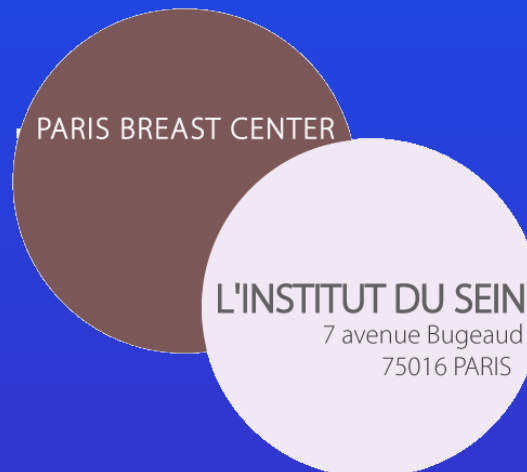
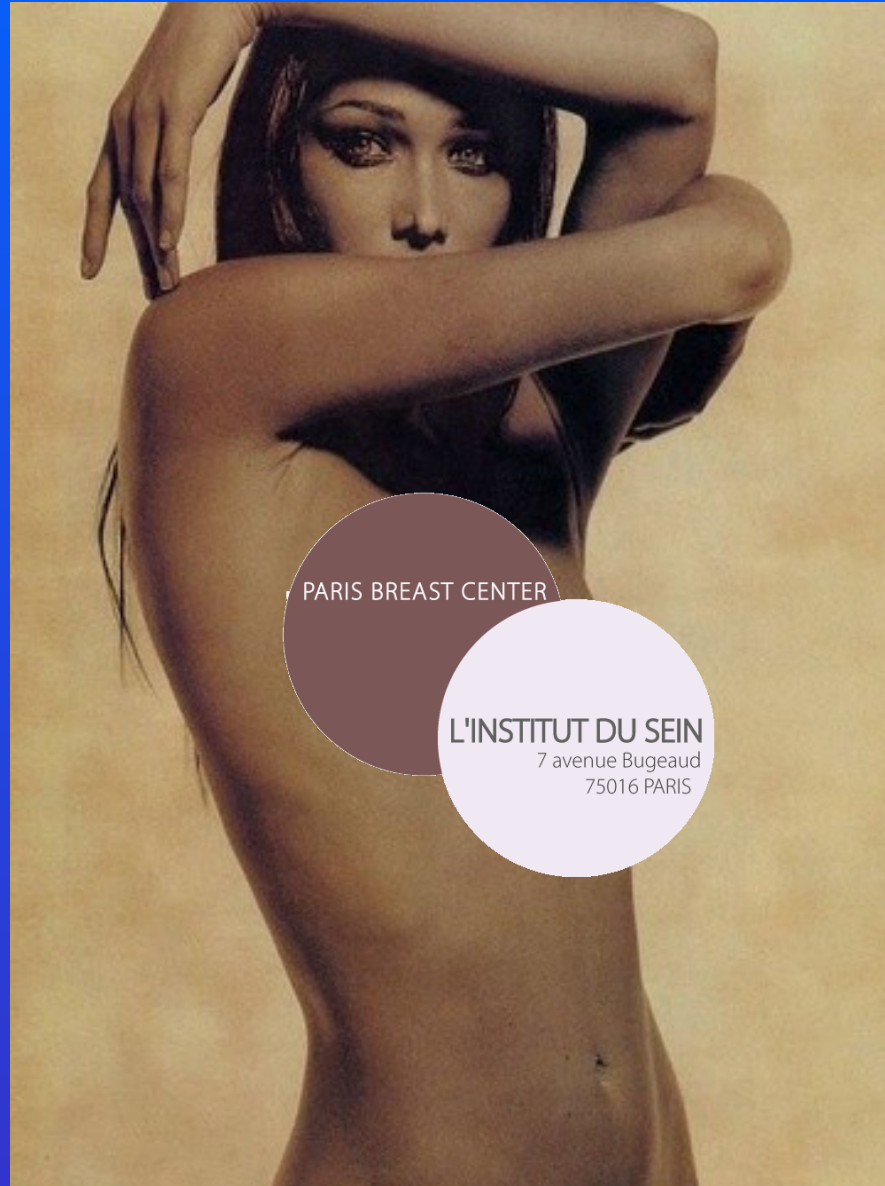


CAN WE DISTINGUISH BREAST AND ARM AXILLARY NODES ?

Krishna B. CLOUGH, Claude NOS



REDUCE ARM SEQUELLAE



AXILLARY DISSECTION LYMPHEDEMA RATE



5 to 50 % (median 20 %) ——— SN biopsy

QUIZZ: SENTINEL NODE BIOPSY LYMPHEDEMA RATE ?

- 0 to 3% ?

QUIZZ: SENTINEL NODE BIOPSY LYMPHEDEMA RATE ?

- 0 to 3% ?
- 3 to 5% ?

QUIZZ: SENTINEL NODE BIOPSY LYMPHEDEMA RATE ?

- 0 to 3% ?
- 3 to 5% ?
- 5 to 10% ?

QUIZZ: SENTINEL NODE BIOPSY LYMPHEDEMA RATE ?

- 0 to 3% ?
- 3 to 5% ?
- 5 to 10% ?

Answer : 6 %

FACTORS INFLUENCING LYMPHEDEMA

- **BMI, Age > 60**
- **RT**
- **Number of nodes removed**
- **Surgical technique ?**

FACTORS INFLUENCING LYMPHEDEMA

- **BMI, Age > 60**
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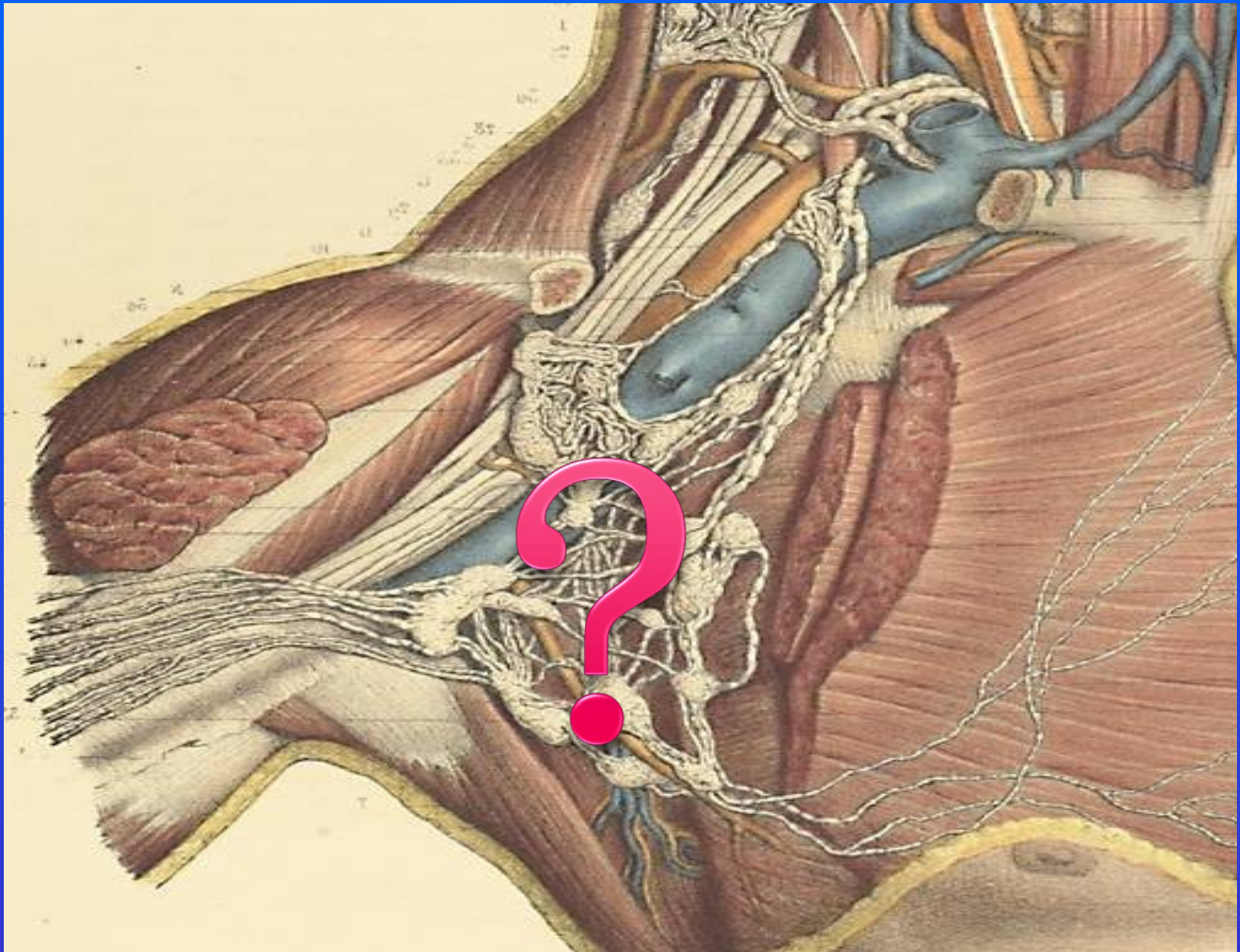
Preservation of arm lymphatics

FACTORS INFLUENCING LYMPHEDEMA

- BMI, Age > 60
- RT
- Number of nodes removed
- Surgical technique ?

Preservation of arm lymphatics + nodes ?

WHICH NODES ARE WHICH ?



3 QUESTIONS

1. **Where are the breast nodes ?**
2. **Where are the arm nodes ?**
3. **Can we spare the arm nodes ?**

3 QUESTIONS

1. Where are the breast nodes ?

1. **Where are the arm nodes ?**

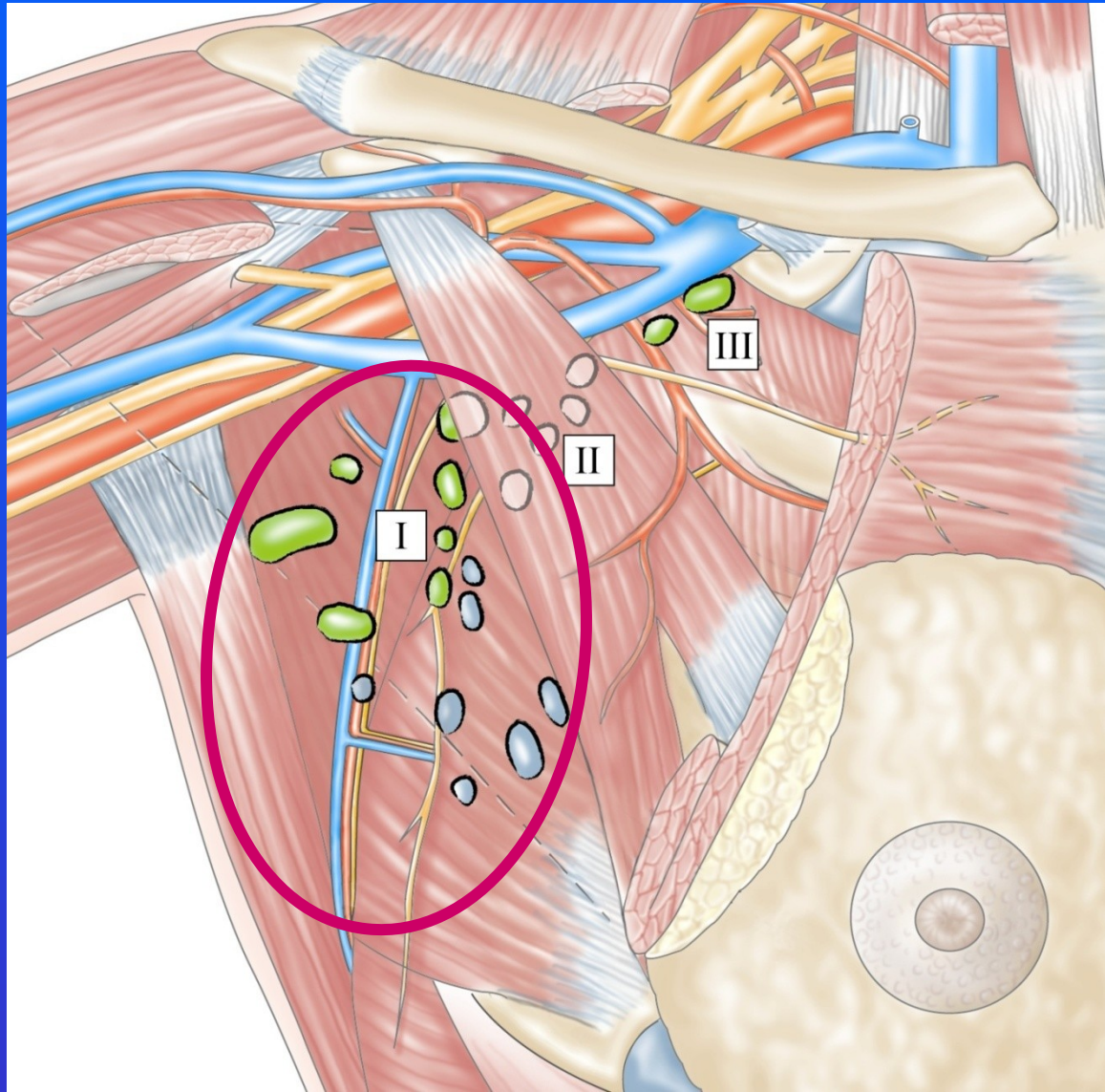
2. **Can we spare the arm nodes ?**

WHERE ARE THE BREAST NODES ?

