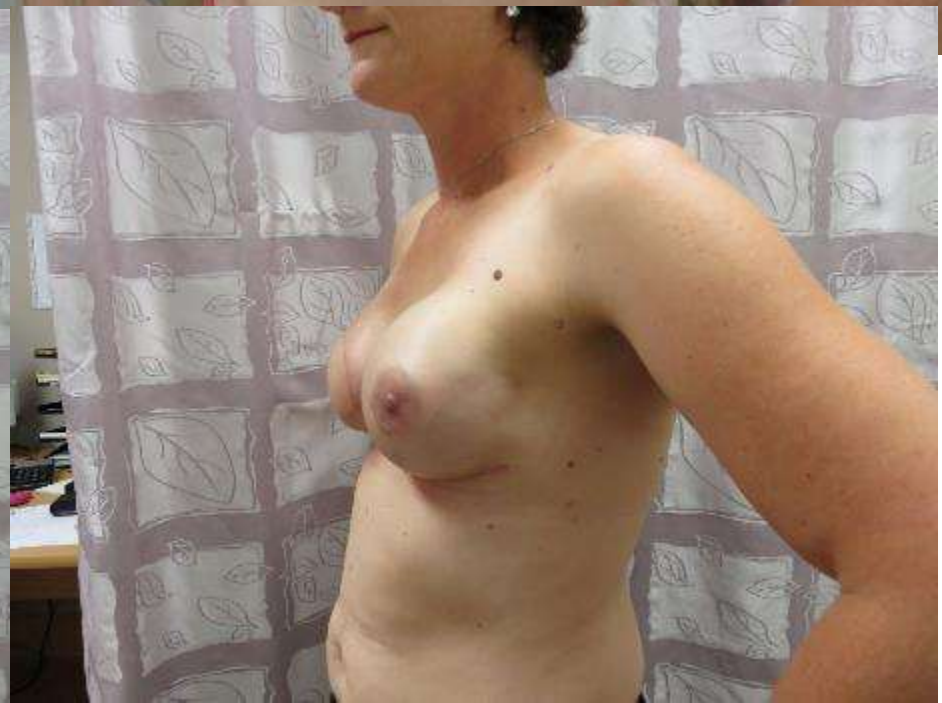




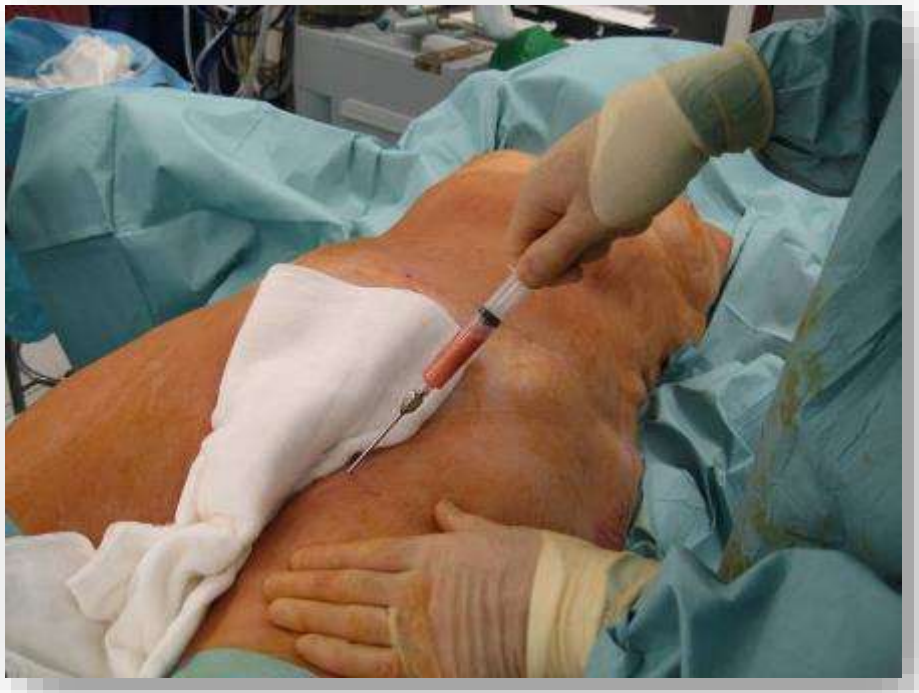


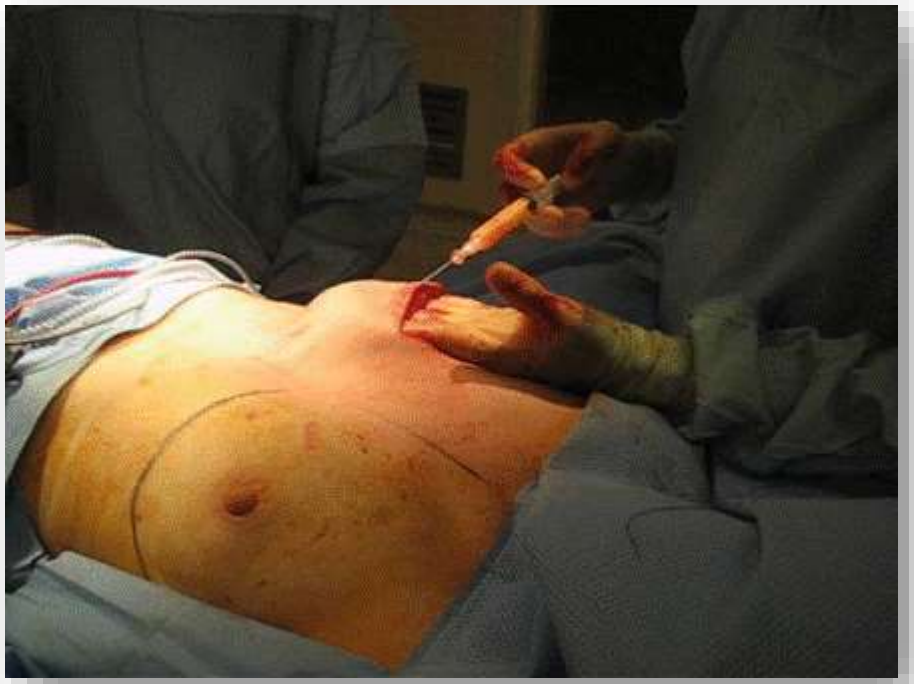


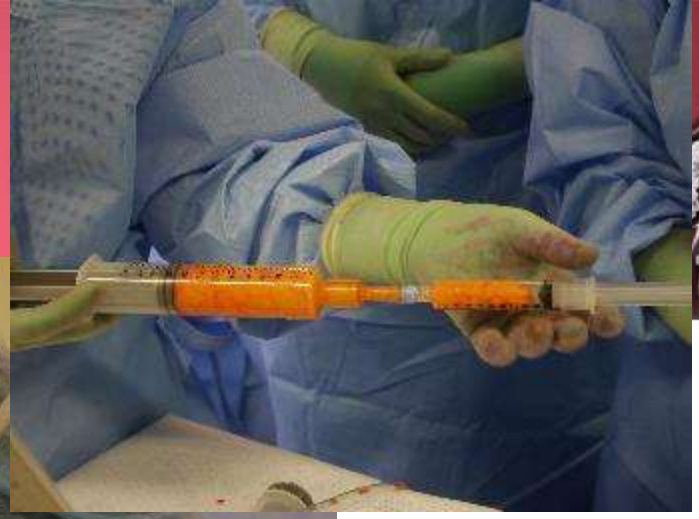


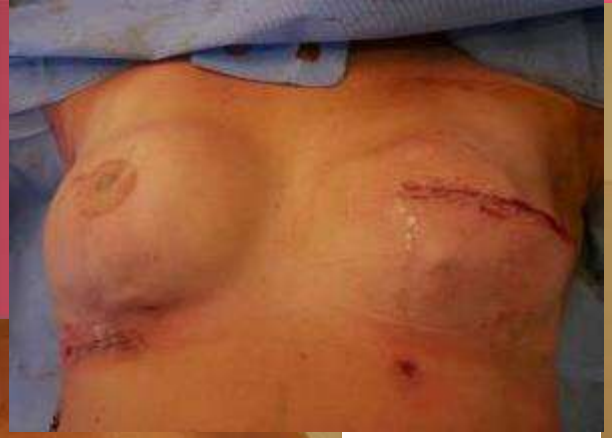


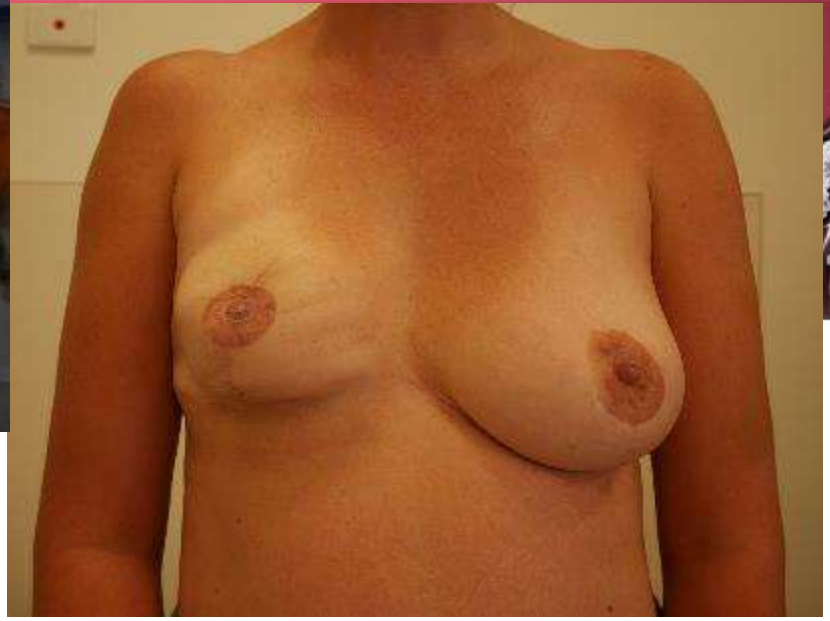
Fat grafting

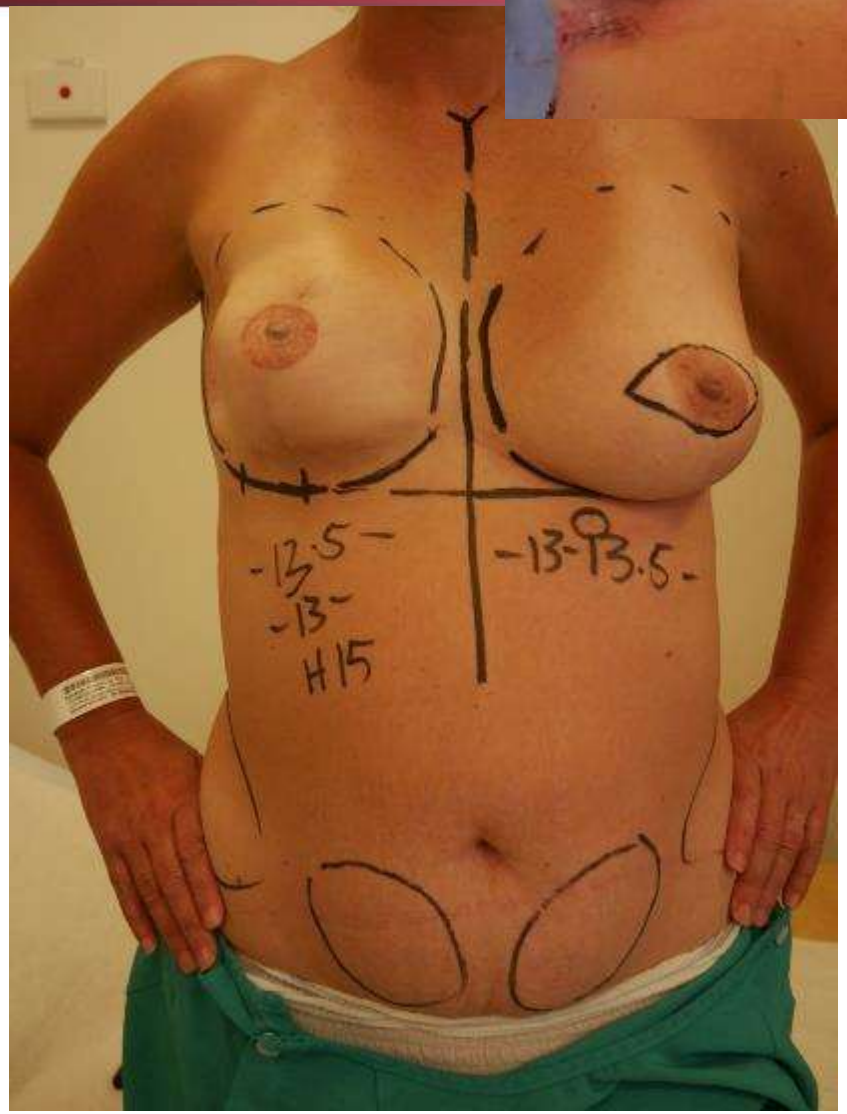








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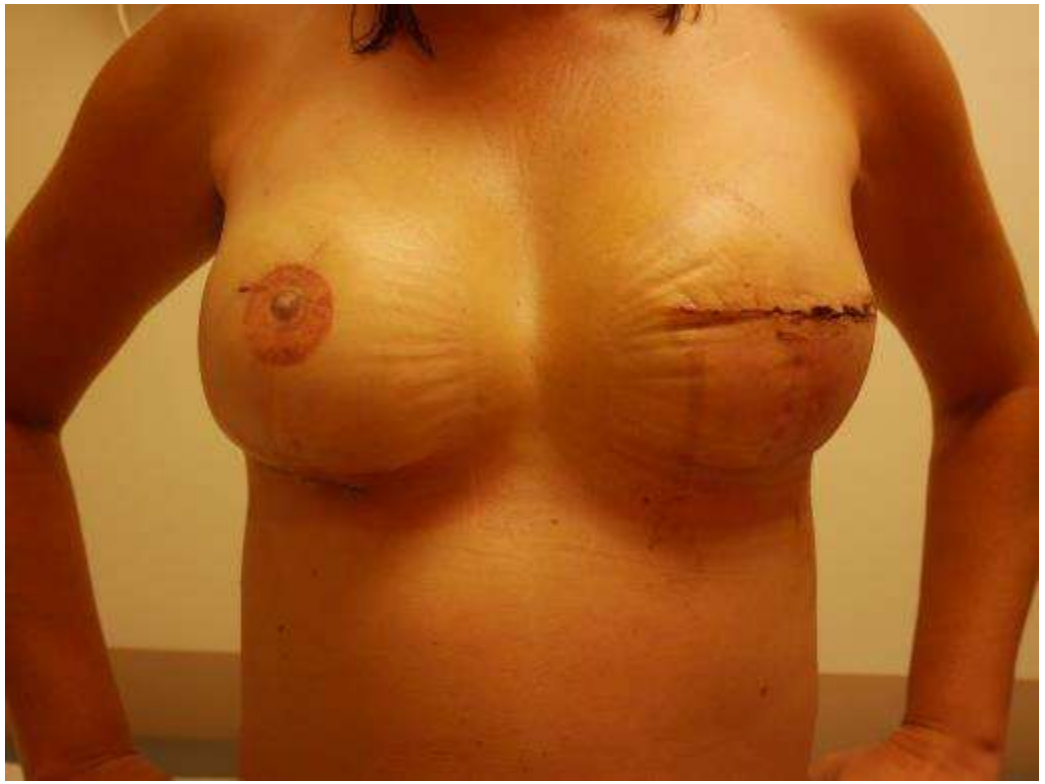

