

# 유방암의 외과적 치료



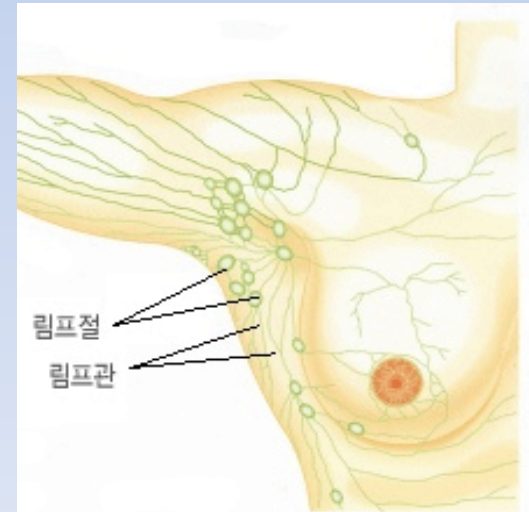
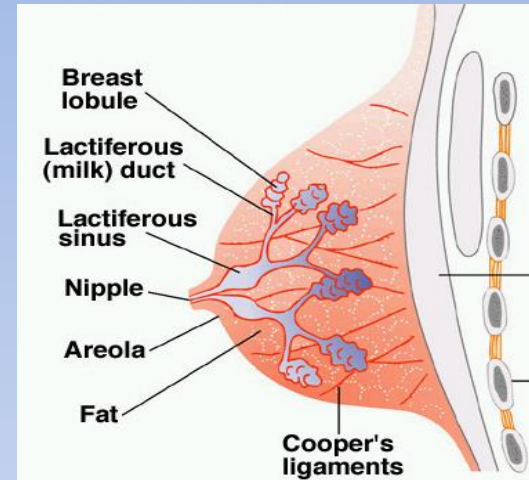
부산백병원 이안복

# Surgical Options for Breast Cancer

- **Breast surgery**
  - Mastectomy
  - Breast conserving surgery



- **Axillary node surgery**
  - Sentinel node biopsy
  - Axillary node dissection

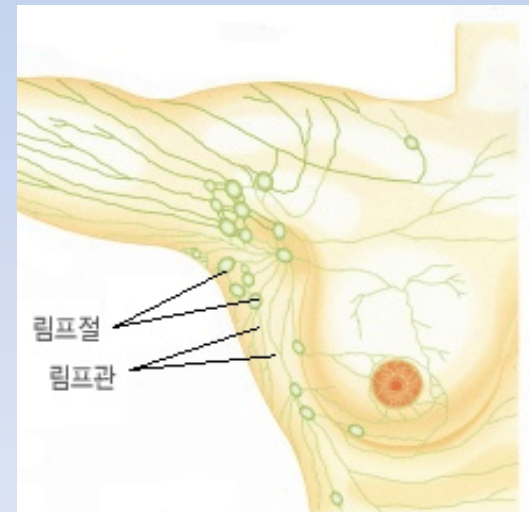
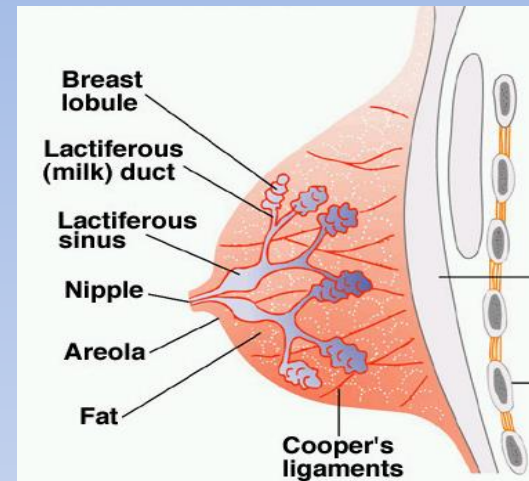


# Surgical Options for Breast Cancer

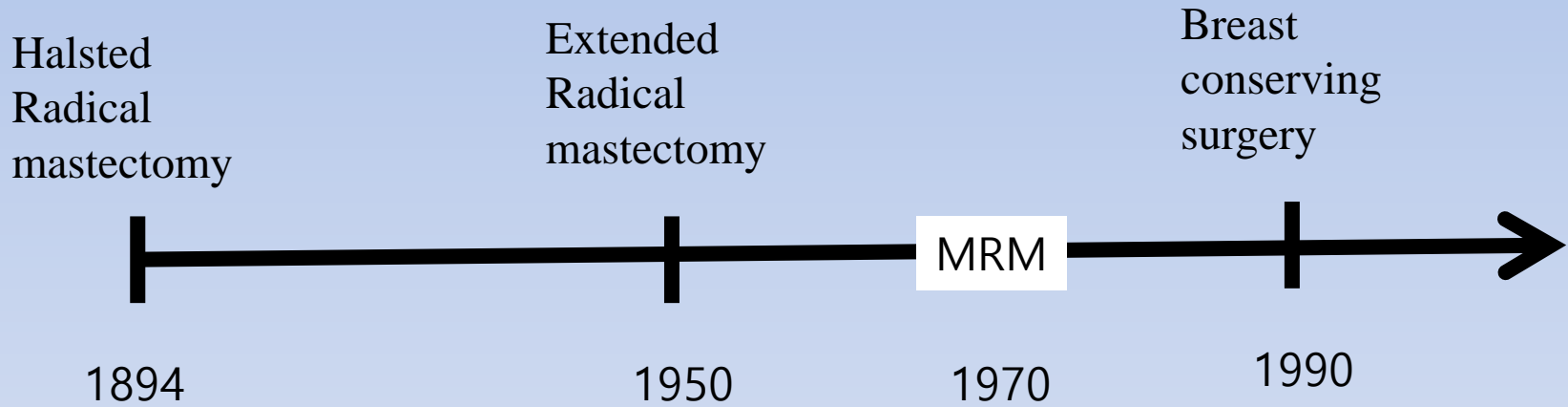
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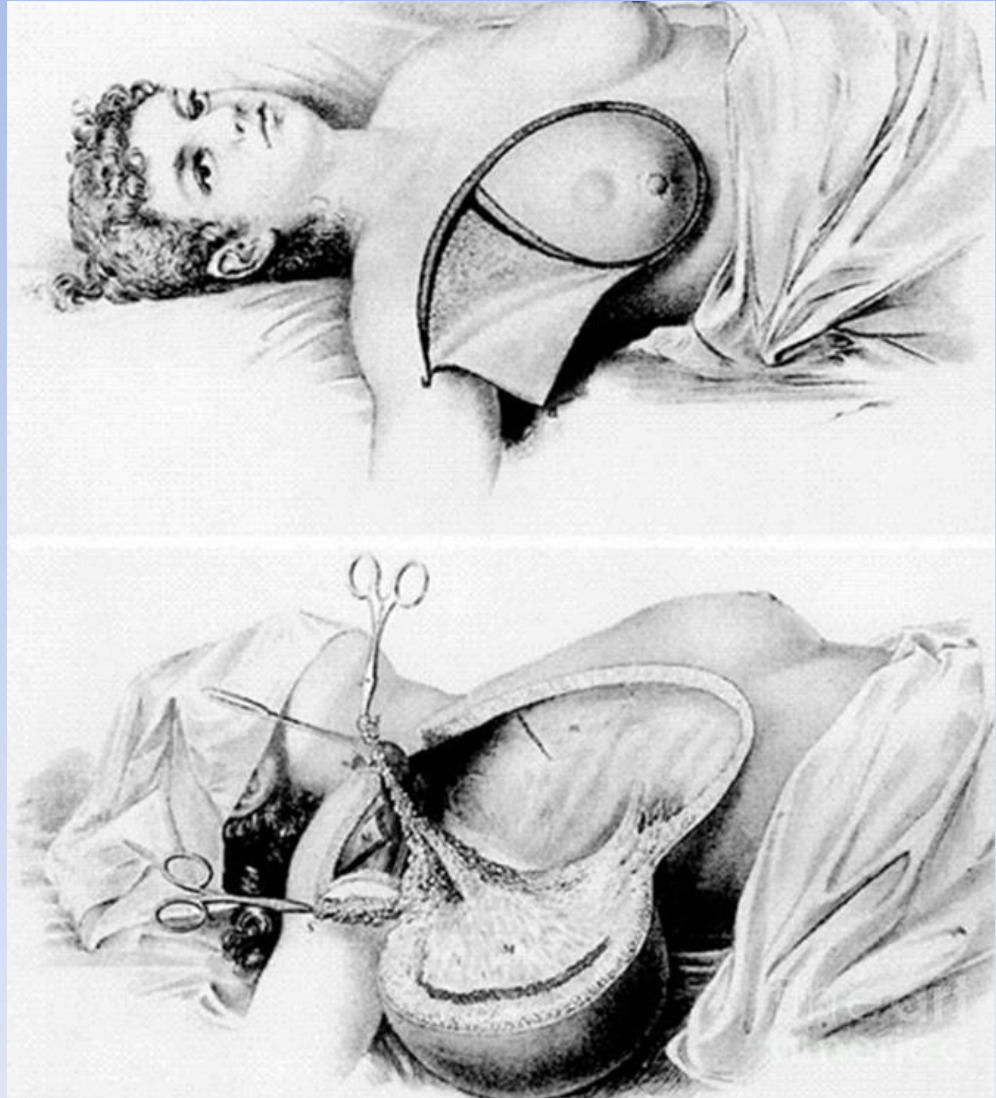
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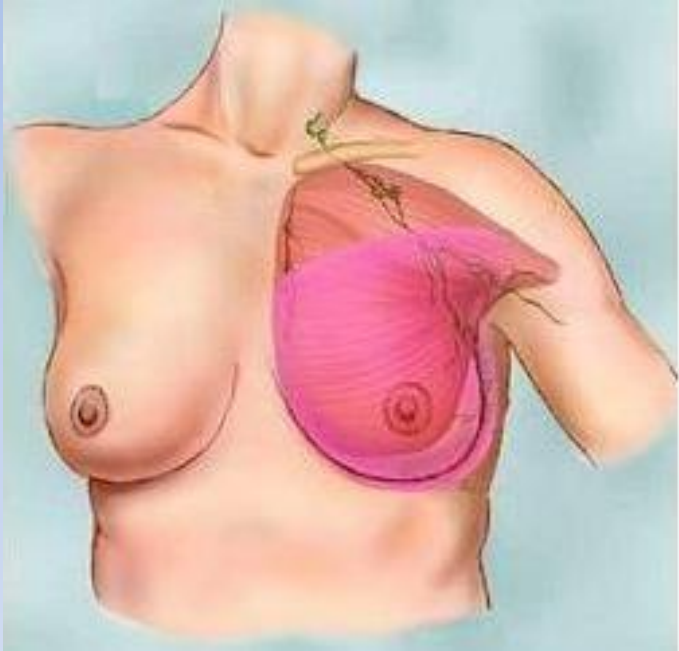
# History of Breast Cancer Surgery



