New algorithm for imaging and tissue sampling in the axilla

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2,1 mm
Key issues in ultrasound of lymph nodes

- when FNA/core of suspicious lymph nodes?
- when frozen section of SN during surgery?
- what is a suspicious LN?
- threshold of thickness of the cortex depending on histological type of cancer?
- inflammatory lymph nodes
Rotter LN
Fig. 3. ROC curves of ‘maximum cortex thickness’, ‘shape’ and the combination of ‘maximum cortex thickness’ and ‘shape’. The curves are obtained by leave-one-out cross validation (estimate of prospective performance). ROC, Receiver Operating Characteristic; FPF, False-Positive Fraction; TPF, True-Positive Fraction; $A_z$, Area under the ROC curve.

Fig. 2. Schematic representation of lymph node characteristics; (a) length; (b) width; (c) maximum cortex thickness.
histologically proven breast cancer

axillary ultrasound

- clearly positive
- negative or slightly suspicious with Z-0011-criteria fulfilled
- suspicious Z-0011-criteria not fulfilled

PET/CT ALND

SNB

- negative
- positive

ALND (with ARM)

no ALND

Z-0011-criteria:

- invasive breast cancer ≤ 5 cm
- clinically N0
- no matted nodes or gross extranodal disease at the time of SLND
- ≤ 2 LN with macrometastases

Z-0011-criteria fulfilled: no frozen section

Z-0011-criteria not fulfilled: with frozen section
4 important trials

- ACOSOG Z0011 (Giuliano, Ann Surg 2010)
- ACOSOG Z1071 (Boughey, JAMA 2013)
- SENTINA (Kühn, Lancet Oncol 2013)
- AMAROS (Donkers, Lancet Oncol 2014)
- 420 patients in the SLND / ALND arm and
- 436 in the SLND only arm

- ALND: 16 (4.1%) locoregional recurrences in 388 (89.0%)
- SLND alone: 12 (2.8%) locoregional recurrences in 425 (97.5%)

Regional recurrence was seen in
- ALND: 2 (0.5%)
- SLND alone: 4 (0.9%)

ACOSOG Z1071

603 initially N+ cases with successful SNL mapping after primary chemotherapy:

1 SN removed: 31.5% fn rate
2 SN removed: 21.1% fn rate
>2 SN removed: 9.1% fn rate

Blue or Tc$^{99}$: 20.3% fn rate
Blue and Tc$^{99}$: 10.8% fn rate
SENTINA

Initially N+ cases:

- SNB $\rightarrow$ primary chemotherapy $\rightarrow$ re-SNB:
  - Identification rate 61%
  - fn rate 51.5%

- No SNB $\rightarrow$ primary chemotherapy $\rightarrow$ SNB:
  - Identification rate 80%
  - fn rate 14.2%
Conclusion Z1071 and SENTINA

- No SNB before primary chemotherapy
- Ultrasound after primary chemotherapy
  - Positive: core biopsy (or FNA)
  - Negative: SNB with
    - Blue dye AND Tc99
    - Minimum 3 nodes
AMAROS trial

- 681 SN pos. cases → Radiotherapy
- 744 SN pos. cases → ALND
AMAROS trial

- Median follow-up 6.1 y
- 220 (33%) of 672 pat. In the ALND group had additional metastatic nodes - 52 (8%) had four or more
- Axillary recurrence:
  - 4 of 744 patients in the ALND group
  - 7 of 681 in the RT group
AMAROS trial
New diagnosis of breast cancer

Axillary ultrasound

Normal lymph nodes
  Sentinel lymph node surgery

Suspicious node
  Percutaneous FNA or core needle biopsy
    Percutaneous biopsy negative
      Sentinel lymph node (SLN) surgery
      Consider SLN surgery if only one abnormal node on AUS, favorable tumor biology and the patient meets Z0011 criteria
    Percutaneous biopsy positive
      Consider neoadjuvant chemotherapy or axillary lymph node dissection if multiple suspicious nodes on AUS, adverse tumor biology or if the patient does not meet Z0011 criteria

1, 2, >2 susp. nodes? PET/CT?
C. Tausch

histologically proven breast cancer

axillary ultrasound

clearly positive

PET/CT

ALND

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JM 1958, G3, L+ – core/FNA?
Histologically proven breast cancer

Axillary ultrasound

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- Invasive breast cancer ≤ 5 cm
- Clinically N0
- No matted nodes or gross extranodal disease at the time of SLND
- ≤ 2 LN with macrometastases

SNB

Z-0011-criteria fulfilled:
- No frozen section

Z-0011-criteria not fulfilled:
- With frozen section

Negative
- No ALND

Positive
- ALND (with ARM)
invasive lobular beast cancer
invasive lobular beast cancer
invasive lobular beast cancer
invasive lobular beast cancer positive SNB $\rightarrow$ pN2 (22/32)
histologically proven breast cancer

axillary ultrasound

suspicious Z-0011-criteria not fulfilled

FNA/core

negative

SNB

positive

Z-0011-criteria fulfilled:
- no frozen section

Z-0011-criteria not fulfilled:
- with frozen section

negative

positive

no ALND

ALND (with ARM)

C. Tausch

Z-0011-criteria:
- invasive breast cancer ≤ 5 cm
- clinically N0
- no matted nodes or gross extra-nodal disease at the time of SLND
- ≤ 2 LN with macrometastases

no ALND

ALND (with ARM)
Spirotome
Spirotome(R) of lymph nodes near large vessels
Thank You