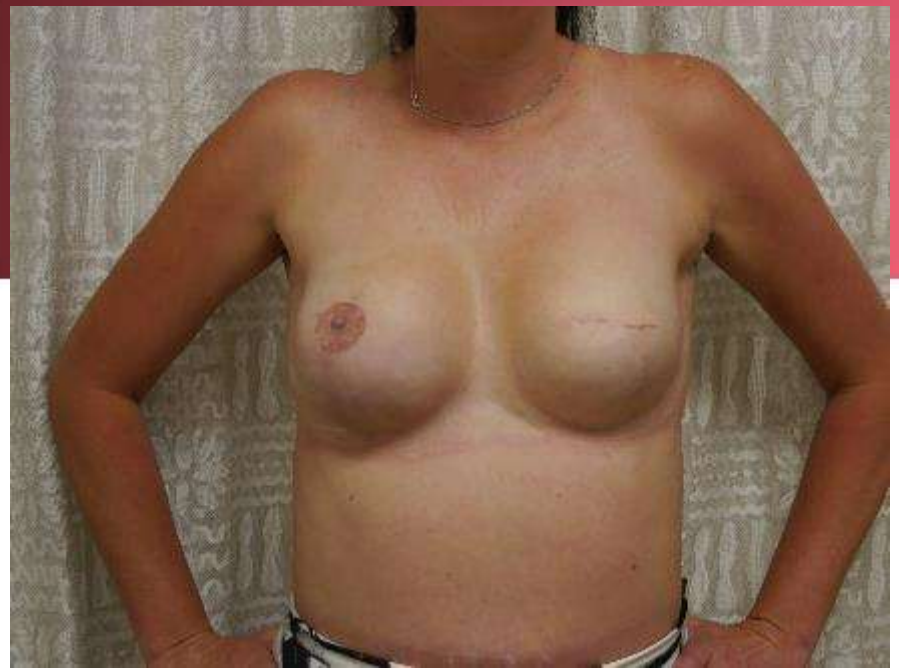

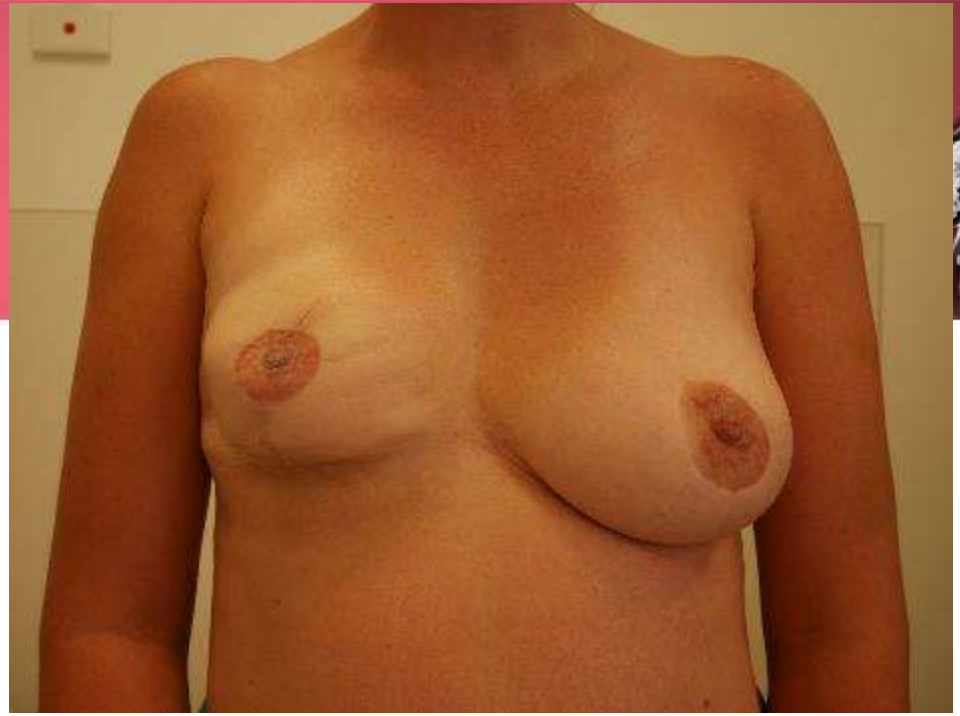

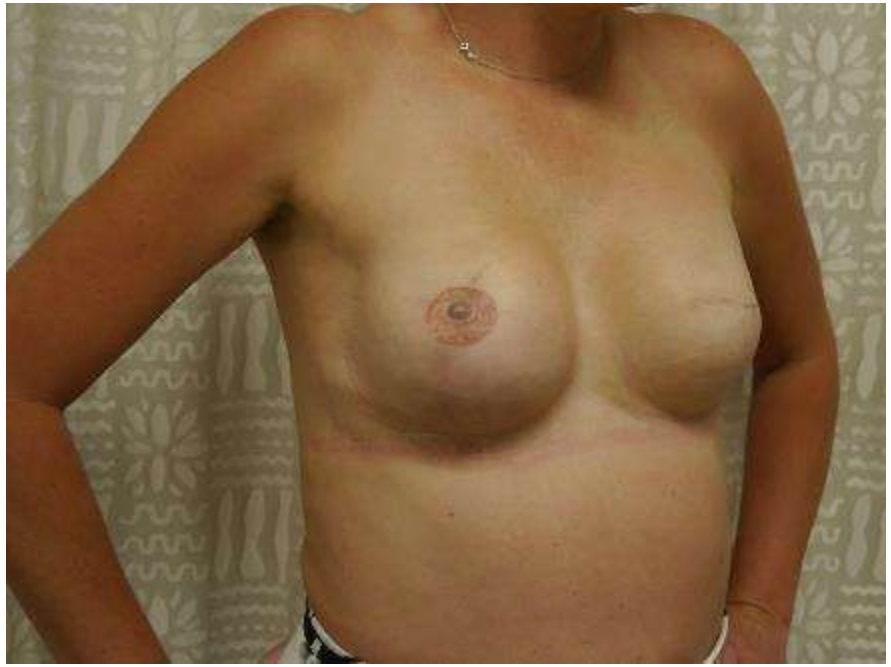

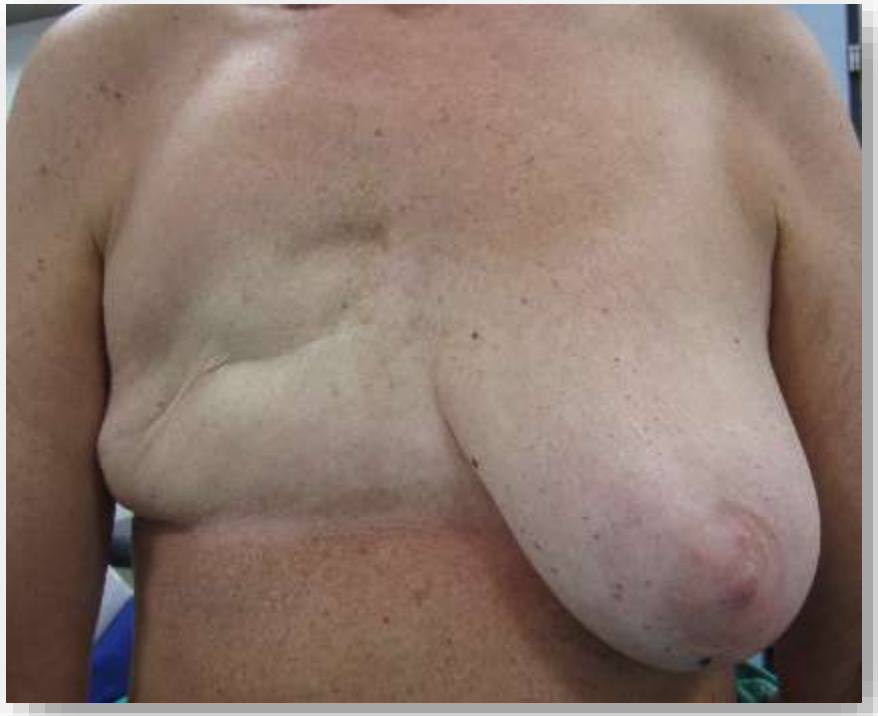

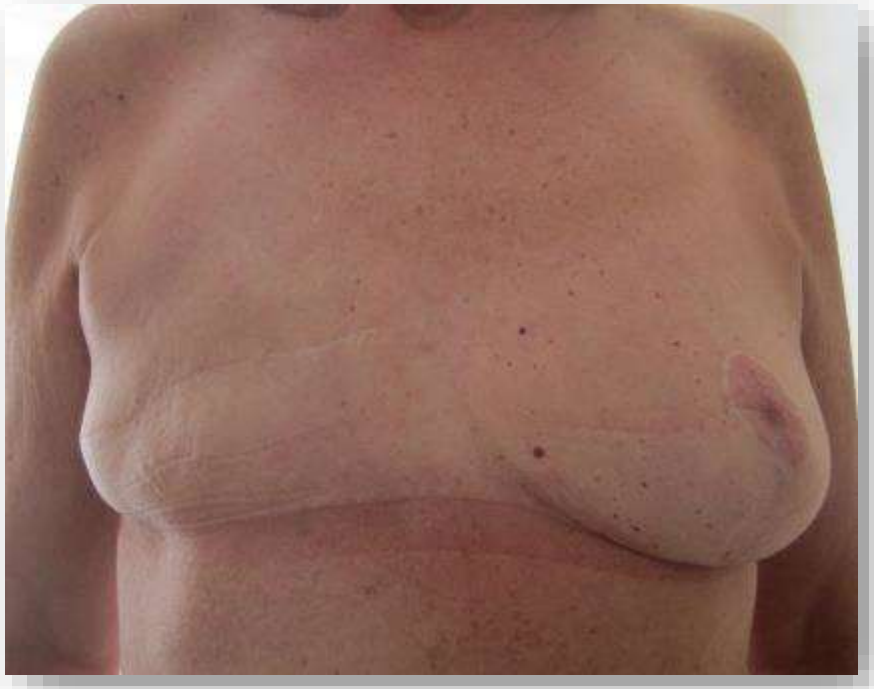



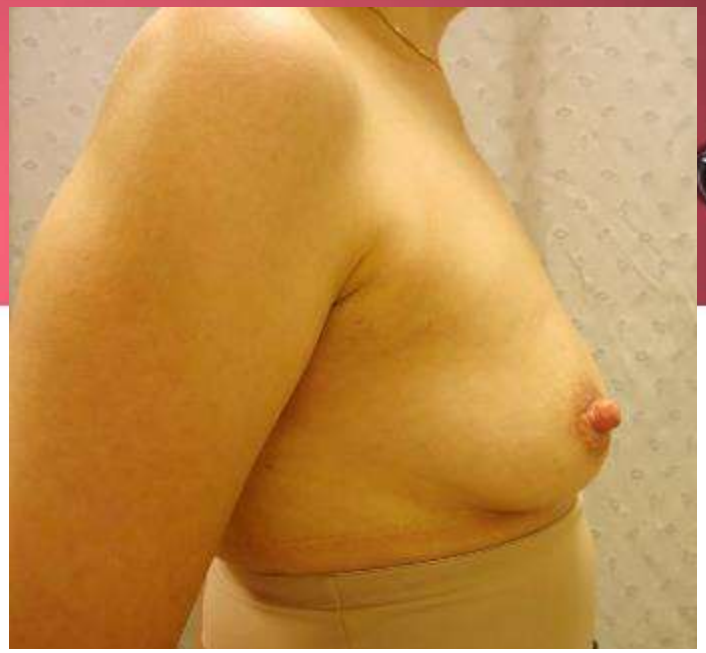

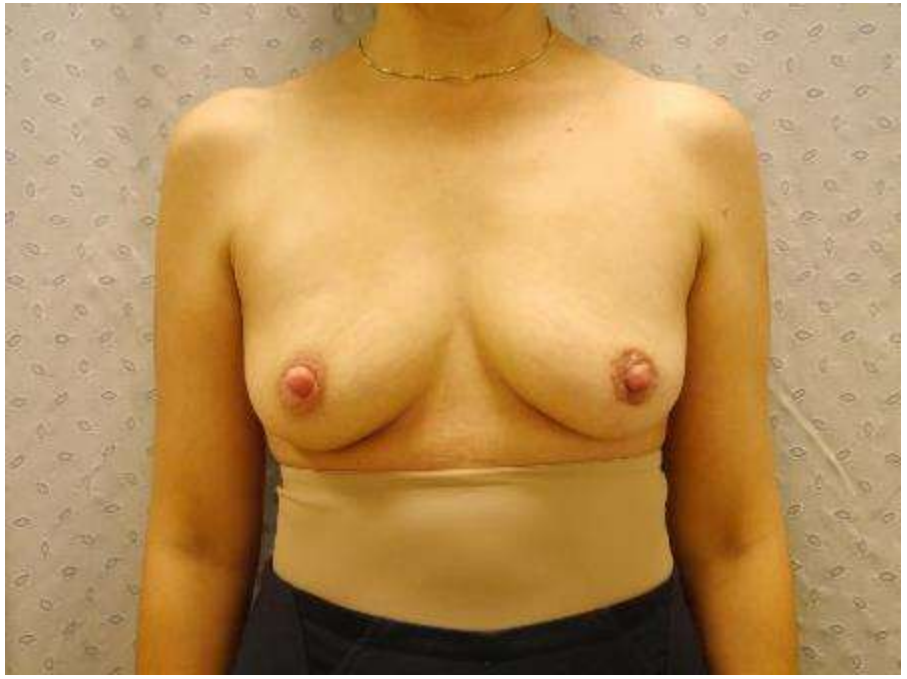
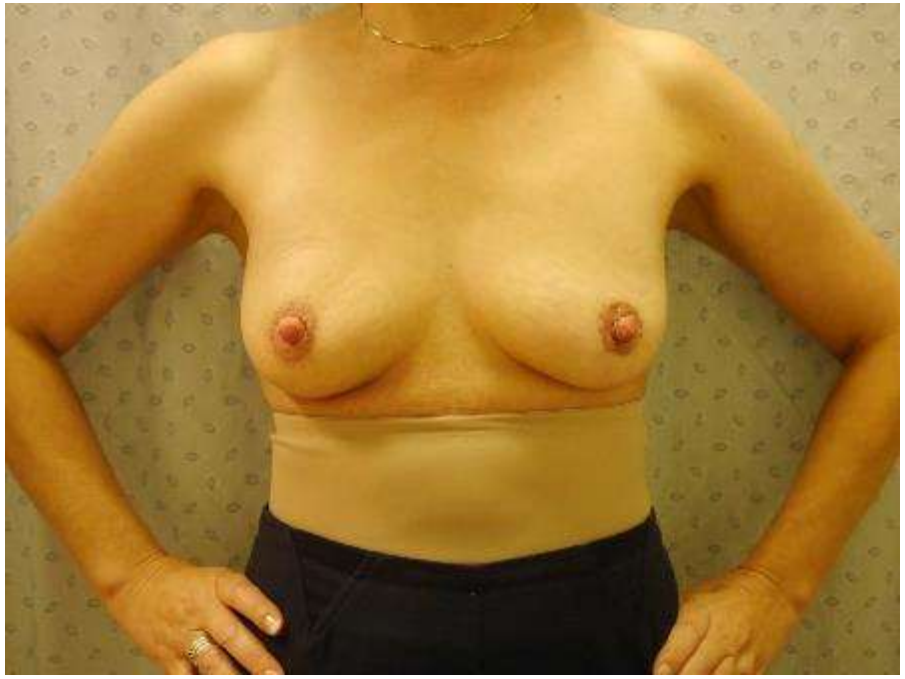