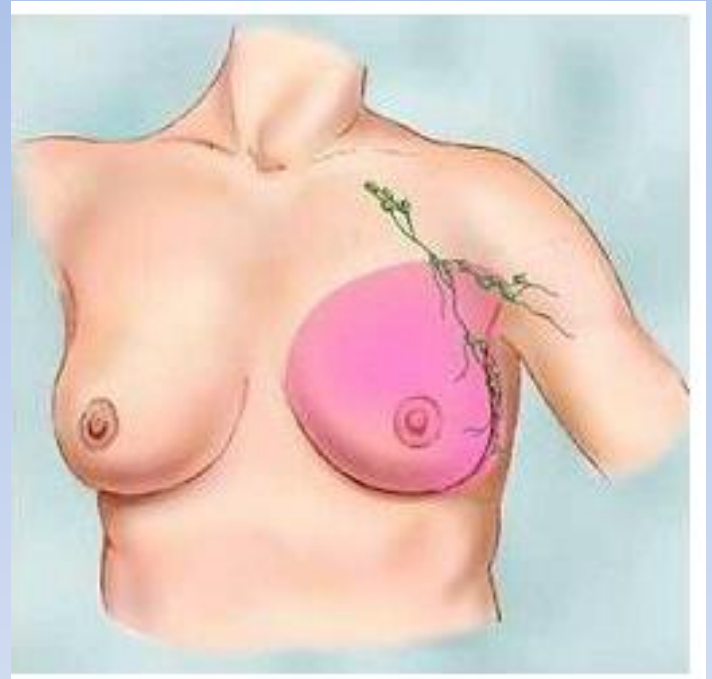
# Halsted Radical Mastectomy



# Extended vs Modified radical mastectomy

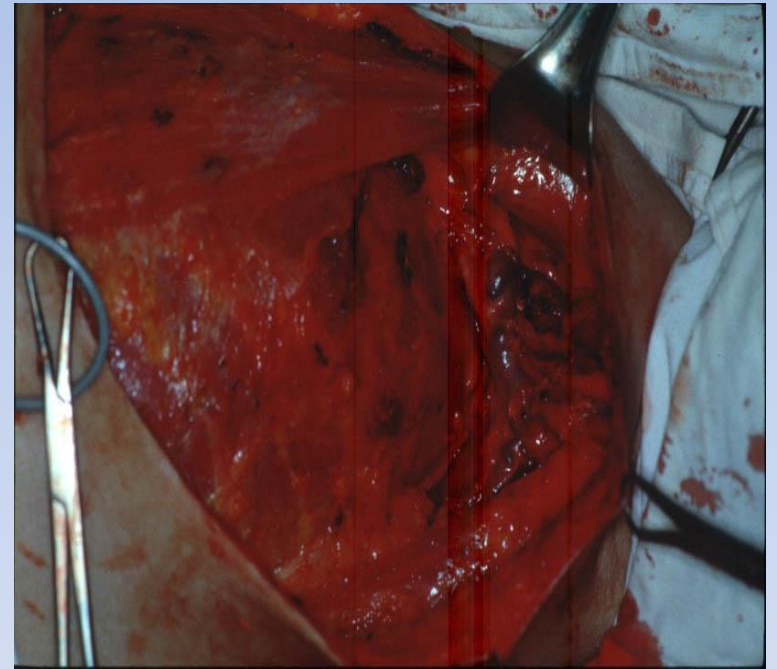
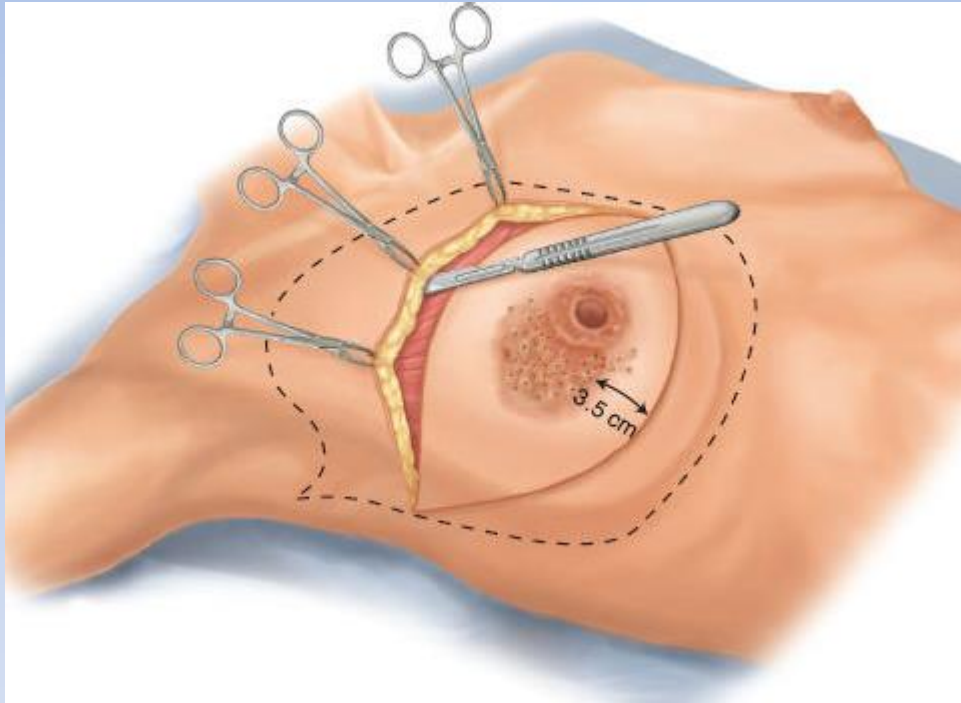


