e-session 579

RT in breast cancer patients after breast reconstruction

Expert: **Dr Orit Kaidar-Person**, Sheba Tel Hashomer, Ramat Gan, Israel

Discussant: **Prof Pierfrancesco Franco**, University of Eastern Piedmont, Novara, Italy

Discussant: **Prof Icro Meattini**, Florence University, Florence, Italy

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Radiation therapy in breast cancer patients after breast reconstruction

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SHEBA Tel HaShomer | Cancer Center

- No COI
- I’m a radiation oncologist, a full-time clinician
- PhD student at MAASTRO and my research is focusing on improving the outcomes of breast cancer patients who undergo mastectomy & breast reconstruction and planned for postmastectomy radiation therapy

In this ESO session

Covered in this talk

- New challenges we encounter as radiation oncologists, and what can we do about it

Not covered in this talk, but important

- Indications for PMRT
- Results of the EBCTCG update of PMRT
- PMRT vs. BCT
- And many other important topics related to mastectomy and PMRT…

PMRT- postmastectomy Radiation therapy; BCT- Breast Conservation Therapy

Why is this topic important?

- The rate of mastectomy and IBR is increasing

Patient wishes, surgical techniques improved, less fear from combining with PMRT

- The rate of PMRT is increasing

Mainly following the EBCTCG data
Deescalation in axillary surgery
Including in N+

PMRT- postmastectomy Radiation therapy; IBR- Immediate Breast Reconstruction

Ann Surg Oncol (2015) 22:2551–2559
DOI 10.1245/s10434-014-4326-x

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

ORIGINAL ARTICLE – BREAST ONCOLOGY

Immediate Reconstruction of the Radiated Breast: Recent Trends Contrary to Traditional Standards

Shailesh Agarwal, MD[1], Kelley M. Kidwell, PhD[2], Aaron Farberg, MD[1], Jeffrey H. Kozlow, MD, MS[1], Kevin C. Chung, MD, MS[1], and Adeyiza O. Momoh, MD[1]

- **IBR with implant-only increased** from **27** to **52 %** (p<0.001) with a decrease in **IBR tissue-only** from **56 to 32 %** (p<0.001)
- IBR rate among pts requiring RT increased from 13.6 to 25.1 %

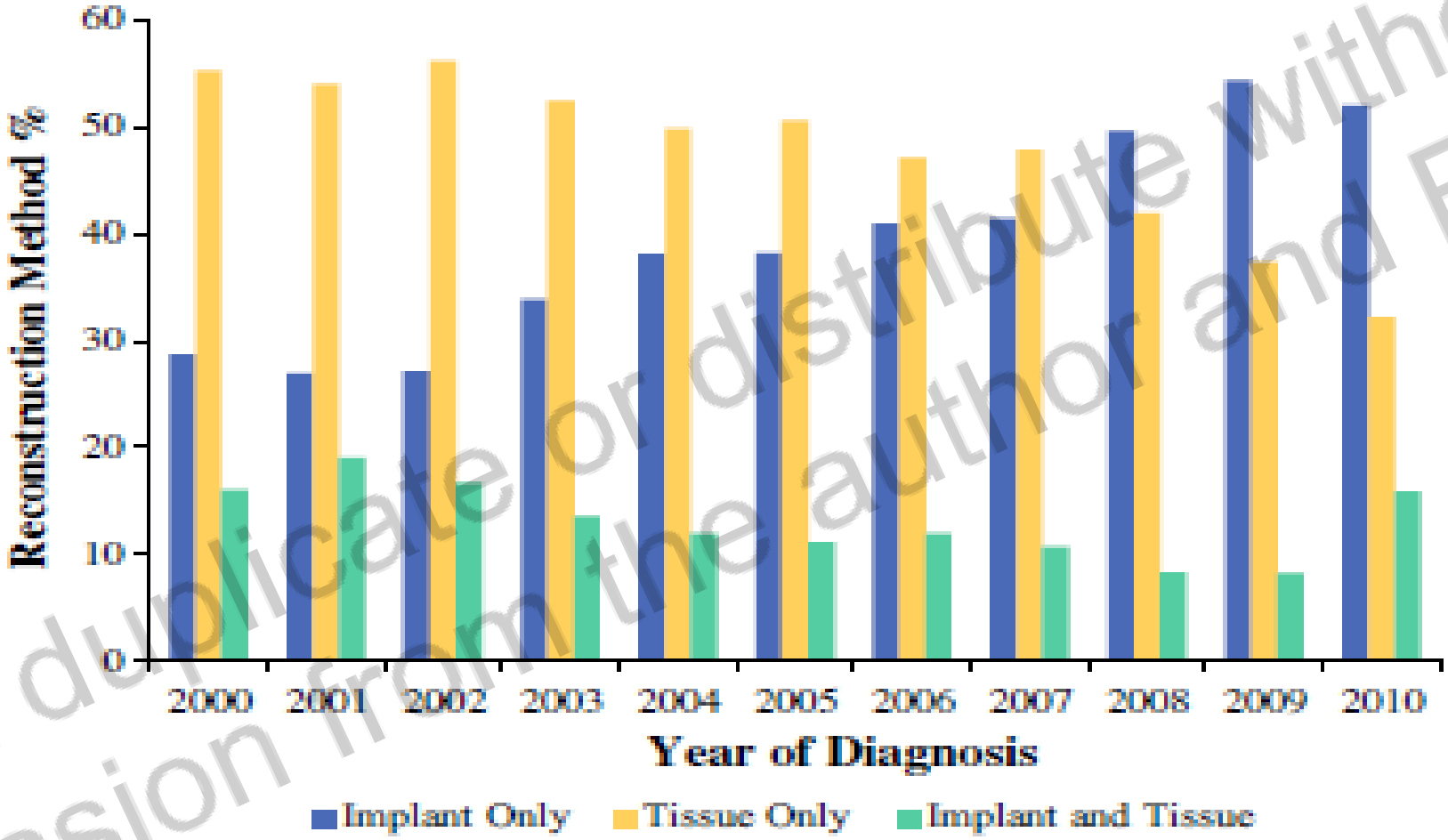
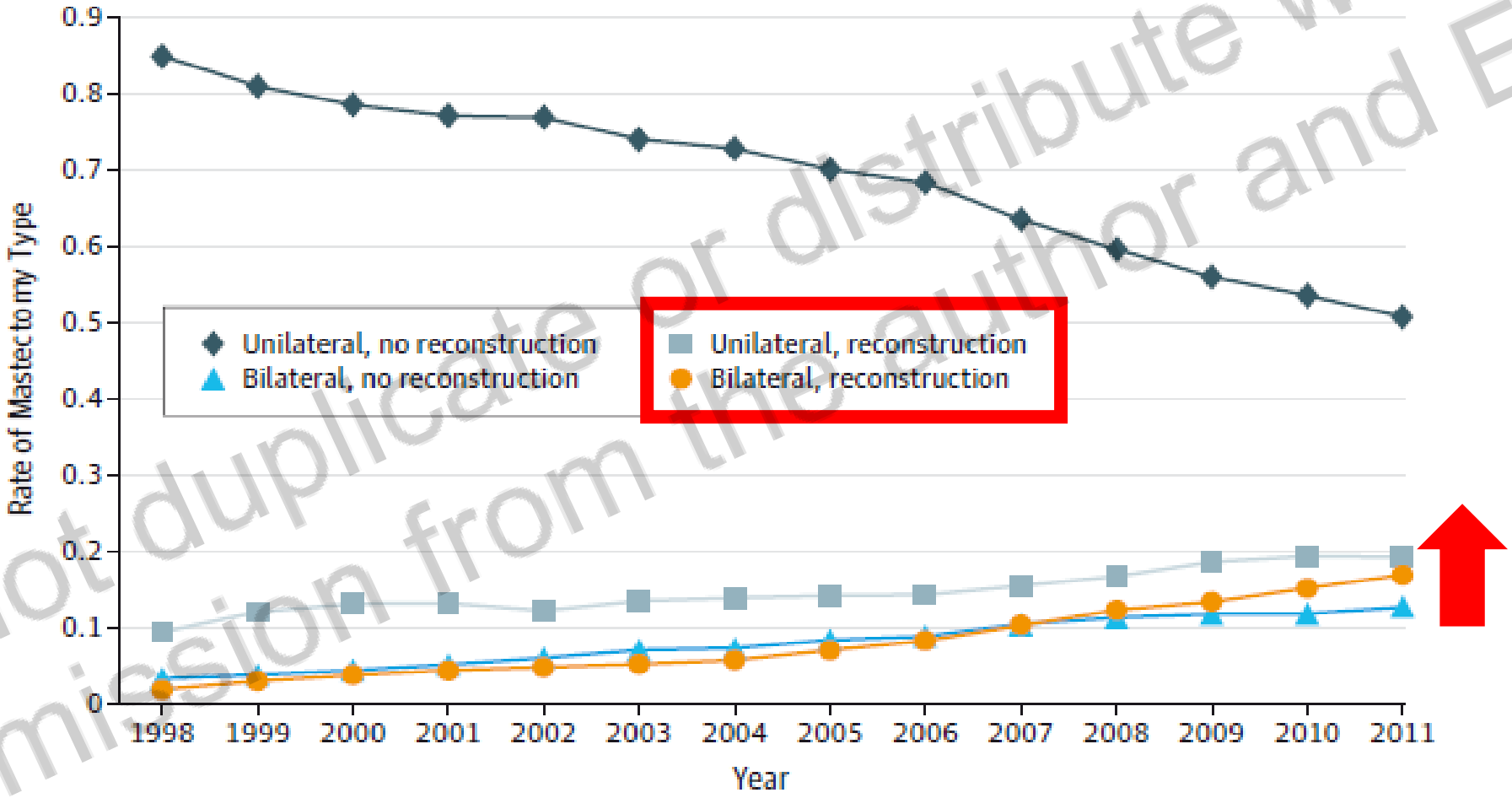