- **242 patients T1T2 N0, no preop treatment**
- **Peritumoral injection**
- **Precise mapping first and second echelon SN**

LYMPHATIC ANATOMY OF AXILLA

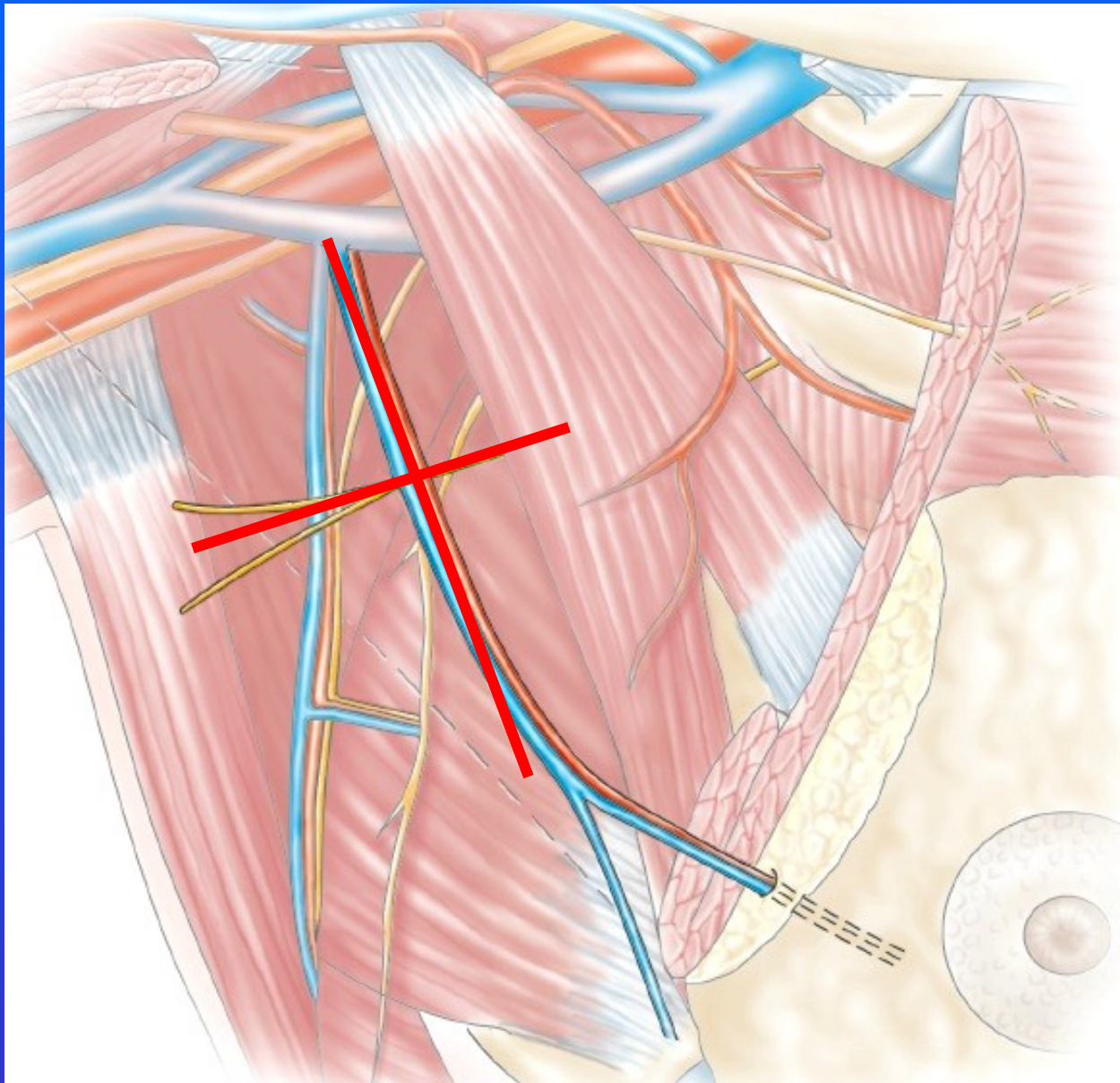
BERG'S 3 LEVELS

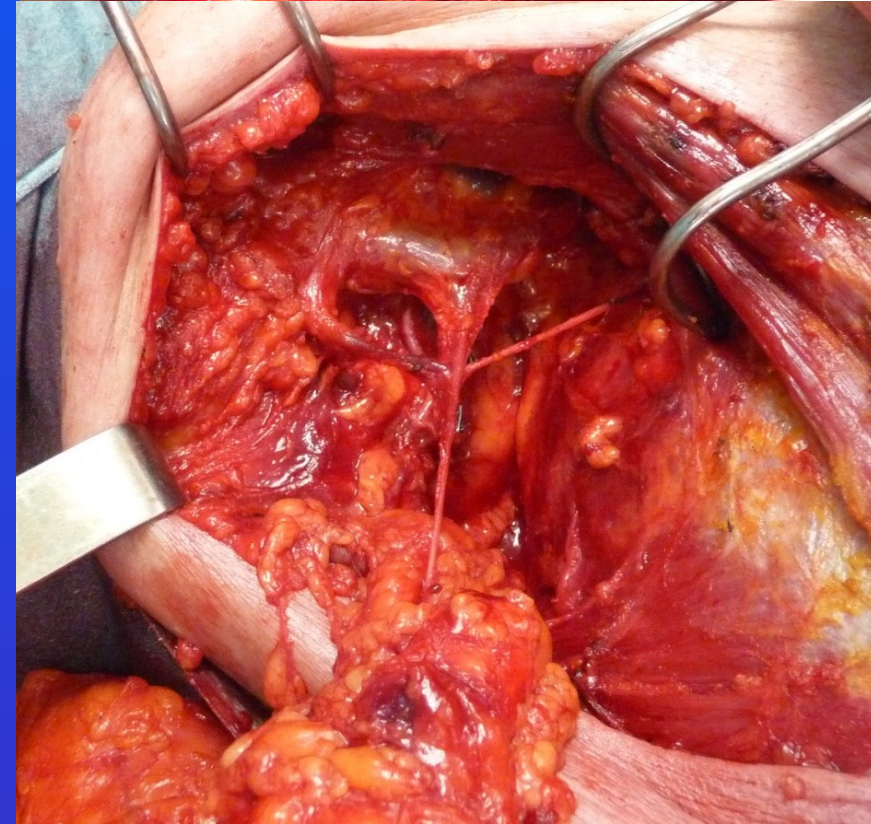
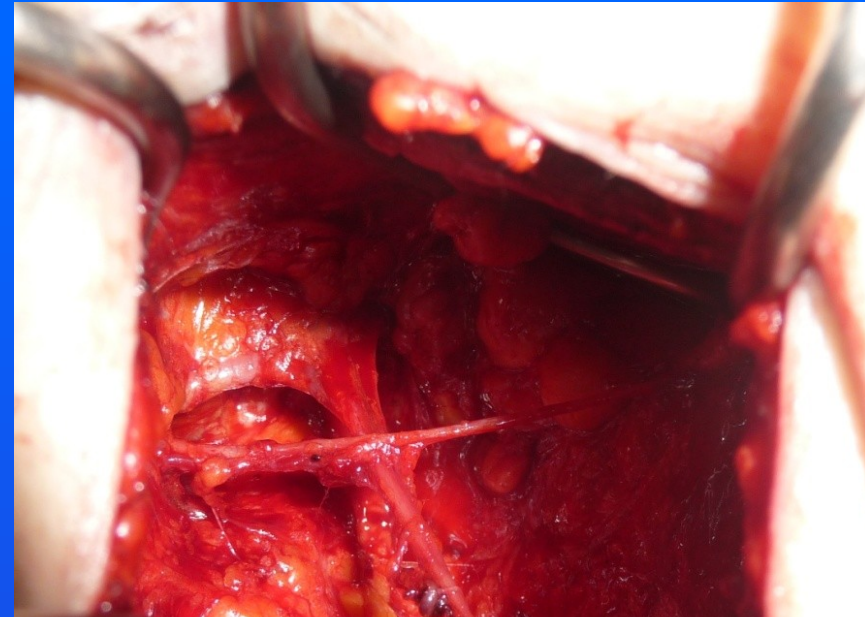
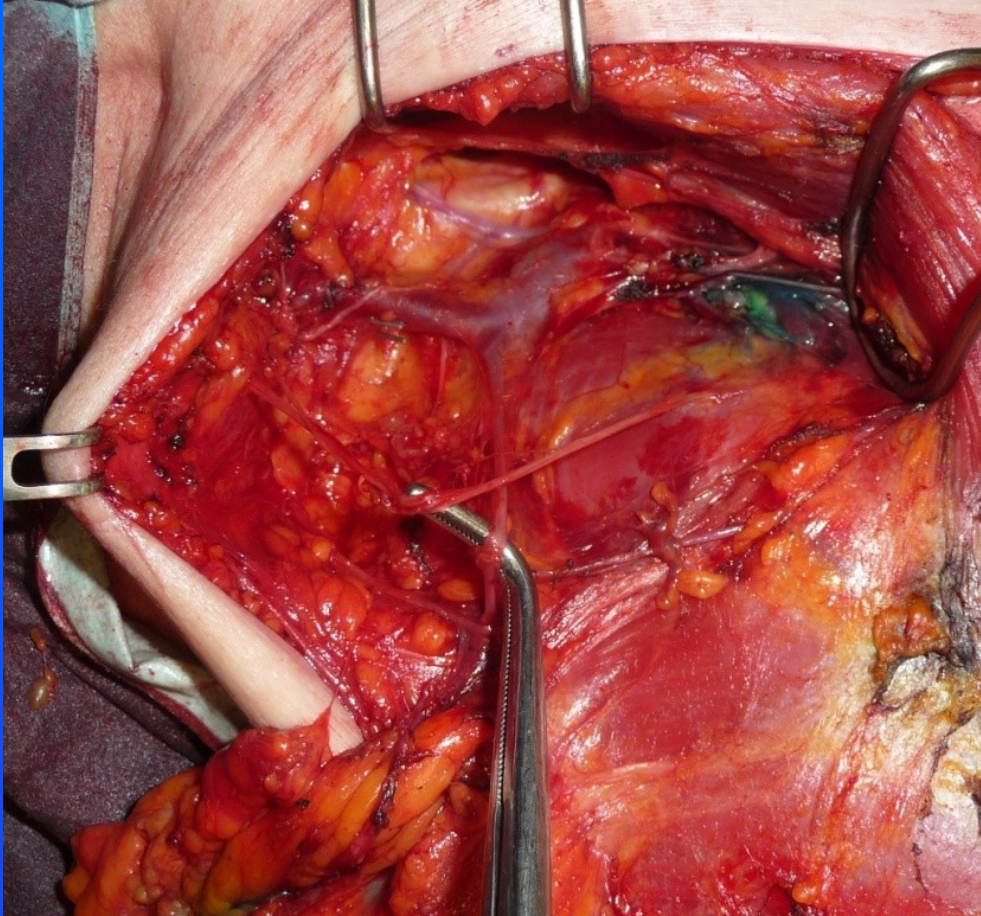


WHERE ARE THE BREAST NODES ?

- **New anatomical classification of lower axilla**
- **Axillary cross : one vessel + one nerve**
- **4 zones: A B C D**

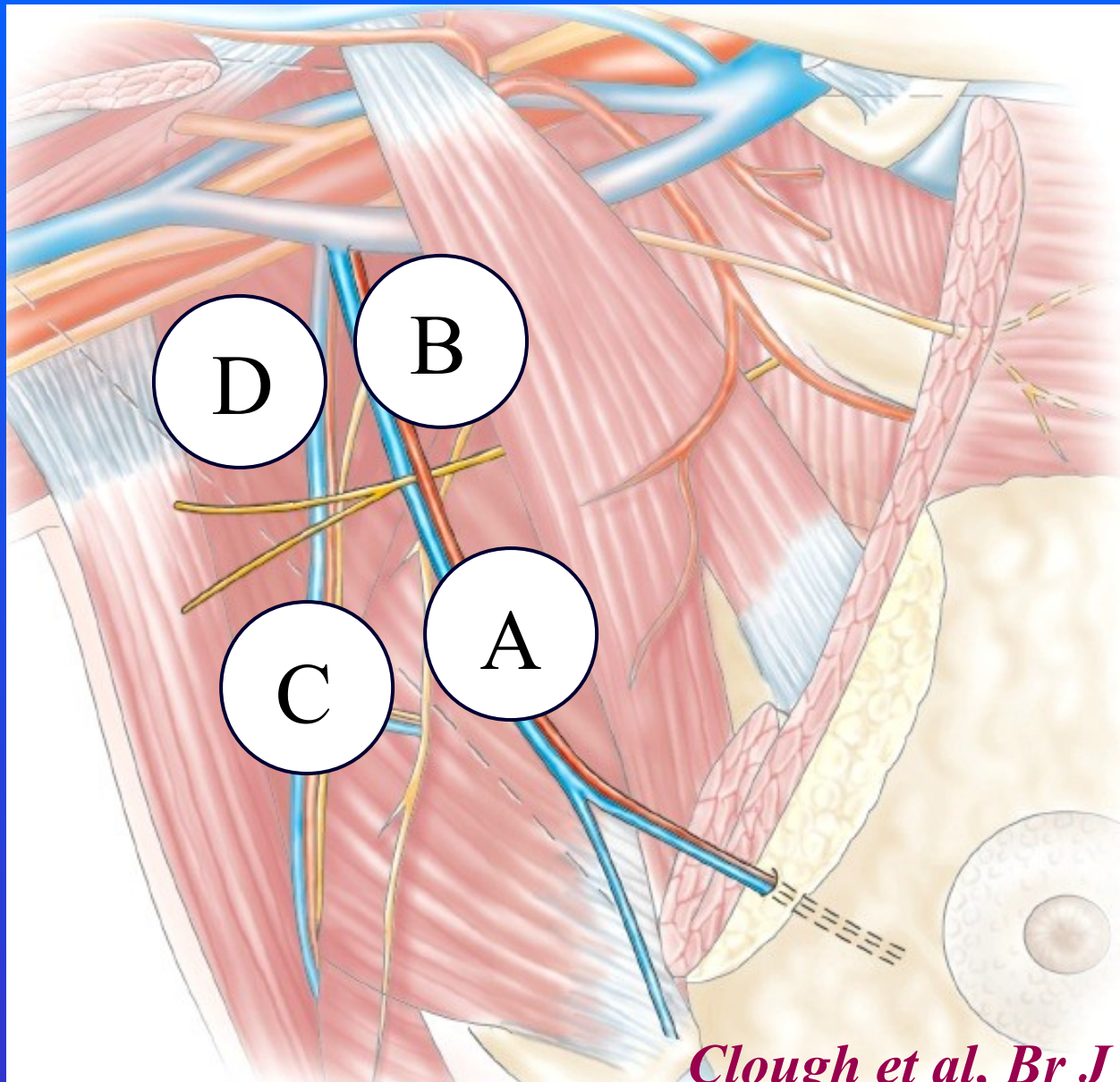
ANATOMY OF LOWER AXILLA





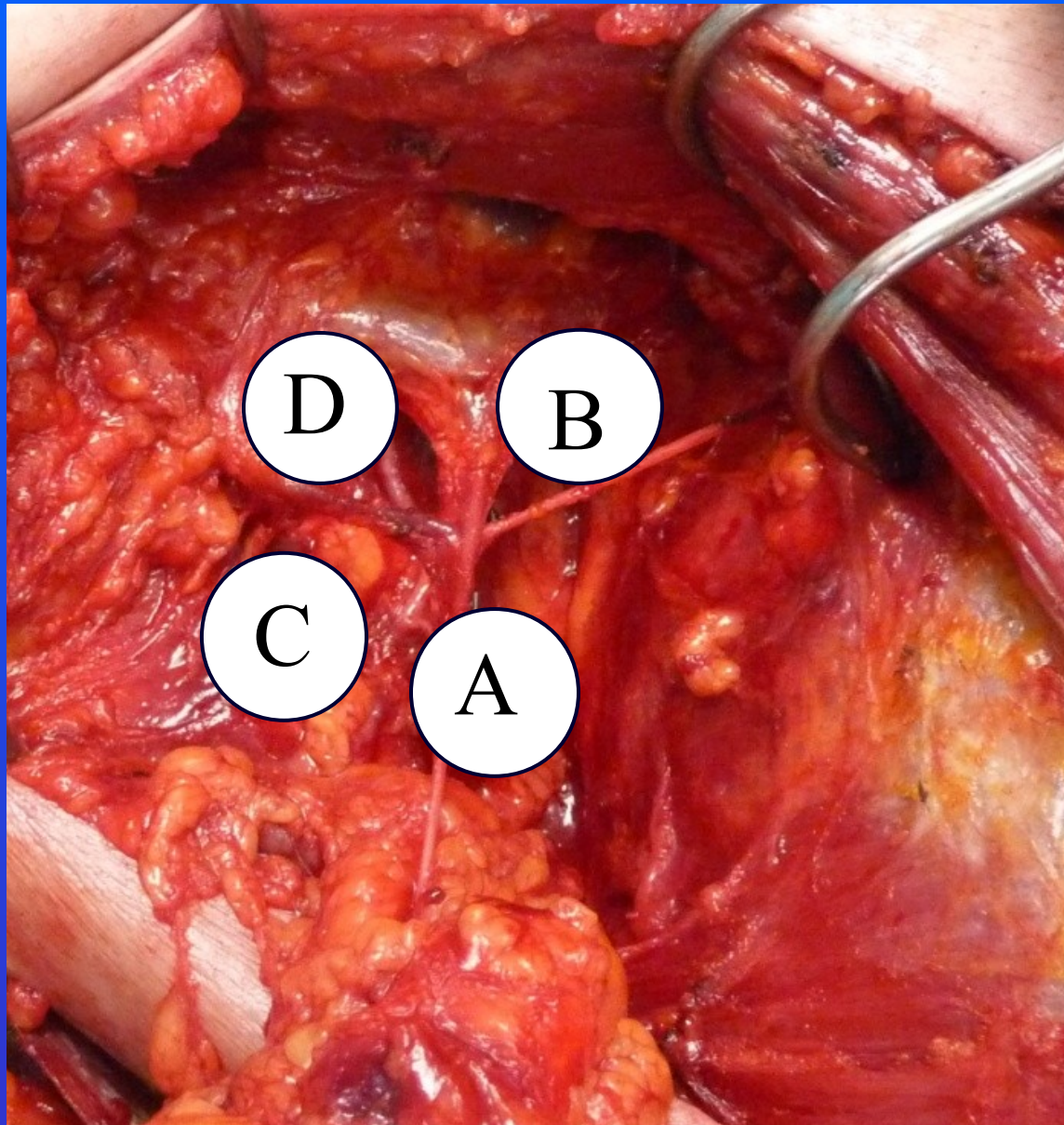
The axillary « cross »