**(Extended) Radical Mastectomy**



**Modified Radical Mastectomy**

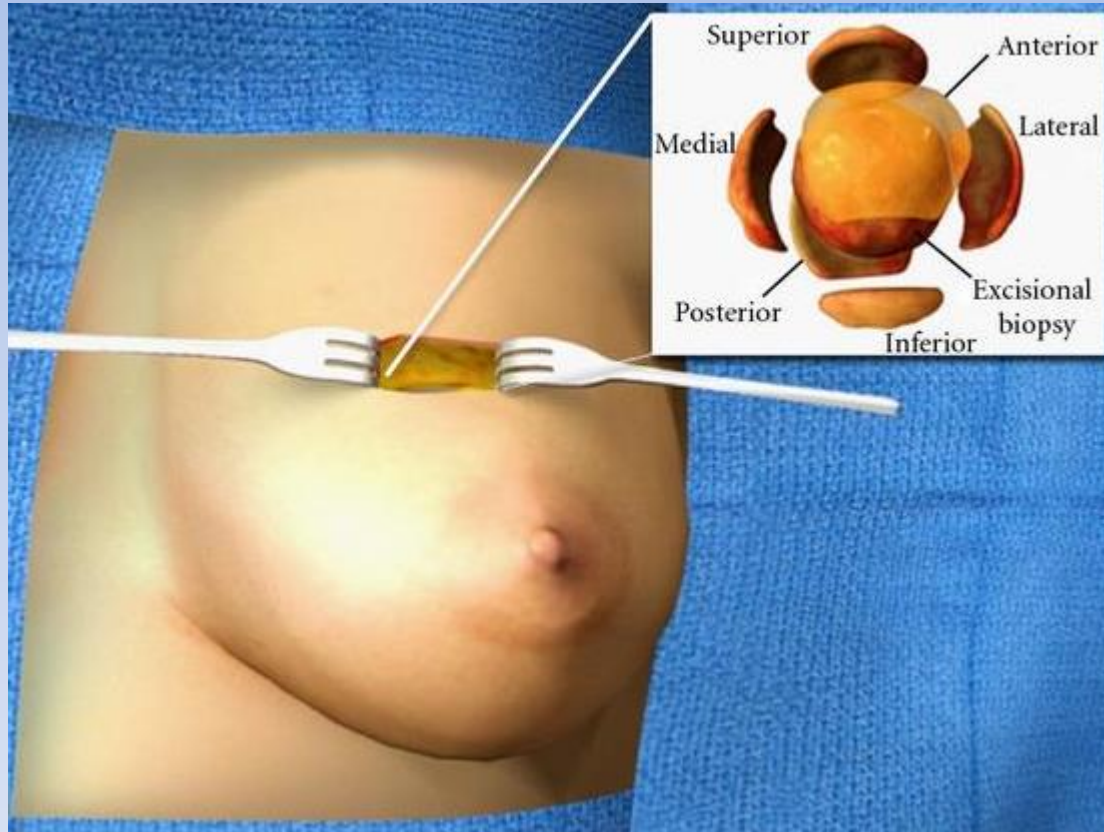
# Modified Radical Mastectomy



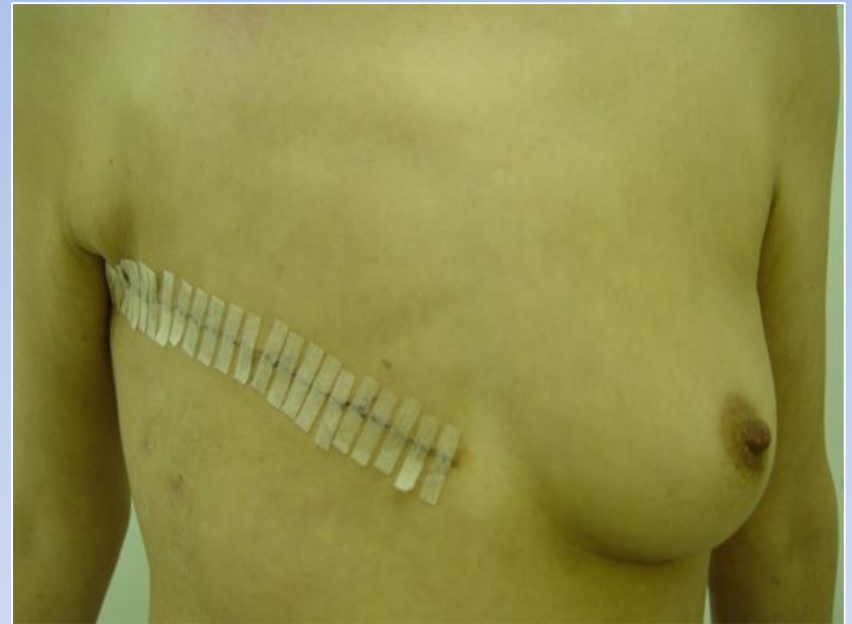




# Breast conserving surgery



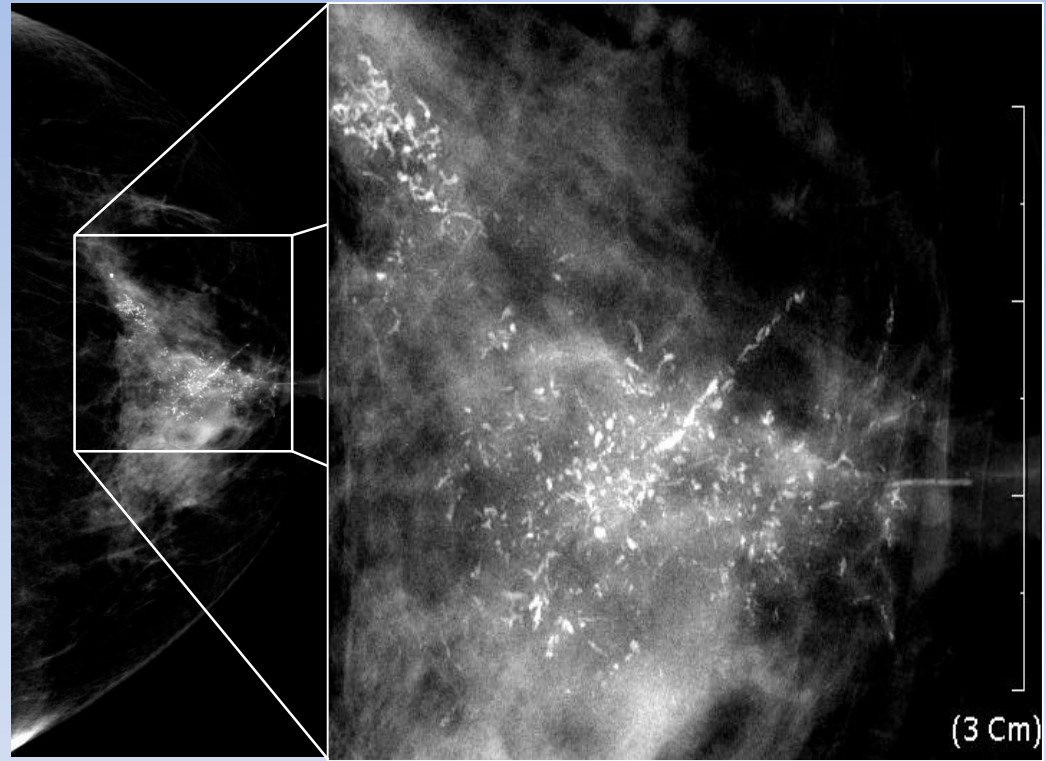
# BCS vs mastectomy



# Contraindications of BCS

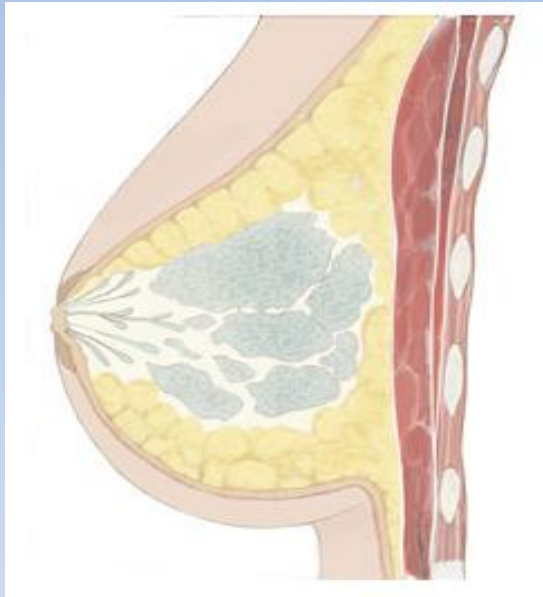


Multicentric lesions

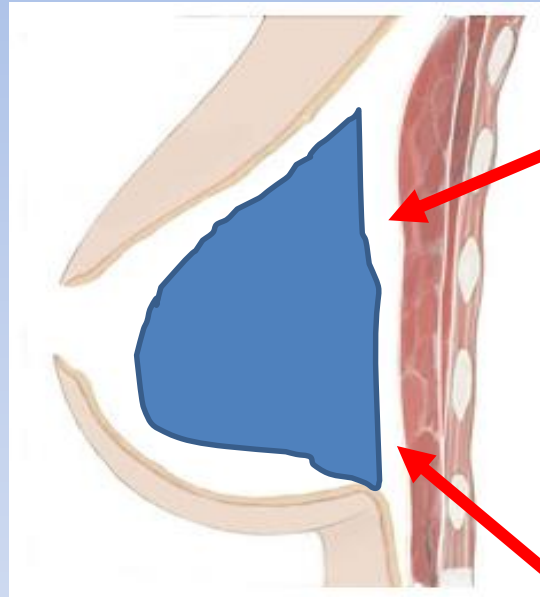
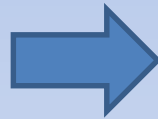


Diffuse microcalcification

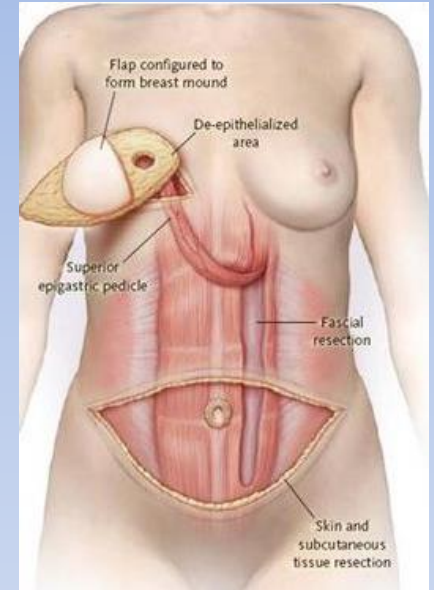
# Subcutaneous mastectomy (Skin sparing mastectomy)