FIG. 2 Reconstruction rates by method in radiated patients from 2000 to 2010

Agarwal Ann Surg 2015

Breast conserving surgery eligible

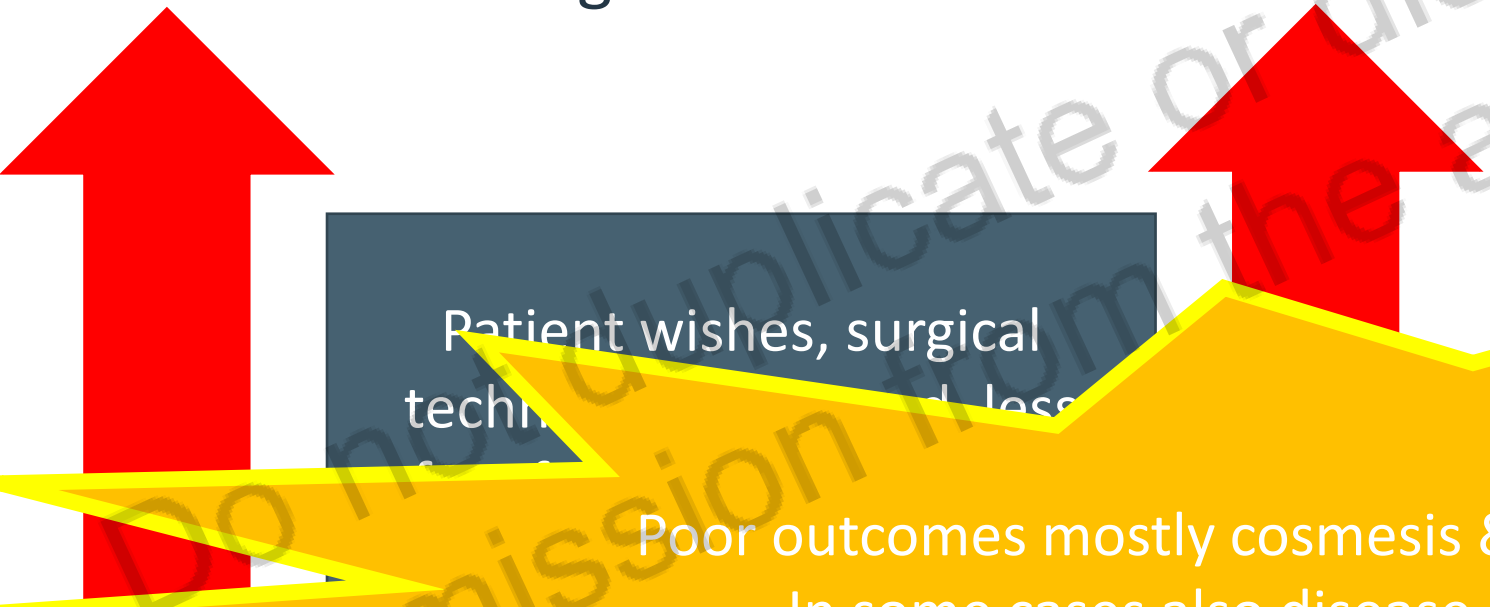


Kummerow, JAMA Surg 2015

Indications for PMRT are mostly N+ , high risk features, these patients can be BCS eligible

Why is this topic important?

- The rate of mastectomy and IBR is increasing
- The rate of PMRT is increasing



Poor outcomes mostly cosmesis & complications
In some cases also disease outcomes

Reconstruction & PMRT

- Reconstruction failure occurred in 21% of the patients with implant vs. no failure in the autologous group (p = 0.04).
- Mean patient-reported ‘Satisfaction with Breasts’ and ‘Sexual Well-being’ were lower after implant compared to autologous.
- IBR & PMRT resulted in a high rate of severe capsular contraction in implant-based reconstruction (16.9%) and fibrosis in autologous reconstruction (13.8%).

Reinders et al., 2020

How can we improve these outcomes?