ANATOMY OF LOWER AXILLA



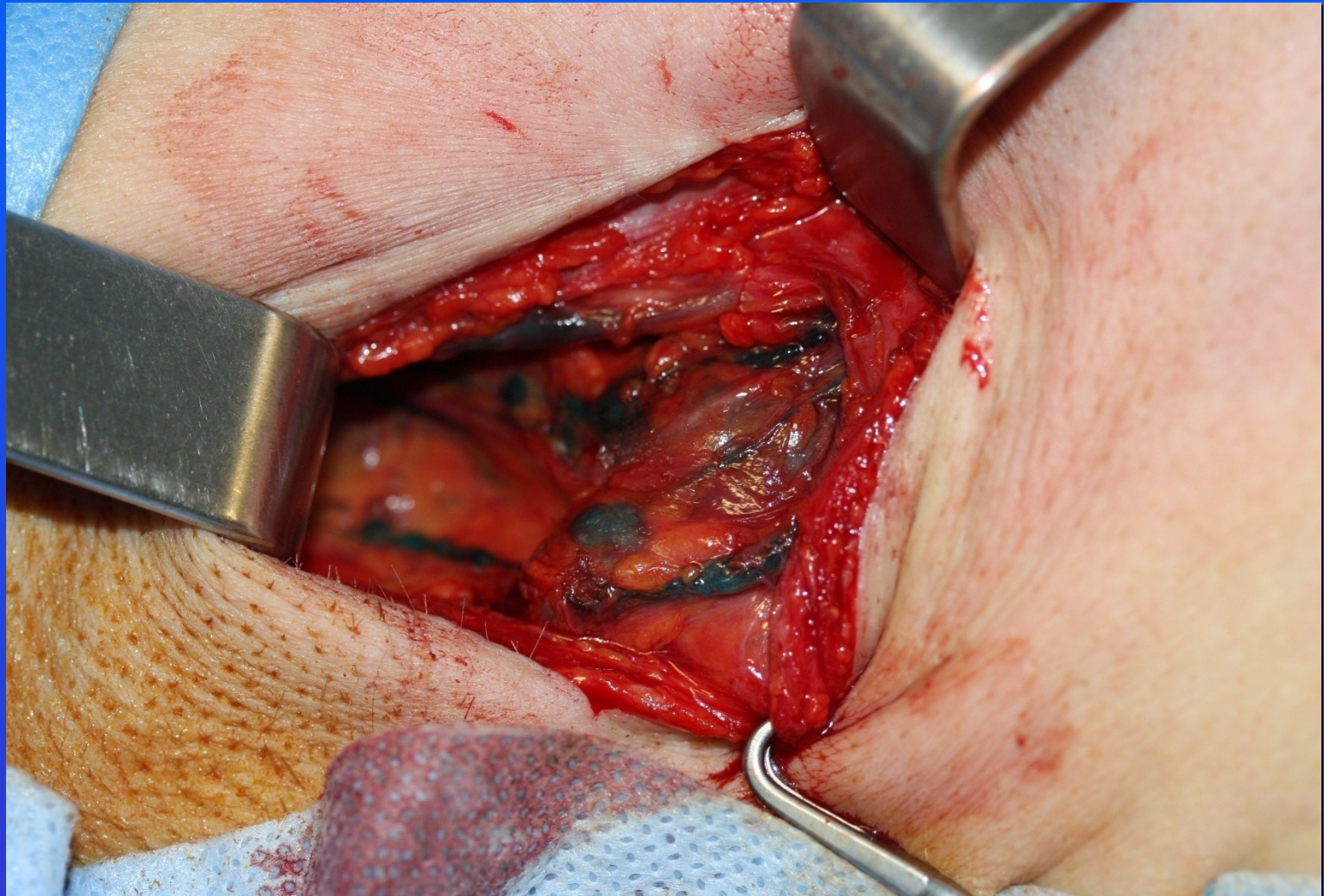
Clough et al, Br J Surg, 2010

ANATOMY OF LOWER AXILLA



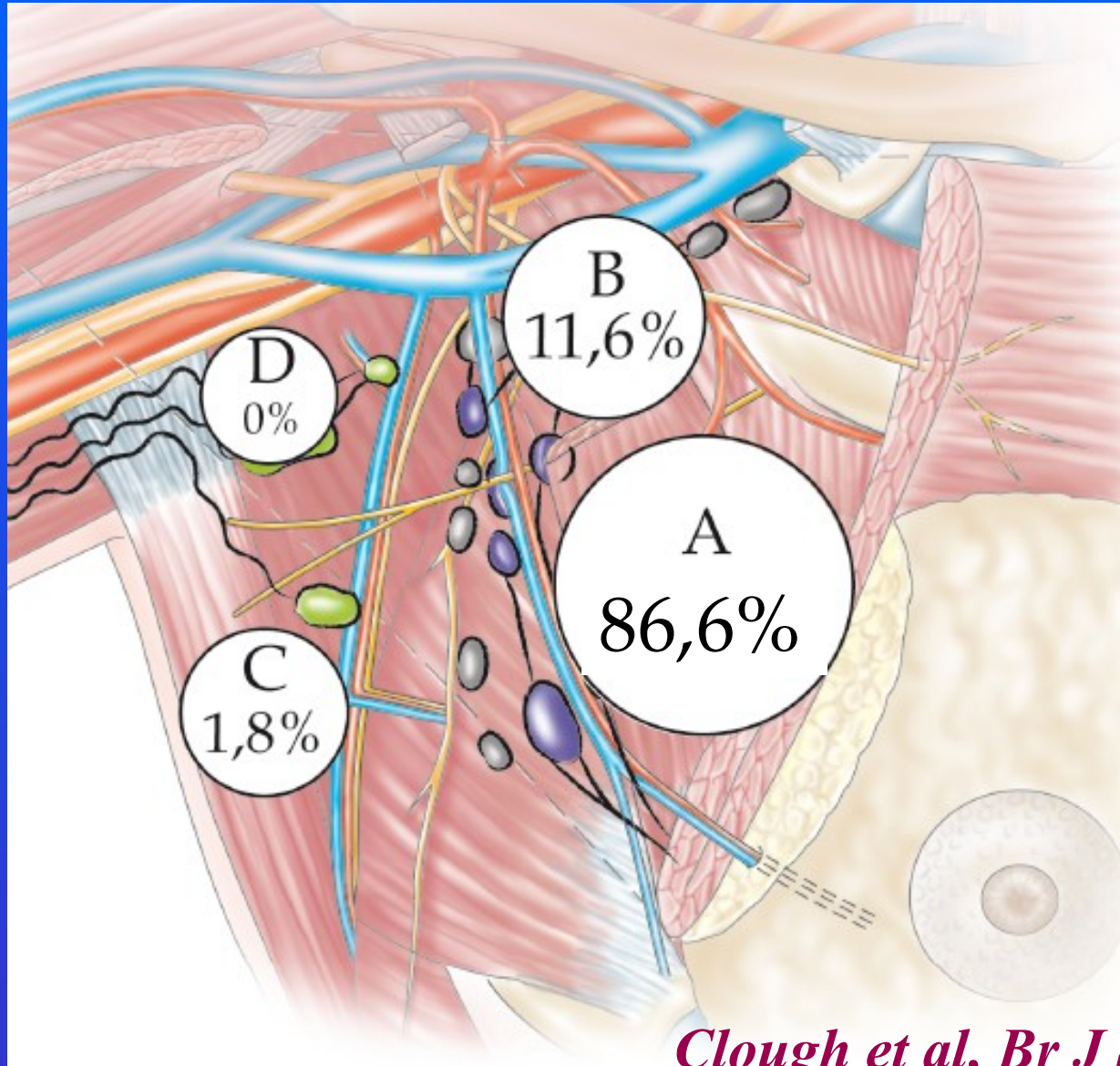
FIRST ECHELON SN ?

242 cases



Adjacent to Lateral Thoracic vein

RESULTS (n=242)



Clough et al, Br J Surg, 2010

WHERE ARE THE BREAST SN?

98 % cases : zones A or B

adjacent to lateral thoracic vein

- **86% : below 2nd intercostobr.N. (A)**
- **12 % : above 2nd intercostobr.N. (B)**

Never found in zone D +++++

3 QUESTIONS

1. Where are the breast nodes ?

1. Where are the arm nodes ?

1. Can we spare the arm nodes ?

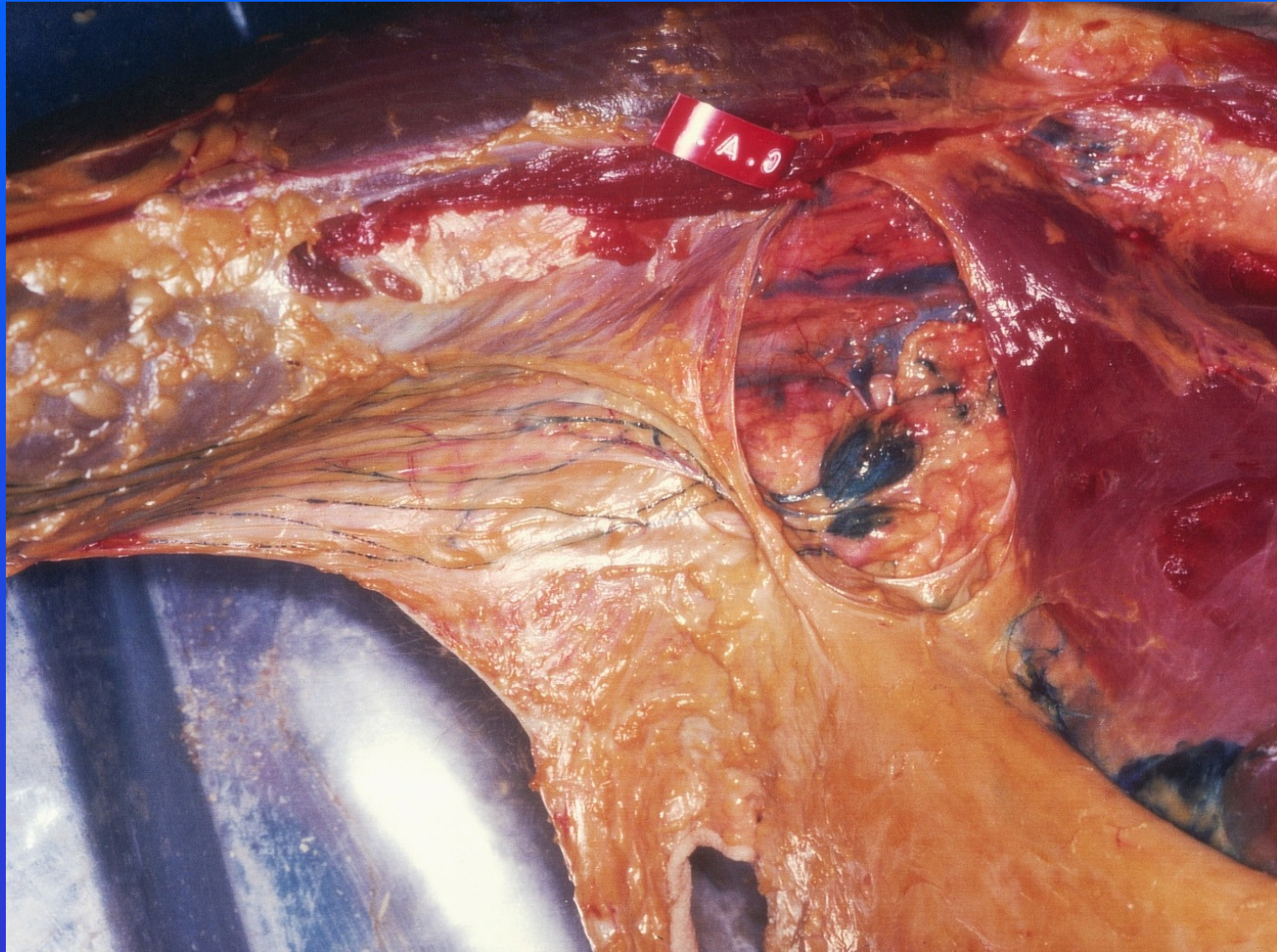
CADAVER STUDIES

Prof G. Hidden :

Blue dye injection fresh cadaver

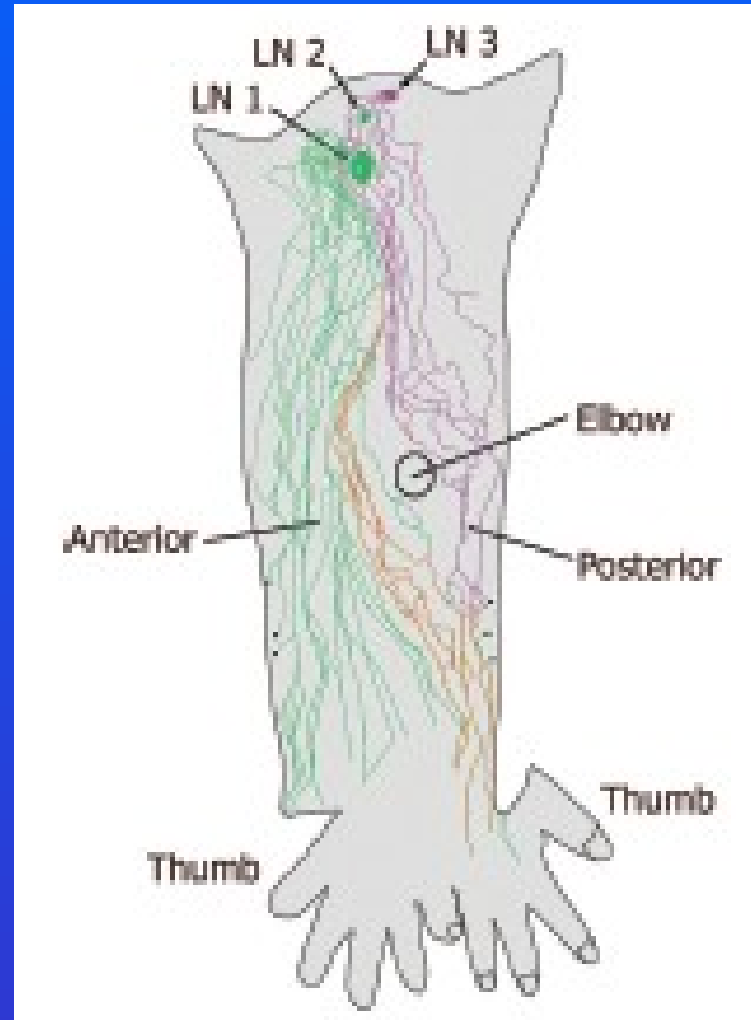


ARM NODES : LATERAL AXILLA



Prof G. Hidden, Paris

The Lymphatic Territories of the Upper Limb: Anatomical Study and Clinical Implications



Suami et al., PRS, 110: 1813 , 2007

ONE MAIN SN DRAINS THE ARM



Fig. 5. Dissection of the axilla (left) and radiograph (right) in cadaver A demonstrating the main sentinel node with its afferent lymphatics and two other smaller nodes, each receiving afferent lymphatics from the upper limb. Compare with Figure 4, left.