유방조직 전절제



유방재건



자가조직



보형물



수술전

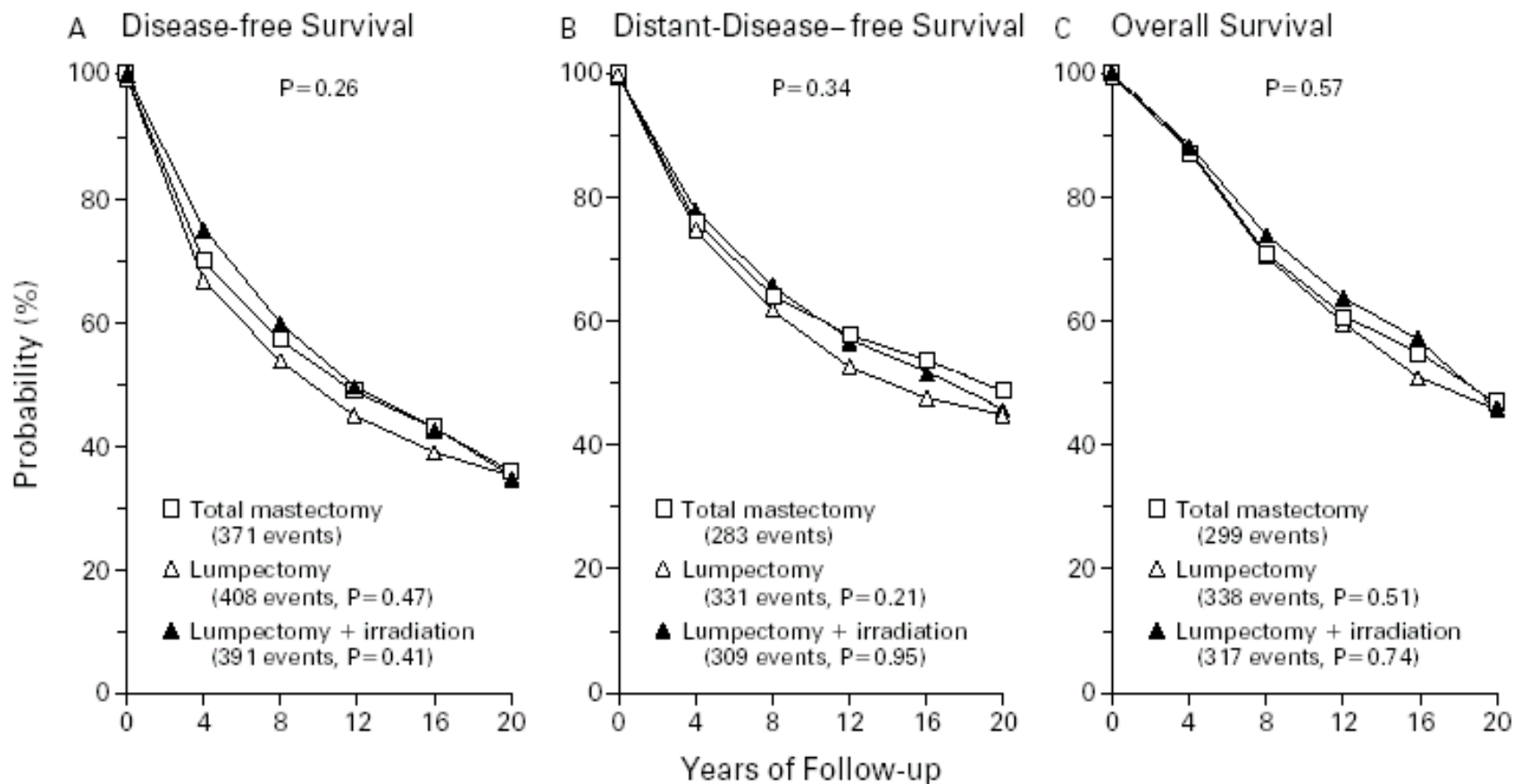


수술후

BCS is safe ?

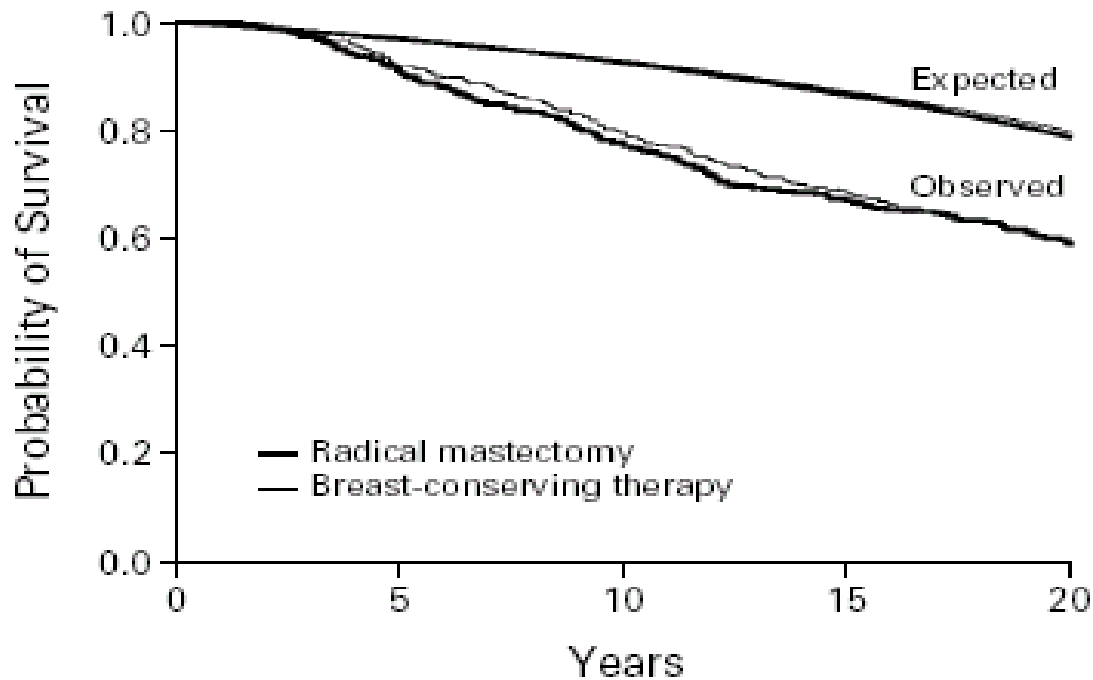


# 20 year results of NSABP 06



**Figure 2.** Disease-free Survival (Panel A), Distant-Disease-free Survival (Panel B), and Overall Survival (Panel C) among 589 Women Treated with Total Mastectomy, 634 Treated with Lumpectomy Alone, and 628 Treated with Lumpectomy plus Irradiation. In each panel, the P value above the curves is for the three-way comparison among the treatment groups; the P values below the curves are for the two-way comparisons between lumpectomy alone or with irradiation and total mastectomy.

# 20 year results of Milan I study



**Figure 2.** Kaplan–Meier Estimates of Survival after Radical Mastectomy or Breast-Conserving Therapy.

The two lower curves correspond to observed survival, taking into account deaths from any cause. The upper curves (which are almost identical in the two groups) show the expected survival rate on the basis of mortality rates in age-matched cohorts of Italian women.



*No doubt...!*

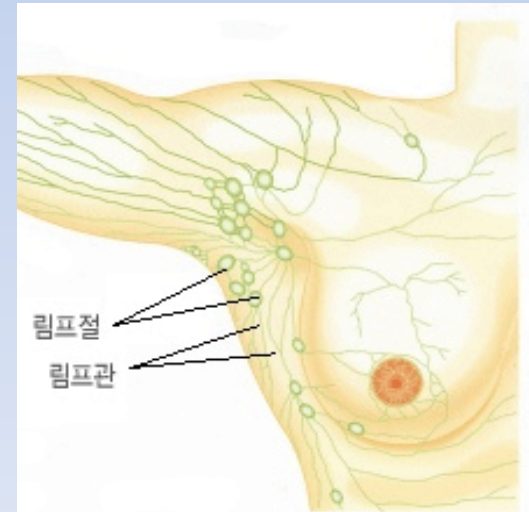
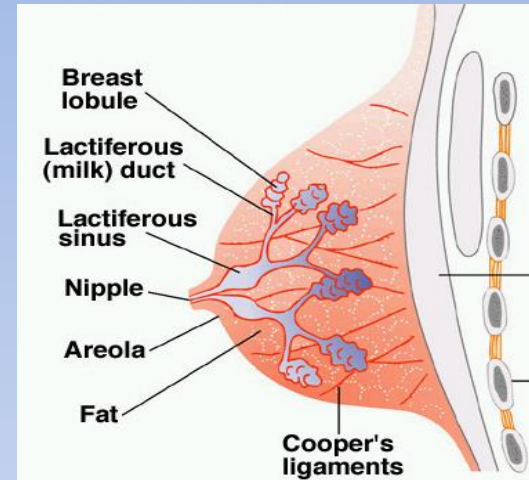


# Surgical Options for Breast Cancer

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  - Axillary node dissection