At time of diagnosis

Advice Breast conserving surgery if possible

Consider risk and benefits of PMRT prior to surgery

Identify cases that are prone for complications: smoking, comorbidities

Discuss the surgical procedure, difficulties, be involved in the process

Risk factors for complications and poor outcome

Patient related factors	Treatment related factors
Comorbidities (e.g., DM)	Systemic therapy
Smoking	Surgery
Body habitus	Radiation
Genetic susceptibility	
Patient desires	

Risk factors for complications: “The patient”

Polymyalgia rheumatica

G3 Toxicity, 1.5 yrs after RT

- Body habitus
- Comorbidities (e.g., DM)
- Smoking
- Susceptibility to RT

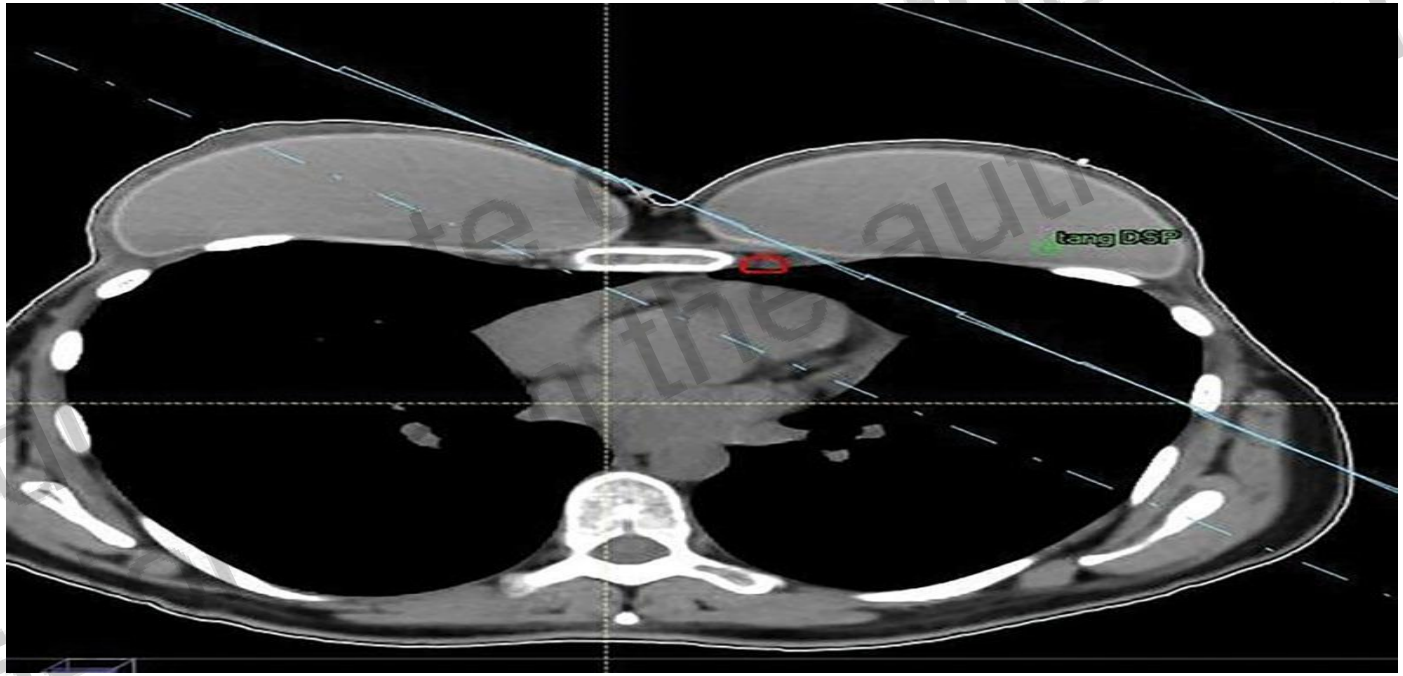
More sensitive

More resistant

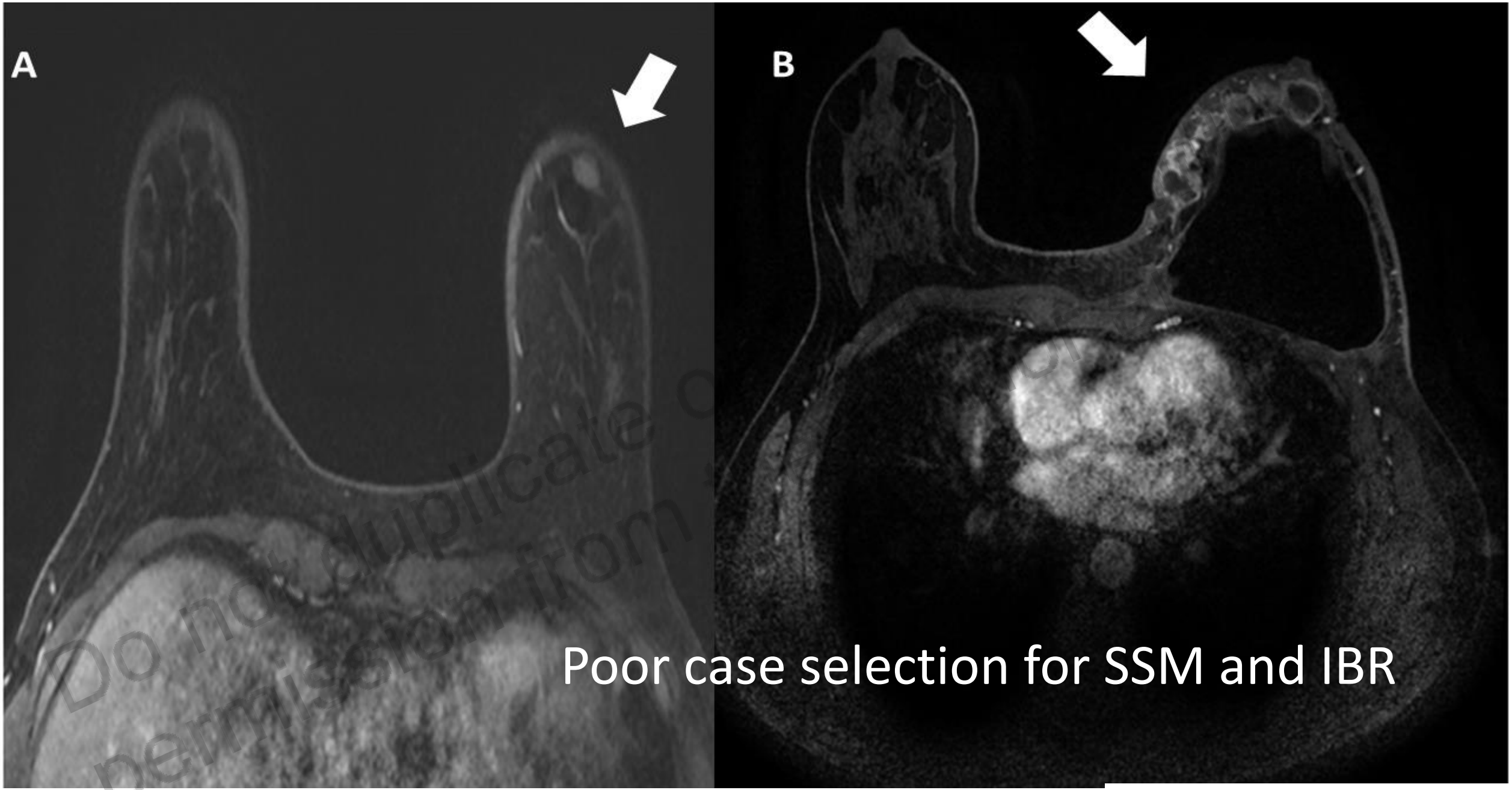
Courtesy of Philip Poortmans

Risk factors for complications: “The patient”