ARM STUDIES # 1

Axillary Reverse Mapping

- Blue dye injection **in upper limb**

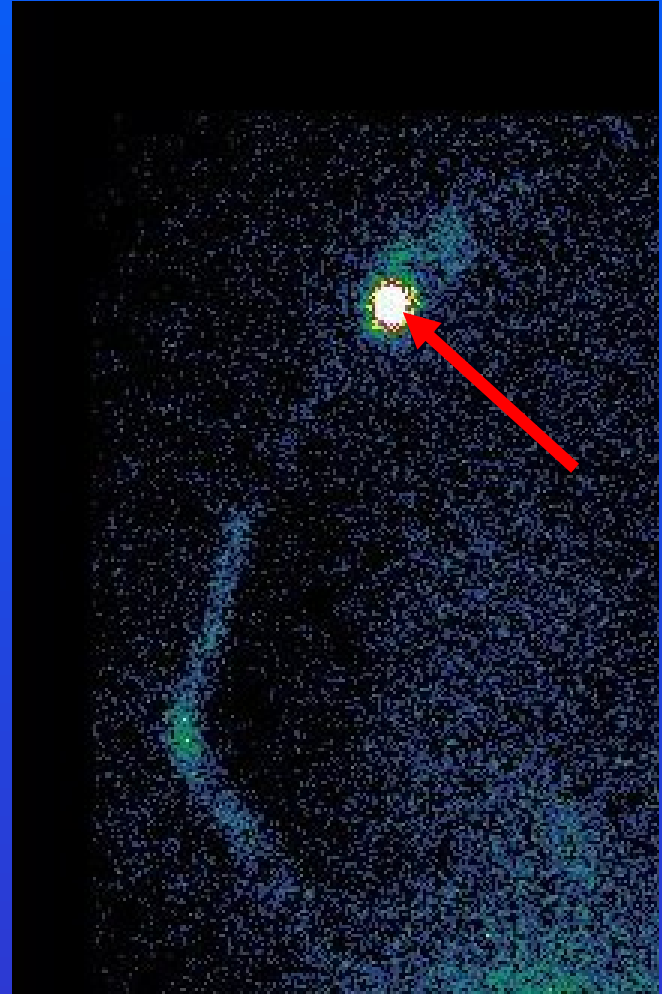
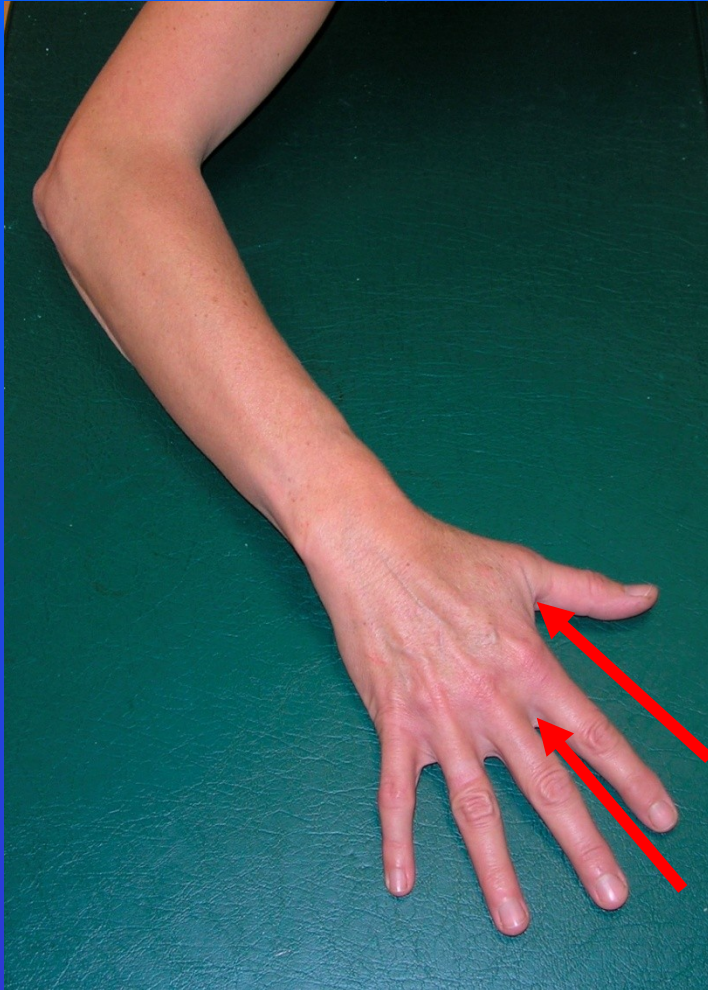
Ann Surg Oncol 2007 : 3 studies

Nos (n=21), **Thomson (n=18)** , **Ponzone (n=4)**

- ARM identification rate: 50 to 71%
- **Location (Nos) : Zone D**

ARM STUDY PHASE 2

Isotope injection in hand

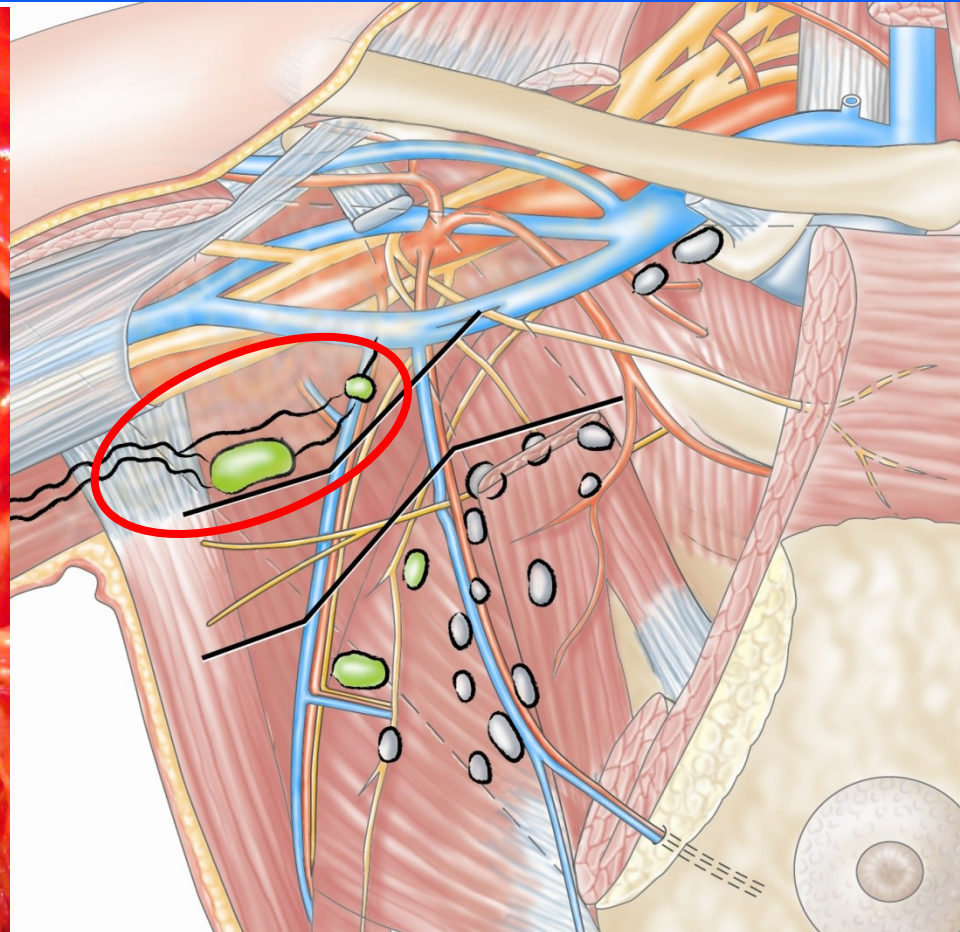
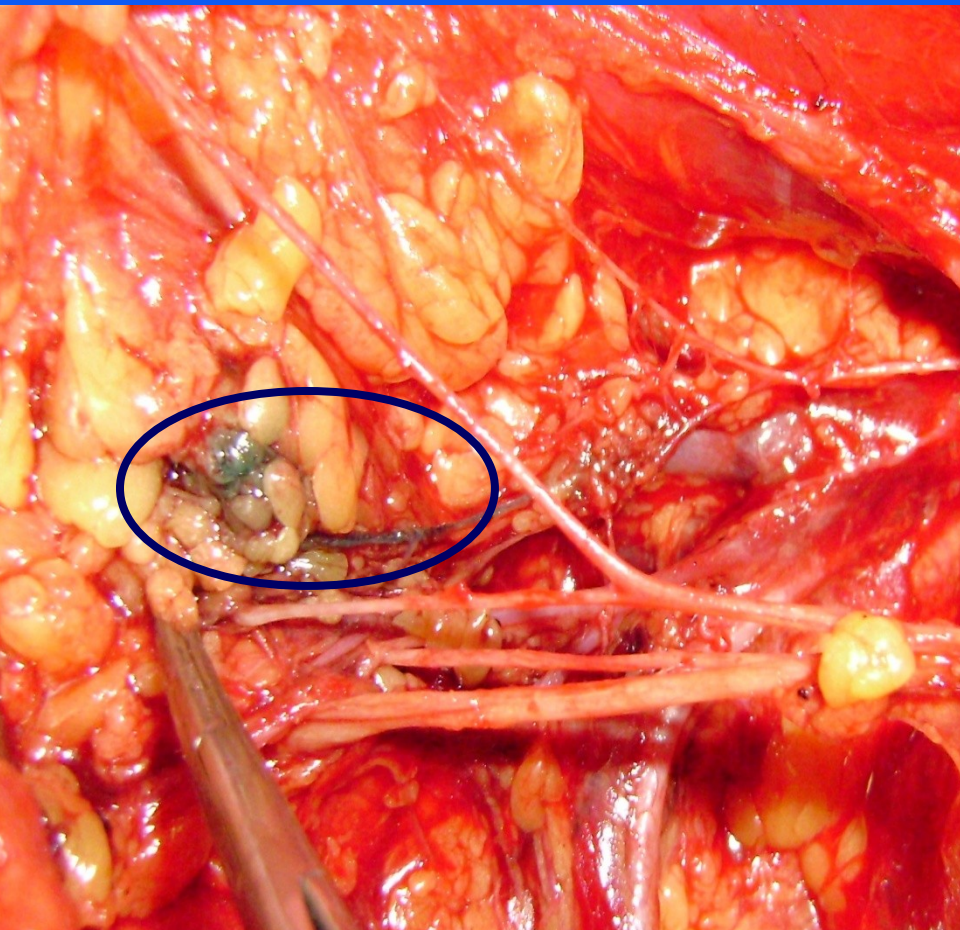


ARM STUDY # 2

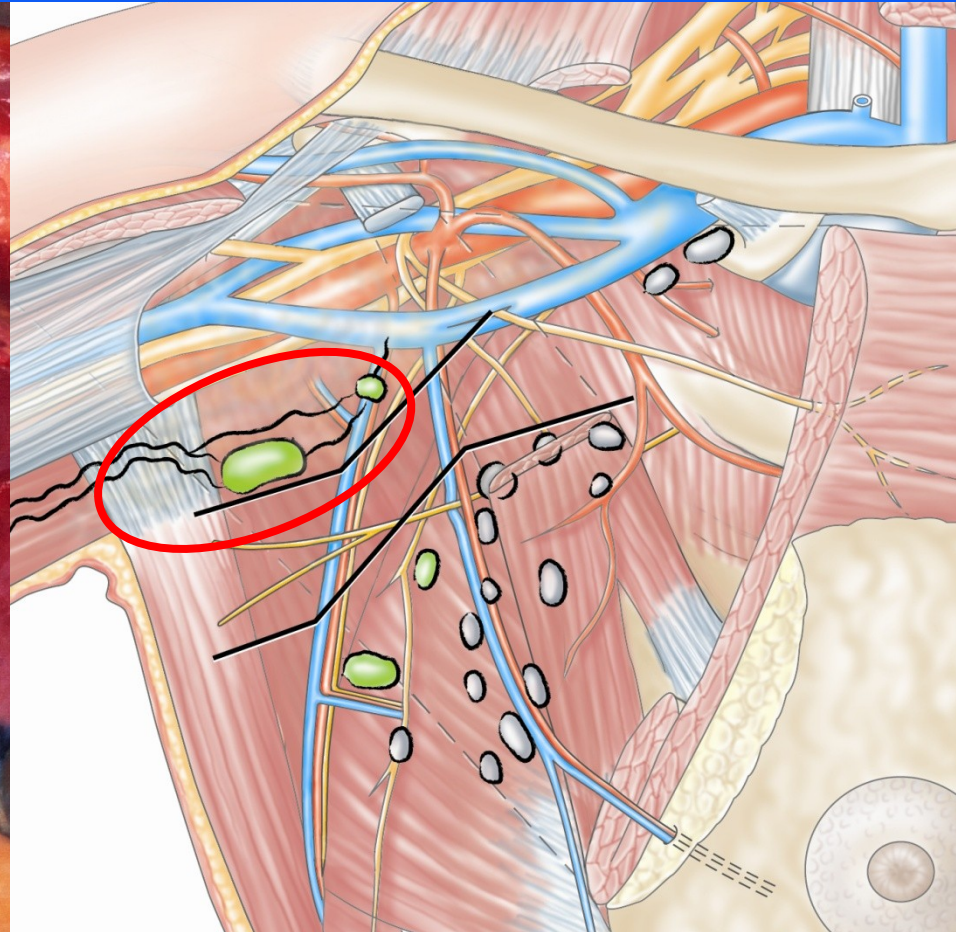
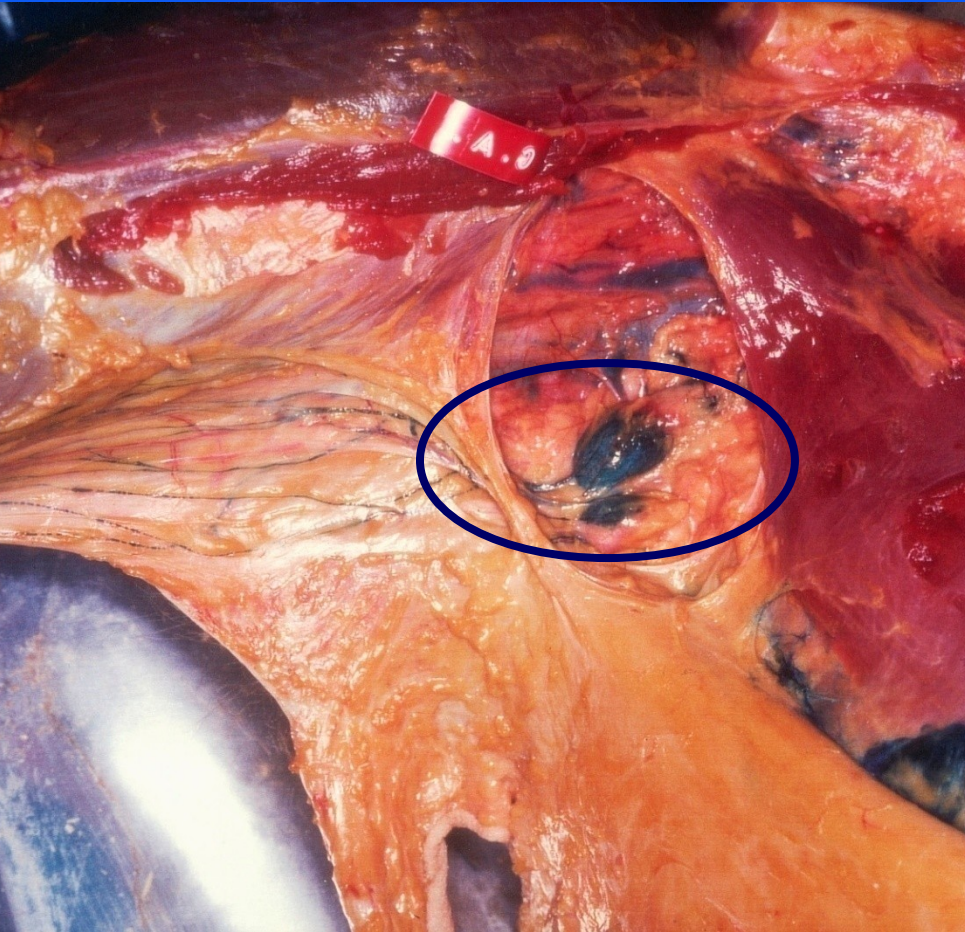
ISOTOPES