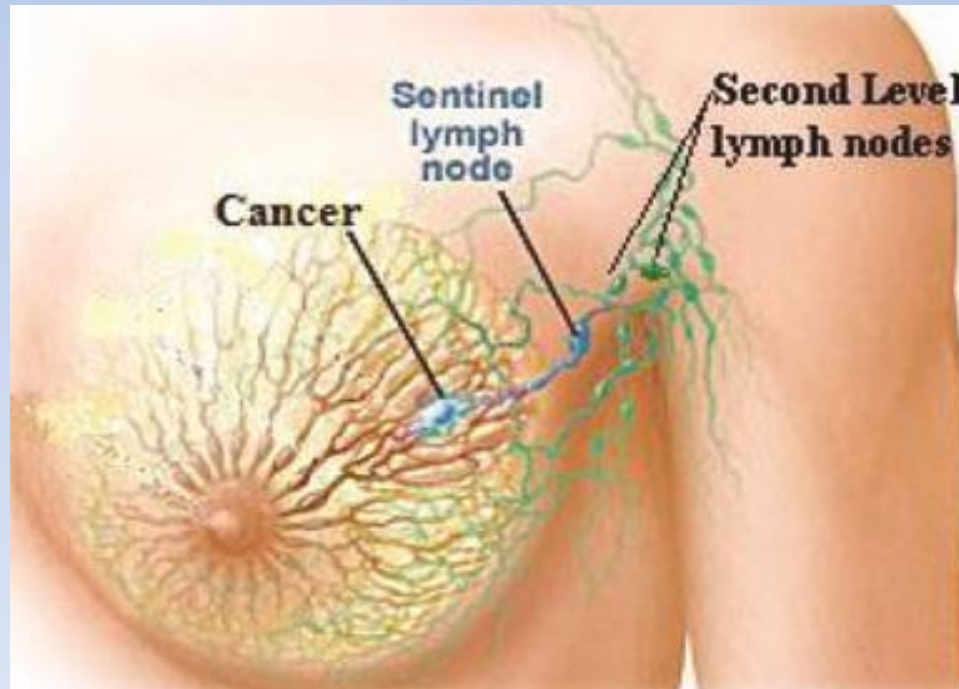
# The Sentinel



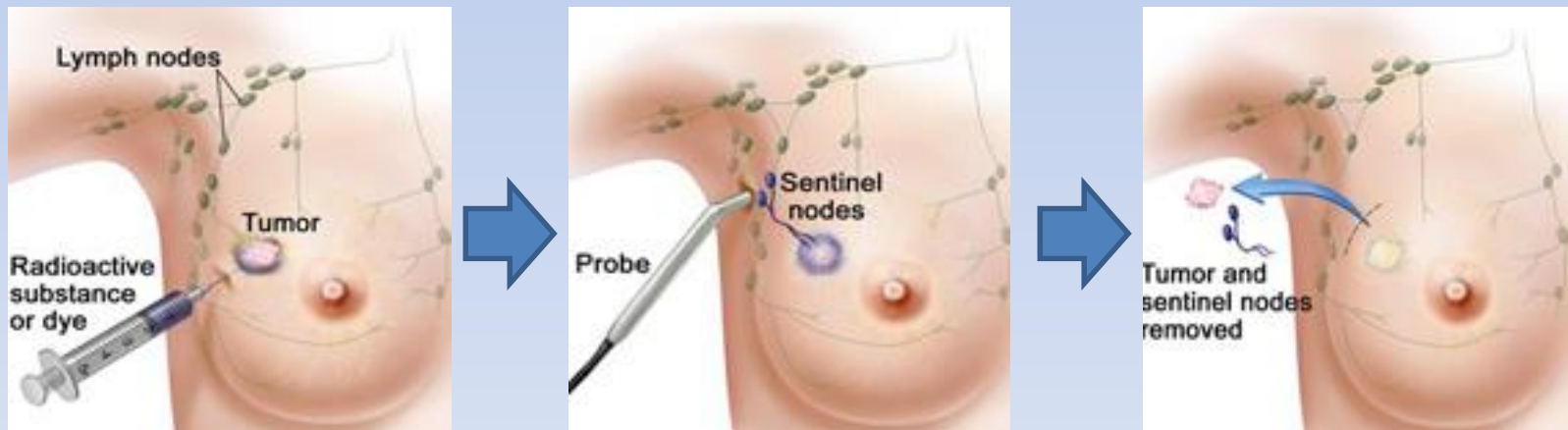
# What is a sentinel lymph node (SLN)?

Sentinel lymph node (SLN):

- 1) The first lymph node or group of lymph nodes encountered in the lymphatic drainage of the breast, generally identified by lymphatic mapping.
- 2) Some consider suspicious nodes found at the time of SNBx as SLNs as well.  
- ASCO guideline



- Injecting a radioactive marker and / or a blue dye into the tumor area or periareolar area → grossly or gamma probe
- If sentinel node is free, axillary node dissection can be avoid



# History

- **Parotid gland (1951)**  
Ernest Gould et al.  
Node at the junction of the ant. and post. facial vein
- **Penile cancer (1976)**  
Ramon Cabanas, a South American surgeon  
Nodes associated with the supf. Epigastric vein
- **Melanoma (1980-90)**  
Donald Morton et al.  
Term “sentinel” lymph node in 1992
- **Breast cancer (1994)**  
Giuliano et al. from Santa Monica, California



Donald L. Morton

WHY???





# Axillary lymph node dissection (ALND) over SLNBx

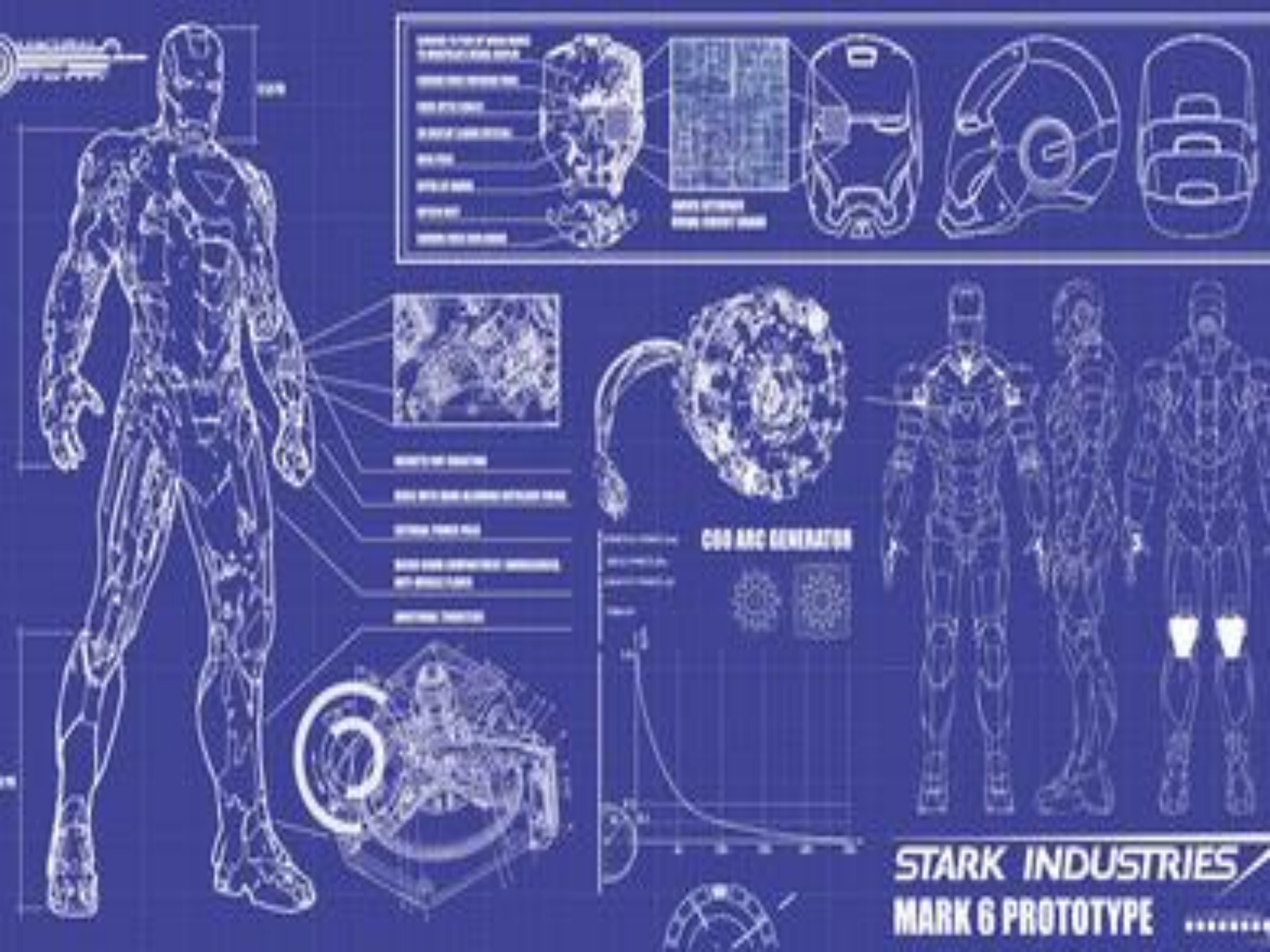
- Pain
- Paresthesia
- Infection
- Limitation of shoulder motion
- Lymphedema



Side Effect	Axillary-Dissection Group (N=100)		Sentinel-Node Group (N=100)	
	<i>no. of patients</i>			
	6 mo	24 mo	6 mo	24 mo
<b>Axillary pain*</b>				
No	9	61	84	92
Yes, sporadic	72	34	14	7
Yes, continuous	19	5	2	1
<b>Numbness or paresthesias on operated side†</b>				
No	15	32	98	99
Yes	85	68	2	1
<b>Arm mobility‡</b>				
80–100%	73	79	100	100
60–79%	22	18	0	0
40–59%	5	2	0	0
20–39%	0	1	0	0
<20%	0	0	0	0
<b>Aesthetic appearance of axillary scar§</b>				
Good	91	85	98	100
Bad	9	15	2	0
<b>Arm swelling (difference in circumference)¶</b>				
No difference	31	25	89	93
<1 cm	44	38	11	6
1–2 cm	17	25	0	1
>2 cm	8	12	0	0

HOW...?