Patient’s desire as a risk factor



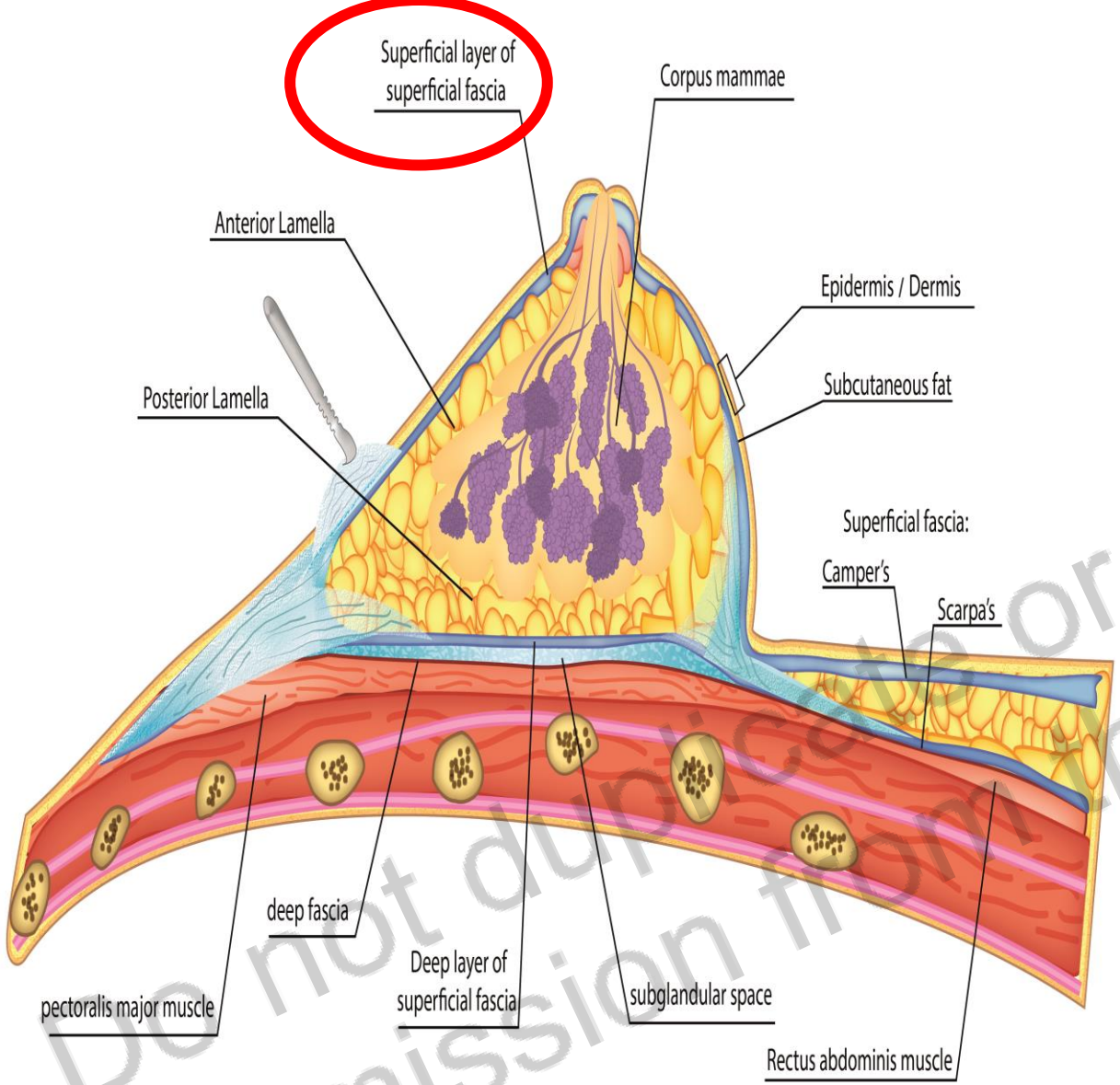
Kaidar-Person et al., PRS Global 2017



Poor case selection for SSM and IBR

Jacobson et al., PRS Global 2020

So how can we improve these outcomes?



- The breast skin is conserved to create a pocket that facilitates IBR
- SSM / NSM the breast parenchyma needs to be accurately dissected from the covering skin at the level of the superficial fascia
- Not easy to identify or perform
- Different amount of residual breast tissue and potential residual disease, at different areas of the breast

Kaidar-Person, Breast. 2021; Radiother Oncol. 2021

SSM- Skin sparing mastectomy; NSM- Nipple sparing mastectomy; IBR- Immidiate reconstruction

