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Ganglion Sentinelle

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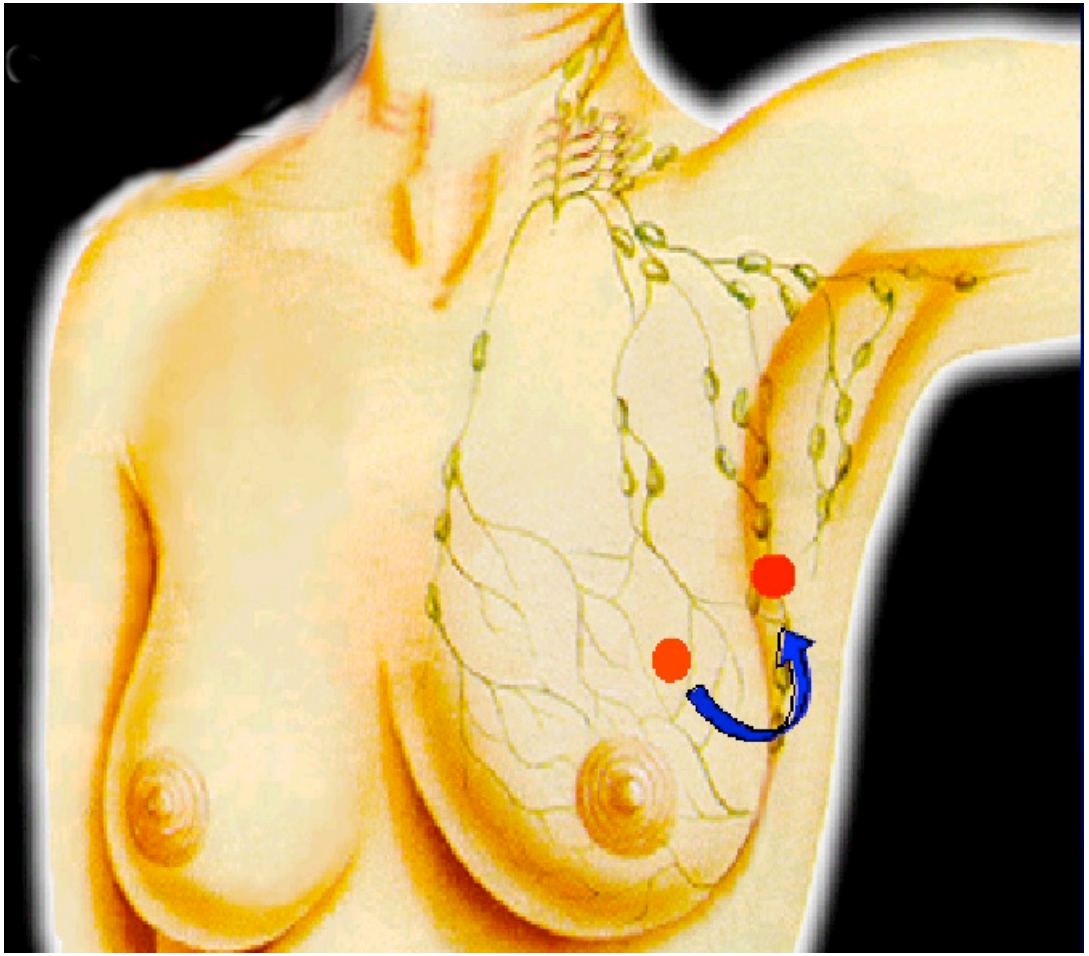
DRAINAGE LYMPHATIQUE DU SEIN

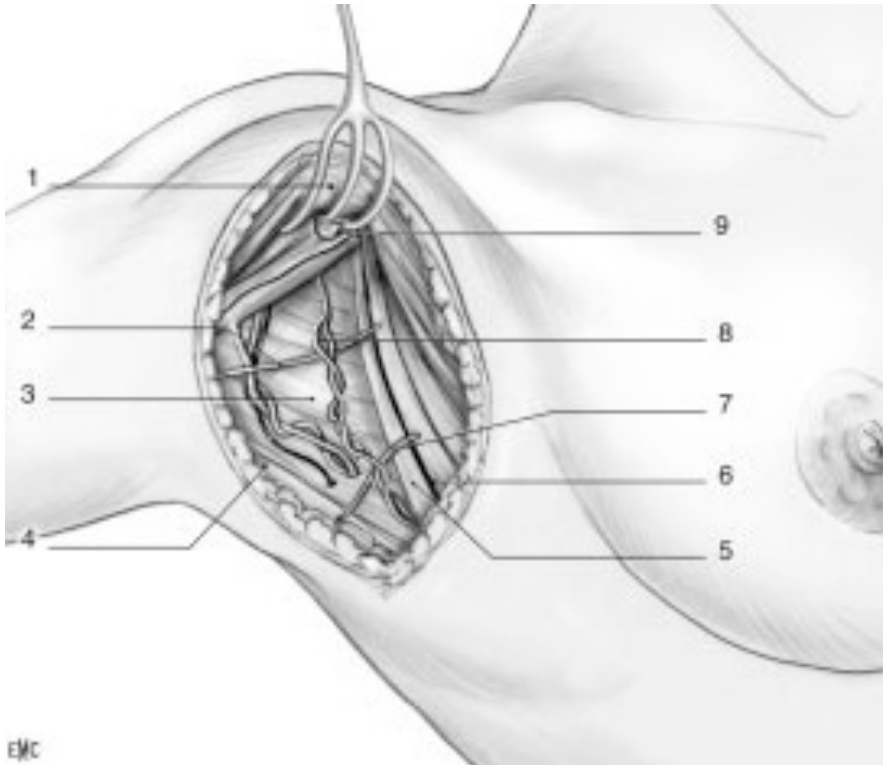


Voie principale AXILLAIRE :
de chaque quadrant vers le plexus sous aréolaire de Sappey, puis vers les ganglions axillaires du premier étage via les lymphatiques sous-cutanés

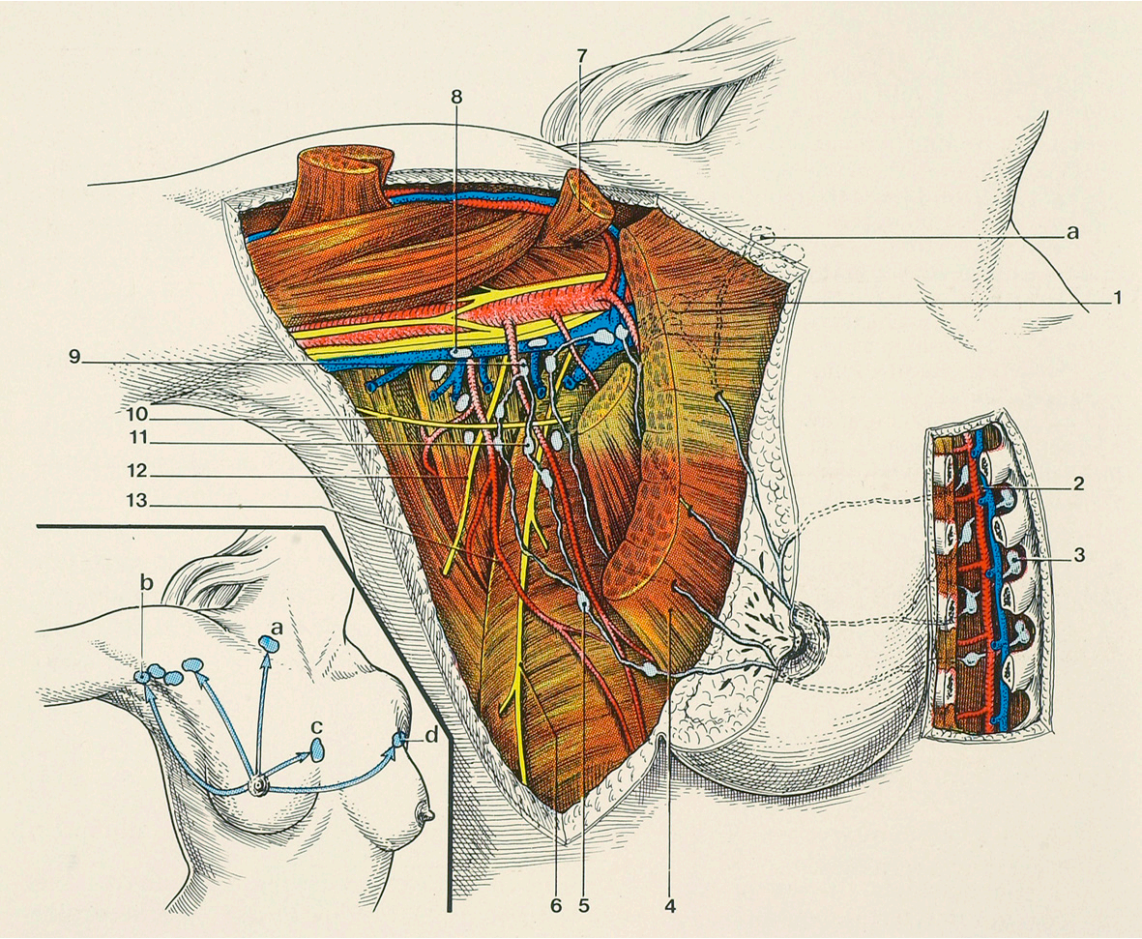
Notion d ’atteinte axillaire séquentielle:
1er puis 2ème puis 3ème étage etc…

Voie accessoire: MAMMAIRE INTERNE
mais atteinte mammaire interne sans atteinte axillaire concomitante = très rare (Veronesi, 1983)

Anatomie de l'aisselle

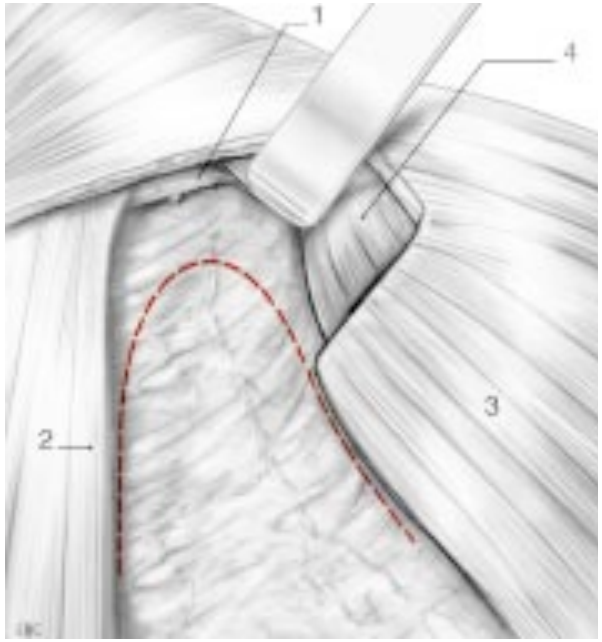


1.Muscle grand pectoral
2. deuxième nerf perforant intercostal
3. muscle sousscapulaire
4. muscle grand dorsal
5. muscle grand dentelé
6. nerf du grand dentelé
7. troisième perforant intercostal
8. vaisseaux mammaires externes 9. anse des pectoraux.

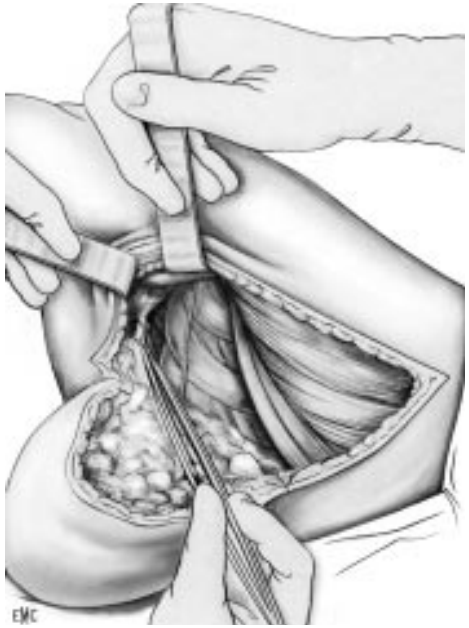


Limite du C A

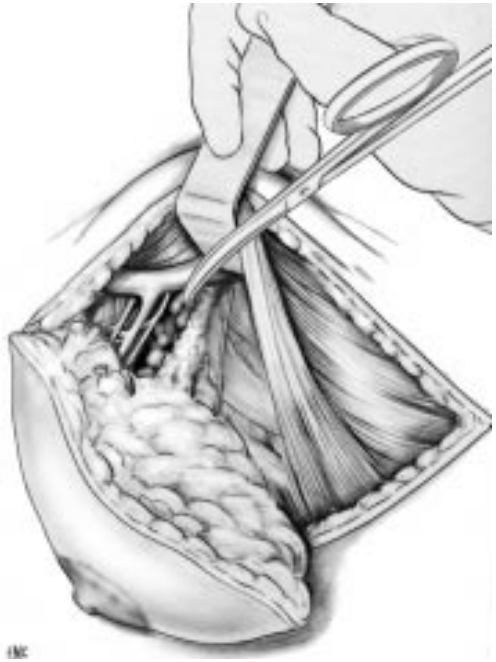
- En dedans: nerf du grand dentelé
- En dehors: pédicule du grand dorsal
- En haut: veine axillaire



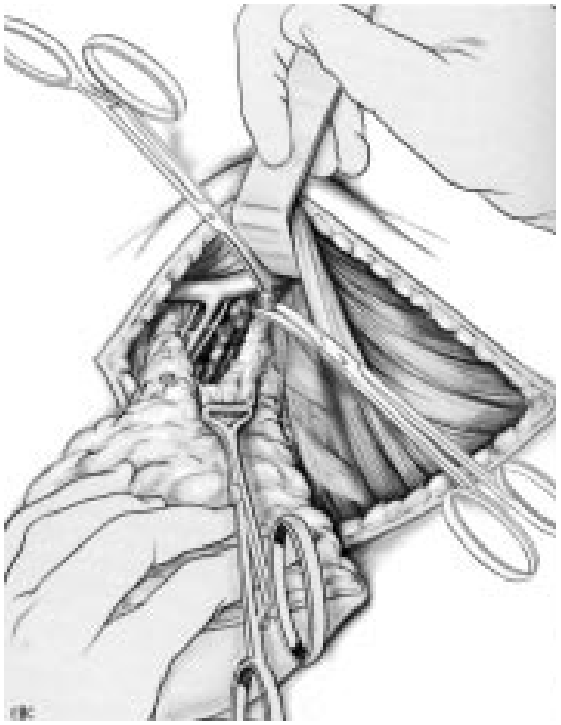
Curage axillaire : ouverture de l'aponévrose clavi-pectoro-axillaire selon un « U inversé ».
1. Veine axillaire ; 2. muscle grand dorsal ; 3. muscle grand pectoral ; 4. muscle petit dorsal.