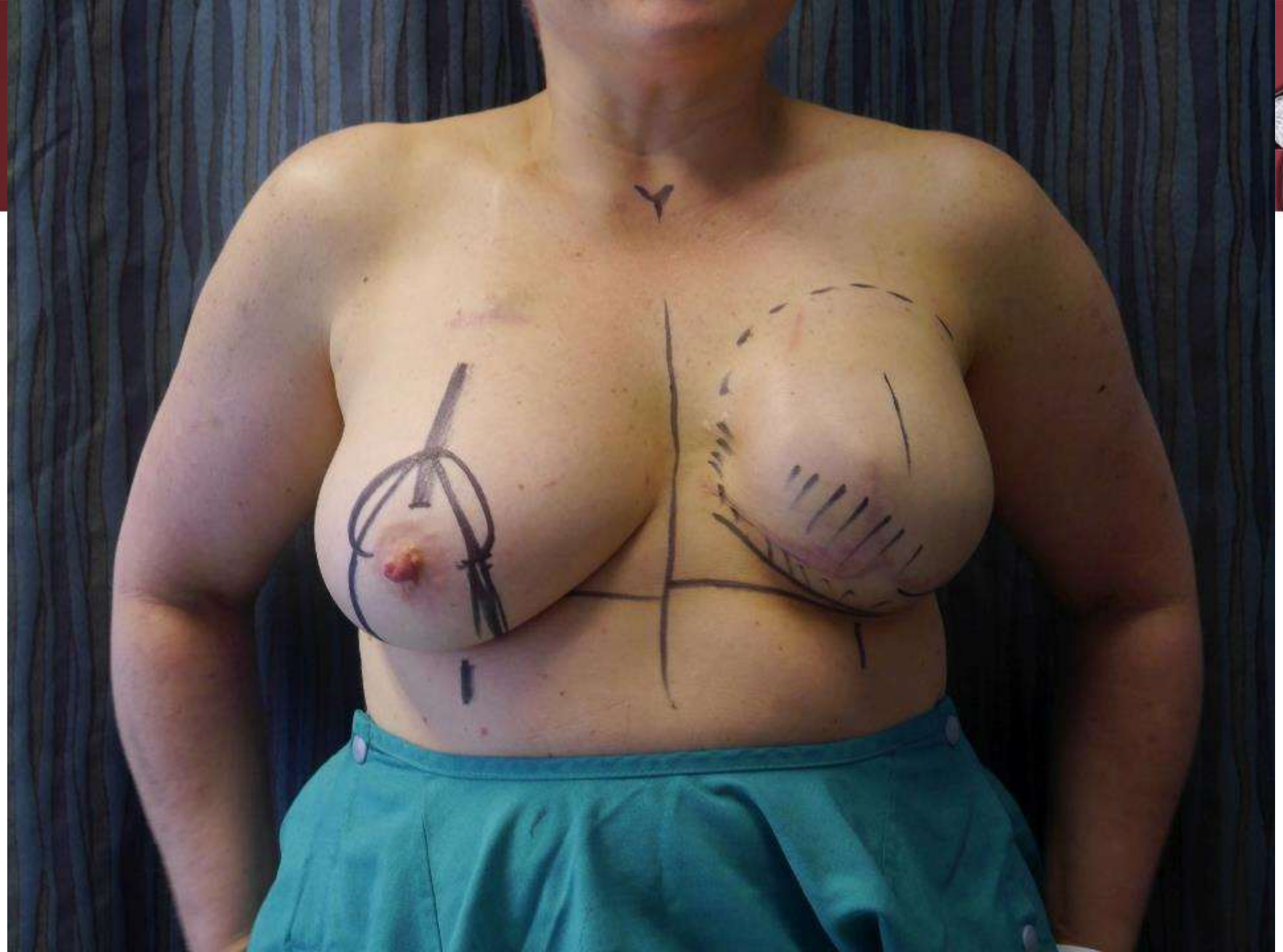

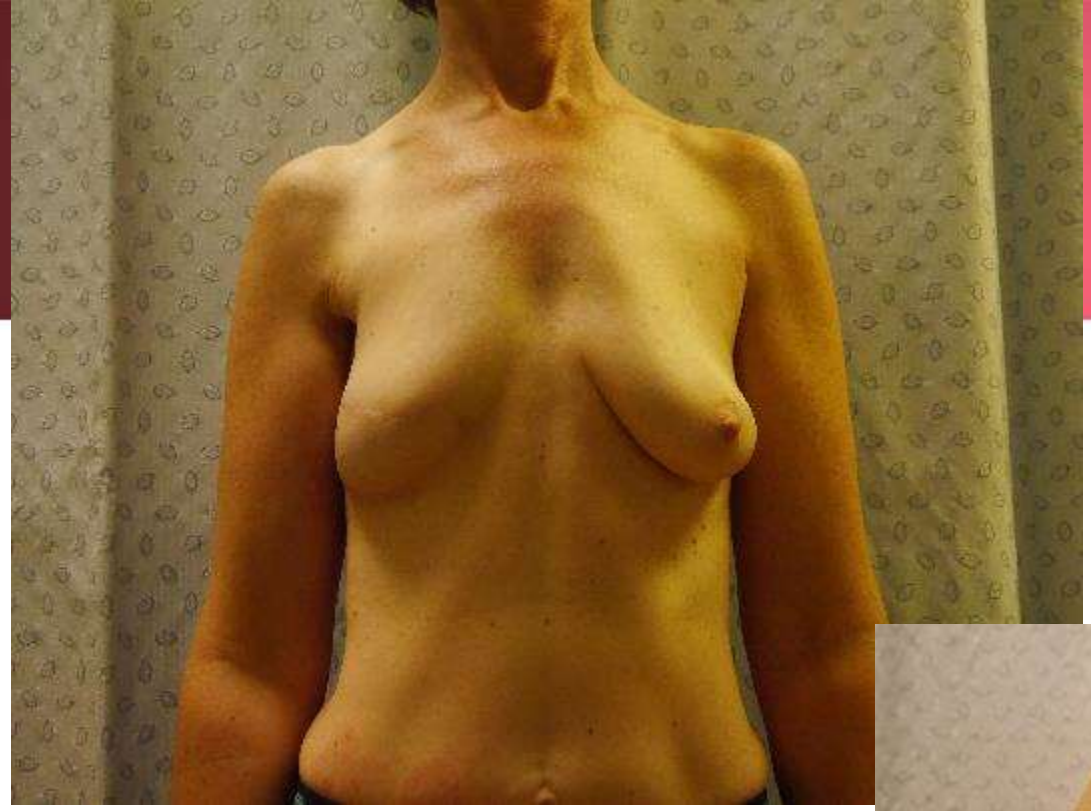

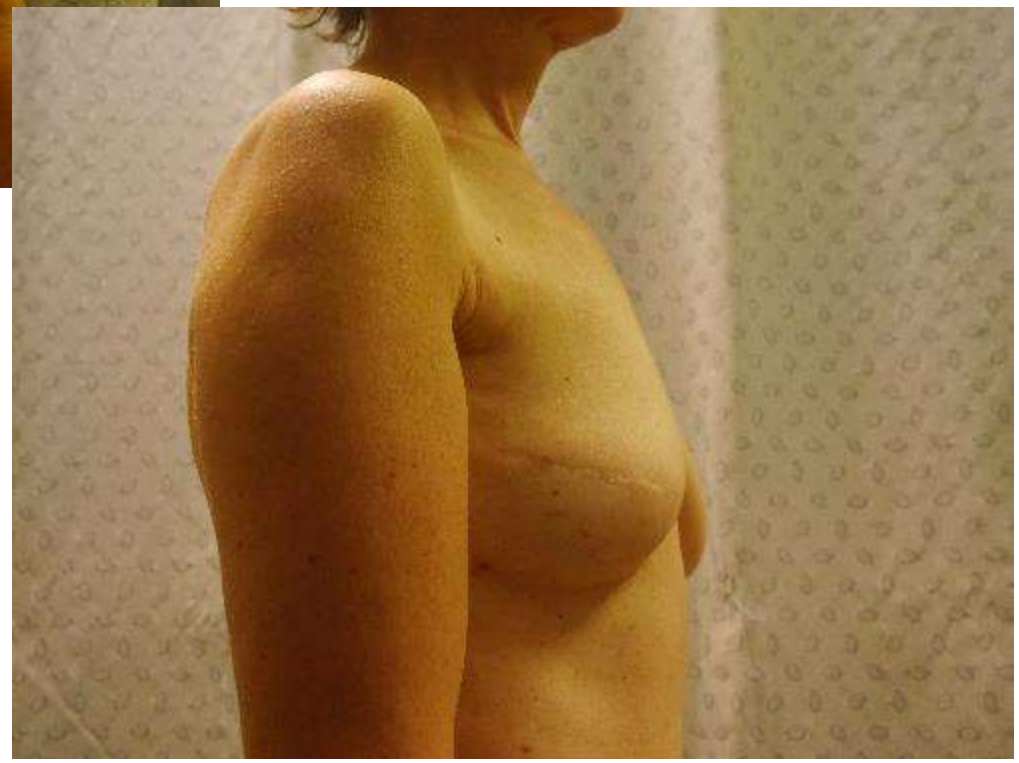

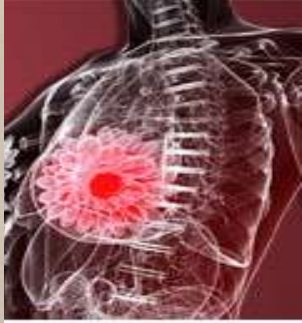

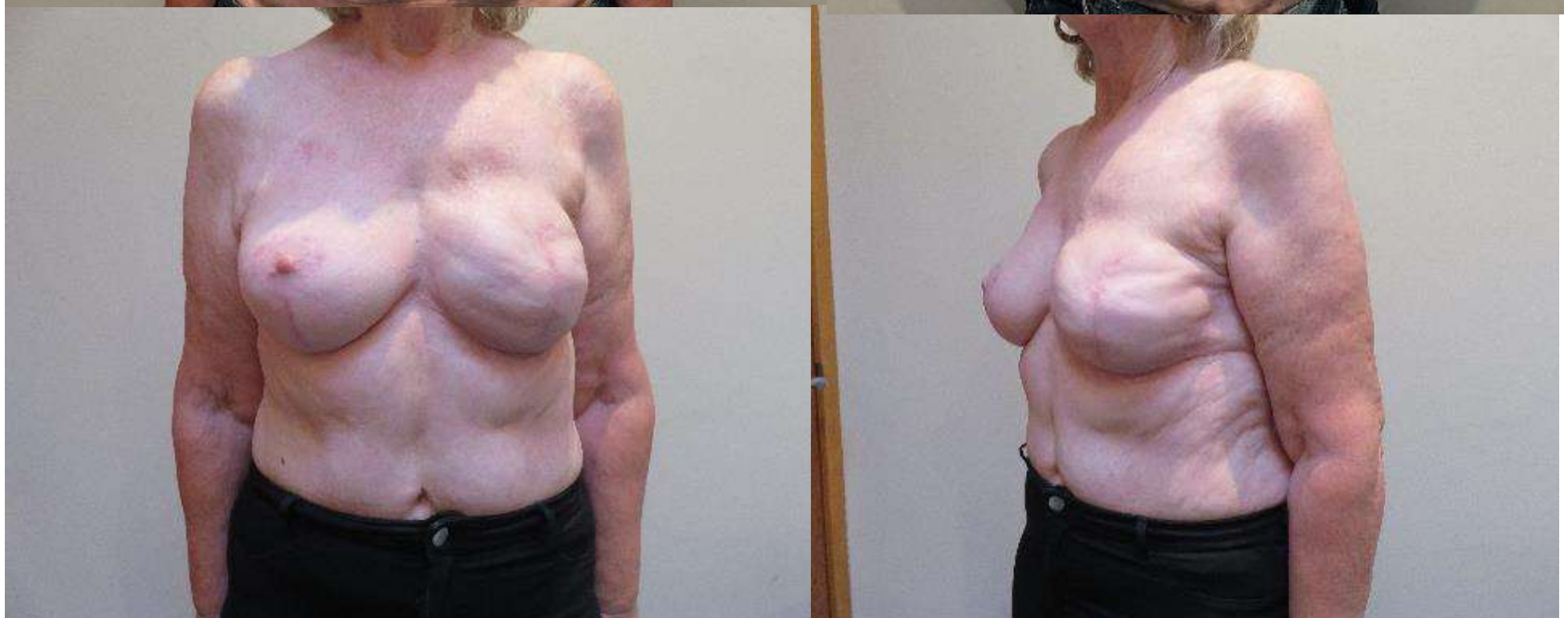

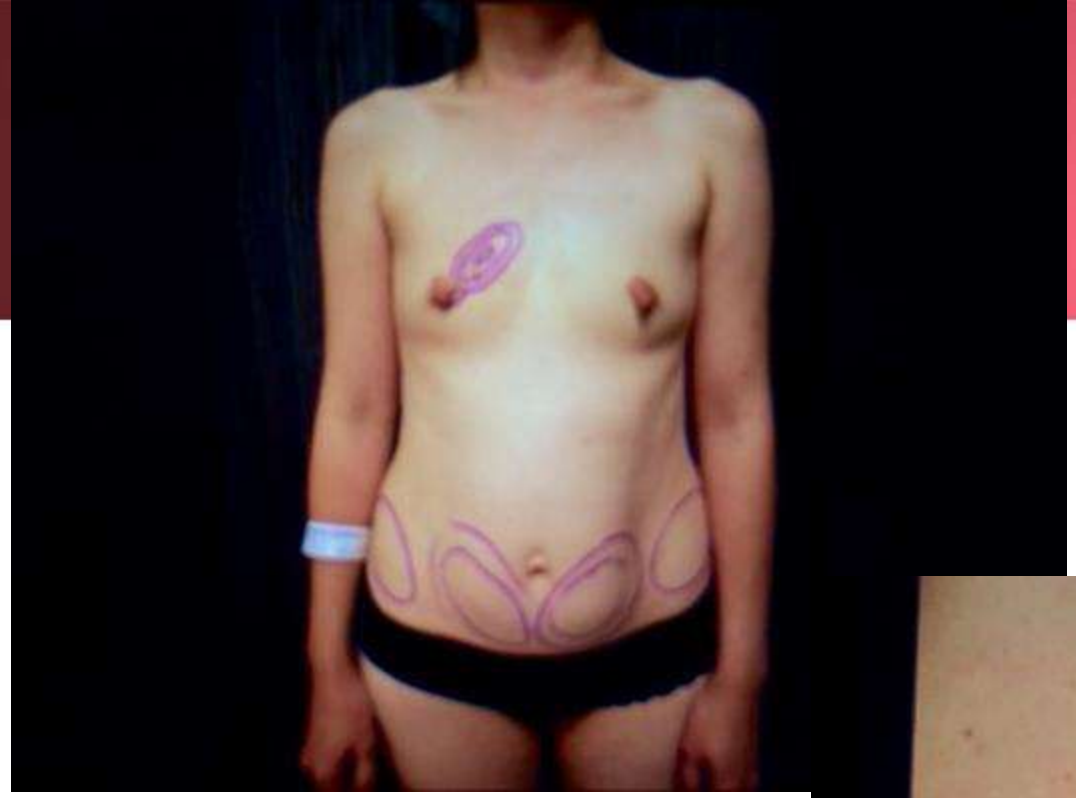

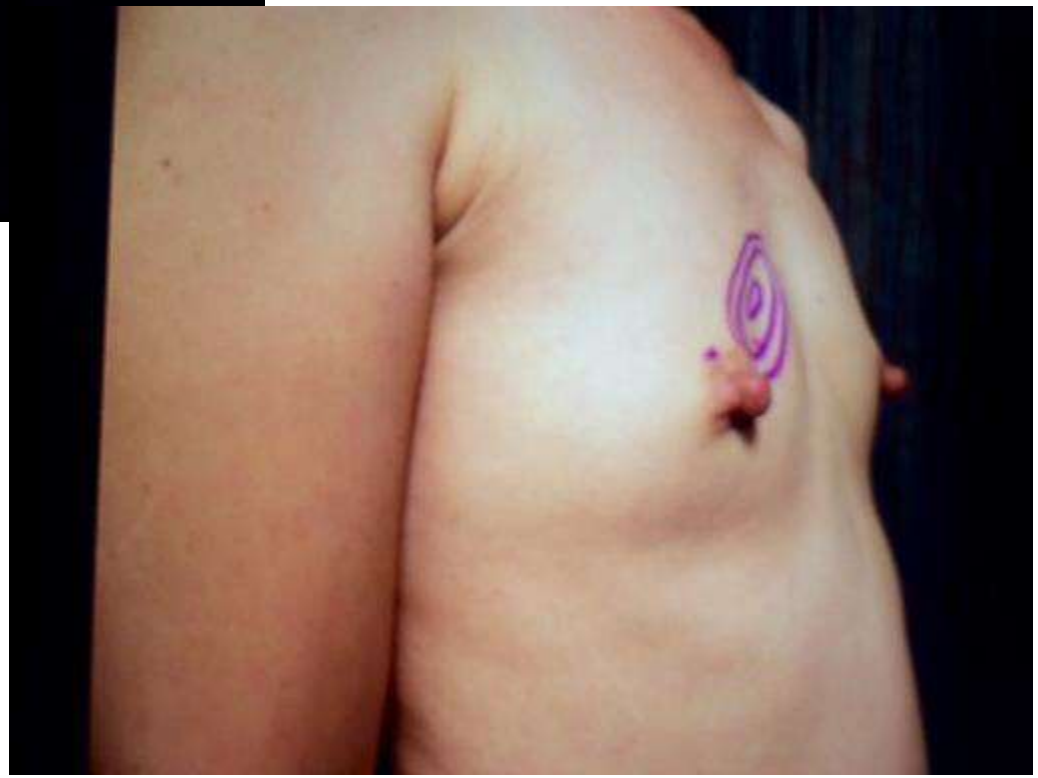

Safety of Fat Grafting

Katherine L. Gale, F.R.A.C.S.
Emad A. Rakha, M.Sc., Ph.D., F.R.C.Path.
Graham Ball, B.S.C., Ph.D.
Veronique K. Tan, F.R.C.S.(Gen)
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Nottingham, United Kingdom

Background: Currently, there is no clinical evidence of oncologic risk associated with fat grafting, although its safety has been questioned. The authors investigated the risk of relapse associated with fat grafting in women with a history of breast cancer.

Methods: Of 328 women with previously treated malignant breast disease who underwent fat grafting at the Nottingham Breast Institute, complete data were available for 211 (invasive carcinoma, $n = 184$; ductal carcinoma in situ, $n = 27$). Mean follow-up was 88 months after primary cancer surgery and 32 months after fat grafting. Control subjects were matched 2:1 for date of primary cancer operation (within 2 years), age (within 5 years), type of surgery, tumor histology, estrogen receptor status, and disease-free status by time equivalent to that of fat grafting. Final endpoints were tumor recurrence and death. Outcome results were compared with a systematic review of all patients undergoing fat grafting with adequate follow-up reported in the literature.

Results: No significant excess oncologic events were observed in patients who had fat grafting compared to controls with regard to local (0.95 percent versus 1.90 percent; $p = 0.33$), regional (0.95 percent versus 0 percent; $p = 0.16$), and distant recurrences (3.32 percent versus 2.61 percent; $p = 0.65$). A systematic review identified case series with a total of 1573 women who had fat grafting after primary oncologic breast surgery. The locoregional relapse rate for these patients was 2.92 percent (0.95 percent per year).

Conclusion: This study has found no evidence of increased oncologic risk associated with fat grafting in women previously treated for breast cancer. (*Plast. Reconstr. Surg.* 135: 1263, 2015.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Risk, II.