Ann Surg Oncol
https://doi.org/10.1245/s10434-020-08516-4

Annals of
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Check for updates

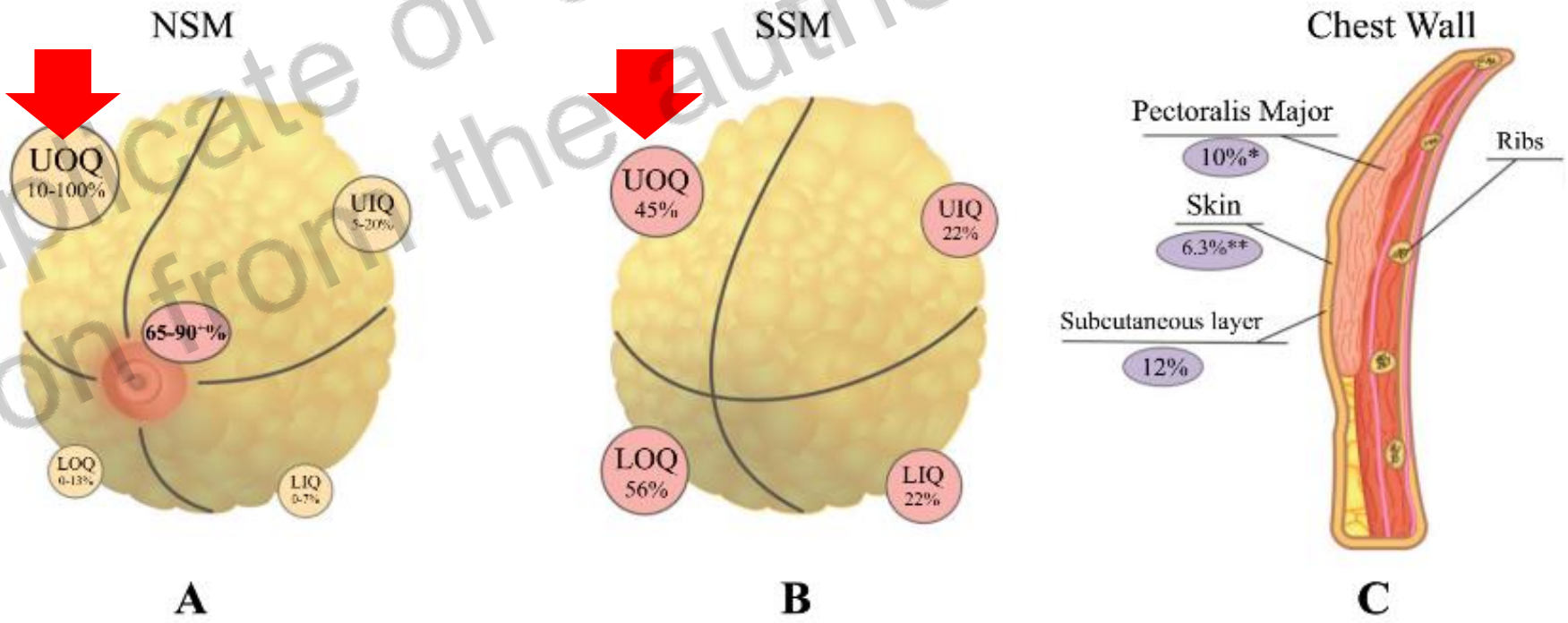
REVIEW ARTICLE – BREAST ONCOLOGY

Residual Glandular Breast Tissue After Mastectomy: A Systematic Review

Orit Kaidar-Person, MD[1,2], Liesbeth J. Boersma, MD, PhD[3], Philip Poortmans, MD, PhD[4], Miri Sklair-Levy, MD[5], Birgitte Vrou Offersen, MD, PhD[6], Maria-Joao Cardoso, MD, PhD[7], and Dirk de Ruysscher, MD, PhD[3]

More breast tissue in these areas, but does surgical approach matters?

FIG. 2 Reported percentage of patients with residual breast tissue according to location and mastectomy type.[8–12] **a** Nipple-sparing mastectomy (NSM), coronal view. **b** Skin-sparing mastectomy (NSM), coronal view. **c** Sagittal view after mastectomy and SSM. **Surface of pectoralis major. ***Beneath skin



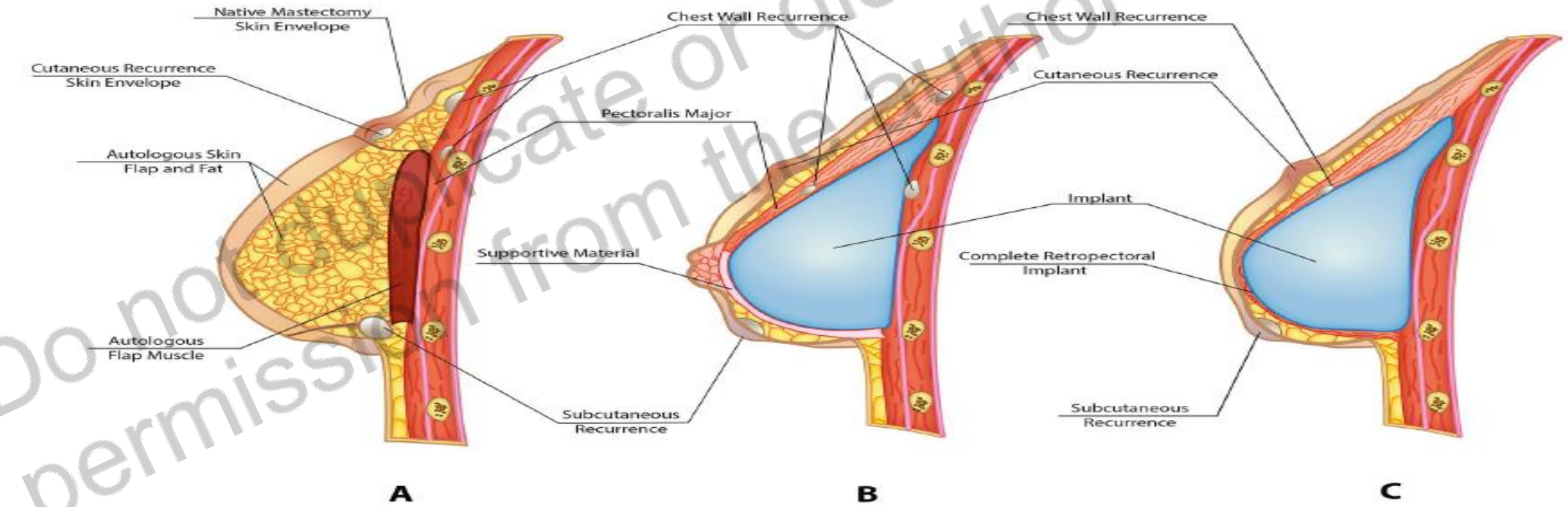
Breast Cancer Research and Treatment
https://doi.org/10.1007/s10549-020-05774-4

REVIEW

Spatial location of local recurrences after mastectomy: a systematic review

Orit Kaidar-Person[1,2] · Philip Poortmans[3,4] · Birgitte Vrou Offersen[5] · Sabine Siesling[6,7] · Miri Sklair-Levy[8,9] · Icro Meattini[10] · Dirk de Ruysscher[11] · Thorsten Kühn[12] · Liesbeth J. Boersma[11]

Breast Cancer Research and Treatment

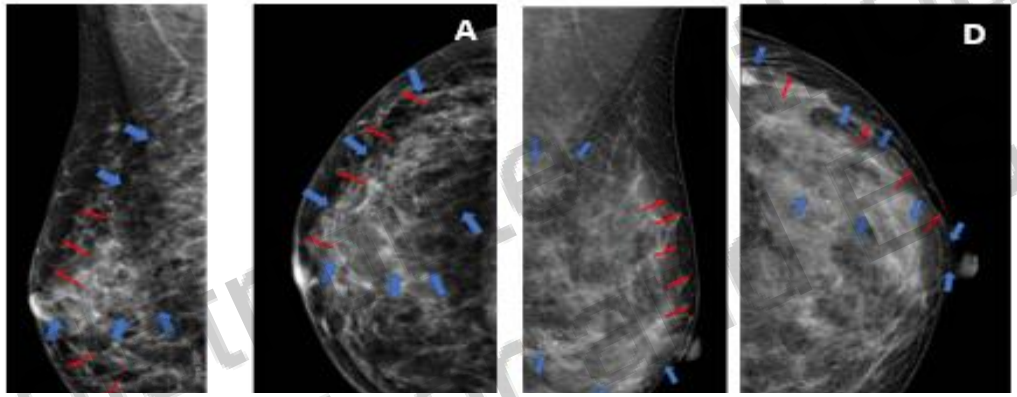


Biopsy tract recurrence?