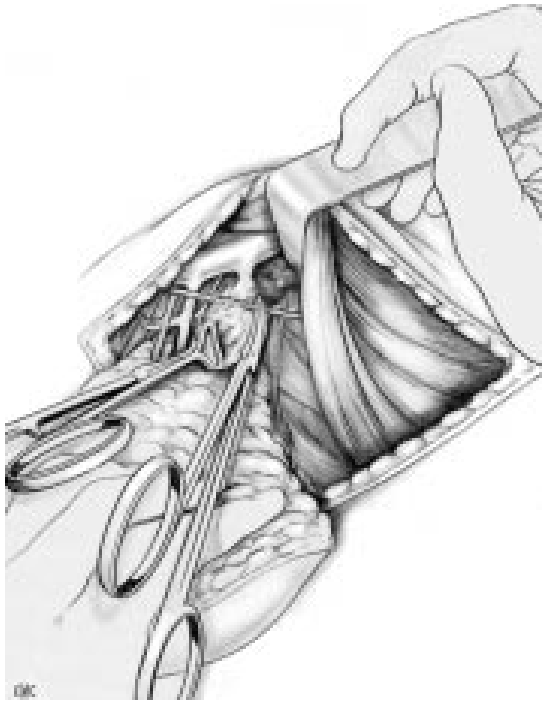
Curage axillaire : libération de la face inférieure de la veine axillaire et du nerf du grand dentelé.



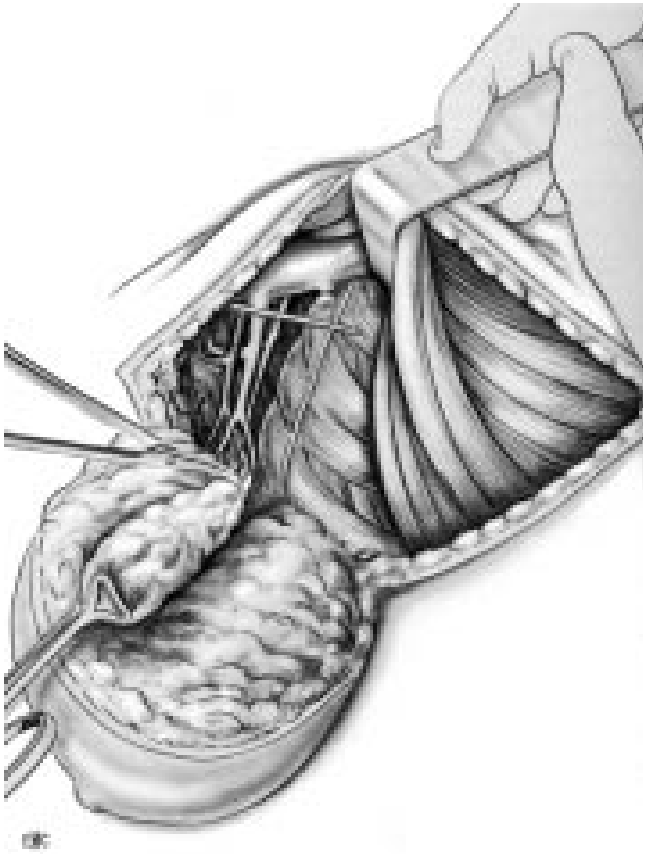
Curage axillaire :
abord du pédicule scapulaire inférieur et du nerf du grand dorsal.



Curage axillaire : section de la lame internerveuse.



Curage axillaire : dissection du deuxième perforant intercostal.



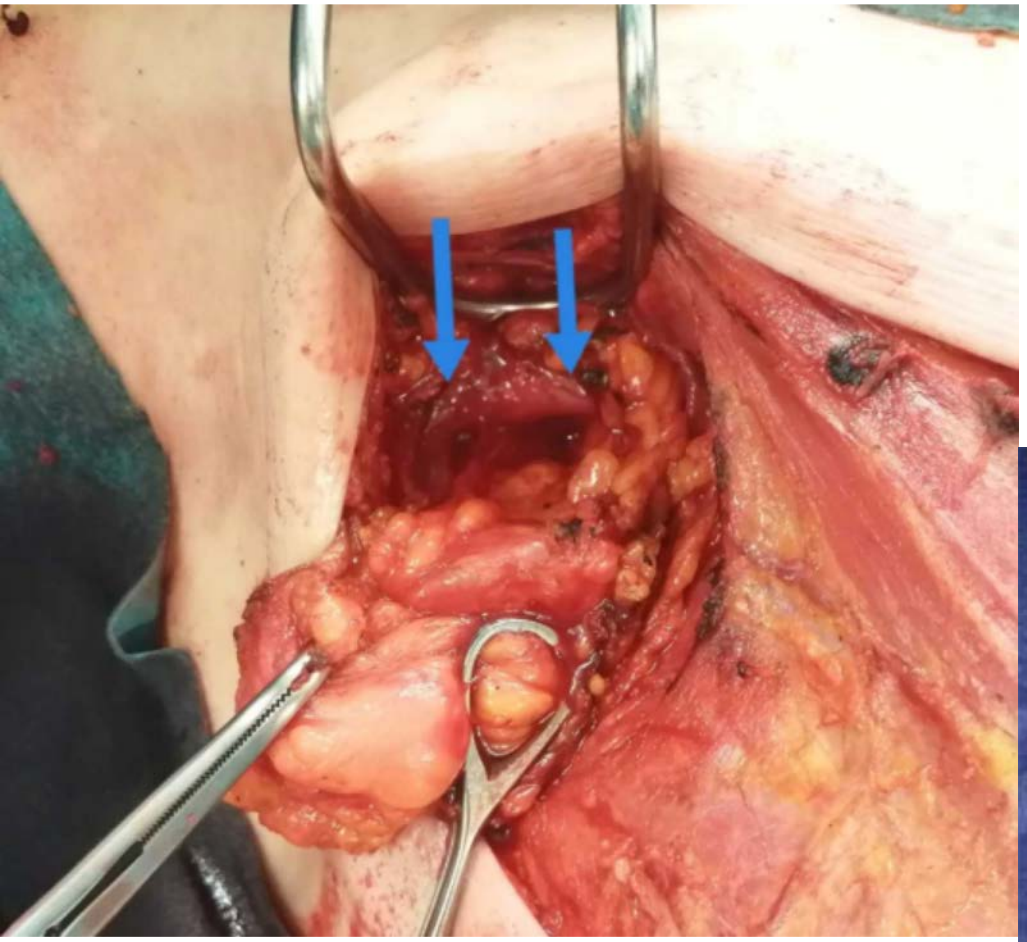
Curage axillaire : dissection du pédicule scapulaire inférieur.

Curage axillaire

Objectif : retirer l'ensemble des ganglions axillaires (environ 10 GG)

Risques :
- douleur
- drain, hospitalisation + longue
- kinésithérapie, troubles nerveux face inférieure du bras
- gêne à la mobilisation du bras
- douleurs chroniques
- lymphoedème

Indications :
N+ cliniquement ou à la ponction
N+ après ganglion sentinelle
tumeur volumineuse, multiple?
traitement préalable?



Dissection extensive

Lymphoedeme MS

CONCEPT DU GANGLION SENTINELLE

- Premier gg recevant le drainage lymphatique d'une tumeur *(Cabanas 1977)*

  = premier gg envahi en cas de métastase lymphatique

- Technique transposée au cancer du sein *(Krag 1993, Giuliano 1994)*

<u>OBJECTIFS</u>

- Réduction de la morbidité
- Examen histologique plus ciblé

Ganglions sentinelles axillaires

Objectif : retirer le premier ganglion qui draine la lésion (1-3GG)

Identification
- colorimétrique : Bleu Patenté®
- isotopique
- Fluorescence: Vert d'indocyanine
- mixte I + C ou F

Intérêts : limiter les risque de séquelles du curage

Risques :
- faux-négatifs
- non identification
- reprise chirurgicale si positif à l'histologie définitive?

Indications :
petite tumeur infiltrante
N-
unique?
sans traitement préalable?

Ultrastadification

Definition histologique

- Macrométastases > 2 mm
- Micrométastases [0,2 – 2 mm] –
- Cellules isolées < 0,2 mm !

« plus on cherche, plus on trouve »

- Coupes sériées : 10-33% de N+ supplémentaires
- Immunohistochimie : 10-15% de N+ supplémentaires

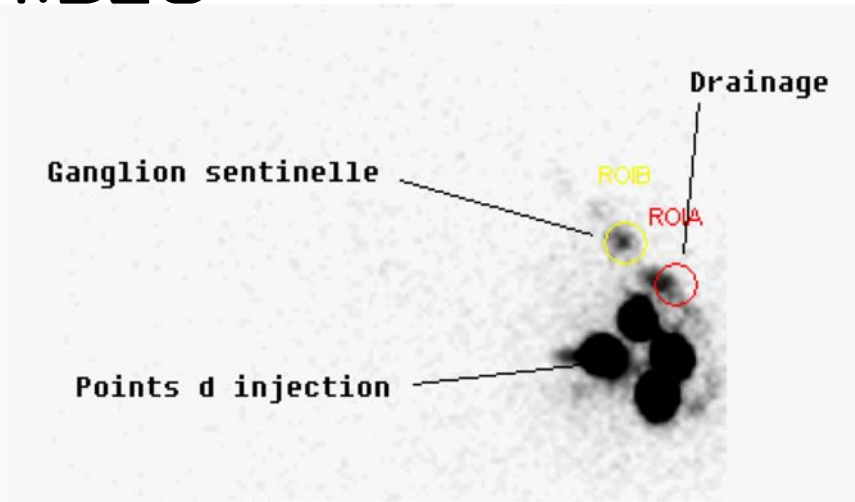
Valeur pronostique de l'ultrastadification

- " Chimiothérapie, irradiation AG "
- Vrais » N- (pN0i-) : survie qui excède de 5% celle des Nconventionnels (sauf pour les très petites tailles) !

Cette amélioration de la stadification pourrait compenser voire dépasser la perte de chance liée au risque de Faux Négatifs.