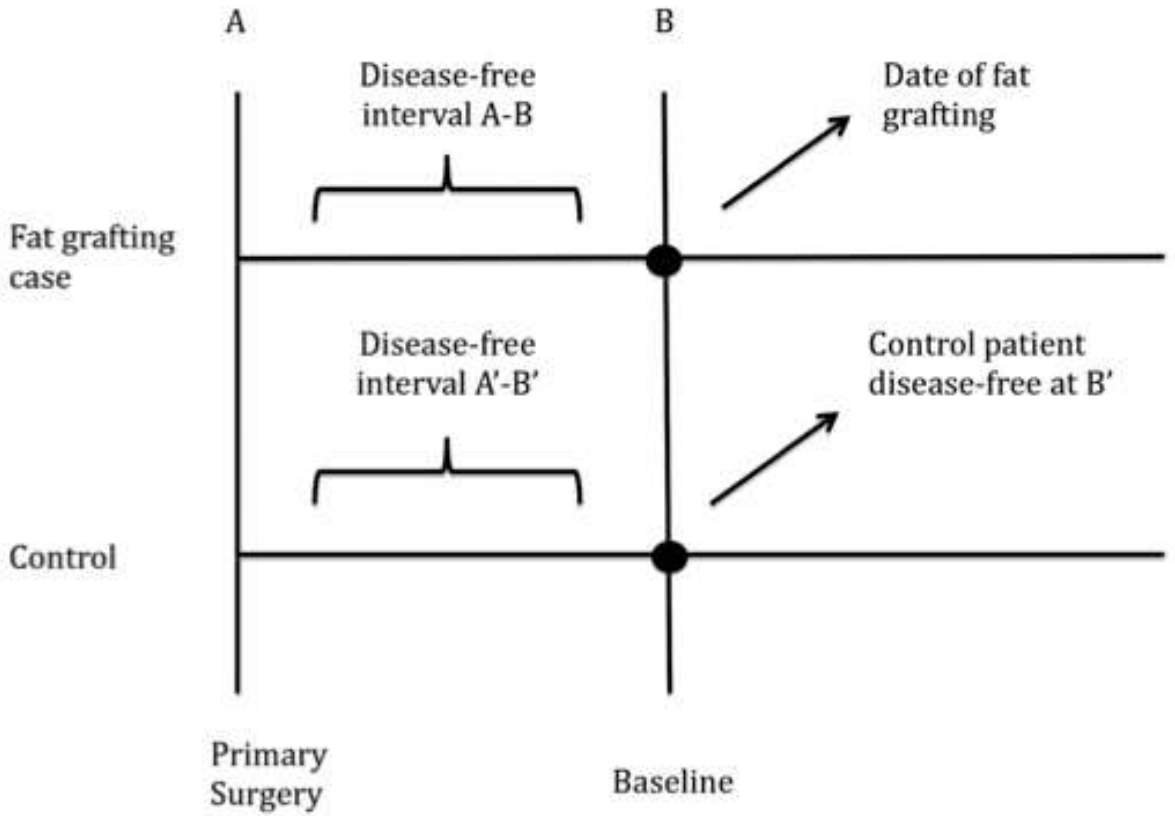


Fig. 1. Matched cohort study design. (Adapted with permission from Petit JY, Botteri E, Lohsiriwat V, et al. Locoregional recurrence risk after lipofilling in breast cancer patients. *Ann Oncol.* 2012;23:582–588.)

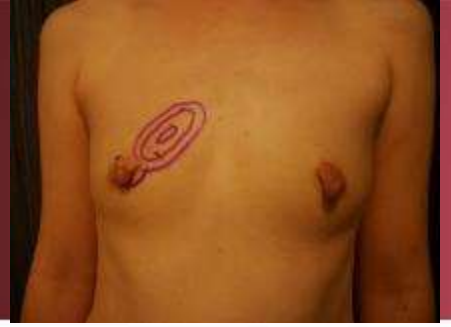


Table 4. Follow-Up

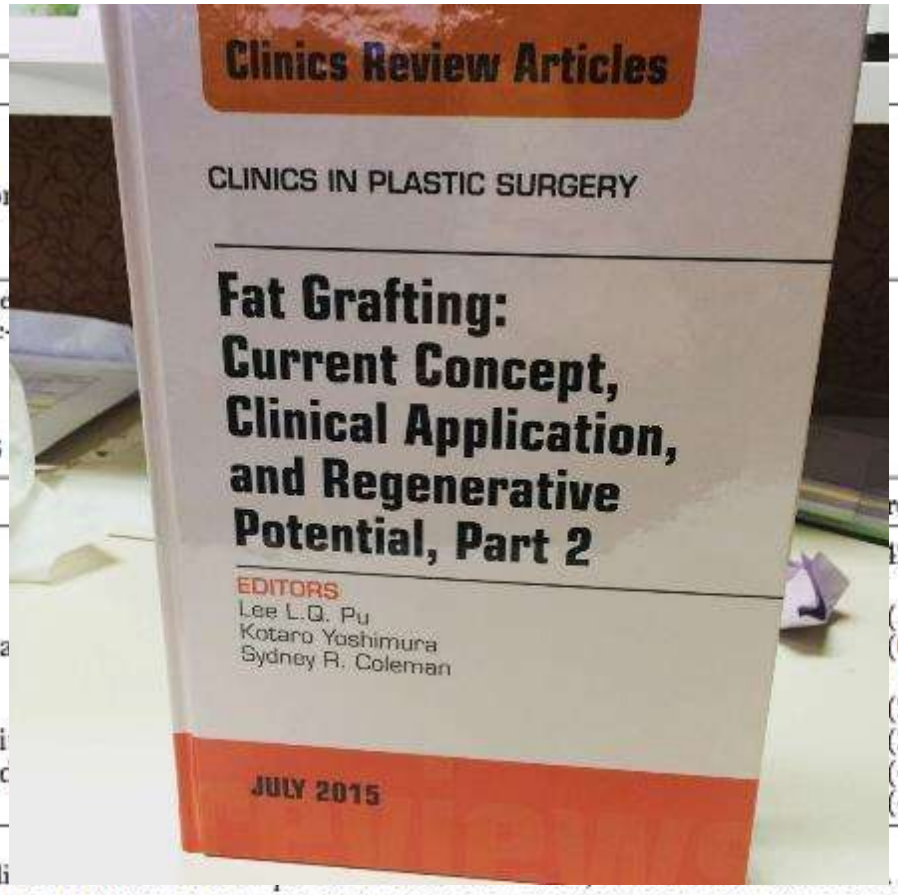
	Controls
No. of patients	422
Follow-up	
Time since cancer operatio	7.35 yr (88 mo)
Time to baseline (A–B)*	4.48 yr (54 mo)†
Time since baseline (B–C)	2.83 yr (34 mo)

*Time to baseline; interval betwee
†Matched variables; equal disease-

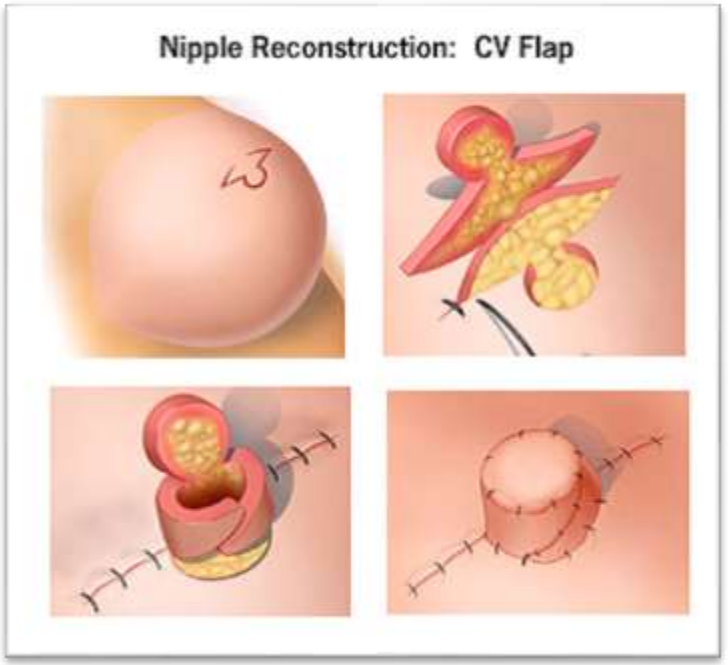
Table 5. Oncologic Events

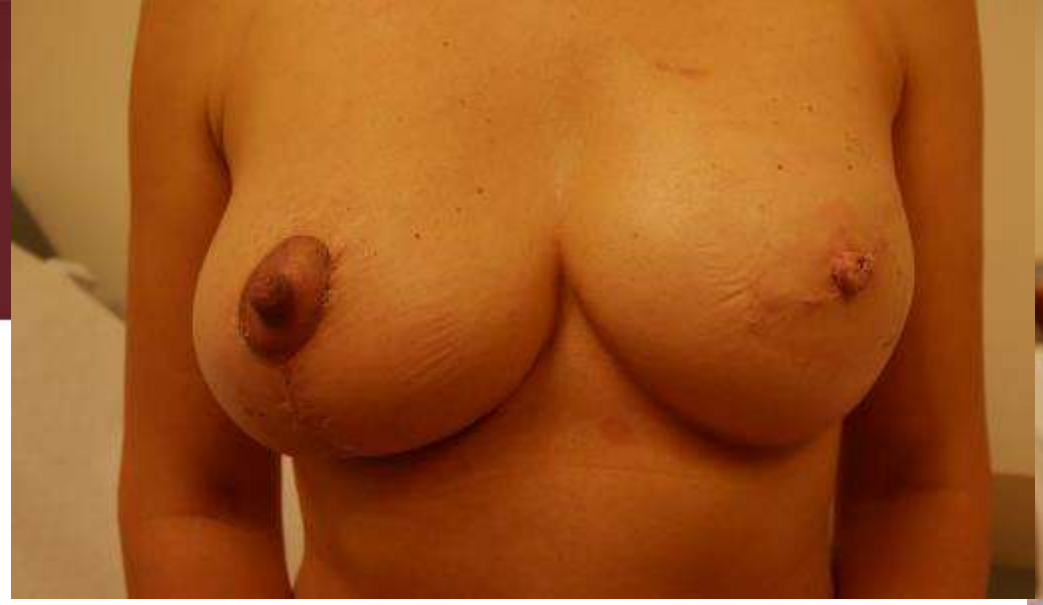
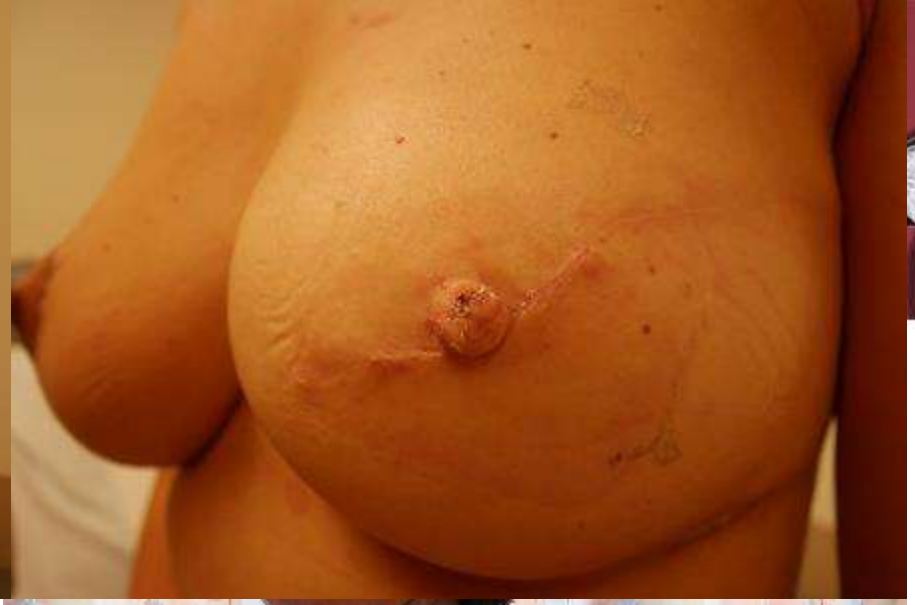
Event	rols (%)	*p*
No. of patients	422	
Event		
Local recurrence	(1.90)*	0.327
Contralateral new breast ma	(0.24)	0.224
Regional LN recurrence	0	0.164
Distant metastases	(2.6)	0.691
Breast cancer–specific mortali	(3.32)	0.297
Total ipsilateral disease-relatec	(4.5)	0.950
Total events‡	(4.7)	0.654