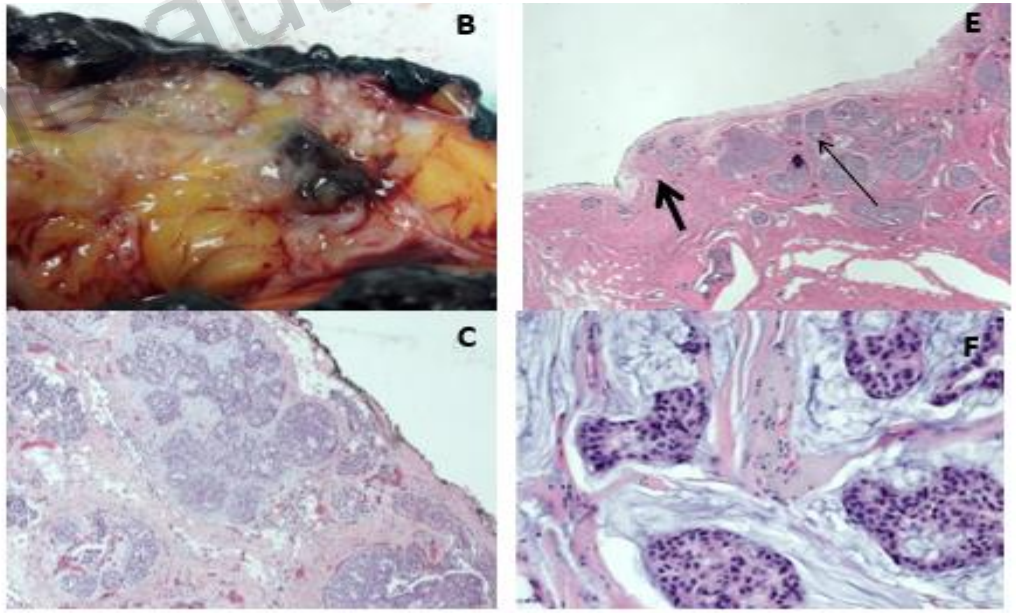
Where are the areas that are at most risk of recurrence?

- The limits of anatomic extension of the fibroglandular tissue may be imprecise and show substantial variation

- Depending on the primary disease site within the breast, involved or close superficial margins in SSM/NSM may be underestimated



Blue arrows indicating microcalcifications
Red arrows indicating the borders of the breast tissue



Extensive DCIS close to the margin

Tramm et al , 2021

Radiotherapy and Oncology 137 (2019) 159–166

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

Original Article

ESTRO ACROP consensus guideline for target volume delineation in the setting of postmastectomy radiation therapy after implant-based immediate reconstruction for early stage breast cancer

Orit Kaidar-Person [a,*,1], Birgitte Vrou Offersen [b,1], Sandra Hol [c], Meritxell Arenas [d], Cynthia Aristei [e], Celine Bourgier [f], Maria Joao Cardoso [g], Boon Chua [h], Charlotte E. Coles [i], Tine Engberg Damsgaard [j], Dorota Gabrys [k], Reshma Jagsi [l], Rachel Jimenez [m], Anna M. Kirby [n], Carine Kirkove [o], Youlia Kirova [p], Vassilis Kouloulias [q], Tanja Marinko [r], Icro Meattini [s], Ingvil Mjaaland [t], Gustavo Nader Marta [u,v], Petra Witt Nystrom [w], Elzbieta Senkus [x], Tanja Skyttä [y], Tove F. Tvedskov [z], Karolien Verhoeven [aa], Philip Poortmans [ab]

Consensus guidelines based on anatomical landmarks and literature review

The location of the primary tumour, residual glandular tissue, and location of the implant should be taken into account: prepectoral vs postpectoral, autologous