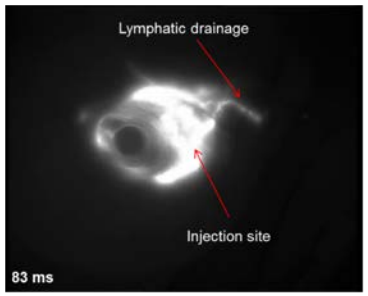
PRINCIPAUX TYPES DE TRACEURS LYMPHOPHiLES

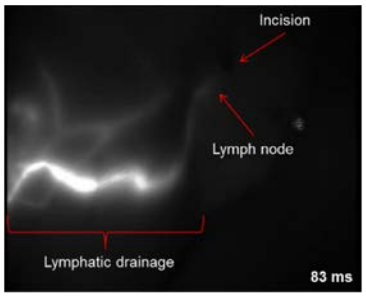
- Radiocolloïde marqué au Technétium 99m
  - injection 2 à 24 h avant intervention
  - clichés scintigraphiques entre 1 et 4 heures après avec dessin des projections du GS à la peau
  - détection per-opératoire des GS guidée par sonde gamma



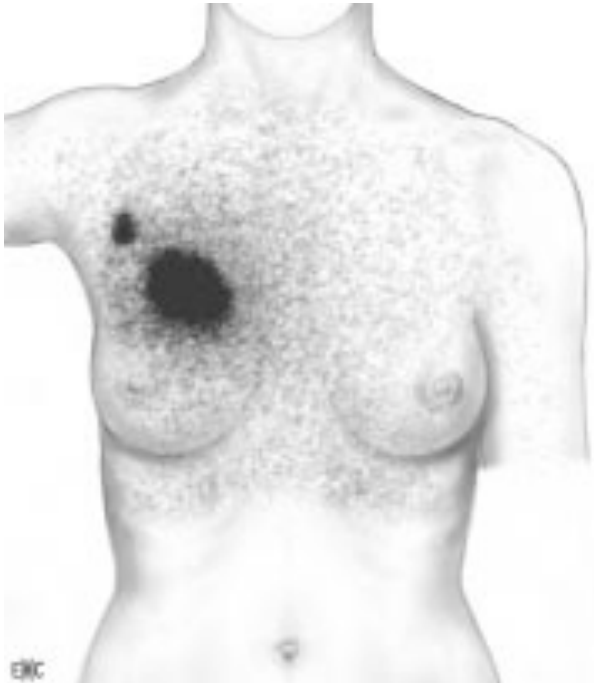
- Colorant : bleu patenté
  - injection qq min avant intervention

- Colorant : Vert d'indocyanine
  - injection qq min avant intervention, camera fluorescence



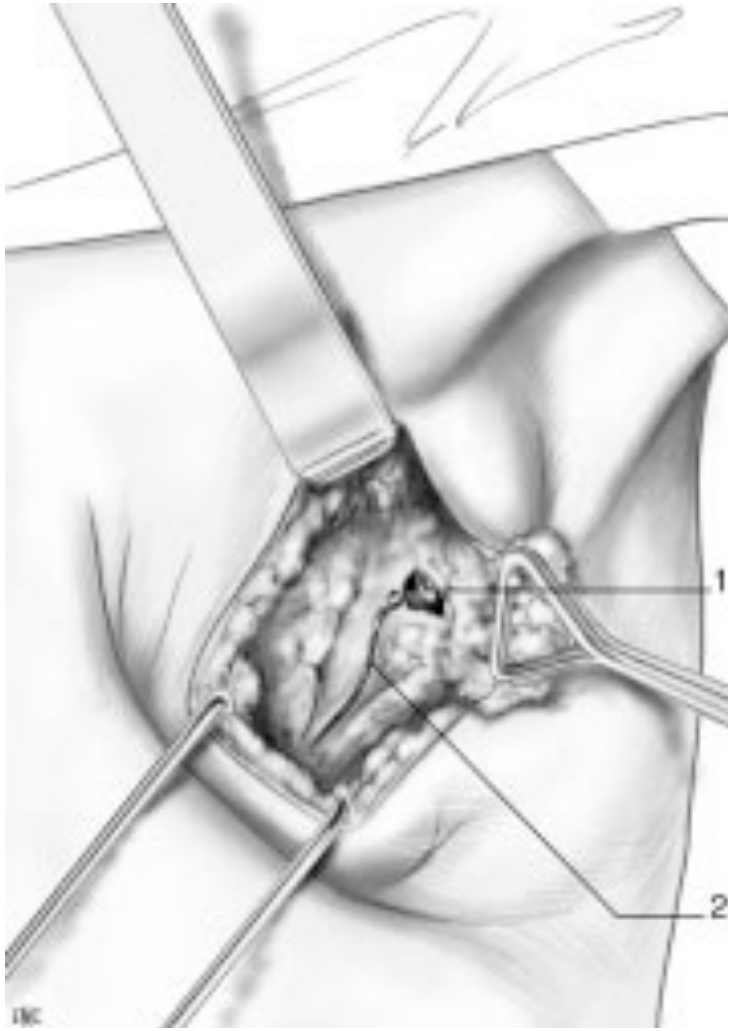


Ganglion sentinelle



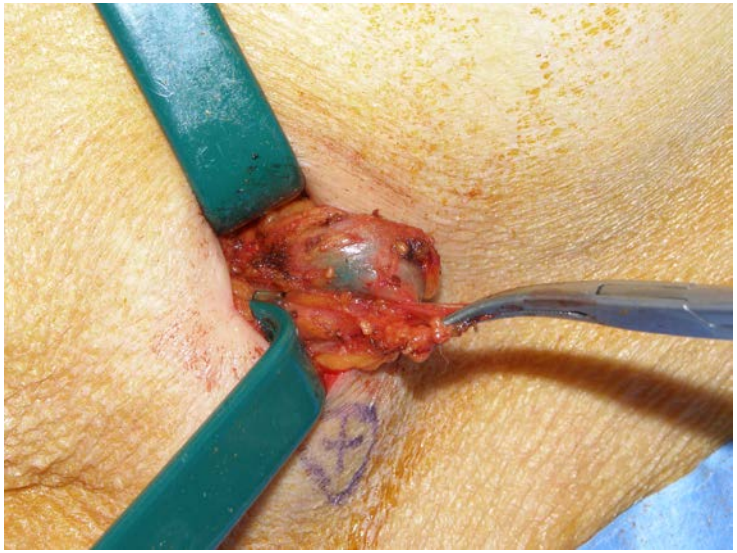
Recherche du ganglion sentinelle par méthode isotopique en préopératoire
Injection péri-aréolaire
Lymphoscintigraphie montrant un drainage axillaire

Ganglion sentinelle

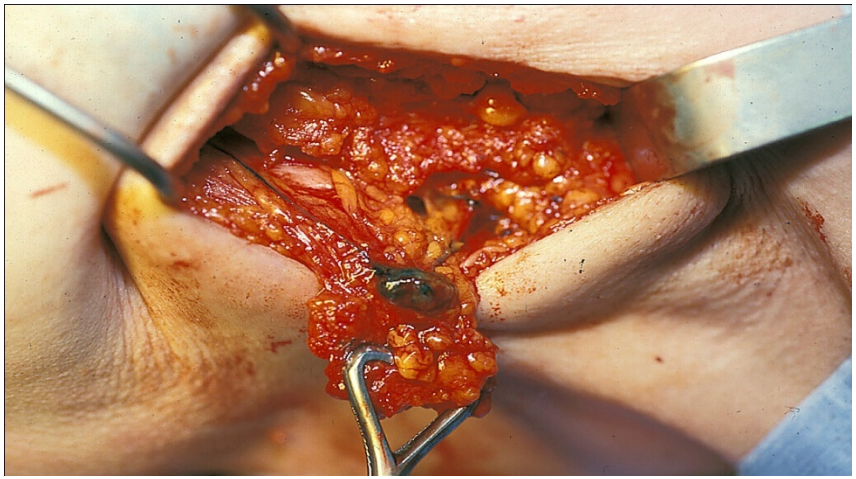


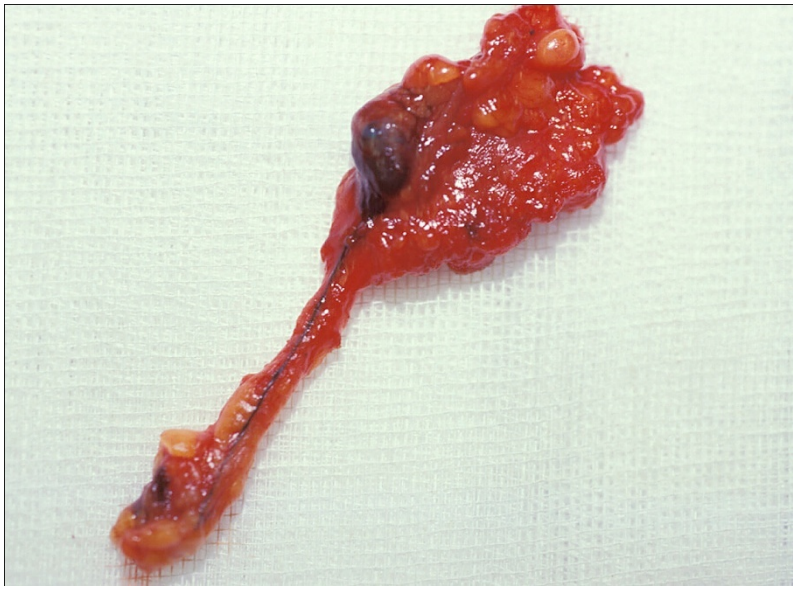
Recherche du ganglion sentinelle par méthode colorimétrique. Injection de bleu patenté (2ml) en périaréolaire ou péri-tumoral
Dissection du canal lymphatique bleuté qui est suivi jusqu'au ganglion sentinelle coloré.
1. Ganglion sentinelle bleuté
2. canal lymphatique afférent.

Exérèse du(des) ganglion(s) sentinelle(s)=chauds et/ou bleus

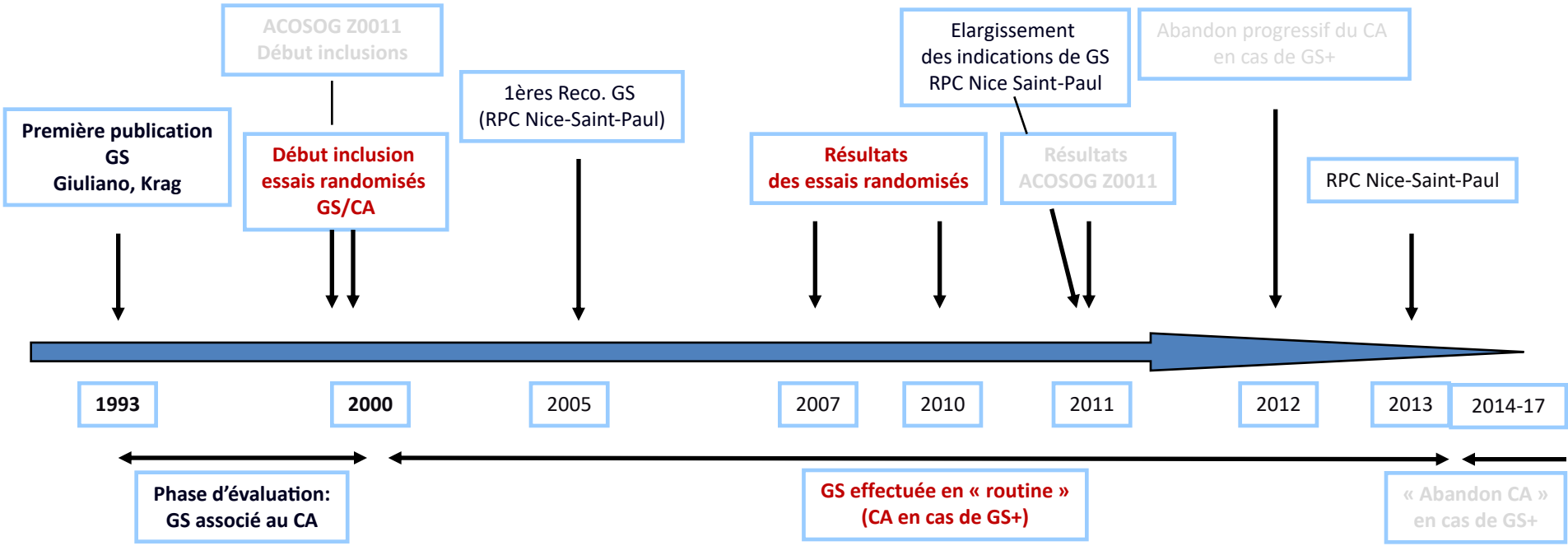


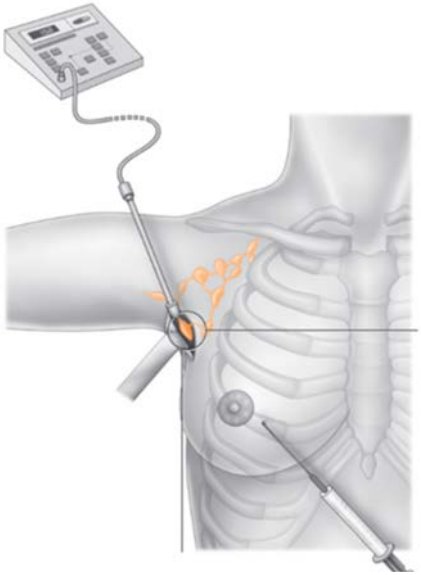
N<4 ganglions

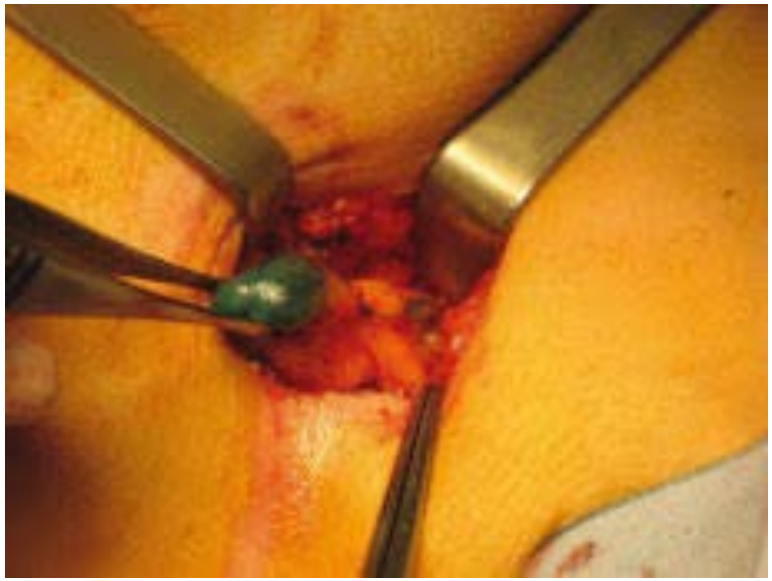


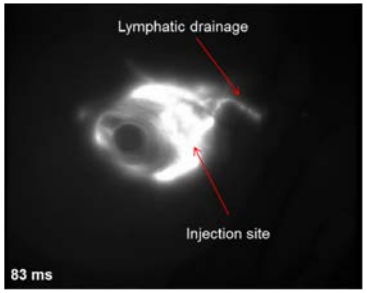


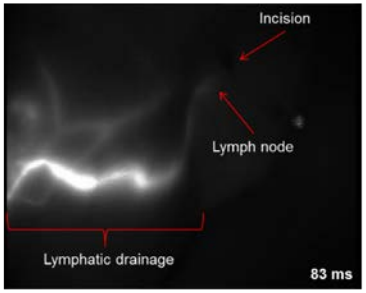
Désescalade chirurgicale
Réduction des indications du curage axillaire depuis l'introduction du GS