- **23 cases : Isotope injection in hand**
- **ARM identification rate: 91%**
- **Almost all cases : ARM node in D**

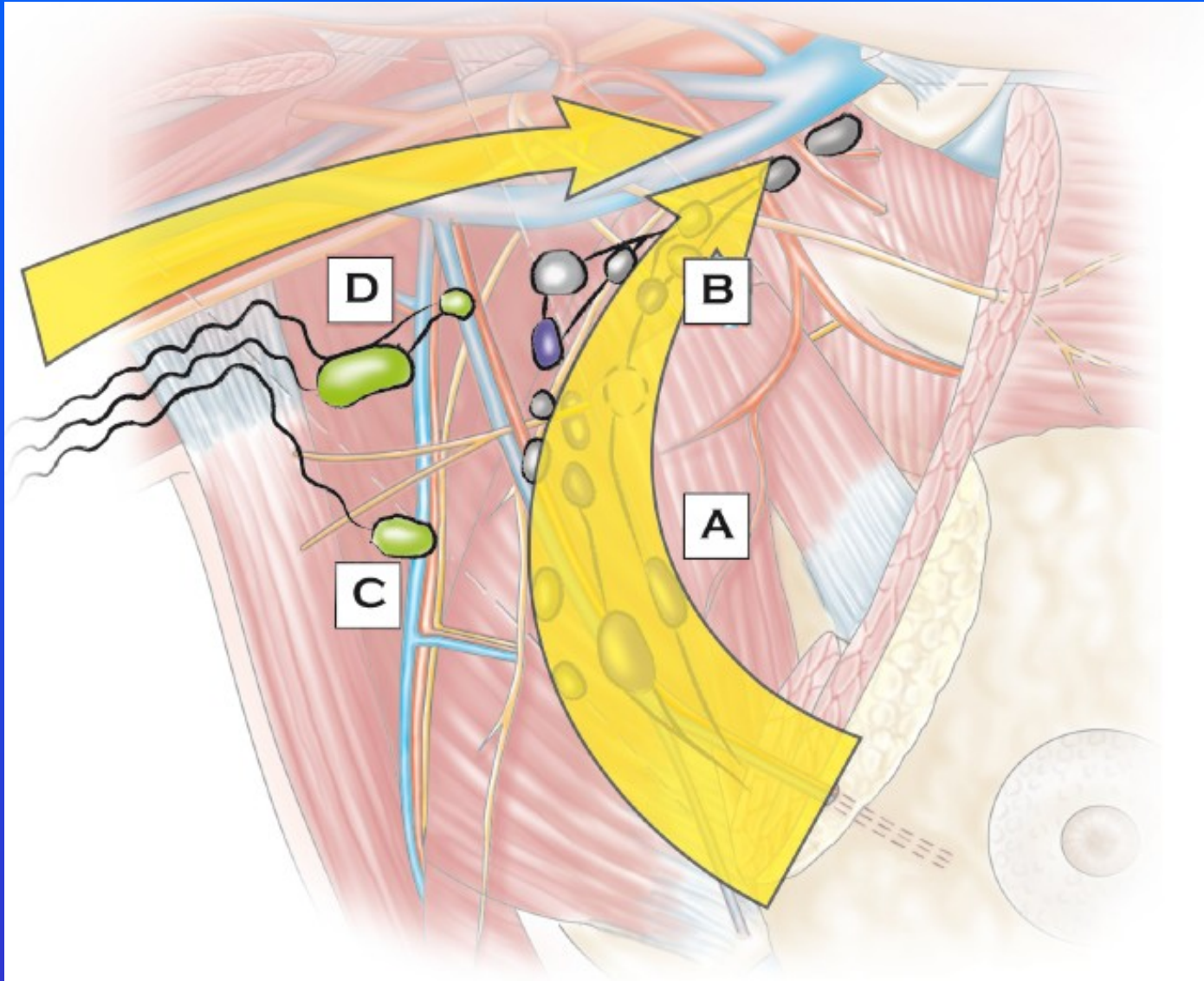
ARM NODE IN ZONE D



ARM NODE IN ZONE D



HYPOTHESIS



3 QUESTIONS

1. Which are the breast nodes ?

2. Which are the arm nodes ?

1. Can we spare the arm nodes ?

SPARING ARM NODES ?

2 different situations:

- 1. No nodes involved, SN Biopsy**
- 2. Positive nodes, Ax Dissection**

SPARING ARM NODES ?

2 different situations:

1. No nodes involved, SN Biopsy

1. Positive nodes, Ax Dissection

SN BIOPSY and ARM NODES

131 ARM (blue dye) with SNB

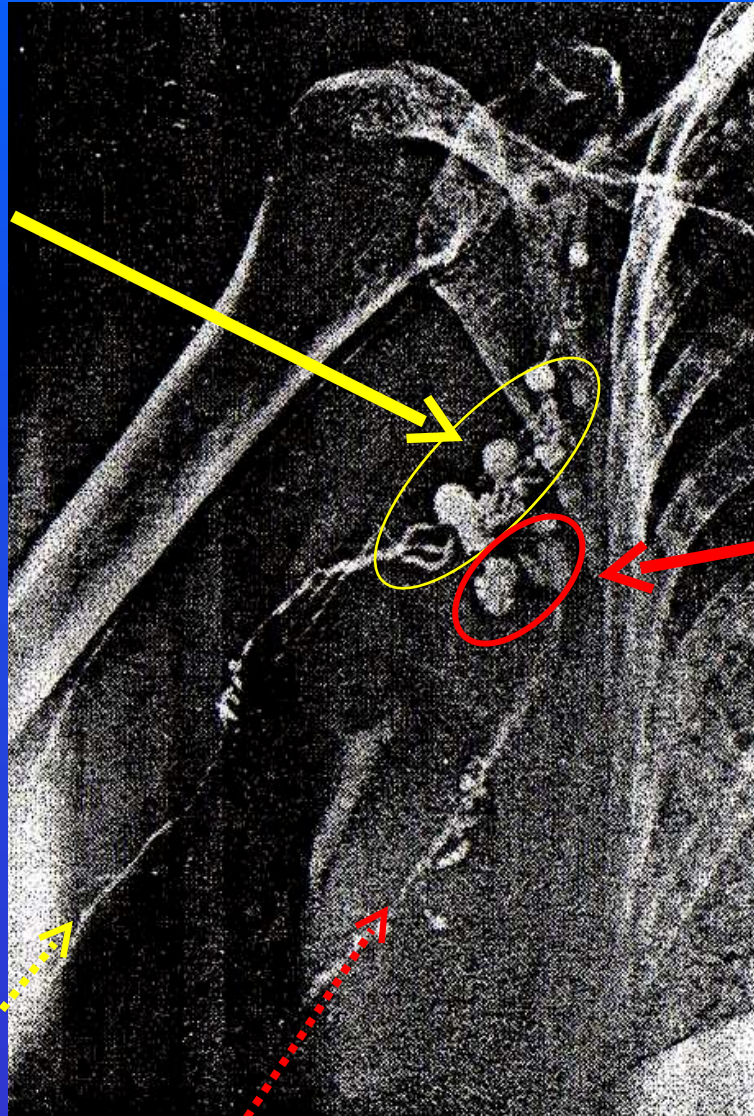
- 42% blue lymphatics in SN field
- 3,9% common channels draining arm & breast

ARM lymphatics at risk during SNB

BREAST+ARM LYMPHOGRAPHY

Dr K. Kett

ARM nodes

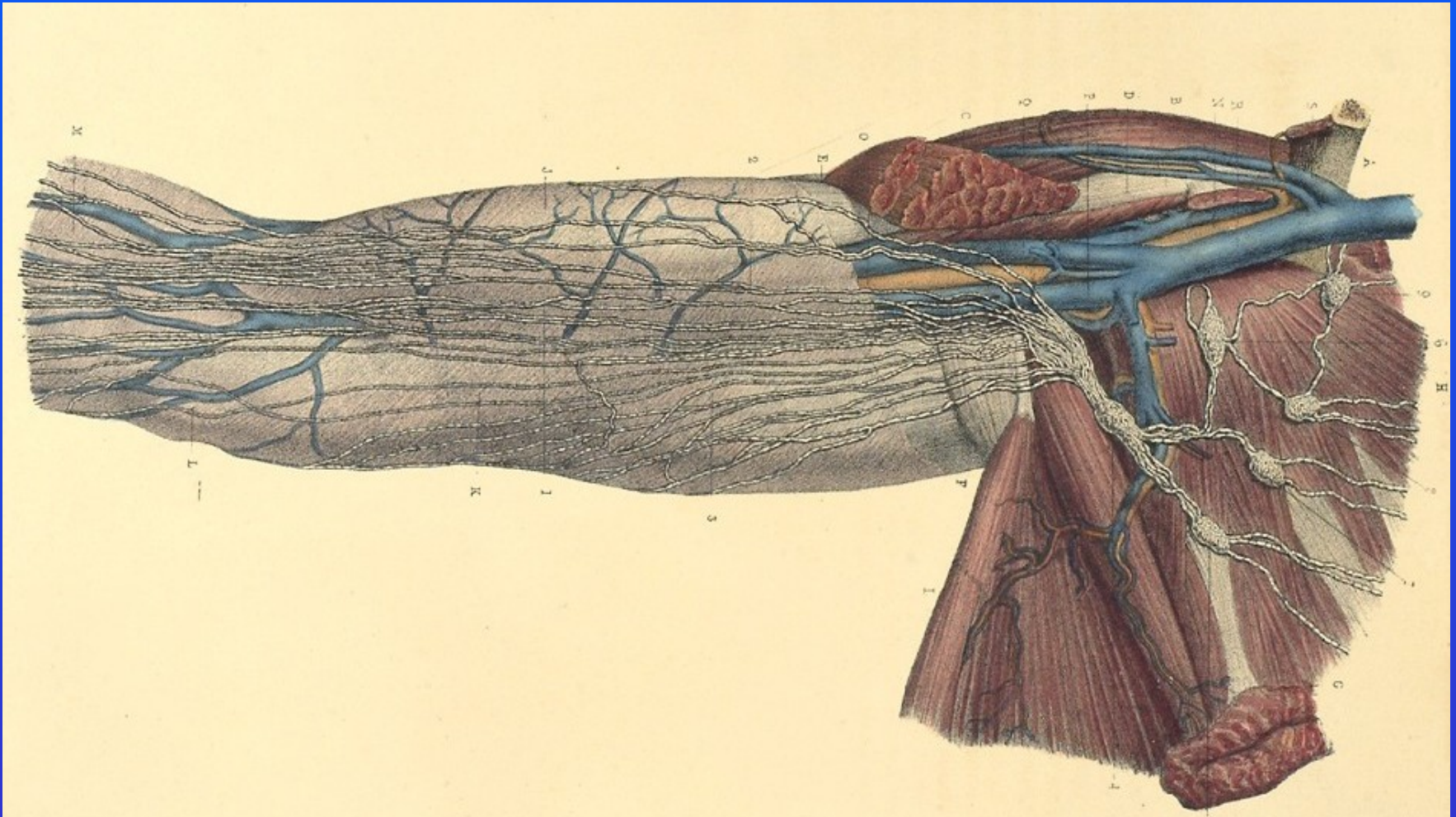


Breast nodes

**Spare lateral palpable
nodes during SN
biopsy !**

2 HYPOTHESIS

1. Arm SN different from breast nodes
2. Arm SN not involved if breast nodes +



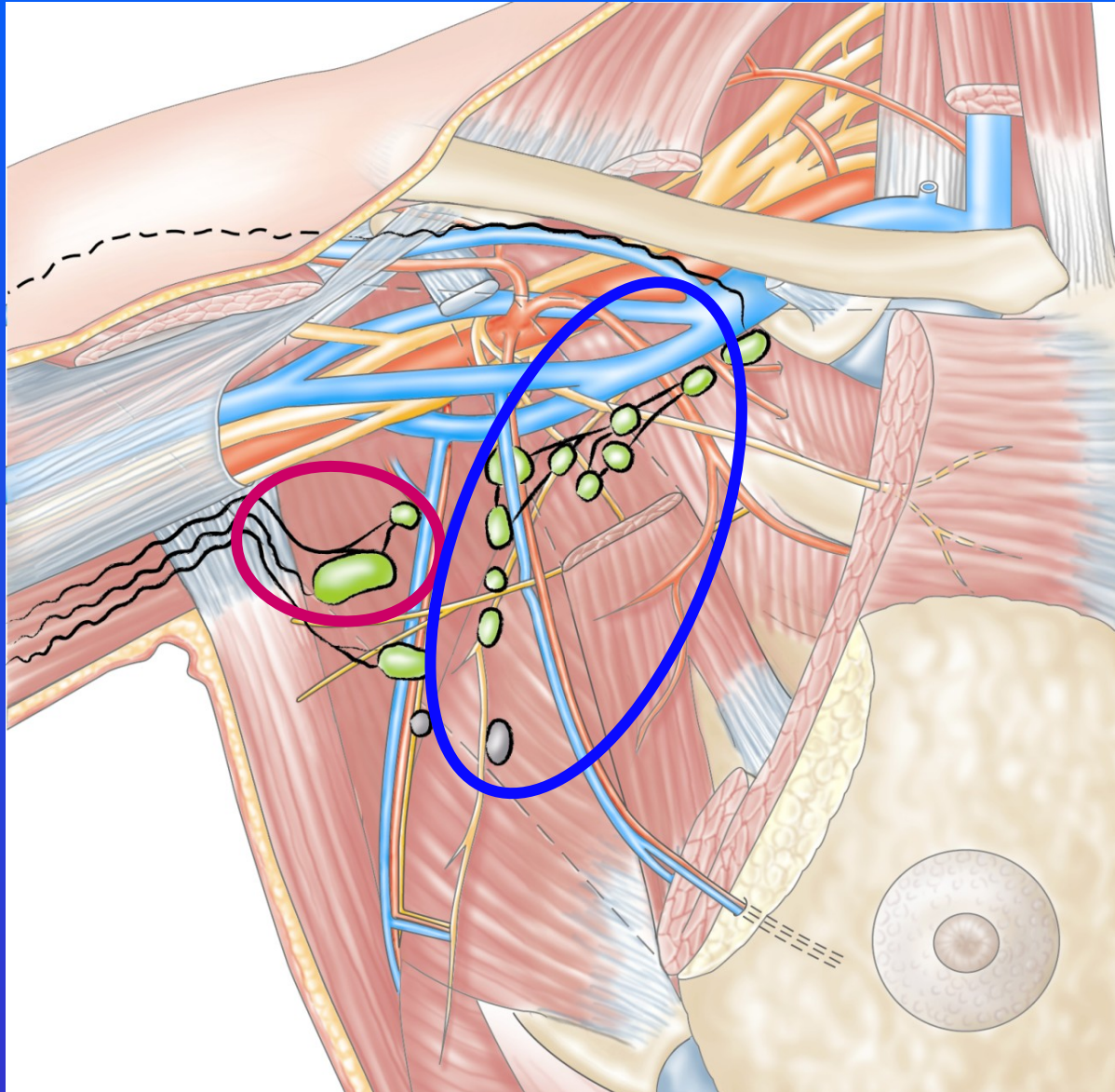
SPARING ARM NODES ?