Kaidar-Person, Breast. 2021; Radiother Oncol. 2021

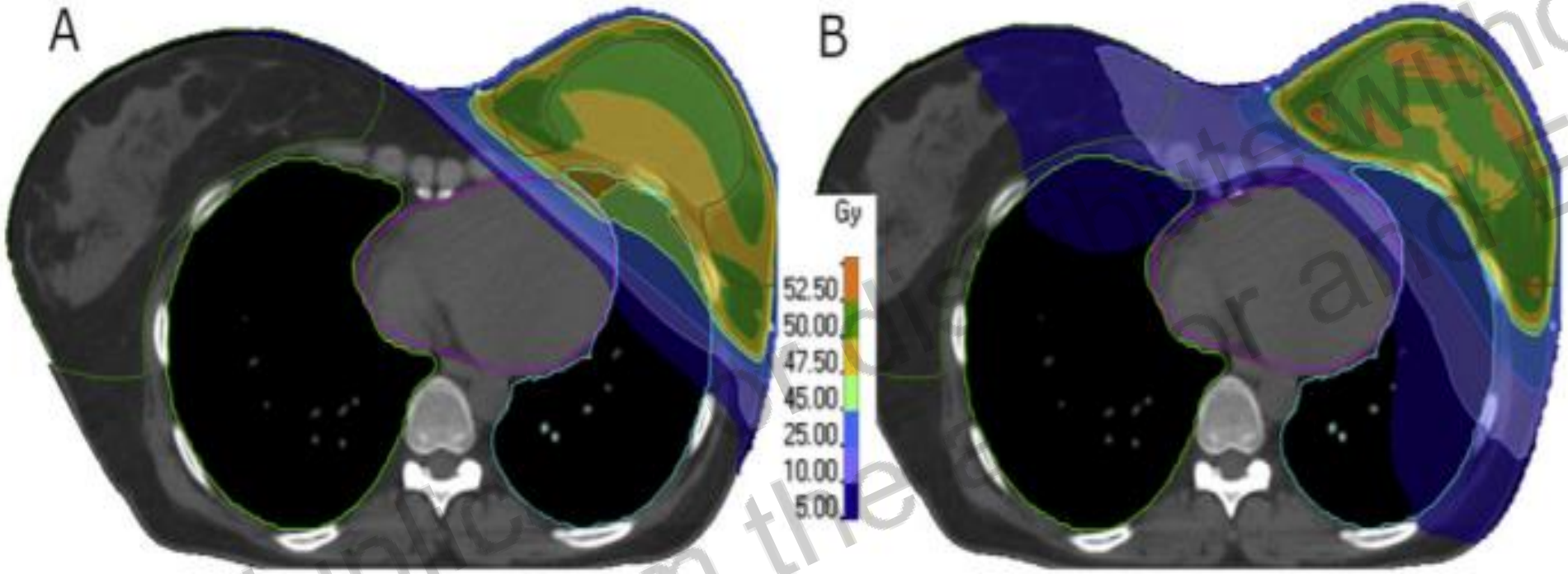


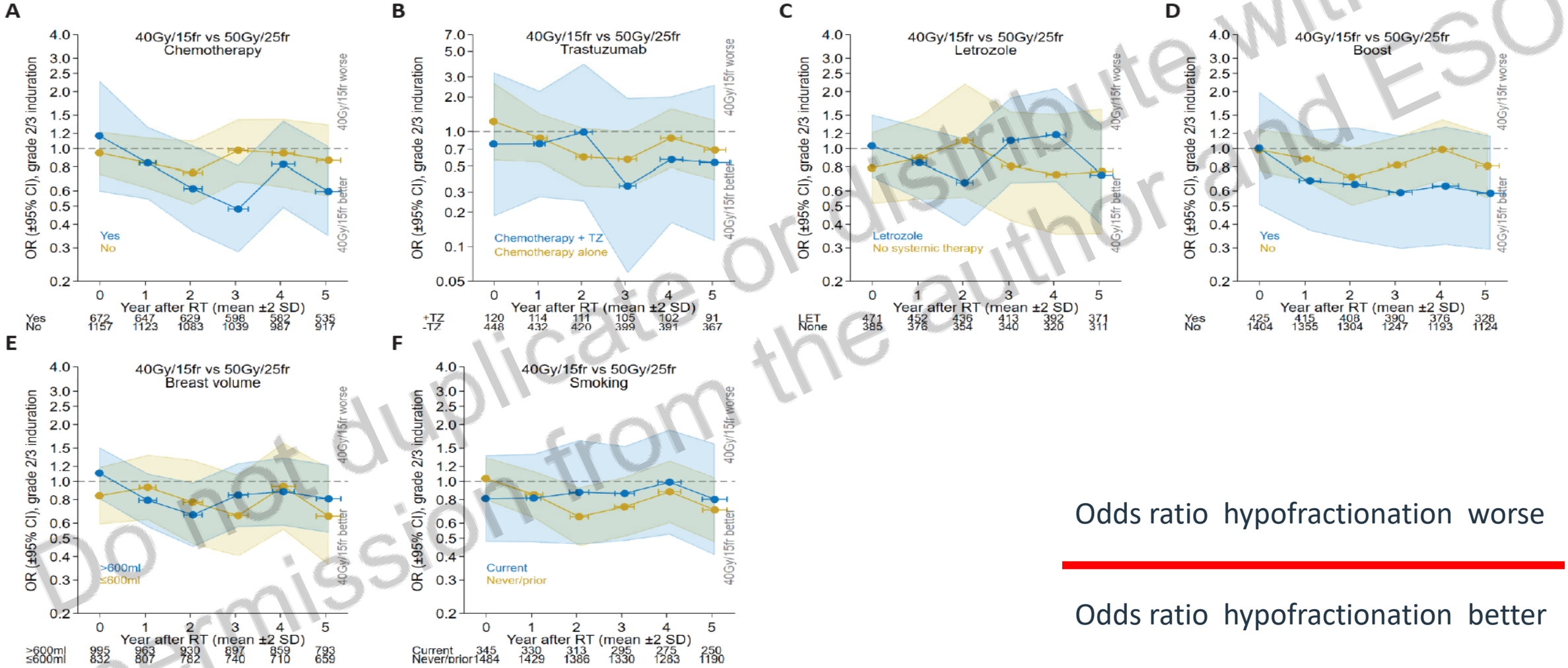
Fig 2. (A) Dosimetric distribution of a field-in-field plan. (B) Dosimetric distribution of a volumetric arc therapy plan.

"Different RT techniques could be used. FiF provided good coverage with acceptable OAR dose. RT is a trade off between target coverage and OAR dose. RT techniques affects the interplay between these objectives. "

FiF – field-in-field; OAR – Organs at risk

Dose and fractionation?

Induration, pre-planned analysis in the Danish trial



Odds ratio hypofractionation worse

Odds ratio hypofractionation better

Offersen BV et al, J Clin Oncol 2020

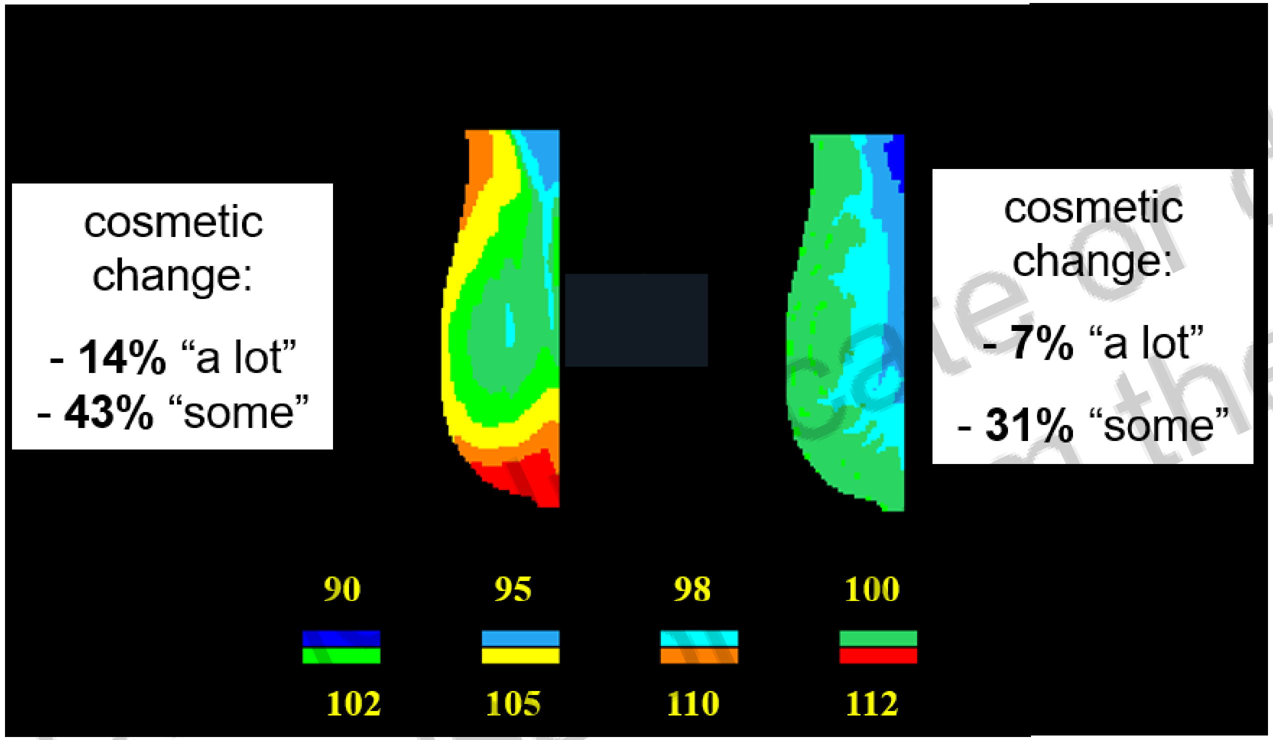
Dose and fractionation?