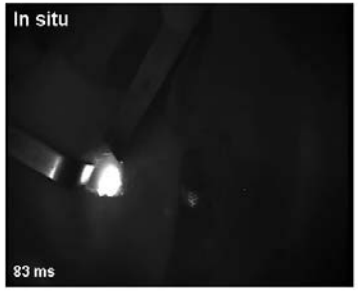


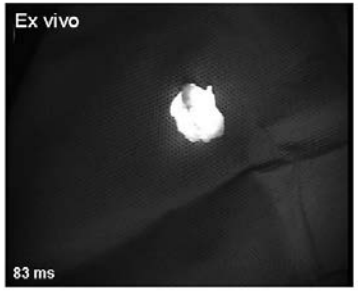






Prélèvement ciblé
Dissection limitée





Réduction de la morbidité chirurgicale

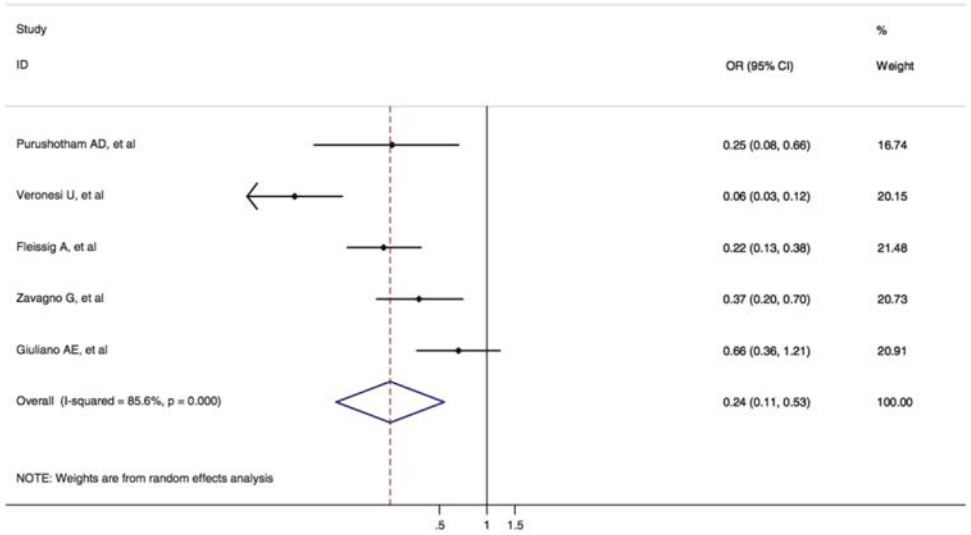


Fig. 5 Meta-analysis of postoperative lymphedema comparing SLNB with ALND

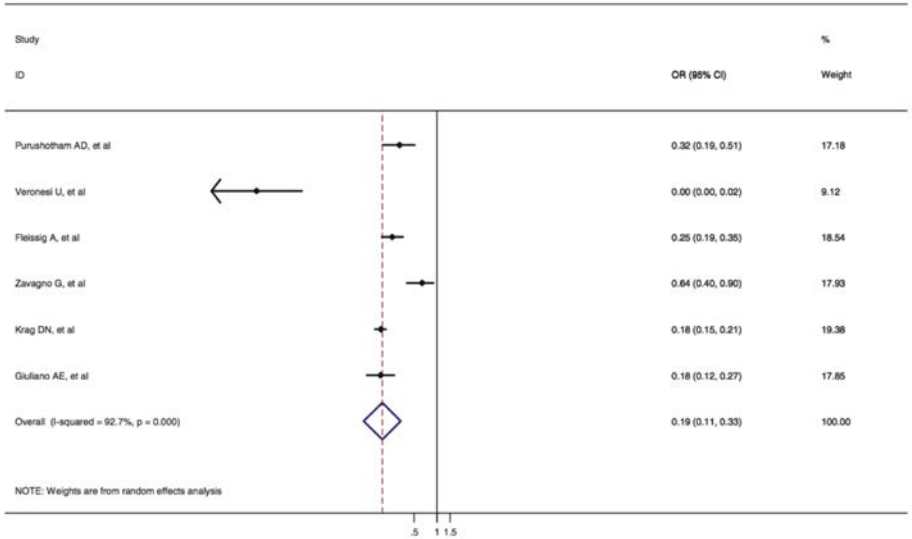


Fig. 6 Meta-analysis of postoperative numbness or paresthesia comparing SLNB with ALND

4 fois moins de lymphœdème

5 fois moins de paresthésies

Wang Z et al. Breast Cancer Res Treat 2011

Risque d'Envahissement des GNS

- Si GS négatif: 5 à 10% de GNS+
- Si GS pN0i+: 10 à 15% de GNS+
- Si GS micrométastatique (pN1mi): 13 à 20% de GNS+
- Si GS macrométastatique (pN1): 40 à 50% de GNS+

Houvenaeghel et al. The Breast 2012

Pourtant Peu de Récidives Axillaires après GS

- Si GS négatif ou GS avec cellules isolées: 0,4% à 1,2% de récidive axillaire à 10ans *(Krag et al. NSABP B32 , Lancet Oncol 2007)*

- Si GS micrométastatique: 1,5% de récidive axillaire recul médian 7 ans *(Houvenaeghel et al. The Breast 2014)*

- Si GS macrométastatique: 0,7% de récidive axillaire à 10 ans ACOSOG Z0011

Quelle Place Reste-t-il au Curage en cas de GS+ ?

- **i+**
- Micrométastase
- Macrométastase
- Contexte néoadjuvant

Aucune

Quelle Place Reste-t-il au Curage en cas de GS+ ?

- i+
- **Micrométastase**
- Macrométastase
- Contexte néoadjuvant

Intérêt du Curage en cas de GS Micrométastatique

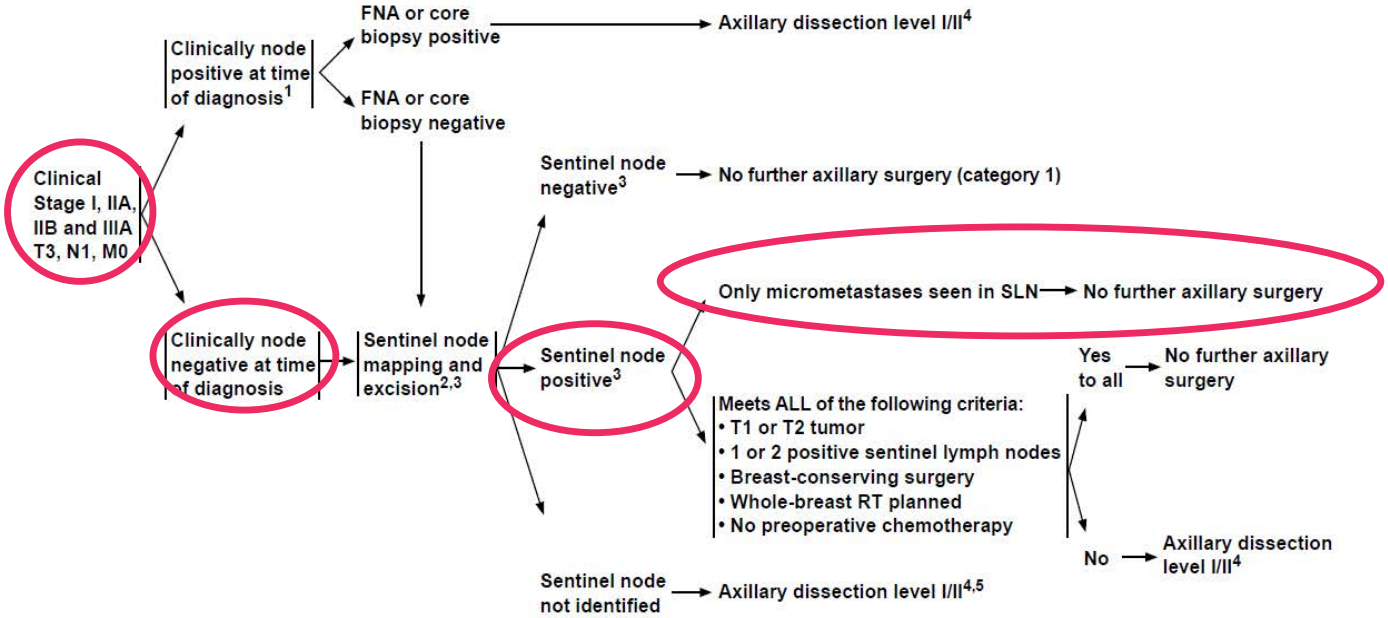
- Essai IBCSG23-01 pour GS micrométastatique
  - Randomisation **<u>GS seul *Versus* GS+curage</u>**
  - Objectif principal: non infériorité de survie sans rechute
  - 464 curages versus 467 GS seul
  - T1-2, N0 clinique

- Pas de CA si ttt conservateur
- Applicable au traitement non conservateur?
9% de mastectomie

- Survie sar[illegible] mique groupe GS seul Vs 8[illegible] p=0,0042)
- Morbidité supérieure dans le groupe curage
  - neuropathie sensitive 18% *Vs* 12% (p=0,012), lymphœdème 13% *Vs* 3% (p<0,0001), neuropathie motrice 8% *Vs* 3% (p=0,0004)

Galimberti V et al. Lancet Oncol 2013

GS Micrométastatique Recommandations



Quelle place reste-t-il au Curage en cas de GS+ ?

- i+
- Micrométastase
- **Macrométastase**
- Contexte néoadjuvant

ACOSOG z0011

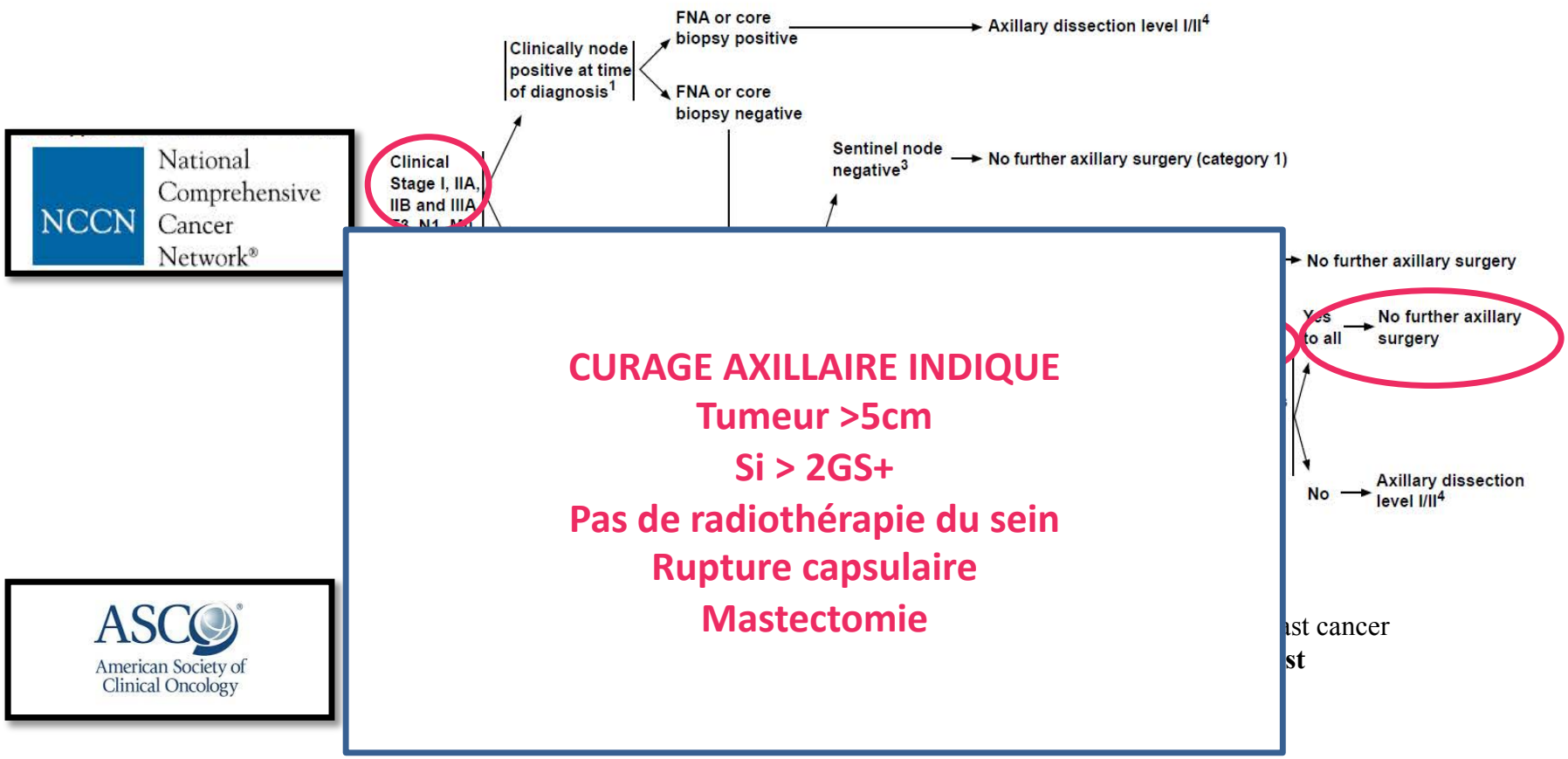
- 891 T1-2, N0 clinique avec GS + (≈ 60% de macrométastases)
- Randomisation curage axillaire Vs GS seul
- 1 ou 2 GS+
- Chir conse
- Traitement