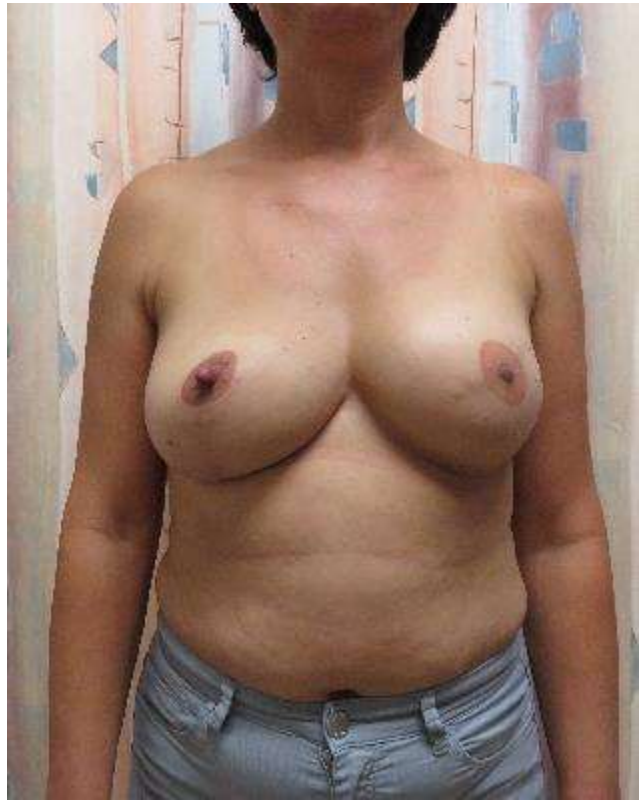
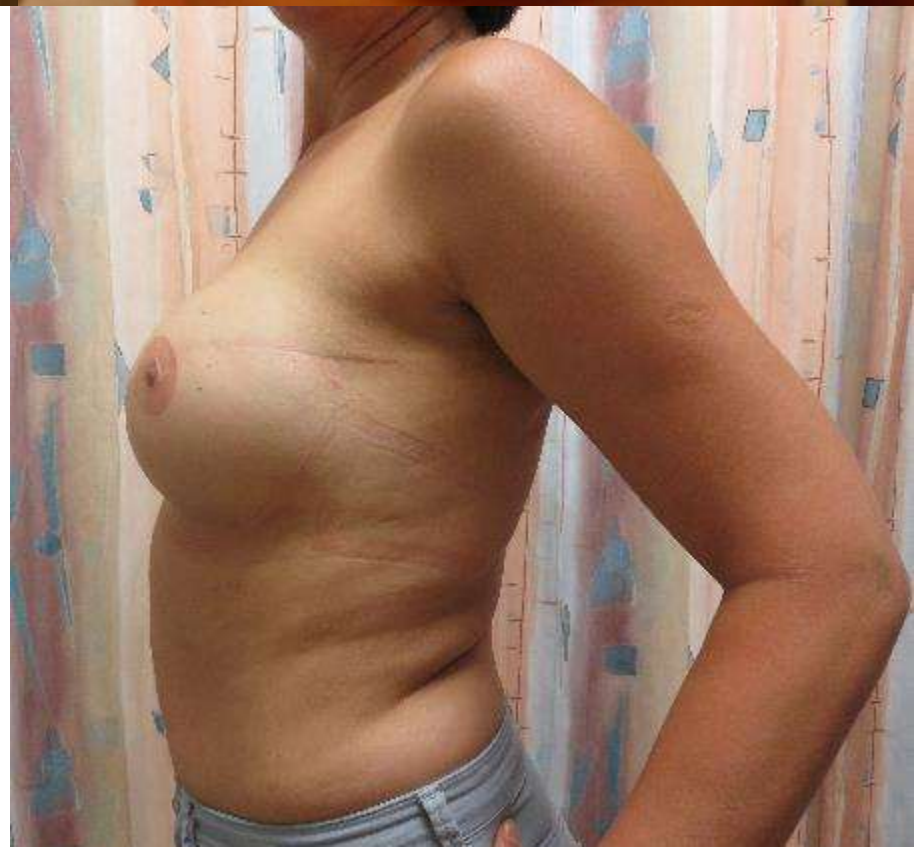
LN, lymph node.
*Two patients had synchronous di
†Event rate without contralateral new invasive events.
‡Event rate inclusive of all events.



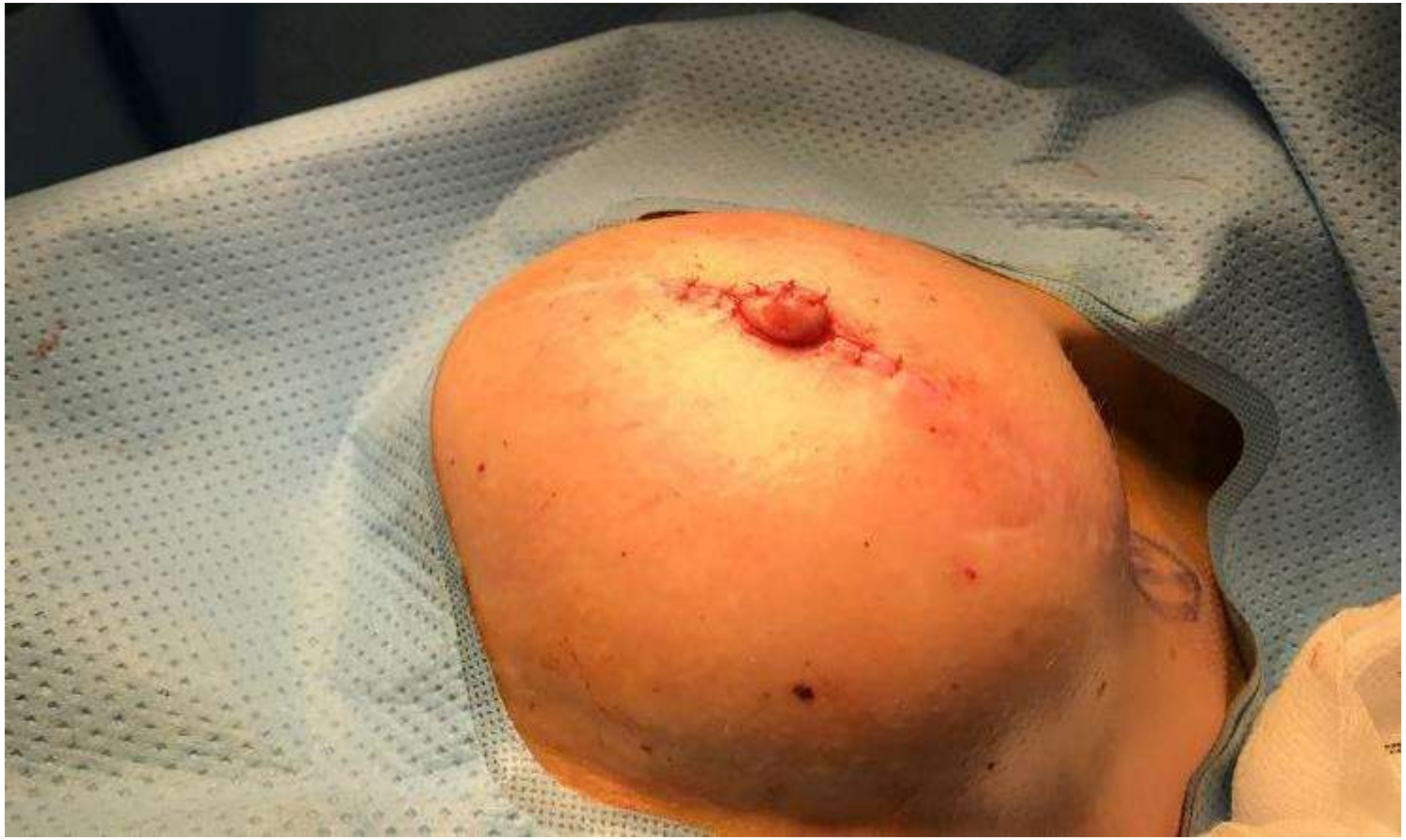
Nipple reconstruction / tattooing



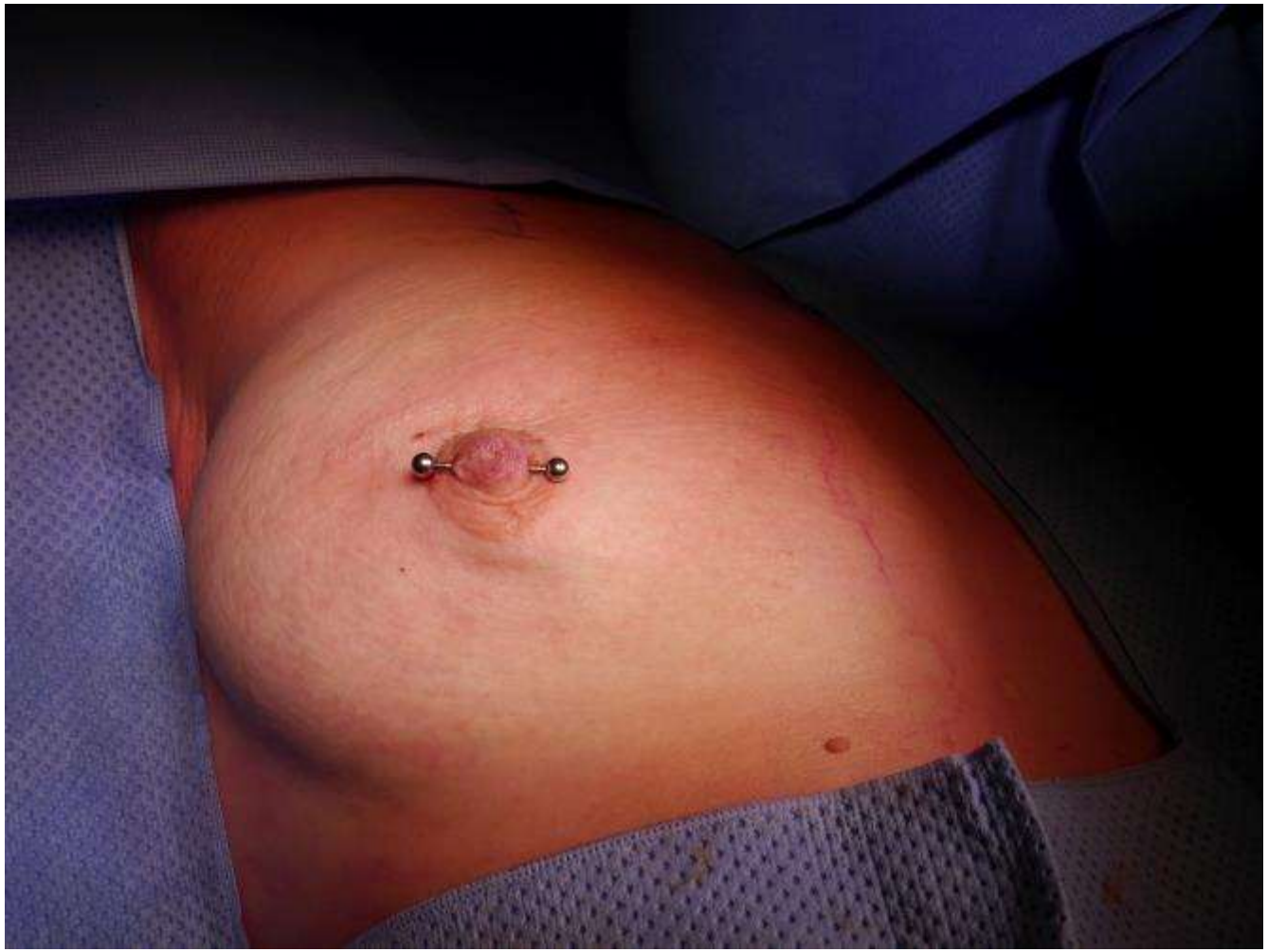



Double CV flap in thin pt



Novel Ideas – Nipple Inversion



Reconstruction & RT

So why delay reconstruction?