2 different situations:

1. No nodes involved, SN Biopsy

1. Positive nodes, Ax Dissection

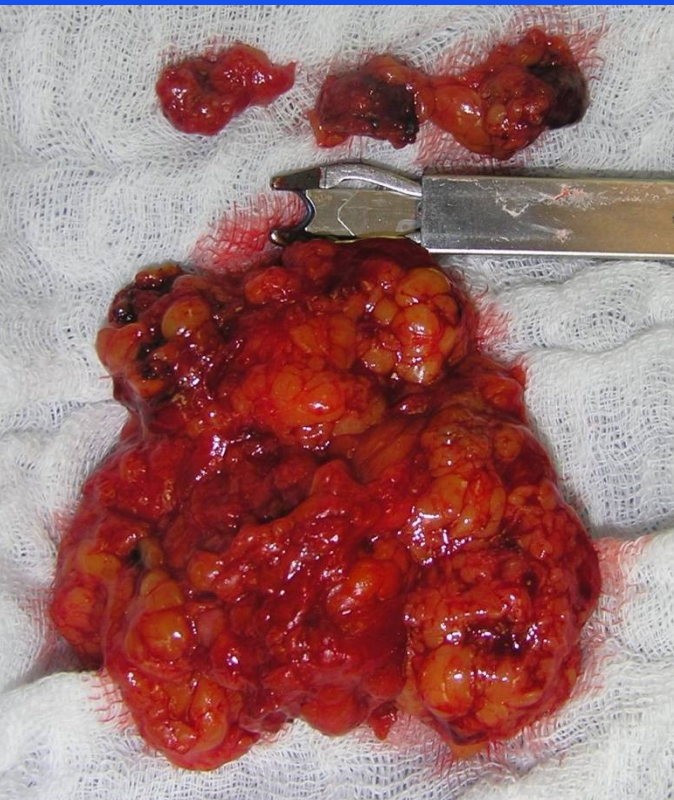
**IF N+, ARE ARM NODES
INVOLVED ?**



ARM NODE INVOLVEMENT ?

Nos 2008

- **23 advanced cases (87% node +ve) : AD**
- **ARM with isotope: 21 identified (91%)**



- **ARM nodes - ve : 18 cases**
- **ARM nodes +ve : 3 cases**

RESULTS

Nº	Age	TNM	SCINTIGRAPHY	Axillary Dissection	ARM nodes
1	42	T3N0	Yes	1N+/9	4 N -
2	41	T4dN2	Yes	4N+/16	2N-
3	56	T4b N1	Yes	9 N+/ 11	1 N+
4	40	T2N0	Yes	1 N+/15	2N-
5	69	T4N2	FAILURE	7N+/11	/
6	74	T3N2	Yes	10 N+ / 11	1N+
7	49	T2N1	Yes	2N+/9	2N-
8	44	T2N0	Yes	1N+ /7	1N-
9	47	T1N0	Yes	1N+/ 9	1N-
10	36	T2N1	Yes	2N+/ 12	3N-
11	34	T2N0	Yes	8N-	1N-
12	34	T3N2	Yes	11 N+/ 11	2N-
13	40	T4d N2	Yes	1 N+ /7	2N-
14	38	T2 N	Yes	7 N+/ 9	1N-
15	77	T2N1	Yes	2N+/20	2N-
16	43	T3N1	Yes	7N-	1N-
17	54	T4dN2	Yes	1N+/5	1N-
18	61	T3N1	Yes	10N+/15	1N+
19	34	T2N2	Yes	4N+/10	2N-
20	69	T1N2	FAILURE	2N+/13	/
21	45	T1N2	Yes	1N+/9	1N-
22	42	T1N2	Yes	4N+/8	1N-

ARM NODE INVOLVEMENT ?

Ponzzone 2009

- 49 ARM with blue dye
- Detection rate 55% (27 cases): Zone D
- 24 cases : ARM nodes not involved
- 3 involved : 18 N+/18, 18N+/24, 7N+/ 18

Ponzzone et al, JCO 2009

SPARE ARM NODES IF N+ ?

- **Limited data : 2 preliminary studies**

ARM not involved if $< 7N+$

- **French multicentric SENTIBRAS (C. Nos):**
 - **N+ patients : ADissection**
 - **ARM: isotope**
 - **ARM nodes involvement rate**

CONCLUSIONS (1)

- **Arm nodes different than breast nodes**

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CONCLUSIONS (1)

- Arm nodes different than breast nodes
- **Anatomy: « axillary cross »**
- **Breast nodes medial : thor. vein (zones A + B)**
- **Arm nodes lateral : zones D + C**
- Spare lateral nodes during SN biopsy +++

CONCLUSION (2)

- **Isotope ARM : 91 % identification**

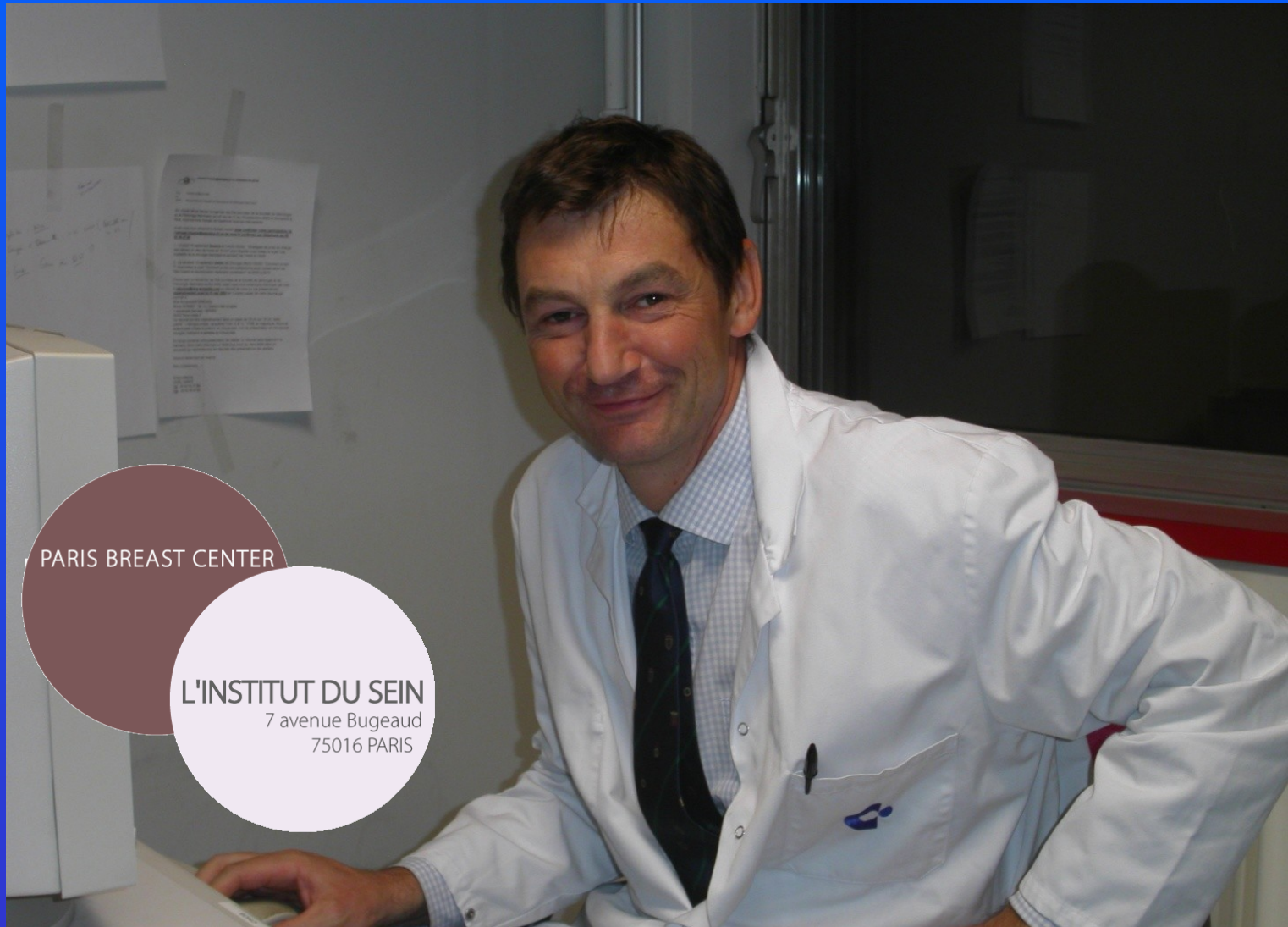
CONCLUSION (2)

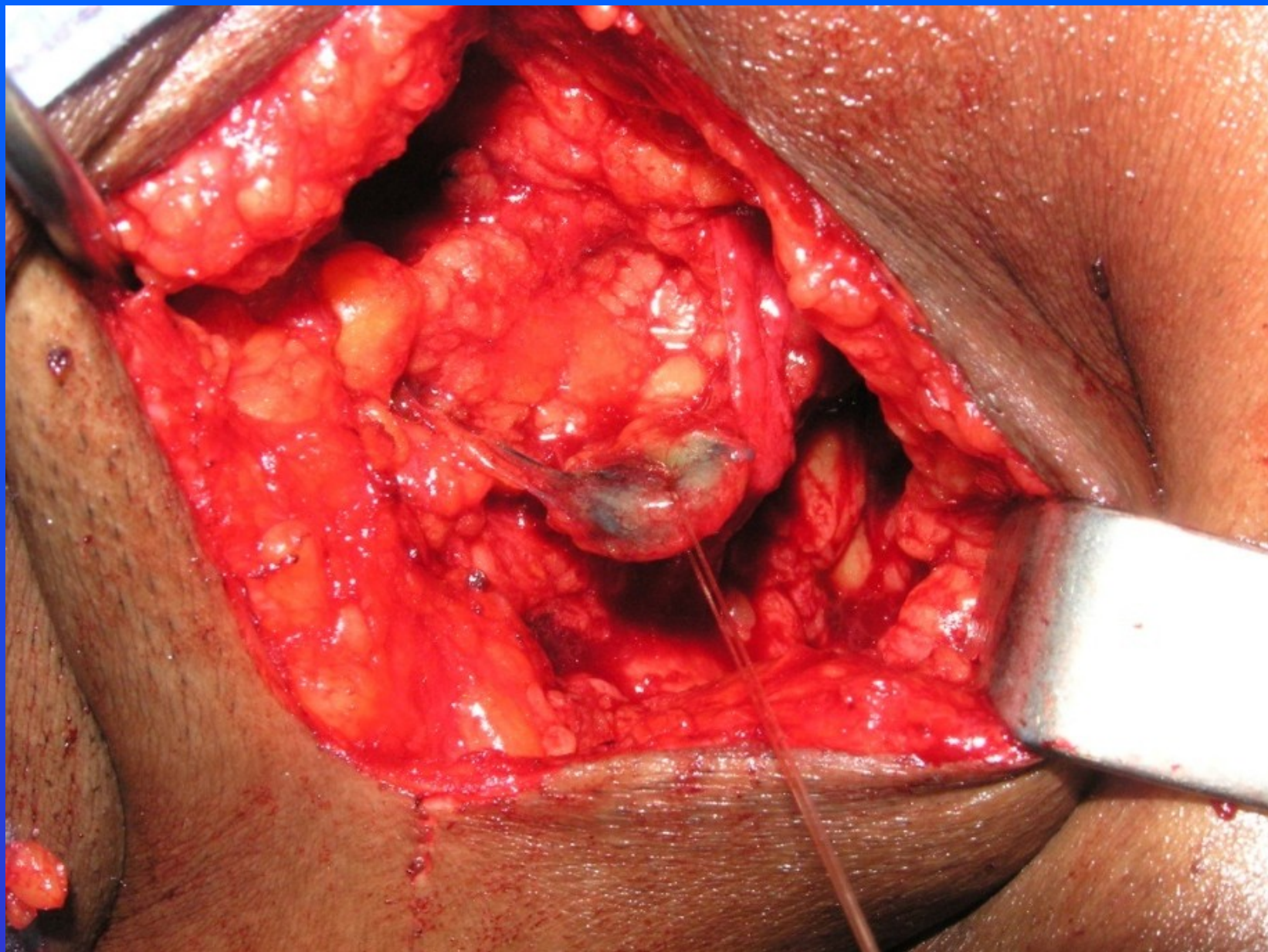
- **Isotope ARM : 91 % identification**
- **N+ patients: ARM nodes rarely involved ?**

CONCLUSION (2)