EXCLUSION des patientes
Tumeur >5cm
Si > 2GS+
Pas de radiothérapie du sein
Rupture capsulaire
Mastectomie

- Incidence d % dans le groupe cur
- Bien que: 2 e curage complémen
- Les grades, les KPI et l'âge étaient associés au risque de récidive loco-régionale, de façon identique dans les 2 bras

Giuliano AE et al. Ann Surg 2016

GS Macrométastatique Recommandations



"**ALND is not required** if 1–2 macrometastatically infiltrated sentinel lymphnodes are detected at primary surgery, provided that ACOSOG Z0011 criteria [6] are fulfilled (tumor≤ 5 cm (pT1–2), no extracapsular lymph node involvement, BCS, adequate adjuvant systemic therapy, adjuvant postoperative tangential field radiation"

Utilité examen extemporané?

- Extemporané ne se justifie plus si le CA n'est pas systématique
- A réserver si :
  - GG douteux en écho avec cyto négative
  - Mastectomie
  - RMI prévue
  - RIOP

Quelle place reste t il au curage en cas de GS+ ?

- i+
- Micrométastase
- Macrométastase
- **Contexte néoadjuvant**

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ORIGINAL REPORT

Sentinel Lymph Node Biopsy After Neoadjuvant Chemotherapy for Advanced Breast Cancer: Results of Ganglion Sentinelle et Chimiothérapie Neoadjuvante, a French Prospective Multicentric Study

Jean-Marc Classe, Virginie Bordes, Loic Campion, Herve Mignotte, François Dravet, Jean Leveque, Christine Sagan, Pierre François Dupre, Gilles Body, and Sylvia Giard

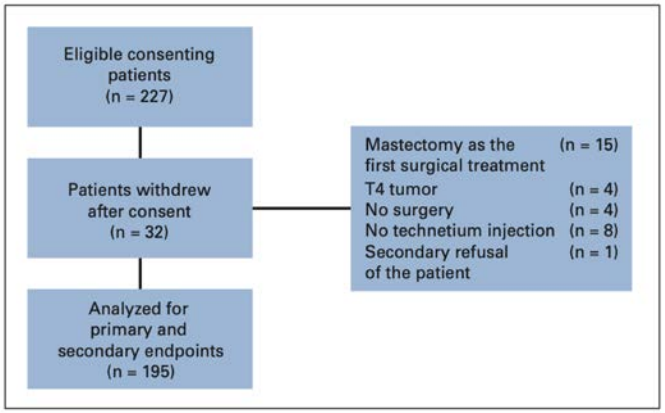

Fig 1. CONSORT diagram.

Table 2. Sentinel Lymph Node Detection Rate

	Detection Rate				False-Negative Rate			
Patient Group	%	No. of Patients	Total Patients	χ^2 *P*	%	No. of Patients	Total Patients	χ^2 *P*
All patients, n = 195	90.1	176	195		11.5	6	52	
N0 patients, n = 130	94.6	123	130	.008	9.4	3	32	.66
N1 patients, n = 65	81.5	53	65		15	3	20	

NOTE. N0 indicates patients with axilla clinically free of involved nodes; N1 indicates patients with clinical axillary suspicious nodes not fixed.

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Table 4. Pathologic Results of Axillary Lymph Nodes According to Sataloff Grading in Patients With SLN Detected

	False-Negative Cases						
	N0		N1		Total		
Sataloff Grade	No. of False-Negatives	Total Patients	No. of False-Negatives	Total Patients	No. of False-Negatives	Total Patients	χ^2 *P*
NA	0	22	0	15	0	112*	.003
NB	0	61	0	14			
NC	3	25	0	12	6	63†	
ND	0	14	3	12			
MD	0	1			0	1	
Total	3	123	3	53	6	176	

Abbreviations: N, node; A, no metastatic disease and evidence of a therapeutic effect; B, no metastatic disease and no therapeutic effect; C, metastatic disease and therapeutic effect; D, metastasis and no therapeutic effect; MD, missing data.
*Total 112 patients = 22 + 61 + 15 + 14 patients with grades NA and NB.
†Total 63 patients = 25 + 14 + 12 + 12 patients with grades NC and ND.

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Sentinel Lymph Node Surgery after Neoadjuvant Chemotherapy in Patients With Node-Positive Breast Cancer: The American College of Surgeons Oncology Group (ACOSOG) Z1071 Clinical Trial

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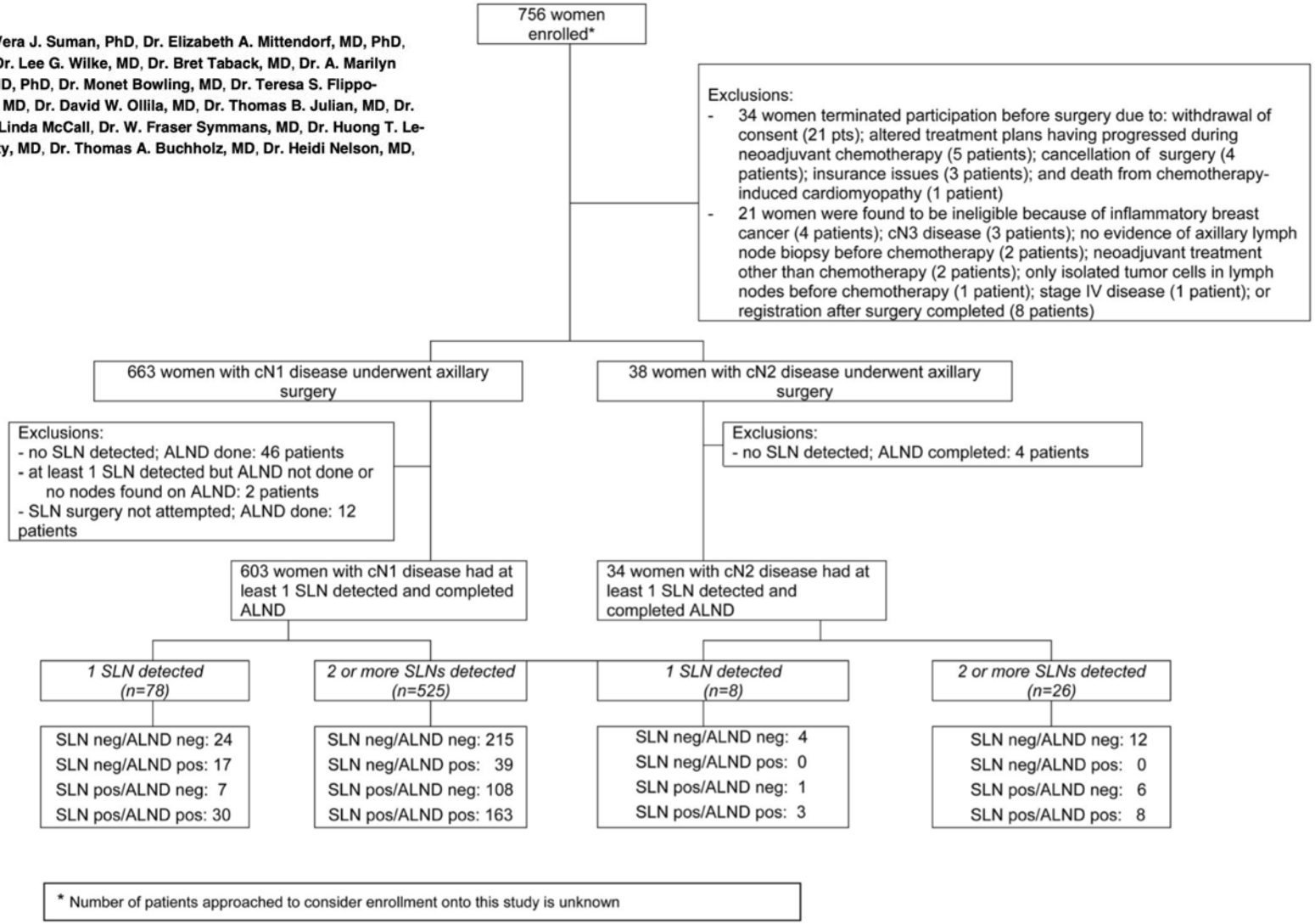


3 GS

Table 3. Factors Affecting the Likelihood of a False-Negative Sentinel Lymph Node Finding in the 310 Women With cN1 Disease at Presentation, 2 or More SLNs Examined, and Residual Nodal Disease After Neoadjuvant Chemotherapy

	False-Negative SLN Findings, No. (Total)	FNR (95% CI), %	Fisher Exact Test, *P* Value
Age, y			
18.0-49.9	20 (150)	13.3 (8.3-19.8)	.73
≥50.0	19 (160)	11.9 (7.3-17.9)	
BMI			
≥25.0	25 (227)	11.0 (7.3-15.8)	.18
<25.0	14 (83)	16.9 (9.5-26.7)	
Clinical T category prior to chemotherapy			
Tis, T0, T1, or T2	32 (225)	14.2 (9.9-19.5)	.18
T3 or T4	7 (85)	8.2 (3.4-16.2)	
Chemotherapy duration, mo			
≤4.0	20 (201)	10.0 (6.2-15.0)	.07
≥4.1	19 (109)	17.4 (10.8-25.9)	
Palpable, fixed, or matted nodes after chemotherapy[a]			
Yes	10 (52)	19.2 (9.6-32.5)	.17
No	28 (247)	11.3 (7.7-16.0)	
Mapping agents used			
Single	12 (59)	20.3 (11.0-32.8)	.05
Dual	27 (251)	10.8 (7.2-15.3)	
Multiple injection sites[b]			
Yes	5 (70)	7.1 (2.4-15.9)	.21
No	30 (225)	13.3 (9.2-18.5)	
No. of SLNs examined			
2	19 (90)	21.1 (13.2-31.0)	.007
≥3	20 (220)	9.1 (5.6-13.7)	

that result in greater sensitivity would be necessary to support the use of SLN surgery as an alternative to ALN

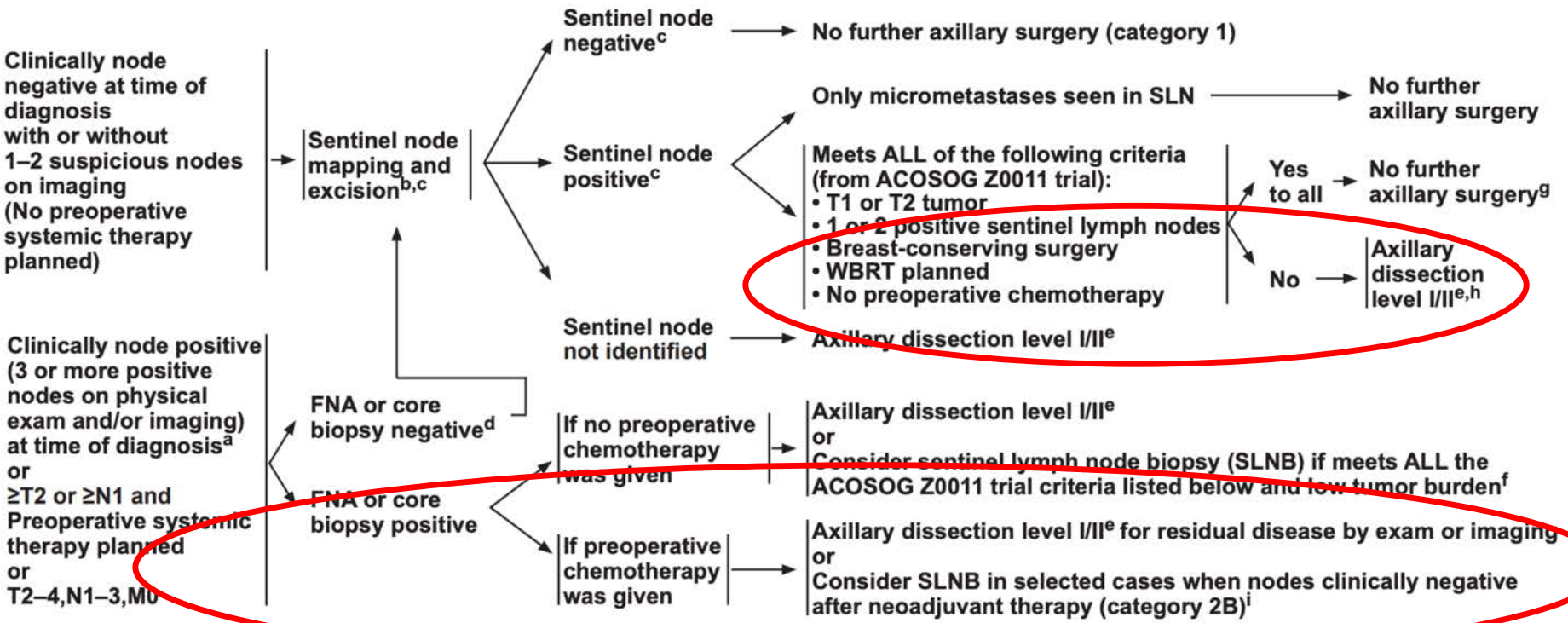
GS post CNA si N1 initial?