- St. Gallen 2021 consensus
- Upcoming ACROP-ESTRO breast fractionation consensus, led by Icro Meattini

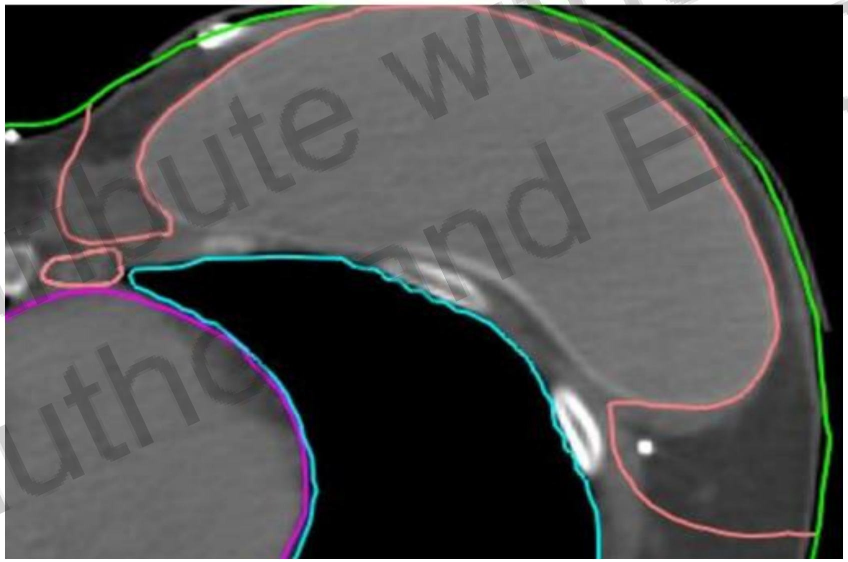
..progressively more guidelines support the use of at least moderate hypofractionation..

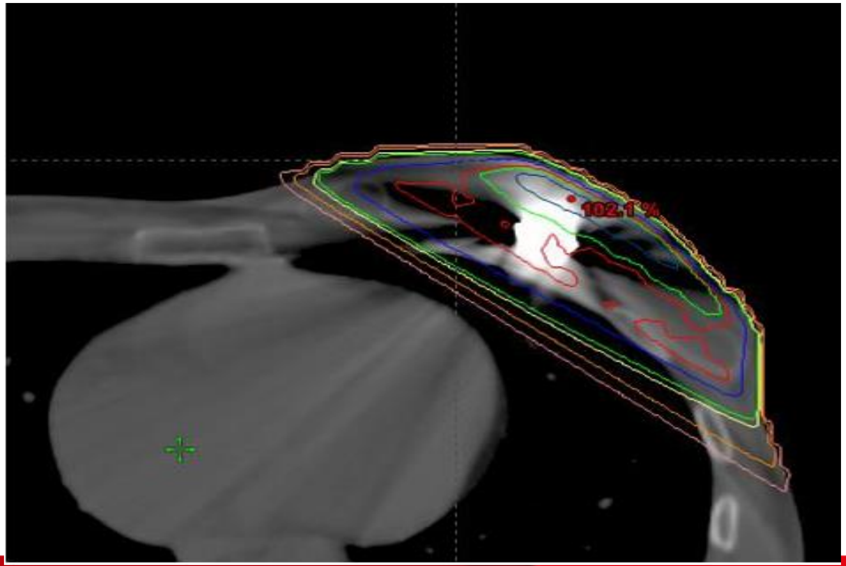
Tissue heterogeneities

Dose homogeneity



Donovan et al., 2007





Boost? Bolus?

To boost or not to boost?

- Chest wall boost to the mastectomy scar or chest wall was associated with reconstruction complications regardless of the type of reconstruction (autologous, DTI, TE/I)
- RT boost was significantly associated with infection, skin necrosis, and implant exposure
- For implant-based reconstruction patients, the boost was associated with increased risks of implant failure
- The addition of the boost was not associated with improving local tumour control, even in high-risk subgroups

DTI- direct to implant; TE- Tissue expander to implant

Ho et al., Lancet Oncol 2017

To bolus or not to bolus?

Critical Reviews in Oncology / Hematology 163 (2021) 103391

Contents lists available at ScienceDirect

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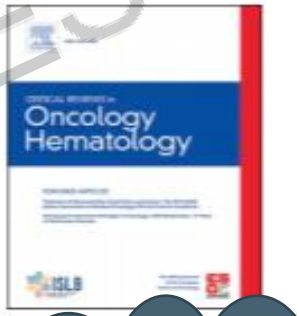

The use of bolus in postmastectomy radiation therapy for breast cancer: systematic review

Hannah M. Dahn [a,*], Liesbeth J. Boersma [b], Dirk de Ruysscher [b], Icro Meattini [c], Birgitte V. Offersen [d], Jean-Philippe Pignol [a], Cynthia Aristei [e], Yazid Belkacemi [f,g], Dori Benjamin [h], Nuran Bese [i], Charlotte E. Coles [j], Pierfrancesco Franco [k,l], Alice Ho [m], Sandra Hol [n], Reshma Jagsi [o], Anna M. Kirby [q], Livia Marrazzo [p], Gustavo N. Marta [r], Meena S. Moran [s], Alan M. Nichol [t], Henrik D. Nissen [u], Vratislav Strnad [v], Yvonne E. Zissiadis [w], Philip Poortmans [x], Orit Kaidar-Person [y,z]

Only a small part of the work done by this amazing group of colleagues

Look for the consensus

Radiation therapy in breast cancer patients after breast reconstruction

RT in IBR– performs badly compared to no RT (better for autologous vs implant)

- Advise BCT, unless…
- Determine the odds for PMRT prior to surgery
- Determine the odds for complications (BMI, smoking, DM..)

We should aim to improve aesthetic and oncological outcomes

- Work with the surgeons to understand the surgical procedures
- Evaluate the risk for recurrence
- Decide on volumes at risk, dose/fractionation, RT planning techniques
- Continue with a multidisciplinary effort to improve outcomes

Much more is going on..

- More work to be done involving the NCR & Florence University
- Validation of ESTRO guidelines in a Randomised phase III (DBCG recon trial NCT03730922– please join)
- FABREC (NCT03422003) and RTCharm (NCT03414970) are planned to compare conventional vs. hypofractionated regimens in case of IBR
- Primary Radiotherapy And DIEP flAp Reconstruction Trial (PRADA) ClinicalTrials.gov Identifier: NCT02771938
- Many other trials, including Proton Beam based RT

- Thank you for listening

- Thanks to my wonderful colleagues
  (and many more, cannot list all)

Philip Poortmans
Birgitte Offersen
Liesbeth Boersma
Dirk de Ruysscher
Icro Meattini
Pierfrancesco Franco
Trine Tramm
Sandra Hol
Henrik Nissen
Charlotte Coles
Anna Kirby
Mjaaland Ingvil
MJ Cardoso
Kuehn Thorsten
Oreste Gentilini
Zoltan Matrai
Strnad, Vratislav

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