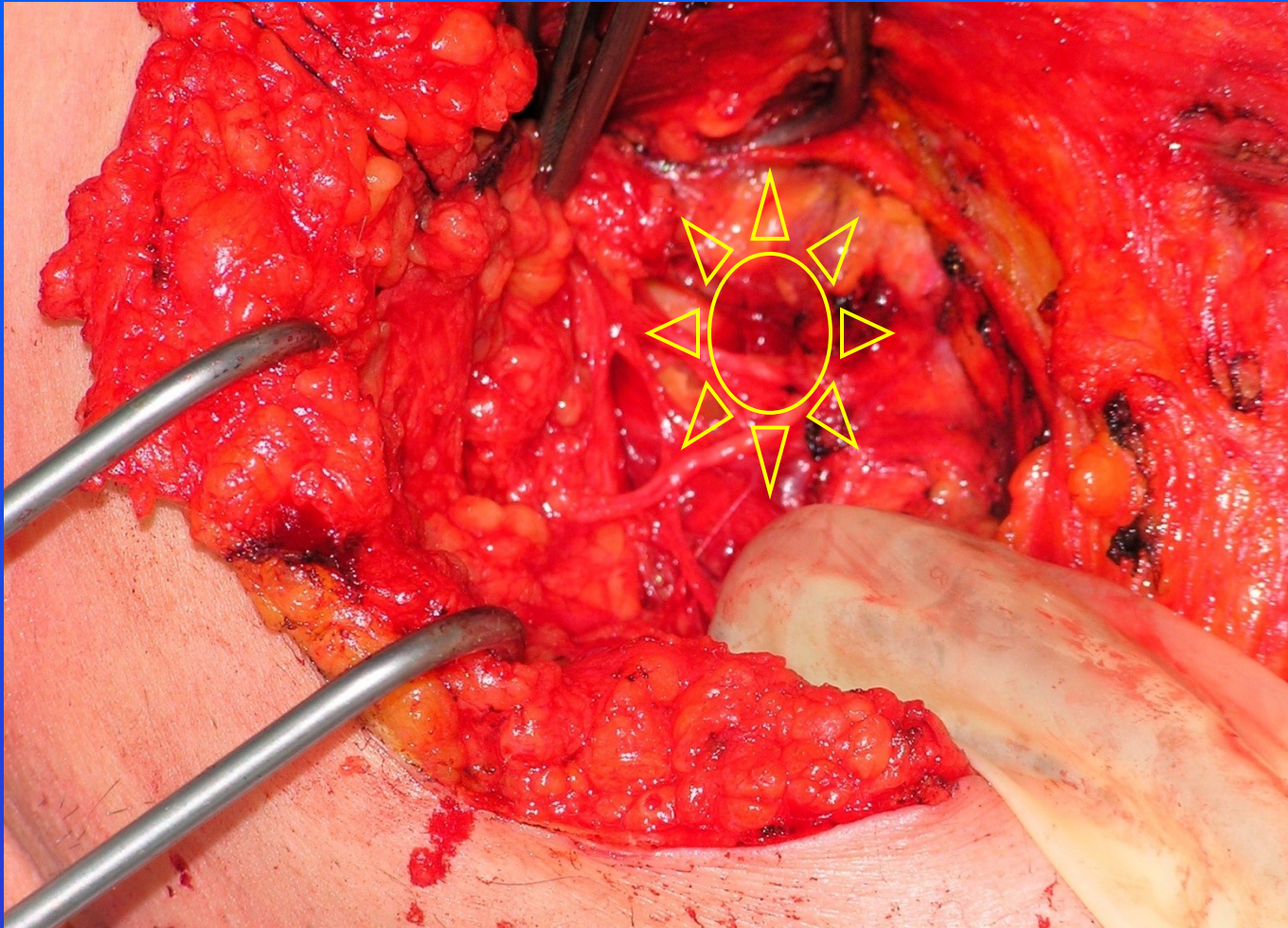
- **Isotope ARM : 91 % identification**
- **N+ patients: ARM nodes rarely involved ?**
- **Multicentric protocol SENTIBRAS**

THE SENTINEL NOS

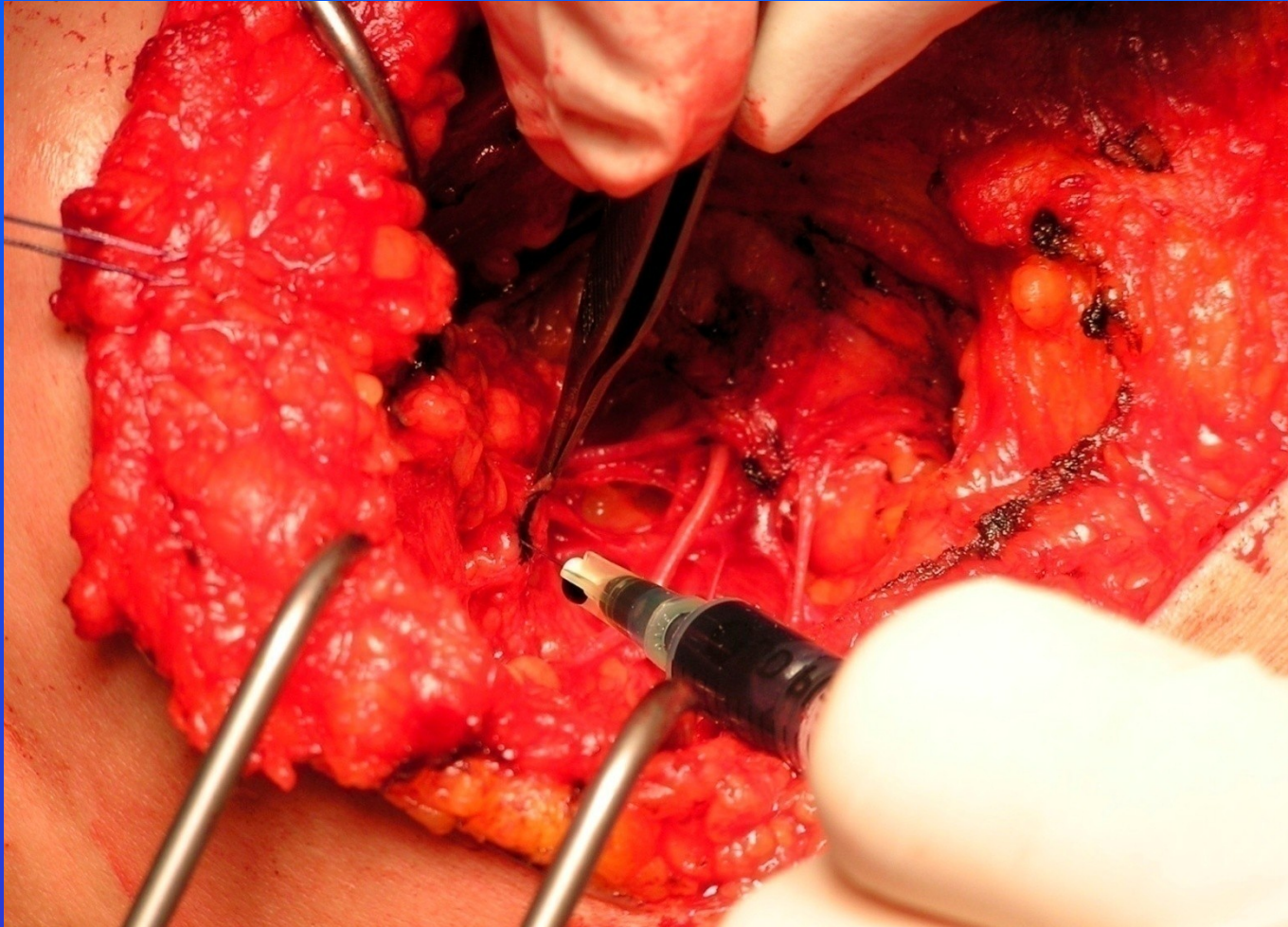


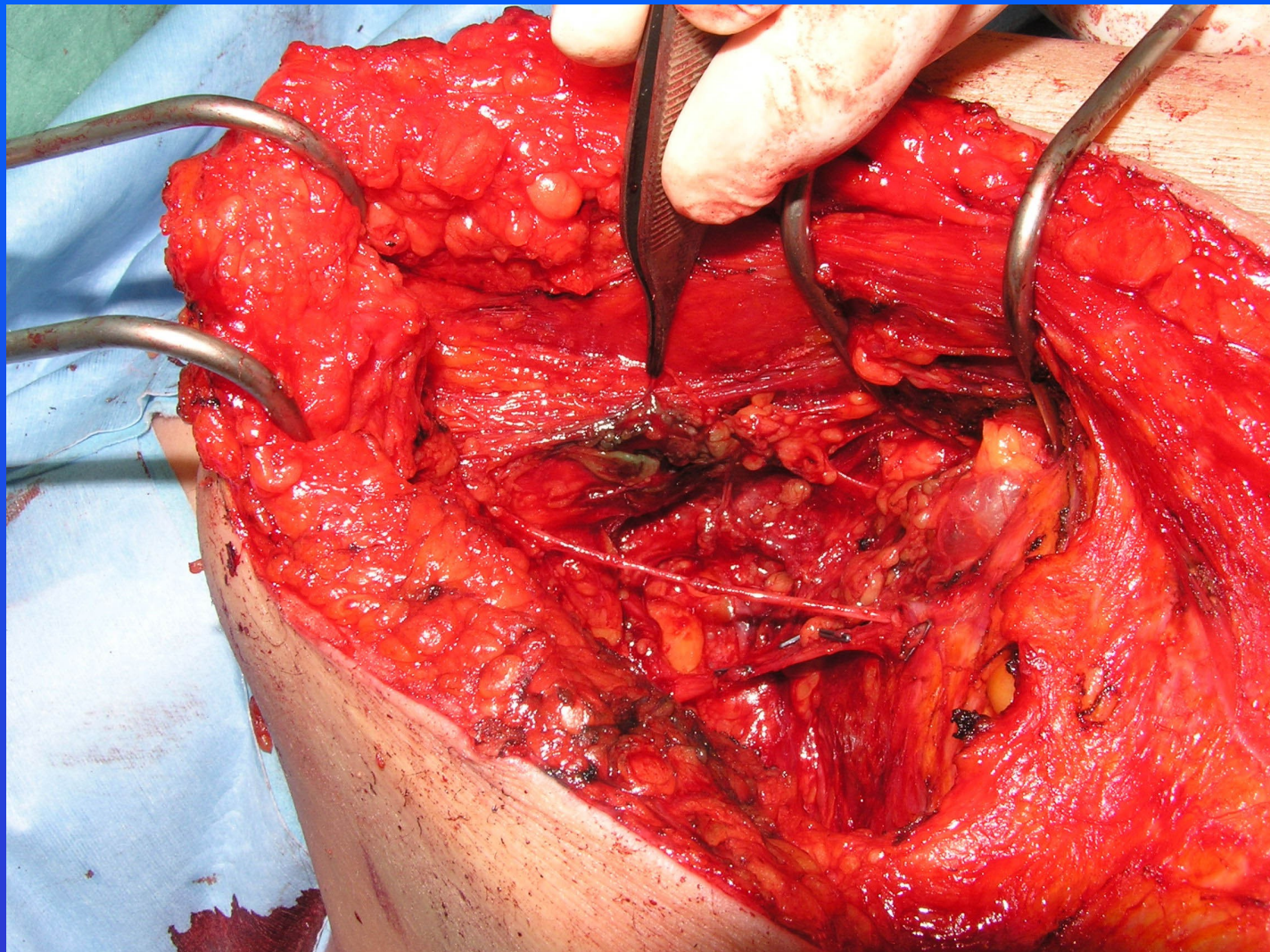


Search for the first Arm SN with the gamma probe



Injection of 0,2 cc of blue dye directly into the node (needle of 30 G)