- Etude rétrospective
- patientes cN0 avant CNA (n=249) et patientes cN1-2 initiales devenant cN0 après CNA
- Suivi médian 61 mois
- Dans le groupe cN1-2 avant CNA:
- 70 patientes GS-
- 77 GS+ donc -> CA complémentaire : une seule patiente a présenté une RA (1,3%)

- Pour les patientes cN1-2 avant CNA, la SSP et la SG étaient respectivement de 75,8% et 86,3%. Les différences n'étaient pas significatives.

Galimberti et al, EJSO 2016

SURGICAL AXILLARY STAGING



[a] Consider pathologic confirmation of malignancy in clinically positive nodes using ultrasound-guided FNA or core biopsy.

[b] Sentinel lymph node mapping injections may be peritumoral, subareolar, or subdermal.

[c] Sentinel node involvement is defined by multilevel node sectioning with hematoxylin and eosin (H&E) staining. Cytokeratin immunohistochemistry (IHC) may be used for equivocal cases on H&E. Routine cytokeratin IHC to define node involvement is not recommended in clinical decision-making.

[d] If clinically negative axilla before chemotherapy and then have a positive sentinel node after chemotherapy, consider completion axillary lymph node dissection or multidisciplinary tumor board discussion on appropriateness of radiation of axilla without further surgery.

[e] See Axillary Lymph Node Staging (BINV-E).

[f] Low tumor burden in the axilla means nodal disease that 1) is image-detected disease not apparent on clinical exam; and 2) appears to be limited to one or two axillary nodes.

[g] In the mastectomy setting, in patients who were initially clinically node negative, who have positive nodes on SLNB, and have no axillary dissection, RT should include chest wall, supraclavicular ± internal mammary nodes.

[h] For patients with clinically negative axilla who are undergoing mastectomy and for whom RT is planned, axillary radiation may replace axillary dissection level I/II for regional control of disease.

[i] Among patients shown to be node positive prior to preoperative systemic therapy, SLNB has a >10% false-negative rate when performed after preoperative systemic therapy. This rate can be improved by marking biopsied lymph nodes to document their removal, using dual tracer, and by removing more than 2 sentinel nodes.

Note: All recommendations are category 2A unless otherwise indicated.
Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

The Breast 59 (2021) 256–269

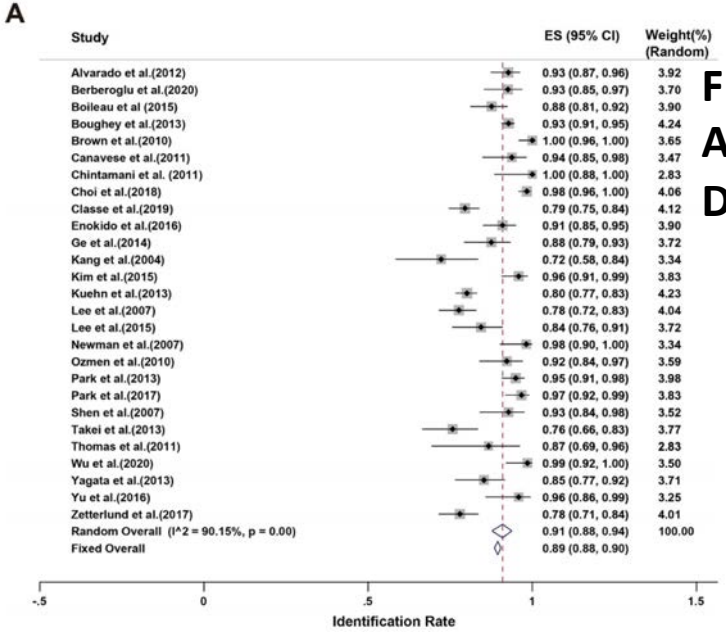
Contents lists available at ScienceDirect

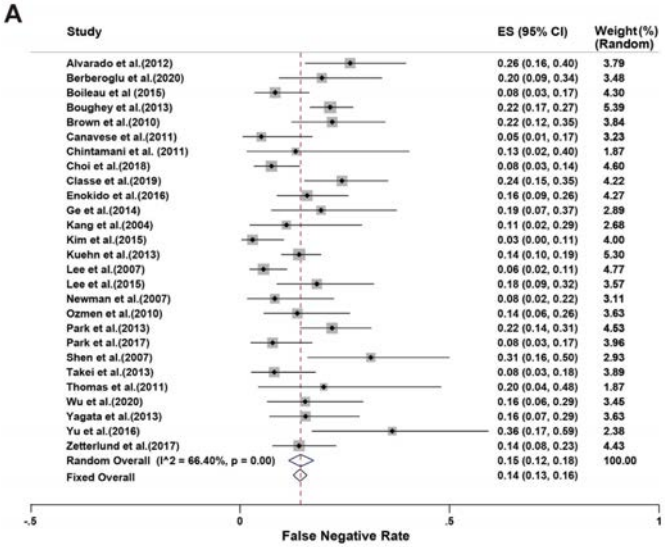
The Breast

journal homepage: www.elsevier.com/brst

Feasibility and reliability of sentinel lymph node biopsy after neoadjuvant chemotherapy in breast cancer patients with positive axillary nodes at initial diagnosis: An up-to-date meta-analysis of 3,578 patients

Siyang Cao [a], Xia Liu [b], Junwei Cui [a], Xiaoling Liu [a], Jieyu Zhong [b], Zijian Yang [a], Desheng Sun [b,**], Wei Wei [a,*]





FN 15%

Augmenté/ luminal

Diminue avec nb GS prélevés

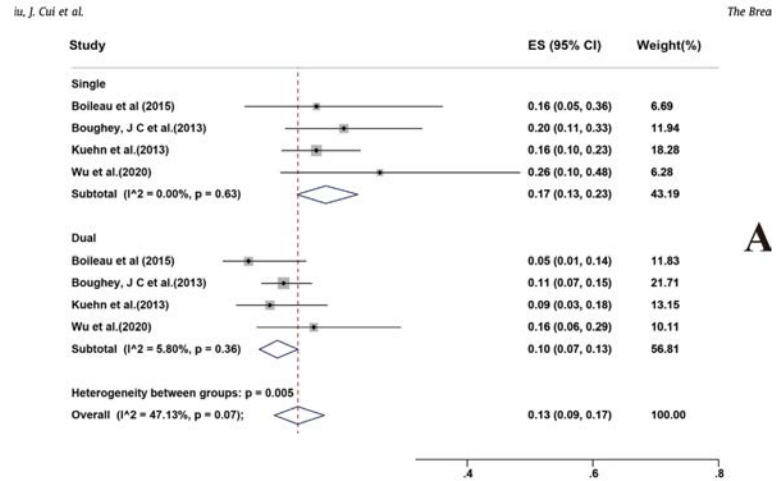


Table 4
IR of SLN according to mapping technique.

Method	Number of studies	Number of patients SLN identified	Number of patients SLNB attempted	IR (95 % CI)
BD	3	102	108	89 % (79%–96 %)
RI	4	397	432	96 % (86%–100 %)
BD + RI	4	511	599	92 % (87%–96 %)

Abbreviation: IR: identification rate; BD: blue dye; RI, radioisotopes; SLNB: sentinel lymph node biopsy; SLN, sentinel lymph nodes.

ELSEVIER

Surgical Oncology
Volume 38, September 2021, 101636

Feasibility and validation of the targeted axillary dissection technique in the axillary staging of breast cancer after neoadjuvant therapy: Definitive results

Diego Flores-Funes [a, f], José Aguilar-Jiménez [a, f], María Martínez-Gálvez [b, f], María José Ibáñez-Ibáñez [c, f], Luis Carrasco-González [a, f], José Ignacio Gil-Izquierdo [b, f], María Asunción Chaves-Benito [d, f], Francisco Ayala-De La Peña [e, f], Andrés Nieto-Olivares [d, f], José Luis Aguayo-Albasini [a, f]

- Etude prospective
- 60 Patientes cN1 avec CNA et réponse clinique
- Ganglions métastatiques marqués par un clip métallique
- 43 patientes (71.7%) avec réponse clinique axillaire complète
- 7 (11.7%) d'échec d'identification
- pCR: 30.5% (18 patients) , ypN0 : 38.3% (23 patients).
- Sensibilité des techniques d'identification:
  - GS: 80.9% (95%CI: 61.8–100);
  - BCLIP: 80.8% (95%CI: 63.7–97.8);
  - TAD (GS+BCLIP): 92.6% (95%CI: 80.9–100)
- VPN:
  - GS: 84.6% (95%CI: 68.8–100)
  - BCLIP: 81.0% (95%CI: 63.7–97.8)
  - TAD: 91.3% (95%CI: 77.6–100)

cancers MDPI

Systematic Review

The Evolving Role of Marked Lymph Node Biopsy (MLNB) and Targeted Axillary Dissection (TAD) after Neoadjuvant Chemotherapy (NACT) for Node-Positive Breast Cancer: Systematic Review and Pooled Analysis

Parinita K. Swarnkar *, Salim Tayeh, Michael J. Michell and Kefah Mokbel *

- Repérage harpon, isotopes , US type SCOUT
- Faux négatifs
- Ganglion marqué seul (N=366) : 6.28% (95% CI: 3.98–9.43)
- TAD (GS + Ganglion marque (N=521): 5.18% (95% CI: 3.41–7.54)

- P=0,48

- GANEA 3 en attente

Cancers **2021**, *13*, 1539

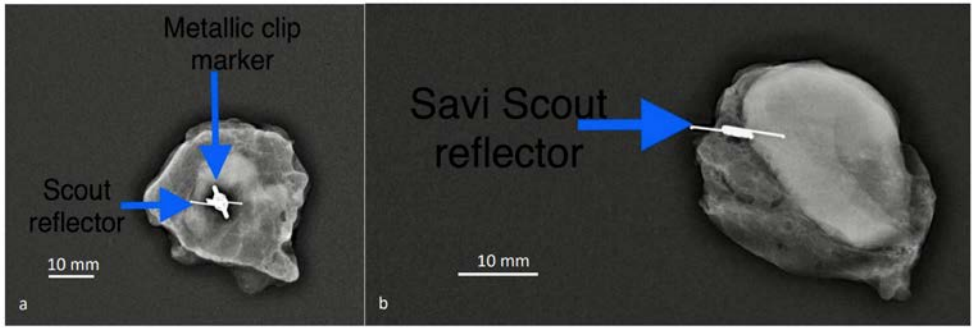


Figure 2. In (**a**), the patient had a metallic marker clip deployed within the pathological lymph node at the time of biopsy before neoadjuvant chemotherapy (NACT) and a second localization procedure using Savi Scout prior to surgery. In (right), the patient had the Savi Scout reflector at the time of biopsy prior to NACT thus avoiding a second procedure. There were no MRI artifacts related to the Savi Scout reflector in (**b**). The surgical procedure of identification and retrieval of the Savi Scout reflector took 15 min. Scale bar: 10 mm.