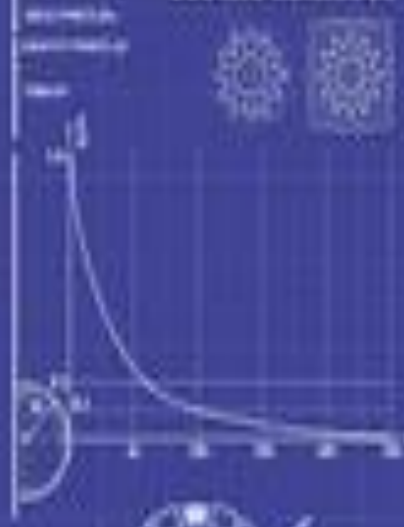
- ARMOR SYSTEM WEIGHT: 250 POUNDS
- ARMOR SYSTEM HEIGHT: 6 FEET 2 INCHES
- ARMOR SYSTEM LENGTH: 7 FEET 10 INCHES
- ARMOR SYSTEM WIDTH: 2 FEET 10 INCHES
- ARMOR SYSTEM DEPTH: 10 INCHES
- ARMOR SYSTEM VOLUME: 100 CUBIC FEET
- ARMOR SYSTEM SURFACE AREA: 100 SQUARE FEET



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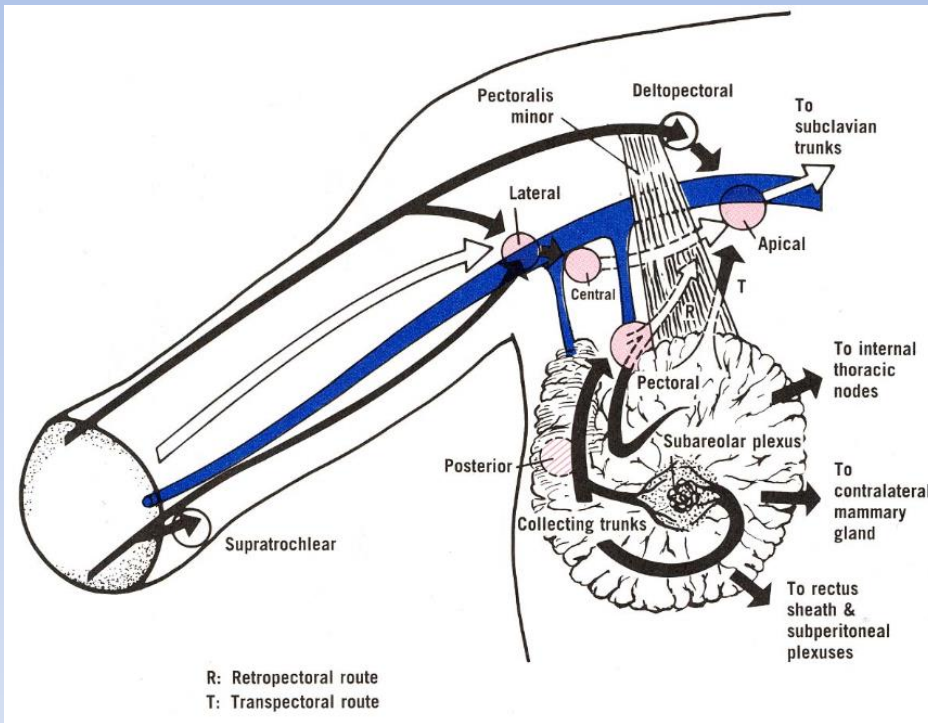


**COB ARC GENERATOR**



**STARK INDUSTRIES**  
**MARK 6 PROTOTYPE**

# Lymphatics in breast



In breast

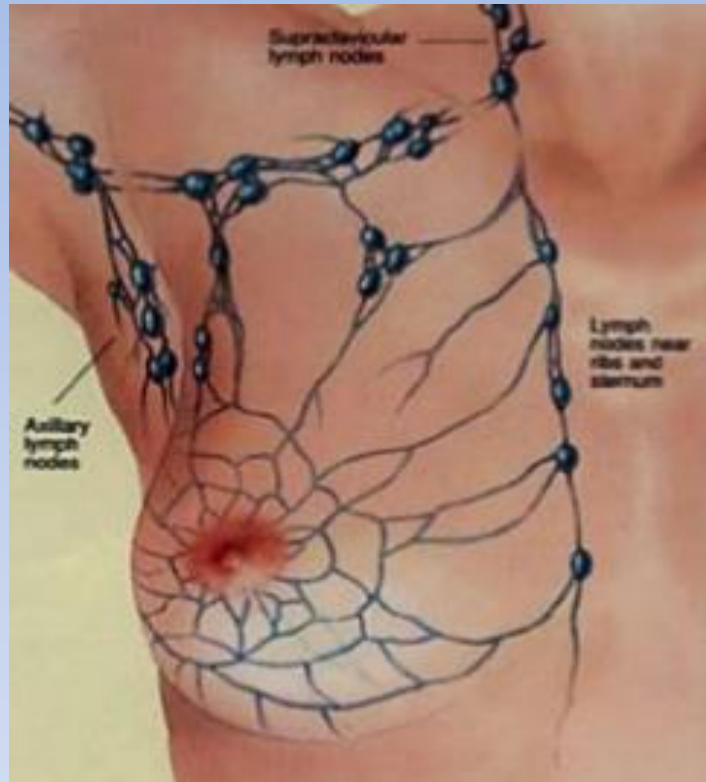
1) **Superficial lymphatics drains :**

skin over the breast except nipple and areola

2) **Deep lymphatics drains :**

a) Parenchyma of breast

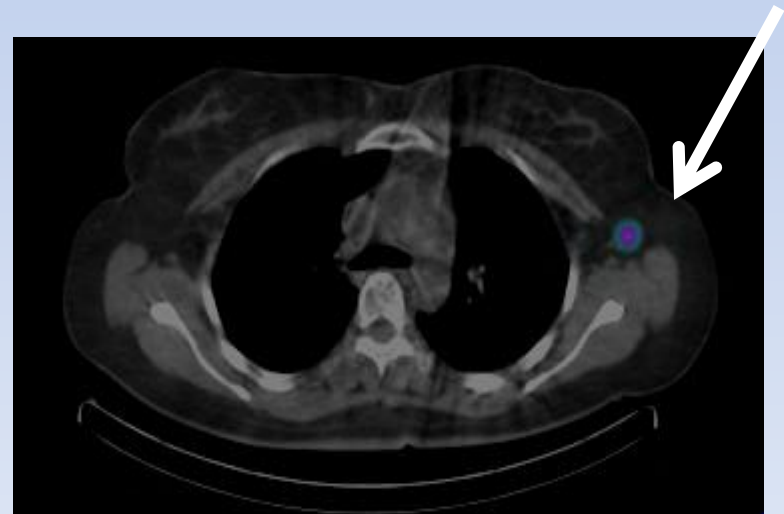
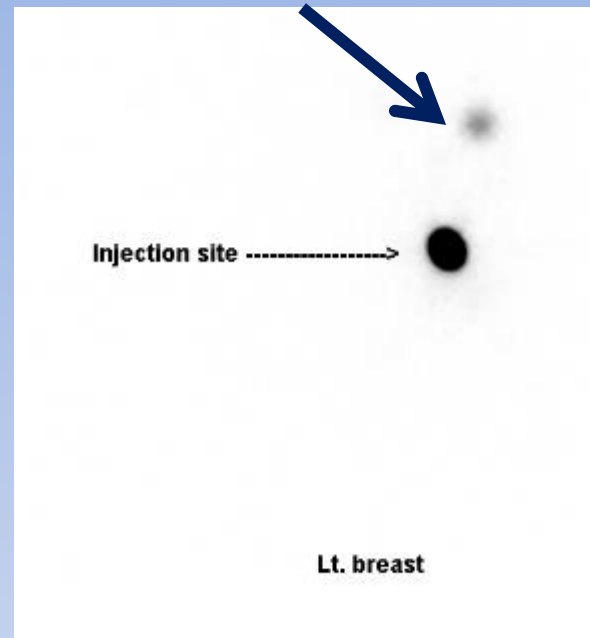
b) Nipple and areola