1. Lack of available reconstructive surgeon
2. High risk patient
3. Pregnancy
4. Mastectomy flap ischemia
5. Advanced Disease
6. **Radiation**

Disagreement

Reconstruction & PMRT

TE/Implant

Autologous

Implant
+ FG

Delayed-Immediate:
TE followed by Autologous

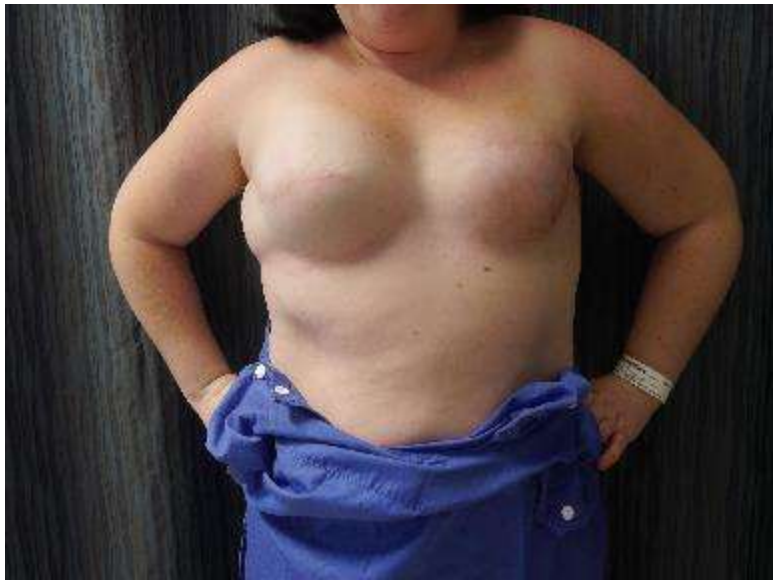
Autologous

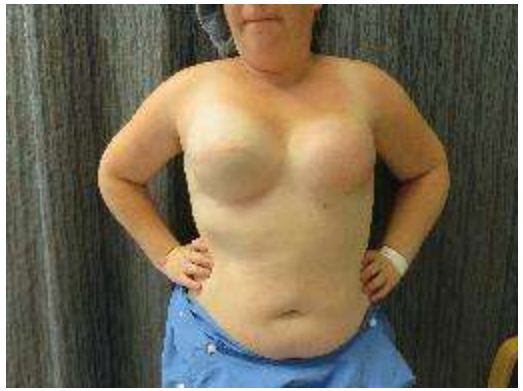
Immediate

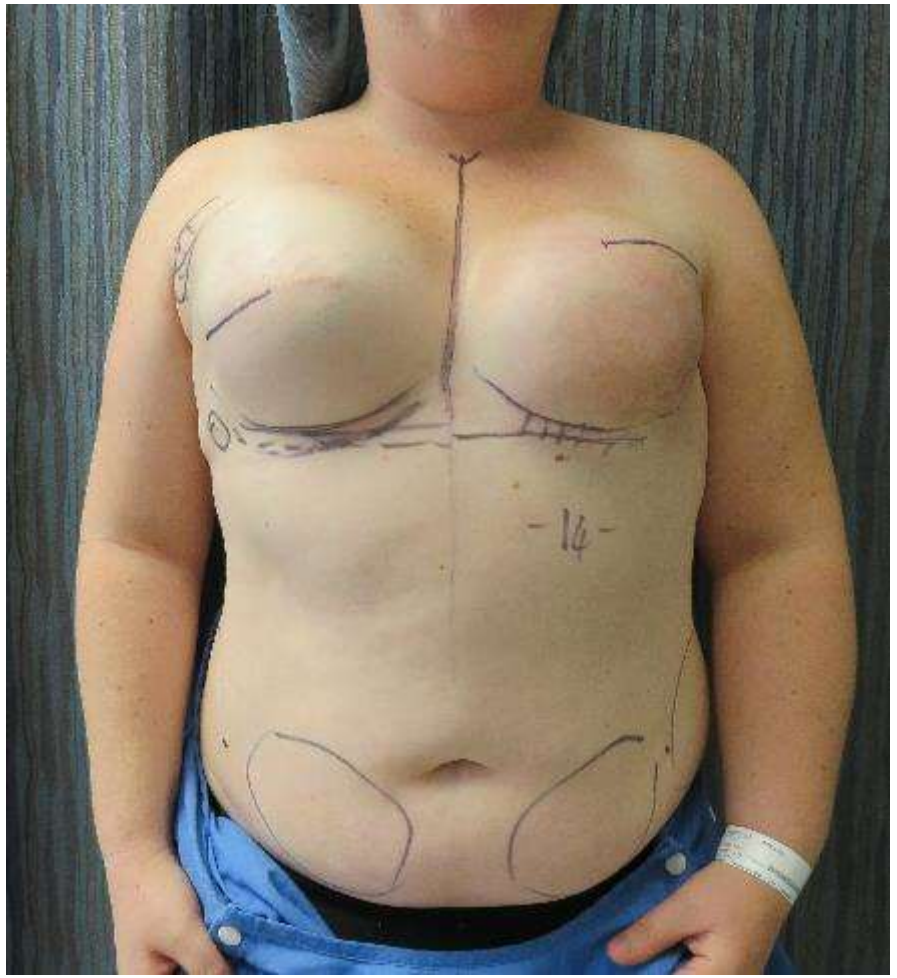
Staged

Delayed

Radiotherapy & Implants







Reconstruction & RT

NCCN Guidelines:

When PMRT is required and autologous tissue reconstruction is planned, either:

- Delay reconstruction
- Place TE and replace with tissue after PMRT

Reconstruction Timing/Type

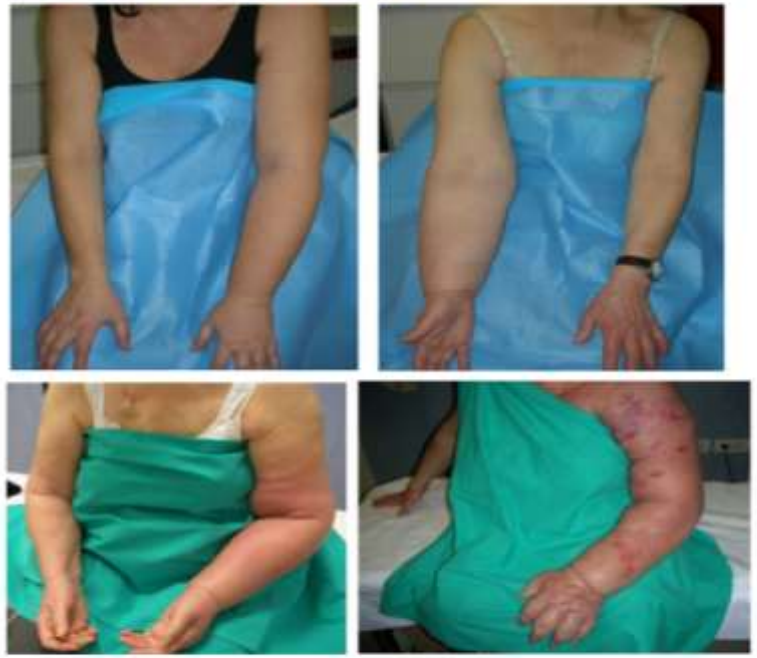
Take home points:

1. Immediate is preferable except for:
   - High-risk
   - Inflammatory
   - PMRT
2. Delayed-Immediate:
   - Autologous reconstruction with PMRT
3. Staged-Immediate:
   - Implants with ischemic mastectomy flaps
4. Delayed reconstruction:
   - After PMRT, use autologous tissue

Lymphoedema

Incidence of lymphedema after breast cancer treatment

- Wide variability: 6% - 63%
- About 1 out of 3 pts
- Higher incidence after radiotherapy
- Higher incidence related to taxane-based chemotherapy

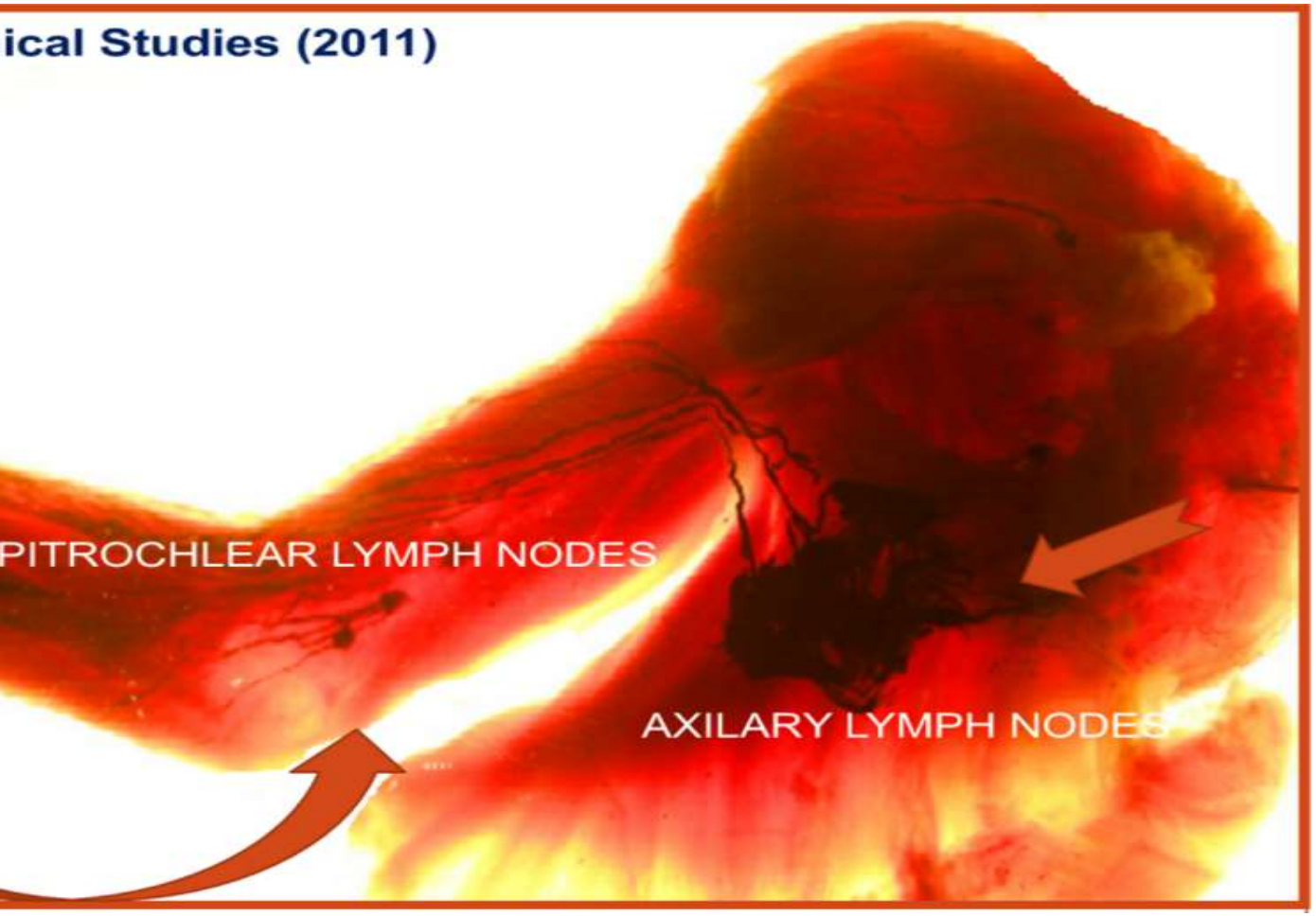


Cormier JN et al. *Cancer* November 15, 2010
Kilbreath SL et al. *The Breast* 28, 2016