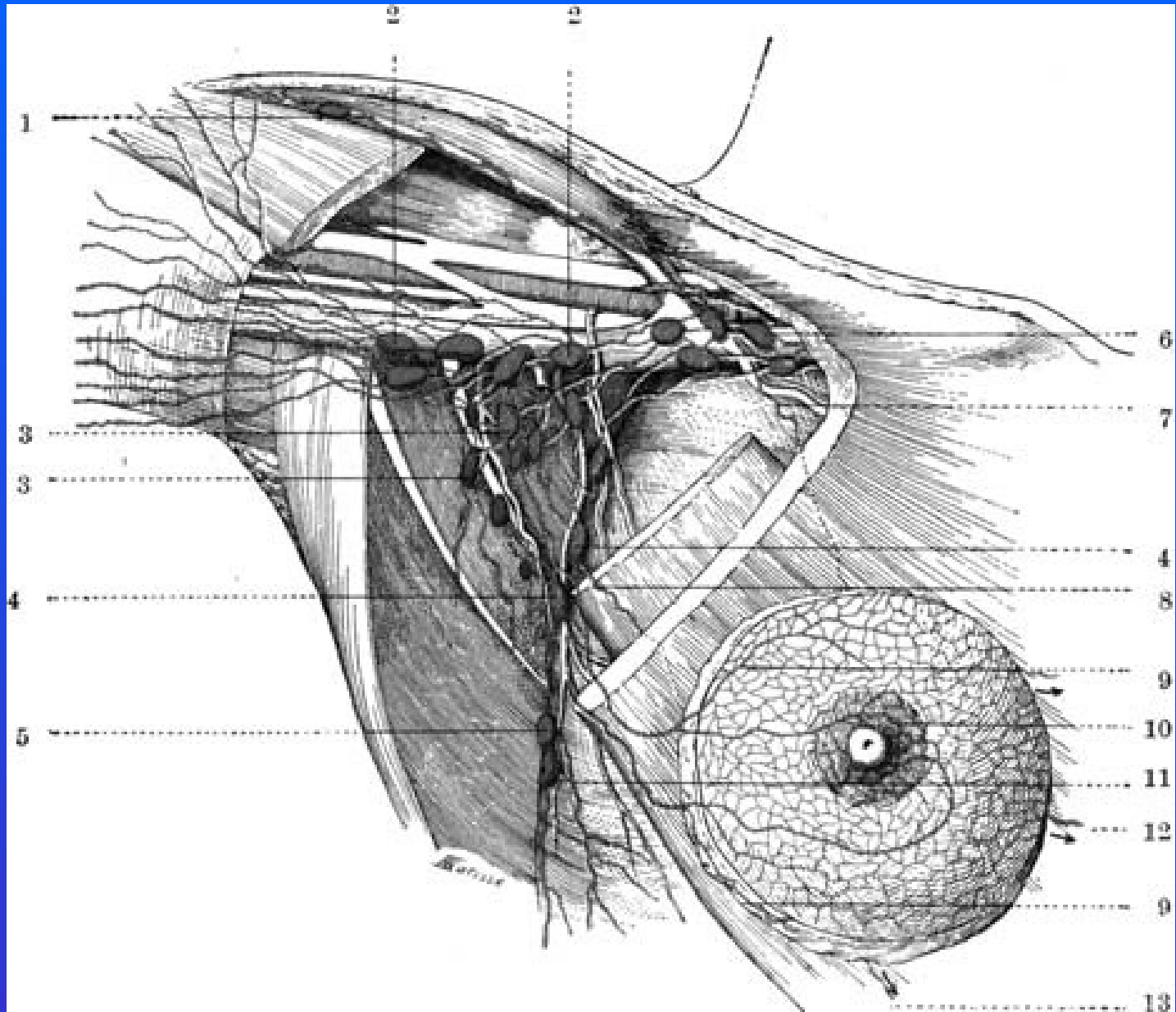


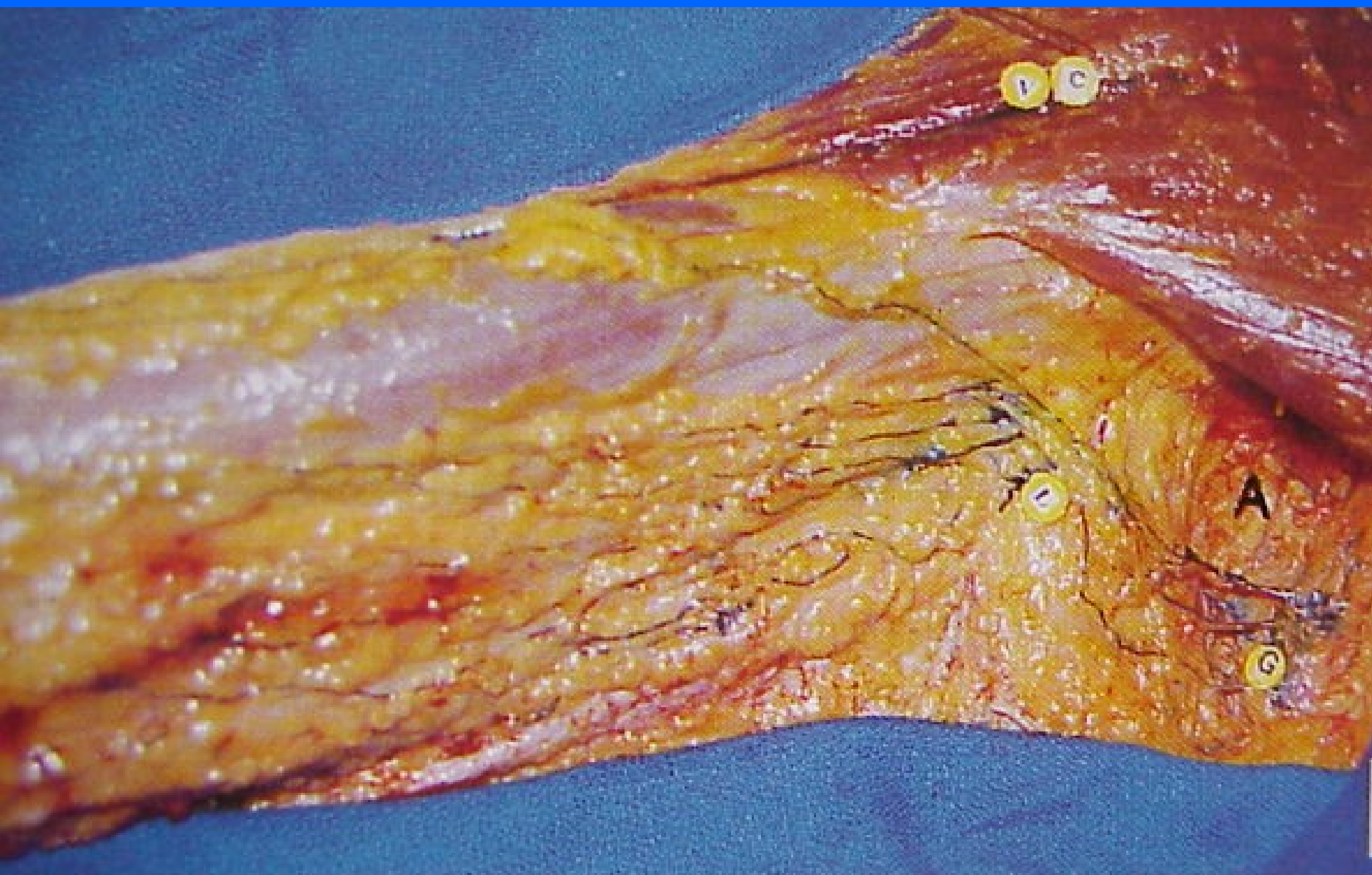


Search for the first ARM Node: gamma probe

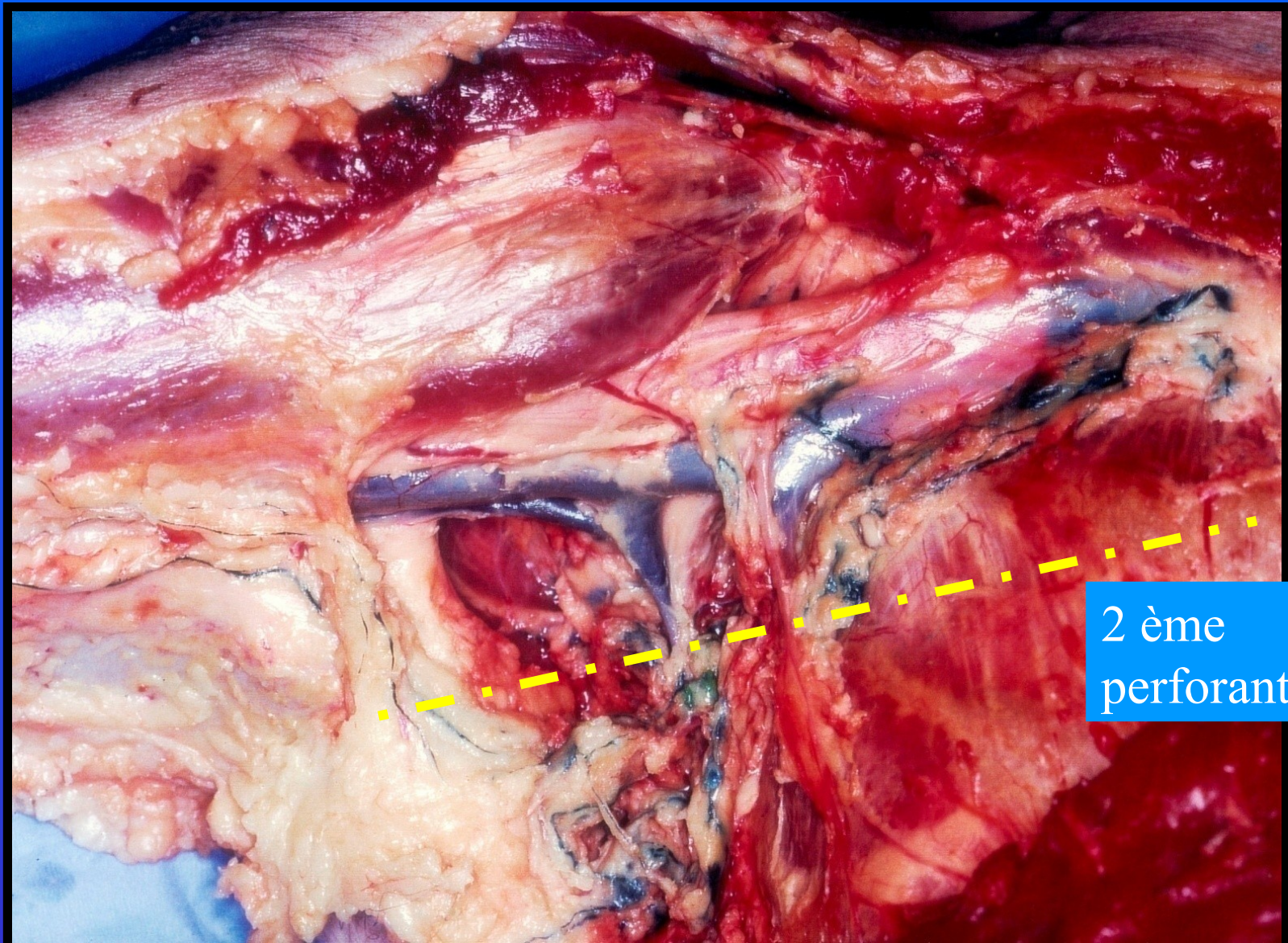


WHICH NODES ARE WHICH ?

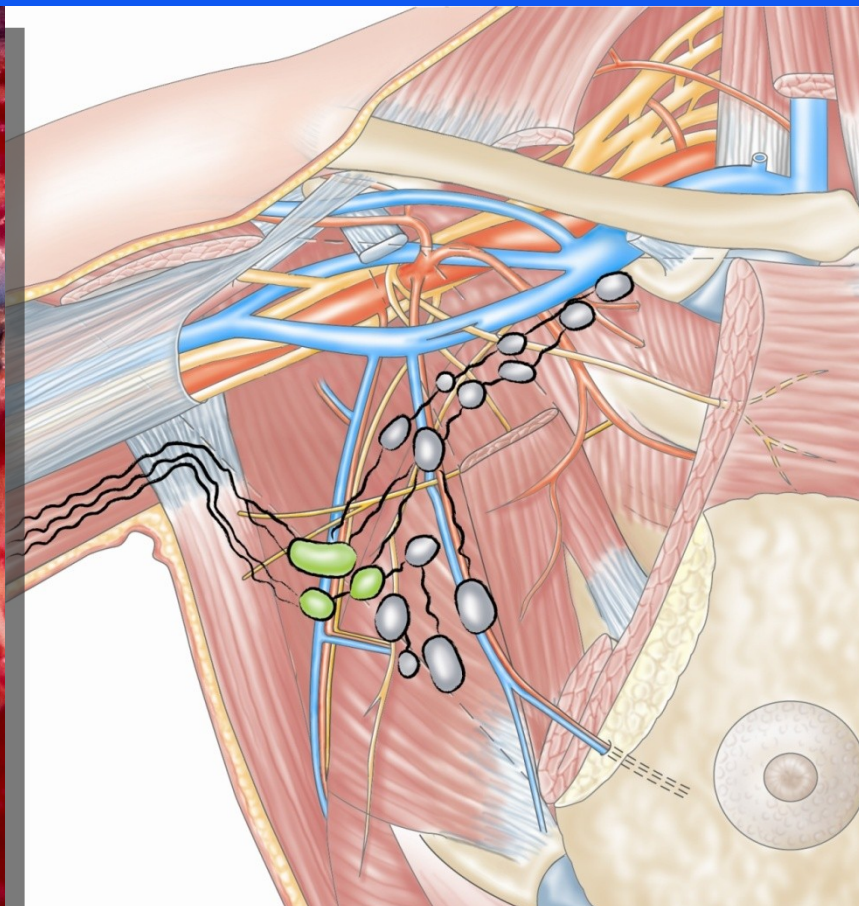
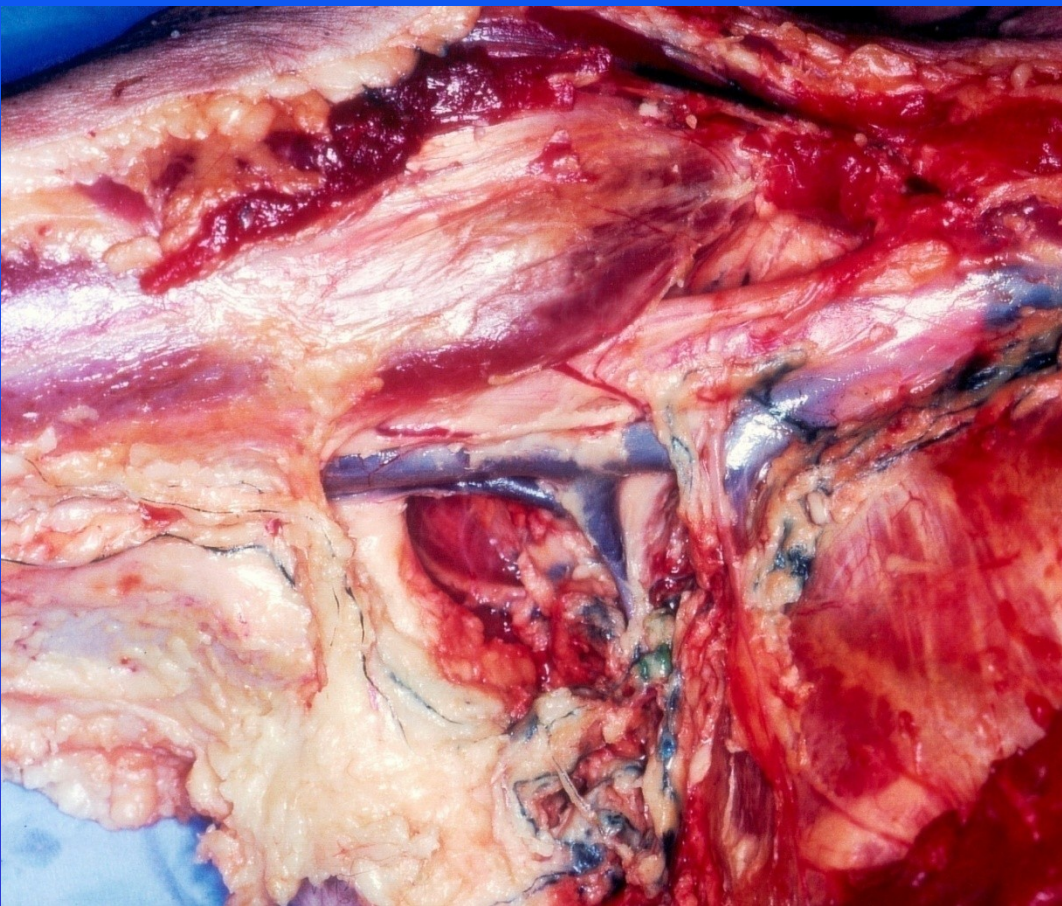




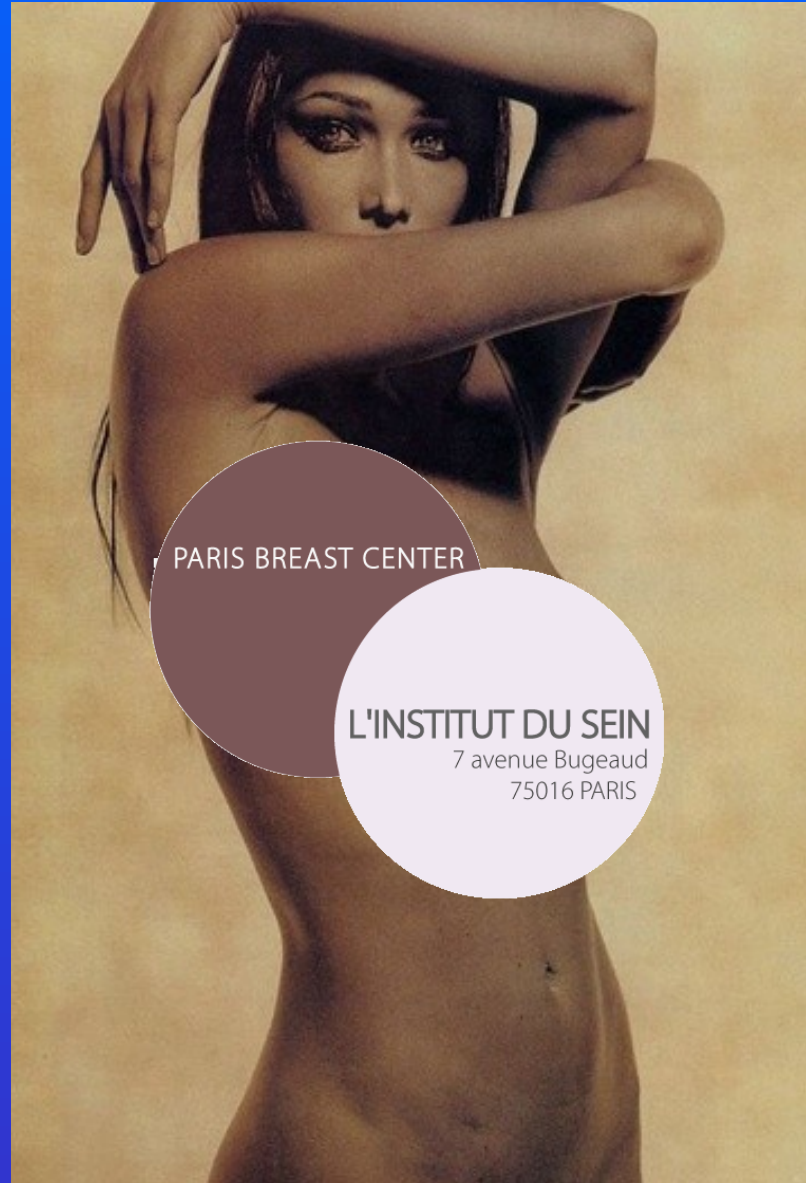
Parfois, tous les ganglions chauds sont au dessous du deuxième perforant (10 % des cas ?) = ECHEC



2^{ème}
perforant



HELLO FROM PARIS



PARIS BREAST CENTER

L'INSTITUT DU SEIN

7 avenue Bugeaud
75016 PARIS