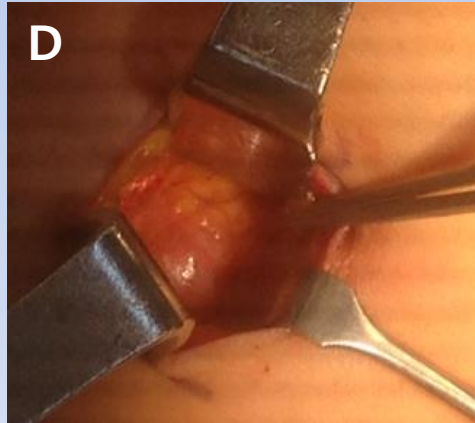
- Lymph of breast drains
  - 75% - axillary nodes
  - 20% - internal mammary nodes
  - 5% - posterior intercostal nodes

# Methods

- Injection material
  - Blue dye
  - Radiotracer ( $^{99m}\text{Tc}$ -colloid)
  - Blue dye + radiotracer
- Injection location
  - Peritumoral
  - Periareolar





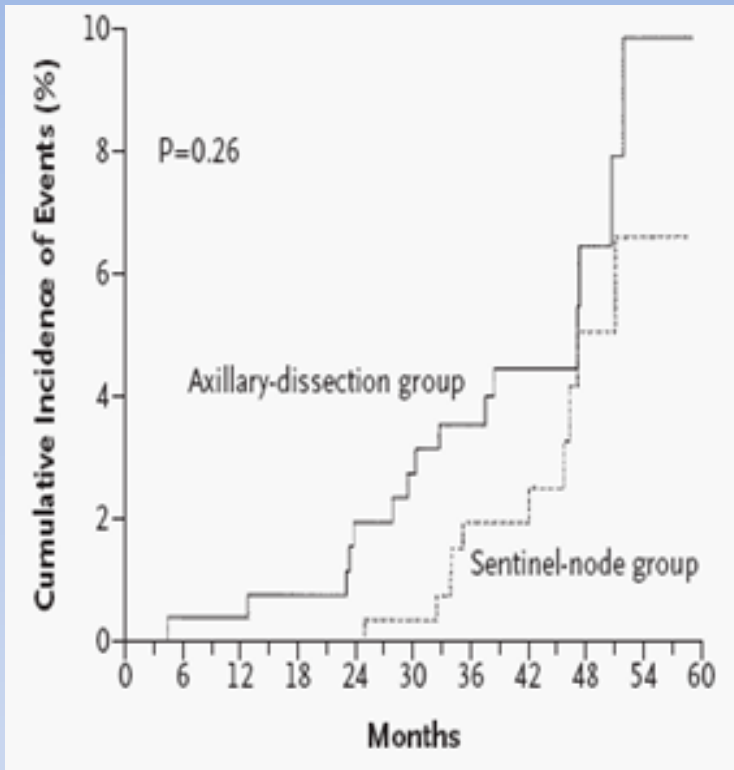


SLNBx is safe ?

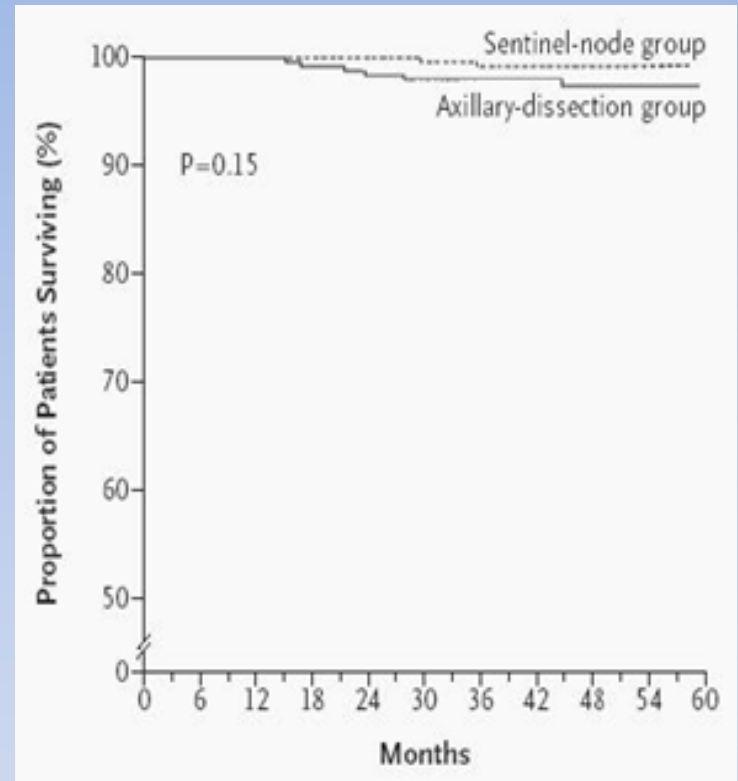


- SLN detection rate  $> 85-90\%$
- False negative rate  $\leq 5\%$





Cumulative incidence rate in ALND and SLNBx



OS between in ALND and SLNBx

# Optimal number of SLN

False negative rate according to the dissected SLN

No. of dissected SLNs (No. of patients)	True negative	False negative	True positive	False negative rate, % (No. of patients)*	Accuracy, % (No. of patients)†
1 or more (328)	217	12	99	10.8 (12/111)	96.3 (316/328)
2 or more (236)	155	4	77	5.0 (4/81)	96.3 (232/236)
3 or more (154)	98	2	54	3.5 (2/56)	96.7 (152/154)
4 or more (97)	59	0	38	0 (0/38)	100 (97/97)

The relationship between the number of resected LNs and the false negative rate and the accuracy in SLN biopsy on permanent pathology

Number of resected lymph nodes	False negative rate	Accuracy
1	23.1% (3/13) $p=0.014$	90.9% (30/33) $p=0.039$
2	11.1% (2/18)	96.2% (50/52)
3	4.8% (1/21)	97.9% (46/47)
$\geq 4$	0% (0/22)	100% (38/38)
Total	8.1% (6/74)	96.5% (164/170)

Metastatic status of SLN and the corresponding percentage of patients ON the basis of the order of radioisotope count

Metastatic status of SLN	Average no. of harvested SLN (range)	No. of patients (%)
S1 (S1[+])	1.24 (1-4)	258 (82.9)
S2 (S1[-],S2[+])	2.45 (2-4)	40 (12.9)
S3 (S1[-],S2[-],S3[+])	3.46 (3-5)	13 (4.2)
S4-8		0 (0.0)
Total		311 (100.0)

SLN=sentinel lymph node.

The needed number of harvested SLN until identifying metastasis

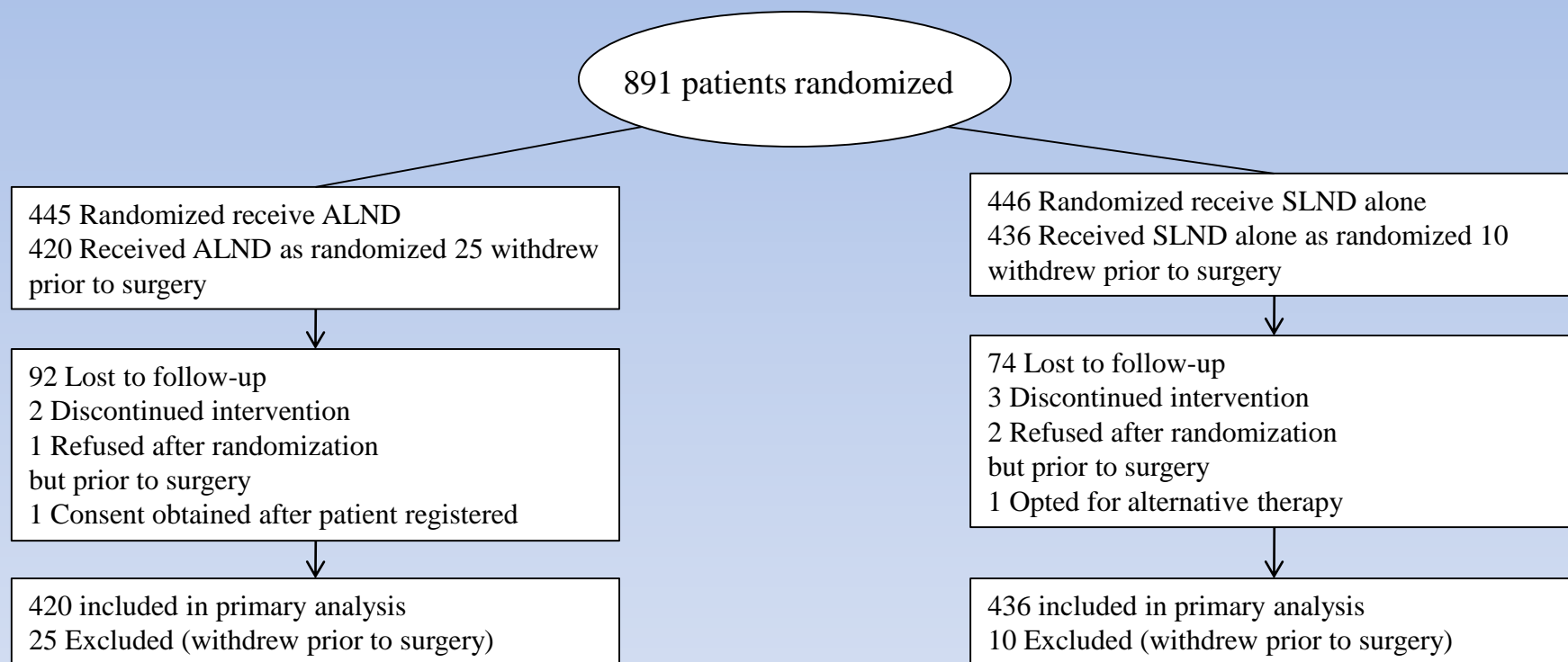
Needed no. of harvested SLN	No. of patients in S1 (S1[+])	No. of patients in S2 (S1[-], S2[+])	No. of patients in S3 (S1[-], S2[-], S3[+])	Total no. of patients (%)
1	207	0	0	207 (66.6)
2	42	26	0	68 (21.9)
3	7	10	8	25 (8.0)
4	2	4	4	10 (3.2)
5	0	0	1	1 (0.3)
Total	258	40	13	311 (100.0)