JAMA Surgery | Original Investigation

Association of Low Nodal Positivity Rate Among Patients With *ERBB2*-Positive or Triple-Negative Breast Cancer and Breast Pathologic Complete Response to Neoadjuvant Chemotherapy

Alison U. Barron, MD; Tanya L. Hoskin, MS; Courtney N. Day, BS; E. Shelley Hwang, MD, MPH; Henry M. Kuerer, MD, PhD; Judy C. Boughey, MD

cN0

- Rétrospectif
- 30 820 patientes
- Si pCR et T1-T2N0 HER2+ ou TN

=> 2%ypN+

Table 4. Extent of Nodal Disease at Surgery by Pathologic Nodal Category

Clinical Node Status	No. of Patients	No. (%) of Patients[a] ypN0	ypN1	ypN2/ypN3
Breast pCR				
Biologic subtype of cN0 disease				
HR-positive/*ERBB2*-positive	1732	1696 (97.9)	NR (<3)	NR (<1)
HR-negative/*ERBB2*-positive	1330	1317 (99.0)	13 (1.0)	0
TNBC	2315	2279 (98.4)	NR (<2)	NR (<1)
HR-positive/ *ERBB2*-negative	646	620 (96.0)	26 (4.0)	0
Biologic subtype of cN1 disease				
HR-positive/*ERBB2*-positive	959	831 (86.7)	110 (11.5)	18 (1.9)
HR-negative/*ERBB2*-positive	842	747 (88.7)	NR (<11)	NR (<2)
TNBC	1229	1056 (85.9)	150 (12.2)	23 (1.9)
HR-positive/ *ERBB2*-negative	711	494 (69.5)	187 (26.3)	30 (4.2)
Residual Breast Disease				
Biologic subtype of cN0 disease				
HR-positive/*ERBB2*-positive	2870	2336 (81.4)	475 (16.6)	59 (2.1)
HR-negative/*ERBB2*-positive	870	772 (88.7)	82 (9.4)	16 (1.8)
TNBC	3907	3415 (87.4)	427 (10.9)	65 (1.7)
HR-positive/*ERBB2*-negative	4423	2959 (66.9)	1203 (27.2)	261 (5.9)
Biologic subtype of cN1 disease				
HR-positive/*ERBB2*-positive	1672	581 (34.7)	858 (51.3)	233 (13.9)
HR-negative/*ERBB2*-positive	691	308 (44.6)	299 (43.3)	84 (12.2)
TNBC	2064	737 (35.7)	932 (45.2)	395 (19.1)
HR-positive/*ERBB2*-negative	4560	785 (17.2)	2487 (54.5)	1288 (28.2)

JAMA Surgery | Original Investigation

Identification of Patients With Documented Pathologic Complete Response in the Breast After Neoadjuvant Chemotherapy for Omission of Axillary Surgery

Audree B. Tadros, MD; Wei T. Yang, MD; Savitri Krishnamurthy, MD; Gaiane M. Rauch, MD, PhD; Benjamin D. Smith, MD; Vicente Valero, MD; Dalliah M. Black, MD; Anthony Lucci Jr, MD; Abigail S. Caudle, MD; Sarah M. DeSnyder, MD; Mediget Teshome, MD; Carlos H. Barcenas, MD; Makesha Miggins, MD; Beatriz E. Adrada, MD; Tanya Moseley, MD; Rosa F. Hwang, MD; Kelly K. Hunt, MD; Henry M. Kuerer, MD, PhD

- 527 patientes cT1-T2N0-N1, HER2 + ou TN
- cN1 et pCR => 11% N+
- cN1 sans pCR: 57.5% N+
- cN0 et absence pCR=> 5.7% N+
- cN0 et pCR=> 100% ypN0

Table 2. Pathologic Axillary Status in 527 Patients With and Without a Breast pCR After NCT

	No. of Nodes With Positive Histologic Finding, No. (%) of Patients				
Breast Cancer Subtype	0	1	2	≥3	All
Breast pCR					
HER2+					
T1N0	6 (100)	0	0	0	6 (100)
T2N0	46 (100)	0	0	0	46 (100)
T1N1	10 (76.9)	2 (15.4)	1 (7.7)	0	13 (100)
T2N1	27 (93.1)	1 (3.4)	0	1 (3.4)	29 (100)
TN					
T1N0	12 (100)	0	0	0	12 (100)
T2N0	52 (100)	0	0	0	52 (100)
T1N1	6 (100)	0	0	0	6 (100)
T2N1	26 (89.7)	2 (6.9)	0	1 (3.4)	29 (100)
HER2+ and TN					
T1N0	18 (100)	0	0	0	18 (100)
T2N0	98 (100)	0	0	0	98 (100)
T1N1	16 (84.2)	2 (10.5)	1 (5.3)	0	19 (100)
T2N1	53 (91.4)	3 (5.2)	0	2 (3.4)	58 (100)
No Breast pCR					
HER2+					
T1N0	8 (100)	0	0	0	8 (100)
T2N0	71 (98.6)	1 (1.4)	0	0	72 (100)
T1N1	10 (71.4)	1 (7.1)	1 (7.1)	2 (14.3)	14 (100)
T2N1	36 (48.0)	7 (9.3)	16 (21.3)	16 (21.3)	75 (100)
TN					
T1N0	6 (85.7)	1 (14.3)	0	0	7 (100)
T2N0	79 (90.8)	8 (9.2)	0	0	87 (100)
T1N1	3 (33.3)	0	3 (33.3)	3 (33.3)	9 (100)
T2N1	19 (30.6)	4 (6.5)	16 (25.8)	23 (37.1)	62 (100)
HER2+ and TN					
T1N0	14 (93.3)	1 (6.7)	0	0	15 (100)
T2N0	150 (94.3)	9 (5.7)	0	0	159 (100)
T1N1	13 (56.5)	1 (4.3)	4 (17.4)	5 (21.7)	23 (100)
T2N1	55 (40.1)	11 (8.0)	32 (23.4)	39 (28.5)	137 (100)

Breast Cancer Research and Treatment (2019) 176:591–596
https://doi.org/10.1007/s10549-019-05214-y

CLINICAL TRIAL

Prediction of axillary pathologic response with breast pathologic complete response after neoadjuvant chemotherapy

Hee Jun Choi[1] · Jai Min Ryu[2] · Isaac Kim[2] · Seok Jin Nam[2] · Seok Won Kim[2] · Jonghan Yu[2] · Jeong Eon Lee[2] · Se Kyung Lee[2,3]

- Rétrospectif

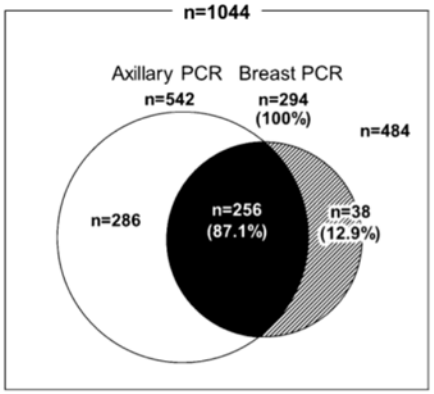


Fig. 2 Association of the incidence rate of axillary pCR on achieving breast pCR

- 1044 patientes
- Facteurs associés :

- sous type histologique
- pCR mammaire
- le stade ganglionnaire clinique

Variables	Axillary pCR ($n=542$)	No axillary pCR ($n=502$)	Total ($n=1044$)	*P* values
Biologic subtypes				< 0.0001
HR+/HER2−	110 (32.5)	228 (67.5)	338 (100.0)	
HR+/HER2+	95 (58.6)	67 (41.4)	162 (100.0)	
HR−/HER2+	121 (65.0)	65 (35.0)	186 (100.0)	
TNBC	216 (60.3)	142 (39.7)	358 (100.0)	
Clinical tumor stages				0.0071
cT1	29 (58.0)	21 (42.0)	50 (100.0)	
cT2	342 (55.3)	276 (44.7)	618 (100.0)	
cT3	171 (45.5)	205 (54.5)	376 (100.0)	
Clinical nodal stages				< 0.0001
cN0	162 (81.0)	38 (19.0)	200 (100.0)	
cN1	56 (44.8)	69 (55.2)	125 (100.0)	
cN2/3	324 (45.0)	395 (55.0)	719 (100.0)	
Breast response				< 0.0001
Breast pCR	256 (87.1)	38 (12.9)	294 (100.0)	
Residual breast disease	286 (38.1)	464 (61.9)	750 (100.0)	

HHS Public Access
Author manuscript
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MRI does not predict pathologic complete response after neoadjuvant chemotherapy for breast cancer

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Selected prior publications reporting results for patients with rCR after NAC.

Author, ref #	# Patients	# With rCR	Number (%) of patients with rCR after NAC with residual cancer[a]
Croshaw[15]	61	9	5 (56%)
Goorts[b,16]	76	13	8 (61.5%)
McGuire[17]	203	77	26 (33.7%)
Weber[18]	129	41	15 (36.6%)
Current study	102	44	12 (27.2%)

Abbreviations: NAC, neoadjuvant chemotherapy; pCR, pathologic complete response.

[a]Residual cancer = invasive cancer or DCIS in final pathologic specimen.

[b]Results of reader #1.

Difficulte d'Evaluation radiologique de la réponse complète

Ann Surg Oncol (2013) 20:3199–3204
DOI 10.1245/s10434-013-3118-z

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

ORIGINAL ARTICLE – BREAST ONCOLOGY

Imaging Response and Residual Metastatic Axillary Lymph Node Disease after Neoadjuvant Chemotherapy for Primary Breast Cancer

Tina J. Hieken, MD[1], Judy C. Boughey, MD[1], Katie N. Jones, MD[2], Sejal S. Shah, MD[3], and Katrina N. Glazebrook, MD[2]

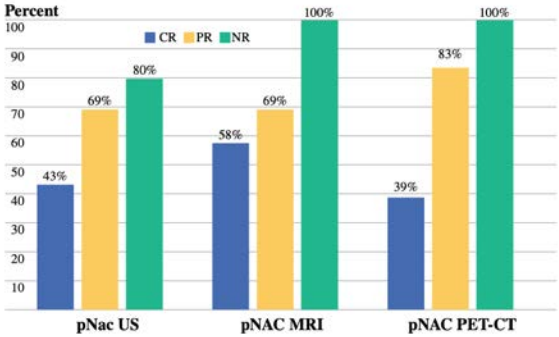

FIG. 1 Percentage of patients node-positive at operation after NAC stratified by the post-NAC imaging response for axillary US, MRI and PET-CT. *CR* imaging complete response, *PR* partial imaging response, *NR* no response or progression by imaging

- 61 cN0: 15 (24.6 %) were node positive with a ypN stage of N0i+ in1(1.6%), N1(mi) in 7 (11.5%), N1 in 3 (4.9%), N2 in 3 (4.9 %) and N3 in 1 (1.6 %)

- 169 c N1: 65 (38.5 %) with cN1 disease had a nodal pCR (ypN0). 104 patients was N0i+ in 4 (2.4 %), N1mi in 11 (6.6%),N1 in 31(18.3%), N2 in 36 (21.3%),and N 3 in 22 (13.0 %)

TABLE 2 Performance characteristics of post-NAC axillary imaging modalities in detecting persistent nodal metastatic disease in cN1 patients

Imaging modality	Sensitivity, % (95 % CI)	Specificity, % (95 % CI)	Negative predictive value, % (95 % CI)	Positive predictive value, % (95 % CI)	Accuracy, %
Ultrasound	69.8 (56.8–80.4)	58.1 (42.2–72.6)	56.8 (41.1–71.3)	71.0 (57.8–81.4)	65.1
MRI	61.0 (47.4–73.1)	58.6 (39.1–75.9)	42.5 (27.4–59.0)	75.0 (60.1–85.9)	60.2
PET-CT	63.2 (38.6–82.8)	84.6 (53.7–97.3)	61.1 (36.1–81.7)	85.7 (56.2–97.5)	71.9

NAC neoadjuvant chemotherapy, *CI* confidence interval, *MRI* magnetic resonance imaging, *PET-CT* positron emission tomography-computed tomography

ABSTENTION GANGLIONNAIRE
après CNA si écho/biopsie neg?

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ClinicalTrials.gov

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Home > Study Record Detail

Eliminating Breast Cancer Surgery in Exceptional Responders With Neoadjuvant Systemic Therapy

Estimated Enrollment:	50
Actual Study Start Date:	January 20, 2017
Estimated Study Completion Date:	January 2022
Estimated Primary Completion Date:	January 2022 (Final data collection date for primary outcome measure)

Management of the Axilla in Early-Stage Breast Cancer: Ontario Health (Cancer Care Ontario) and ASCO Guideline

Muriel Brackstone, MD, PhD[1]; Fulvia G. Baldassarre, MSc[2]; Francisco E. Perera, MD[1]; Tulin Cil, MD, MEd[3]; Mariana Chavez Mac Gregor, MD, MSc[4]; Ian S. Dayes, MD[5]; Jay Engel, MBBCh[6]; Janet K. Horton, MD[7]; Tari A. King, MD[8]; Anat Kornecki, MD[9]; Ralph George, MD[10]; Sandip K. SenGupta, MD[11]; Patricia A. Spears, BS[12]; and Andrea F. Eisen, MD[13]

Objective 4

To determine what axillary treatment is indicated and what the best timing of axillary treatment for women with early-stage breast cancer is when NAC is used.