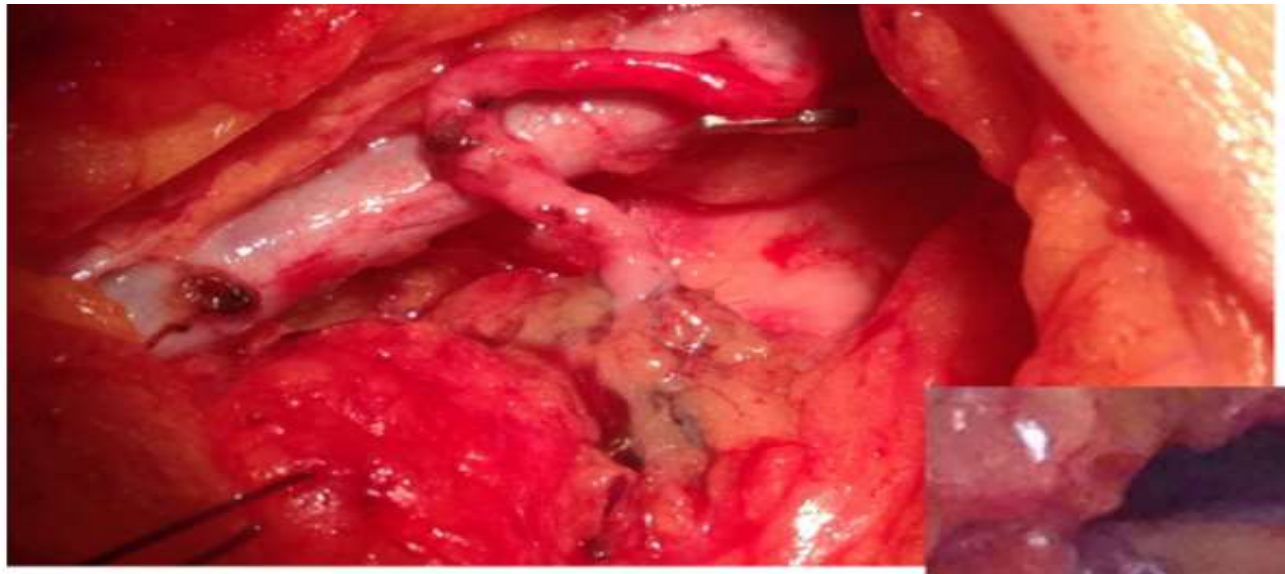
Lymphoedema

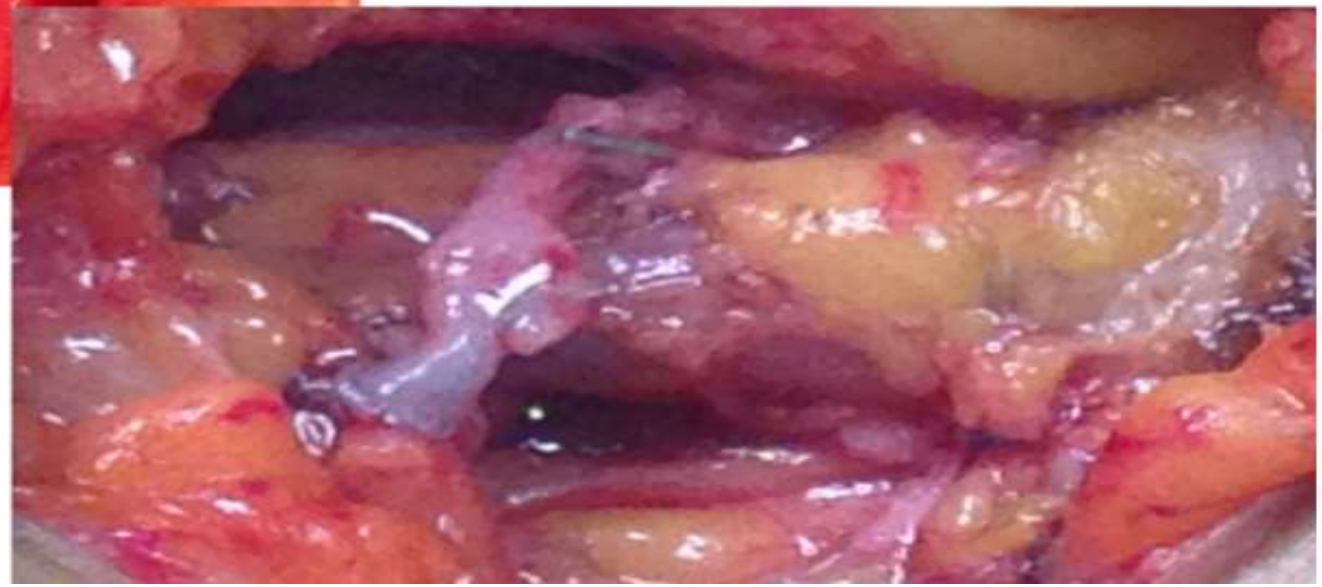
- Prevention
- Recognition
- Physio: Garments/Massage
- Surgical Management;
  - Liposuction
  - *Lymphovenous anastamoses*
  - *LN transfer*

Preventing Lymphoedema

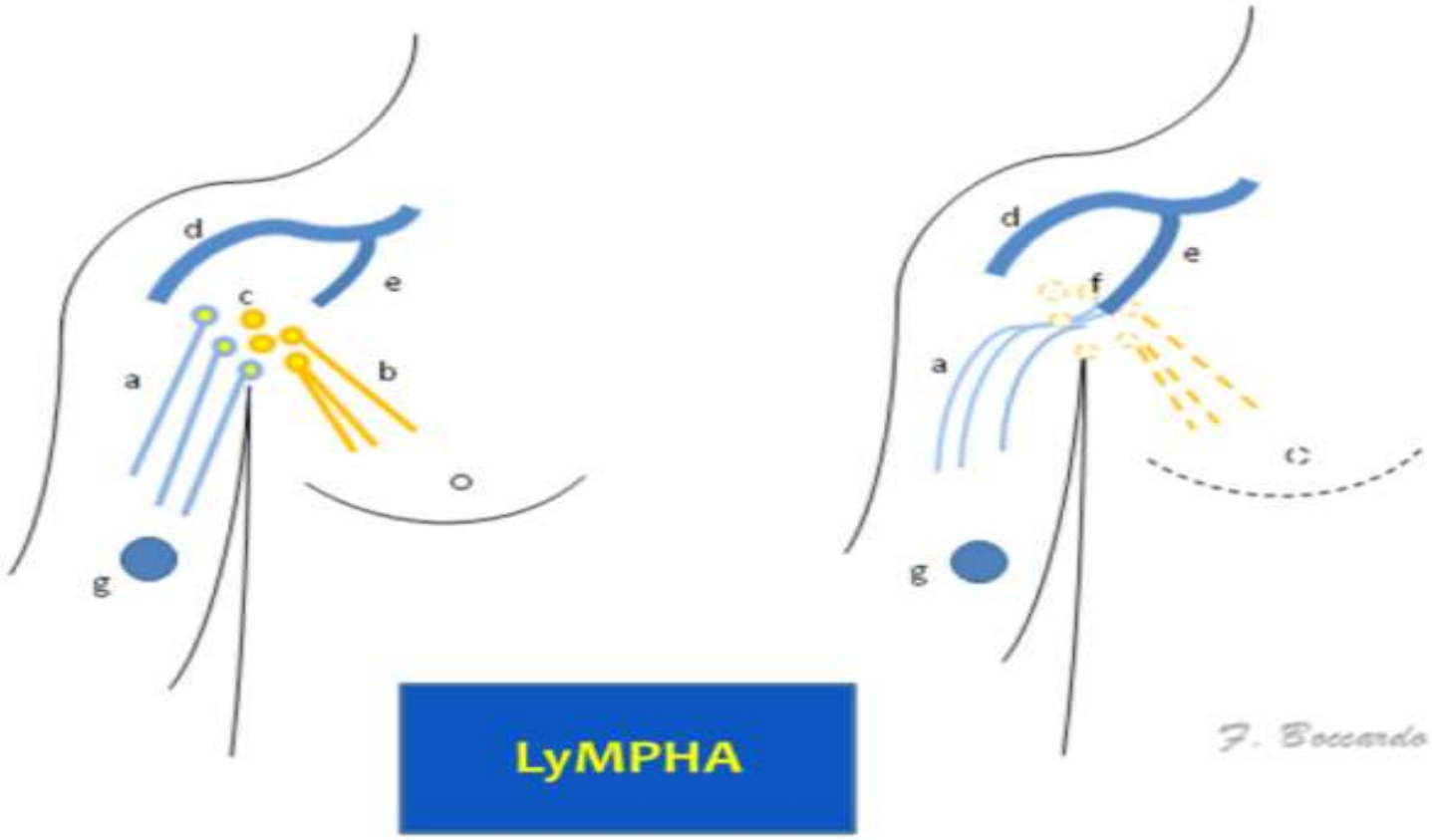


Lympha Technique





Lympha Technique



LyMPHA

a. Arm Lymphatics
b. Breast Lymphatics
c. Axillary Nodes
d. Axillary Vein
e. Collateral Venous Branch
f. LVA
g. Blue Dye

Preventing Lymphoedema

Table 3. Lymphedema rate

Techniques	Lymphedema rate
LYMPHA (5)	4.05 %
Sentinel Node (1)	6-13 %
Axillary Dissection (1)	13-65 %

Feldman S, Bansil H, Ascherman J, Grant R, Borden B, Henderson P, Ojo A, Taback B, Chen M, Ananthakrishnan P, Vaz A, Balci F, Divgi CR, Leung D, Rohde C. *Single Institution Experience with Lymphatic Microsurgical Preventive Healing Approach (LYMPHA) for the Primary Prevention of Lymphedema*. Ann Surg Oncol. 2015 Jul 23.

Summary of Advances

Choosing Wisely
An initiative of the ABIM Foundation

The American Society of Breast Surgeons
THE AMERICAN SOCIETY OF Breast Surgeons

Five Things Physicians and Patients Should Question

Released June 27, 2016

1. **Don't routinely order breast MRI in new breast cancer patients.**
   After a new diagnosis of breast cancer, breast MRI can be useful in selected patients to aid treatment decisions. However, there is a lack of evidence that routine use of MRI lessens cancer recurrence, death from cancer or the need for re-operation after lumpectomy surgery. The routine use of MRI is associated with an increased need for subsequent breast biopsy procedures, delays in time to treatment and higher cost of care. Increased mastectomy rates can occur if the MRI finds additional cancers or indeterminate findings cause patient anxiety, leading to patient requests for mastectomy.

2. **Don't routinely excise all the lymph nodes beneath the arm in patients having lumpectomy for breast cancer.**
   After a new diagnosis of invasive breast cancer, most patients undergoing partial breast removal (lumpectomy) benefit from a sentinel node (SN) biopsy, a procedure that removes a small number of lymph nodes beneath the arm. In the past, patients found to have cancer in any SN underwent extra surgery to remove more nodes. Recent evidence suggests further node surgery is not necessary in patients with cancer found in fewer than three SN if the patient receives other recommended cancer treatments.

3. **Don't routinely order specialized tumor gene testing in all new breast cancer patients.**
   There are multiple new tumor multi-gene signature tests that provide selected patients with information about their risk of distant cancer recurrence, dying of cancer or the likelihood they will benefit from chemotherapy. These tests are helpful in selected patients, including those with early stage hormone receptor positive cancers with low scores on 21 gene recurrence testing, who can safely omit chemotherapy. There is no evidence these tests should be used routinely in every patient. These tests should not be done in patients who indicate the test results would not change their choice of treatment.

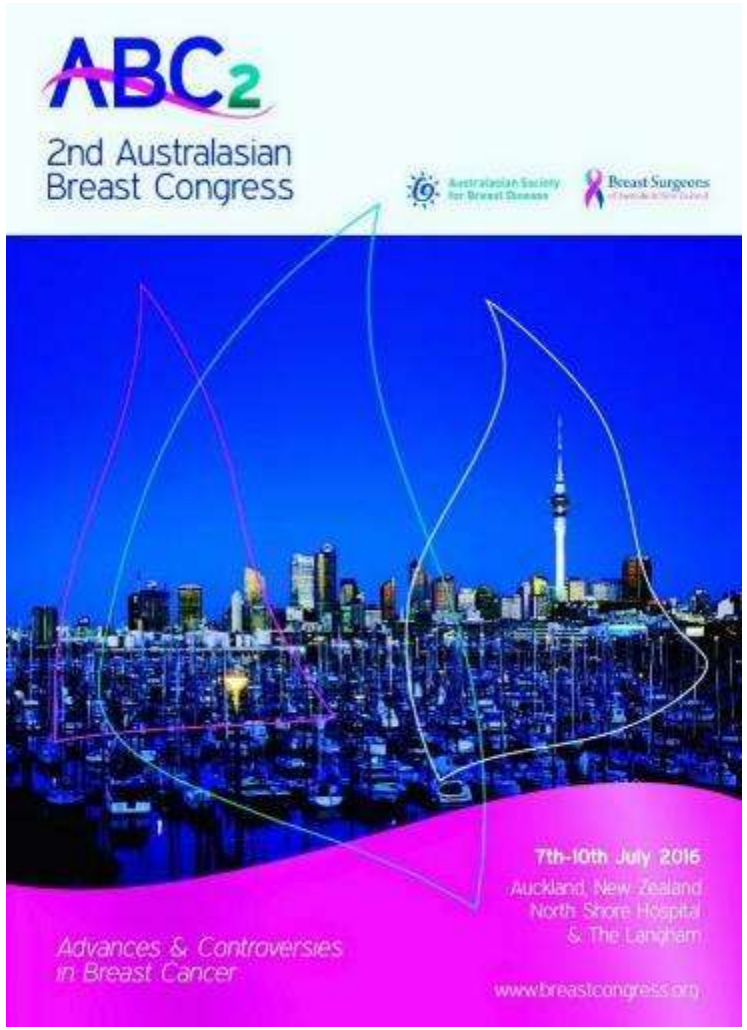
4. **Don't routinely re-operate on patients with invasive cancer if the cancer is close to the edge of the excised lumpectomy tissue.**
   Patients undergoing partial breast removal (lumpectomy) of the breast for **invasive** cancer benefit from re-operation to excise more breast tissue if microscopic review of the lumpectomy breast tissue indicates cancer cells at the tissue edge. However, if cancer cells are close to the edge, but not at the actual edge, then re-operation is not mandatory but can be considered on a case-by-case basis.

5. **Don't routinely perform a double mastectomy in patients who have a single breast with cancer.**
   After a new diagnosis of breast cancer in a single breast, many patients desire removal of both breasts, believing their cancer risk in the other breast is high and their cancer cure rate will be improved with double mastectomy. Double mastectomy should not be routinely performed in these patients until they have been provided with adequate understandable information about the generally low risk they will develop cancer in the other breast and the minimal effectiveness, if any, of double mastectomy improving their life expectancy.

MAYO CLINIC

http://www.choosingwisely.org/societies/american-society-of-breast-surgeons

In summary….take home messages



- **New techniques allow more choice**
  - ***There are always options***
- **Making a good overall treatment plan**
  - ***Doing the right thing from the start***
- **Quality of life without compromising treatment**
  - ***There is usually a lot of life after breast cancer***

Thanks!

aobi
Auckland Oncoplastic Breast Institute