ALND in patients with SLNBx (+)





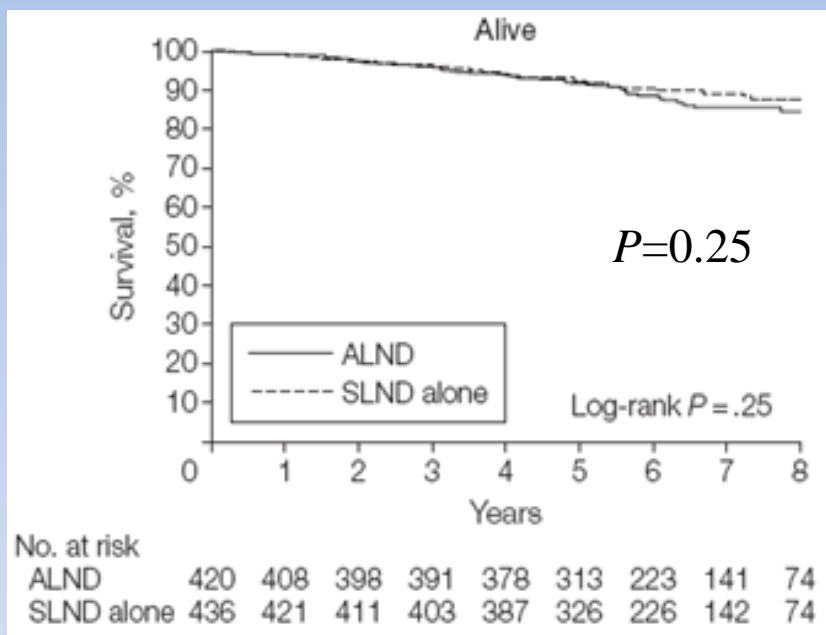
# Axillary Dissection vs No Axillary Dissection in Women With Invasive Breast Cancer and Sentinel Node Metastasis (ACOSOG Z0011 trial)



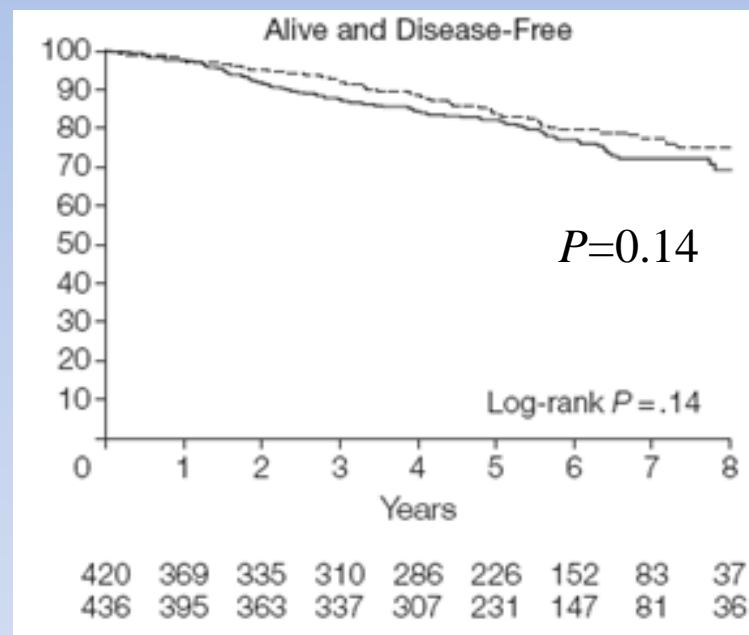
# Those included in Z0011

- Clinically (-) axillary nodes
- Gross extranodal disease (-)
- No-neoadjuvant treatment (CTx or hormonal Tx)
- T1-T2 tumors
- BCS with RTx

# Survival of the ALND Group Compared With SLND- Alone Group



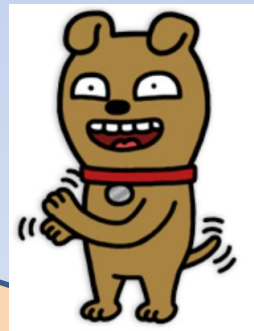
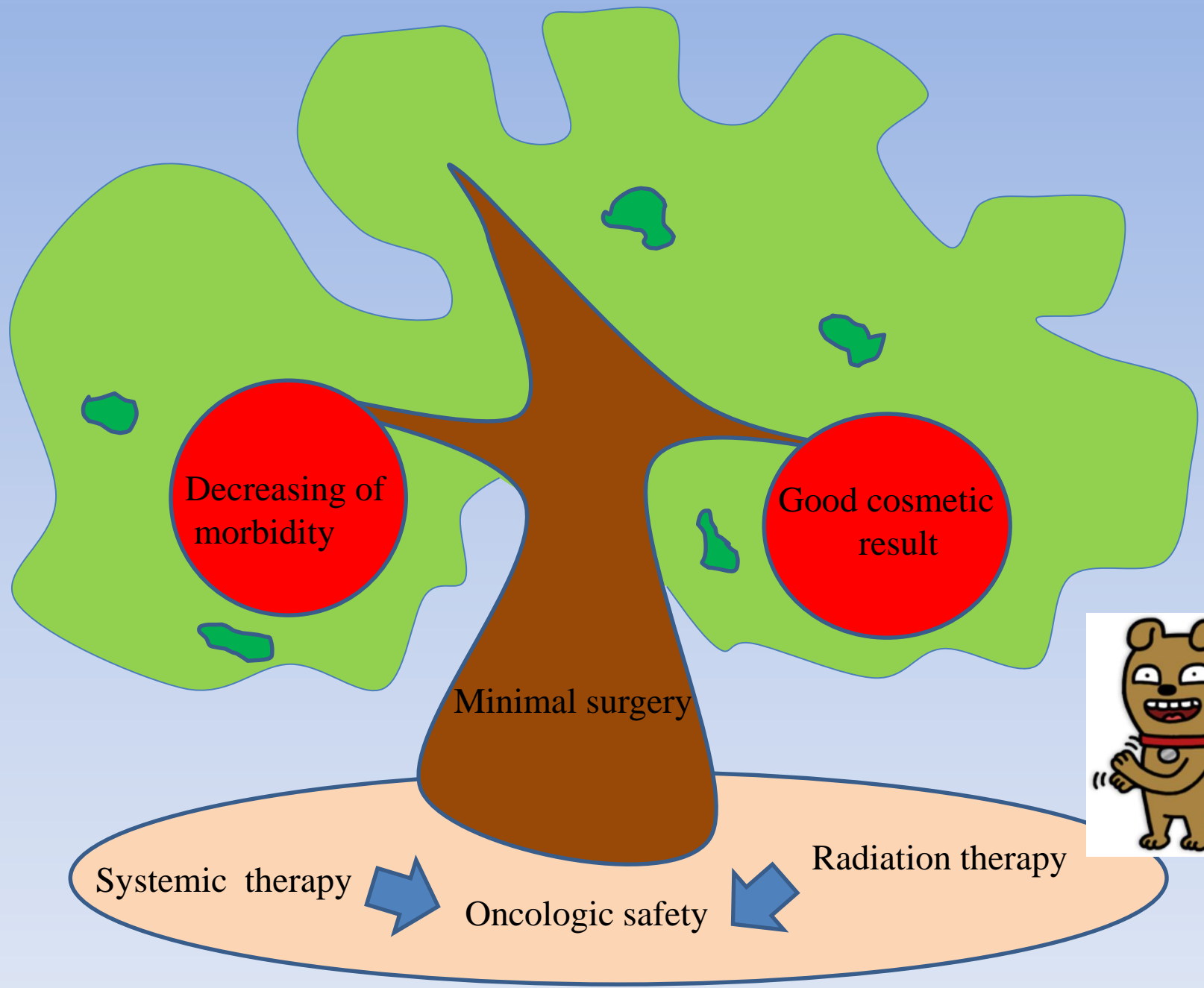
Overall survival



Disease free survival

# Conclusion

- Treatment of patients with early stage breast cancer in the SLN era
  - SLN dissection replaces ALND in T1-T2 tumors
  - IHC is not warranted for evaluation of H&E negative SLNs
  - Patients with 1-2 positive SLNs can avoid ALND when planned for BCT with whole breast irradiation



**Thank you...!**