Recommendation 4

(A) Initially node-negative patients

- Patients who are initially clinically node-negative on physical examination, and those who had clinically suspicious nodes on physical examination but deemed to be pathologically negative at fine needle aspiration or core needle biopsy, and were treated with NAC should receive SLNB at the time of surgery as their axillary staging procedure (Type: informal consensus; benefits outweigh harms; Evidence quality: insufficient; Strength of recommendation: strong).

(B) Initially node-positive patients

- For patients who were initially clinically and biopsy-proven node-positive, and who remained clinically node-positive after NAC, we recommend ALND.
- For patients who were initially clinically and biopsy-proven node-positive, and became node-negative after NAC, we recommend SLNB to restage the axilla. Restaging can be achieved by placing a biopsy clip into the biopsied positive node at diagnosis and localizing it at surgery along with sentinel node biopsy or, in institutions where the use of biopsy clips for nodes is not available, by performing sentinel node biopsy with dual tracer and excising at least three sentinel nodes to minimize the false-negative rate (FNR) and optimize accuracy of the procedure. At this time, we also recommend LRNI for these patients, regardless of pathologic status of sentinel lymph nodes.

(A) Dual tracer should be used in settings where it is expected to be a learning curve for the operators performing the procedure (eg, low-volume centers and surgeons in training or post-training).

(C) If a clip is used to identify a biopsied lymph node at diagnosis, the node containing the clip needs to be localized to make sure that it is excised. If dual tracer is used, three or more sentinel nodes have to be identified. If three or more sentinel nodes are not identified in a patient who has had NAC according to standard sentinel lymph node techniques, an axillary dissection is recommended.

INDICATIONS DU GS

La technique du ganglion sentinelle est indiquée après exploration axillaire négative :
- clinique,
- échographique
- +/- cytoponction contributive (présence de lymphocytes)

Pour les lésions intracanalaires :

- Micro invasion avérée ou suspectée sur la biopsie
- Masse associée
- Mastectomie
- À discuter en cas d'oncoplastie pour lésion étendue

Pour les lésions infiltrantes :

- Lésion infiltrante non T4

Possible:

- Antécédent de chirurgie mammaire ou axillaire et/ou de radiothérapie mammaire sans geste ganglionnaire axillaire préalable
- Grossesse : GS isotopique, en privilégiant un protocole « court » sur 1 jour pour diminuer l'activité injectée
- Chez l'homme avec les mêmes indications
- Récidive mammaire en alternative à un curage axillaire :
- o si pas de geste axillaire initial
  o Un deuxième GS peut être discuté au cas par cas si l'examen clinique et l'écho axillaire sont négatifs; dans ce cas, il est recommandé de réaliser une lymposcintigraphie préopératoire (risque de migration ectopique)
- Tumeurs multicentriques et multifocales

Indications de curage axillaire complémentaire en cas d'envahissement du GS

- **Cellules isolées :** pas d'indication à un curage axillaire complémentaire
- **Micrométatases :** pas d'indication à un curage axillaire complémentaire sauf après CNA
- **Macrométastases :** pas d'indication à un curage axillaire complémentaire si tous les critères suivants sont présents :
  - ✓ non pT4
  - ✓ Indication de traitement médical (hormonothérapie et/ou chimiothérapie et/ou anti HER2) adjuvant
  - ✓ ≤ 2 GS+ (quel que soit le nombre de ganglions prélevés)
  - ✓ Absence d'envahissement résiduel évident du creux axillaire au bilan d'extension (réponse complète échographique et TEP si réalisé)
  - ✓ Absence de contre-indication à la radiothérapie

- En l'absence de reprise du curage, une irradiation axillaire sera effectuée.
- Si ≥5 ganglions sentinelles prélevés, on pourrait surseoir à une irradiation axillaire complémentaire.

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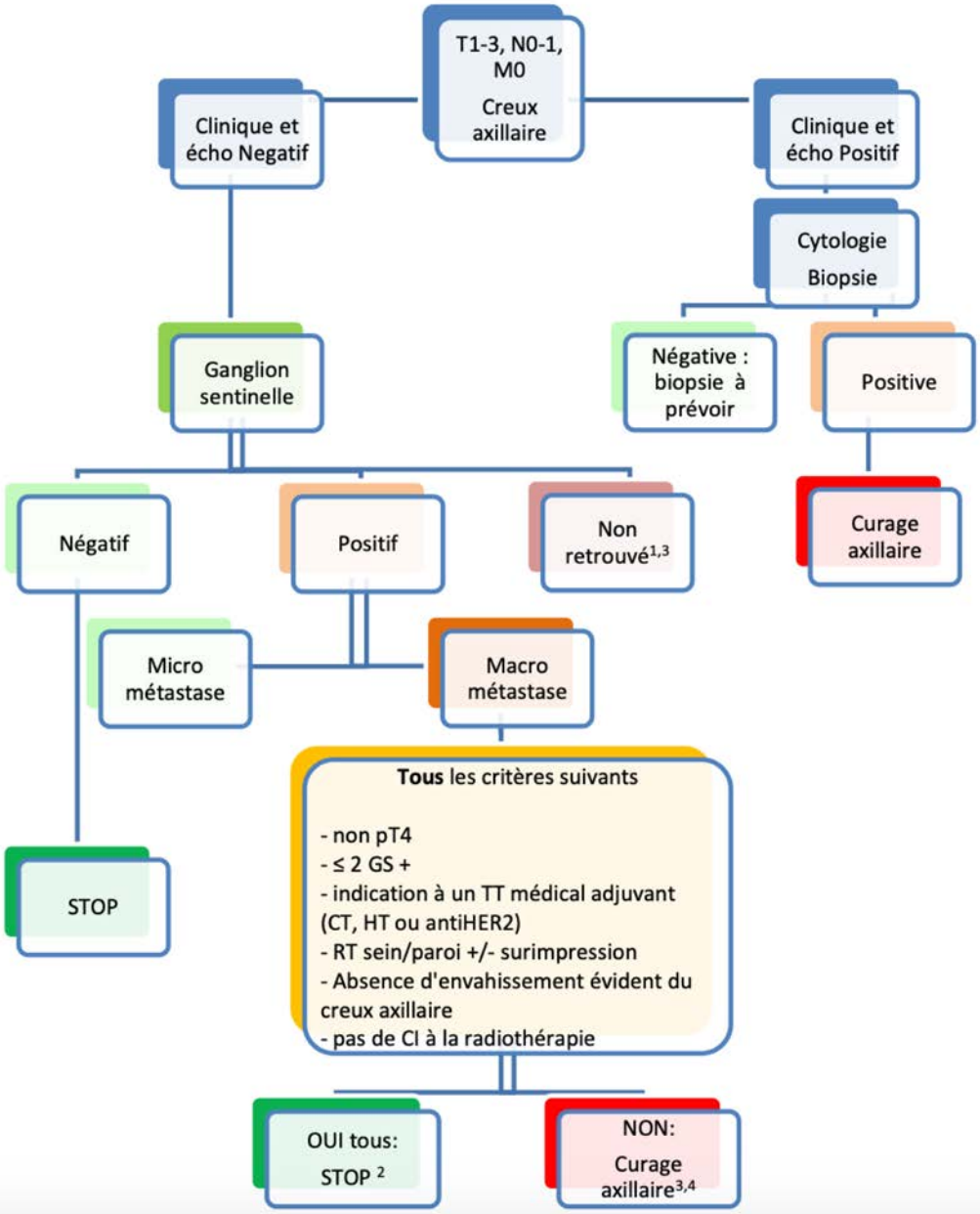
2021-2022

Ganglions : arbre de décision chirurgical si chirurgie première



En cas de chimiothérapie néoadjuvante (CNA) : TEP initiale recommandée

N0 initial (évaluée par clinique + imagerie + cytologie si écho suspecte +/- TEP FDG) :
procédure du ganglion sentinelle

N+ initial prouvé cytologiquement ou histologiquement avant traitement systémique :

- **curage axillaire**
- ○ **Option** : Ganglion sentinelle si tous les critères suivants :
  - N1 initial (≤3ggl) **avec clip ou marquage ganglion positifs en début de prise en charge**
  - TNBC ou HER2 amplifié
  - réponse complète échographique et TEP
  - double traceur isotopique et colorimétrique
  - au moins 3GS prélevés, en emportant les ganglions initialement positifs
  - pas de T4 initial

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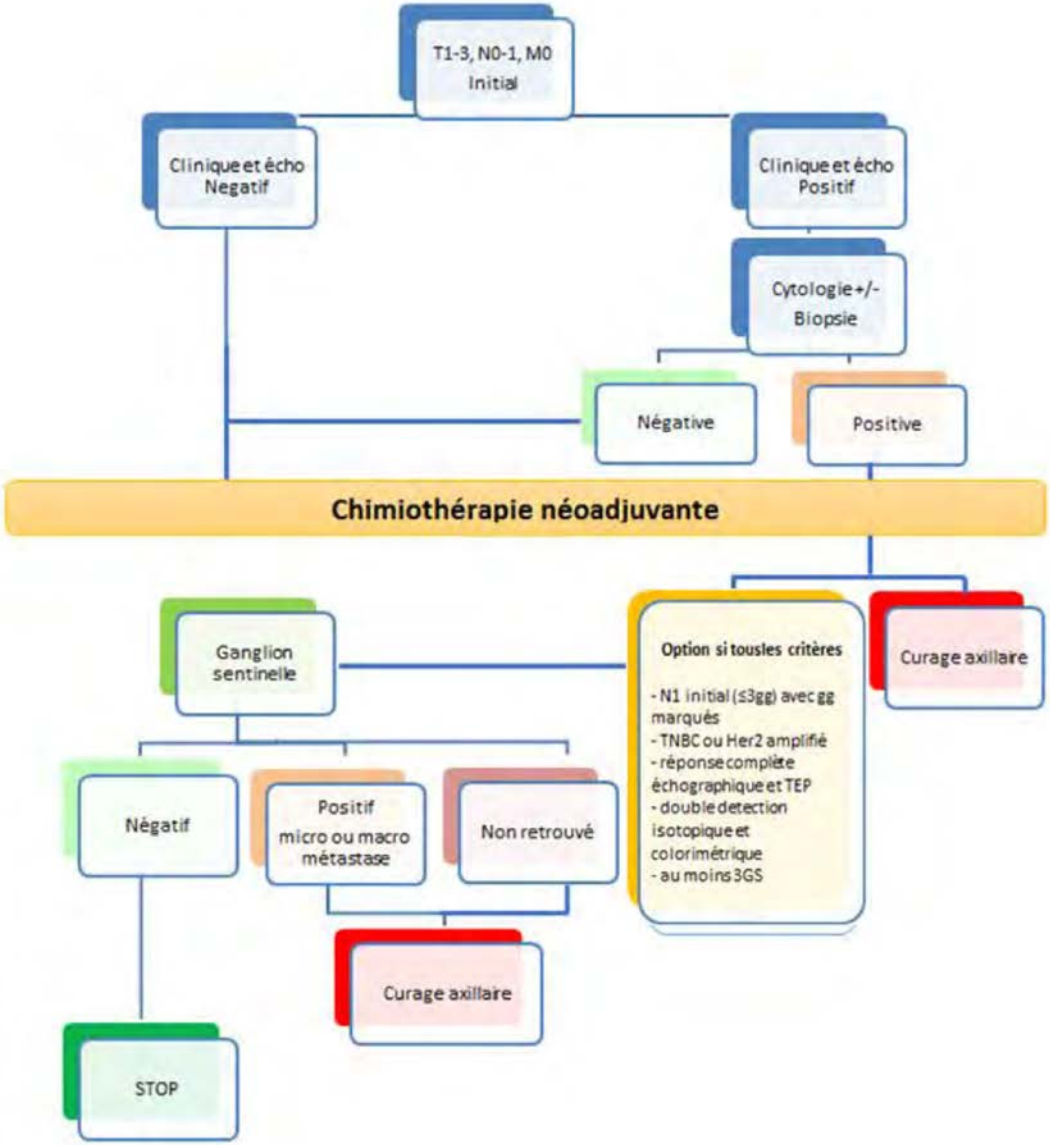
PROTOCOLES DE TRAITEMENT

2021-2022

Ganglions : arbre de décision chirurgical après chimiothérapie néoadjuvante



Possible abstention du GS : découverte fortuite ou d'emblée si tous les critères

- T1a/b et N0
- luminal A
- âge>70ans
- et/ou comorbidités majeures
- et découverte fortuite
- Echographie axillaire obligatoire
- Tumeur papillaire encapsulée

Quelles indications au curage axillaire d'emblée?

- Atteinte axillaire prouvée lors du bilan pré-thérapeutique par un examen cytologique ou histologique d'atteinte axillaire lors du bilan préopératoire (cf option pour N1 avec réponse complète à la chimiothérapie néoadjuvante)

- Tumeur T4, même après traitement néoadjuvant et quelle que soit la réponse clinique ou radiologique au traitement

- Absence de GS retrouvé pour les lésions infiltrantes

Conclusion

- Désescalade chirurgicale
- 3 GS
- Extemporané? CA indiqué si GS+?
- Extension du GS au cN1 initial en CNA
- Clip des Ganglions métastatiques avant CNA
- Abstention de geste axillaire sur certaine population?