

XXV CONGRESSO NAZIONALE

**AIRO 2015**

PALACONGRESSI - Rimini, 7-10 novembre

## **SIMPOSIO**

# **Ricostruzione mammaria ed implicazioni radioterapiche** *Indicazioni*

**Icro Meattini, MD**

Radiation Oncology Department - University of Florence

**Azienda Ospedaliero Universitaria Careggi Firenze**  
**Breast Cancer Research**  
**Radiation Oncology Research**



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## DICHIARAZIONE

Relatore: Icro Meattini

- Posizione di dipendente in aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**
- Consulenza ad aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**
- Fondi per la ricerca da aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**
- Partecipazione ad Advisory Board **(NIENTE DA DICHIARARE)**
- Titolarità di brevetti in compartecipazione ad aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**
- Partecipazioni azionarie in aziende con interessi commerciali in campo sanitario **(NIENTE DA DICHIARARE)**

# OVERVIEW



Breast reconstructive surgery: generality

Breast reconstructive techniques: pros and cons

Reconstructive surgery and RT

Oncoplastic, RT and conservative surgery

Conclusions

# OVERVIEW



## **Breast reconstructive surgery: generality**

*Breast reconstructive techniques: pros and cons*

*Reconstructive surgery and RT*

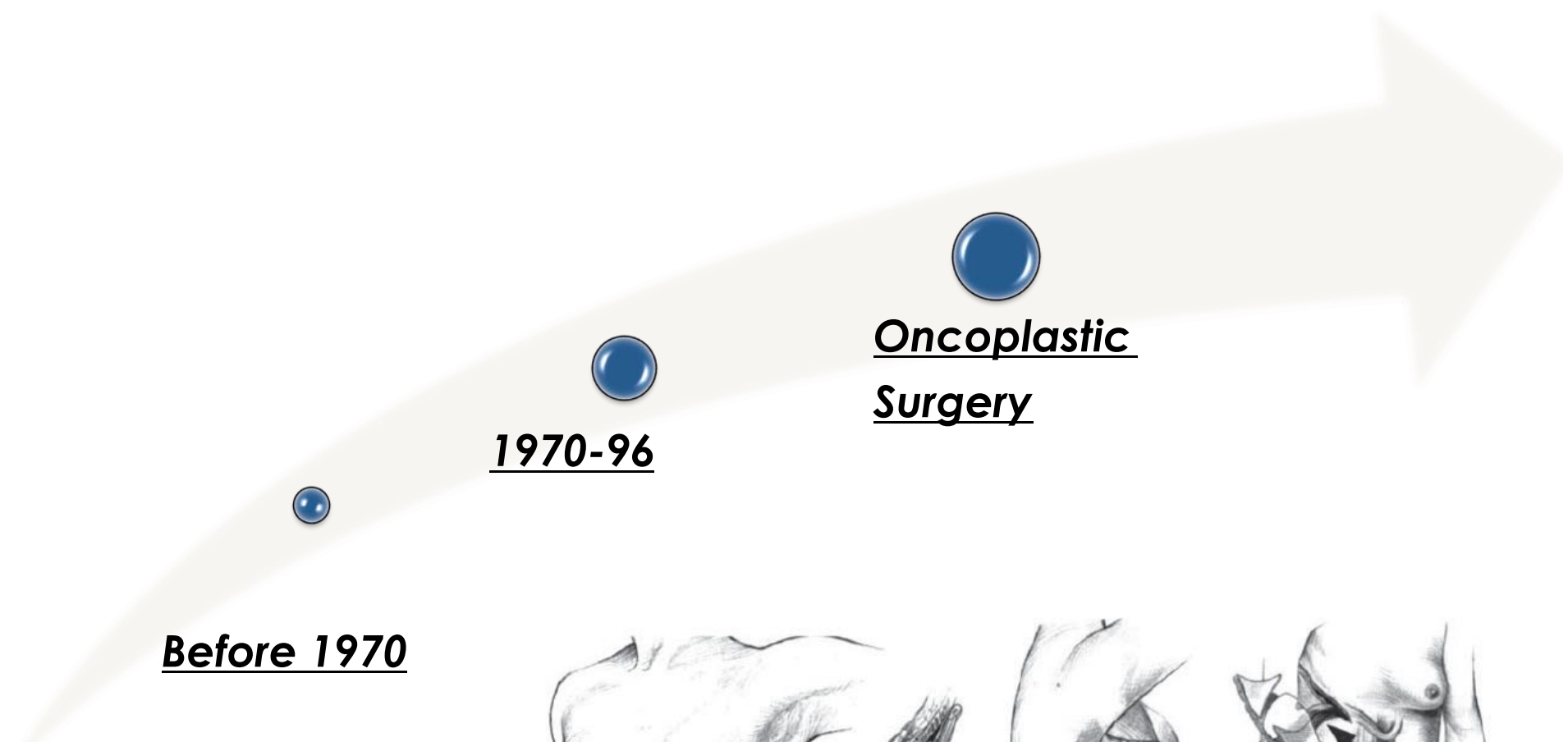
*Oncoplastic, RT and conservative surgery*

*Conclusions*

# Background - Oncoplastic surgery



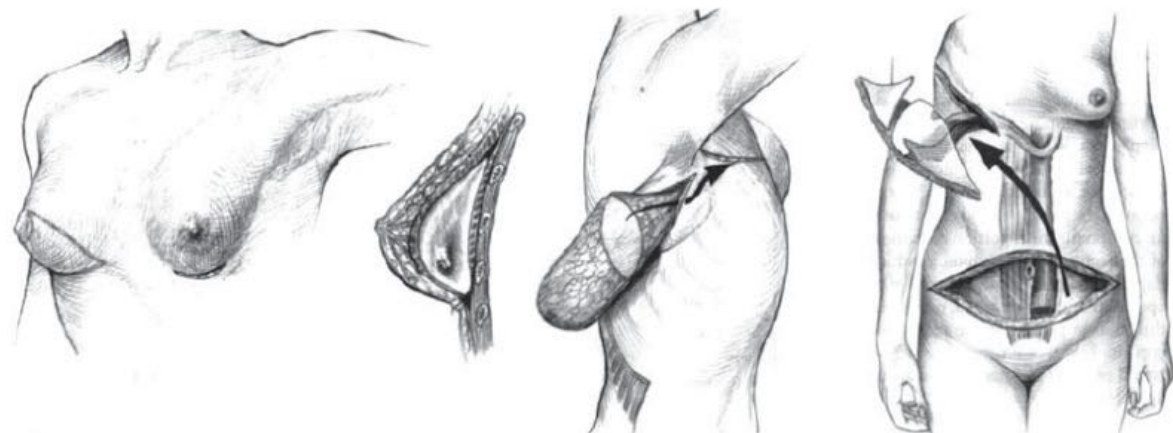
TARGET SURGERY



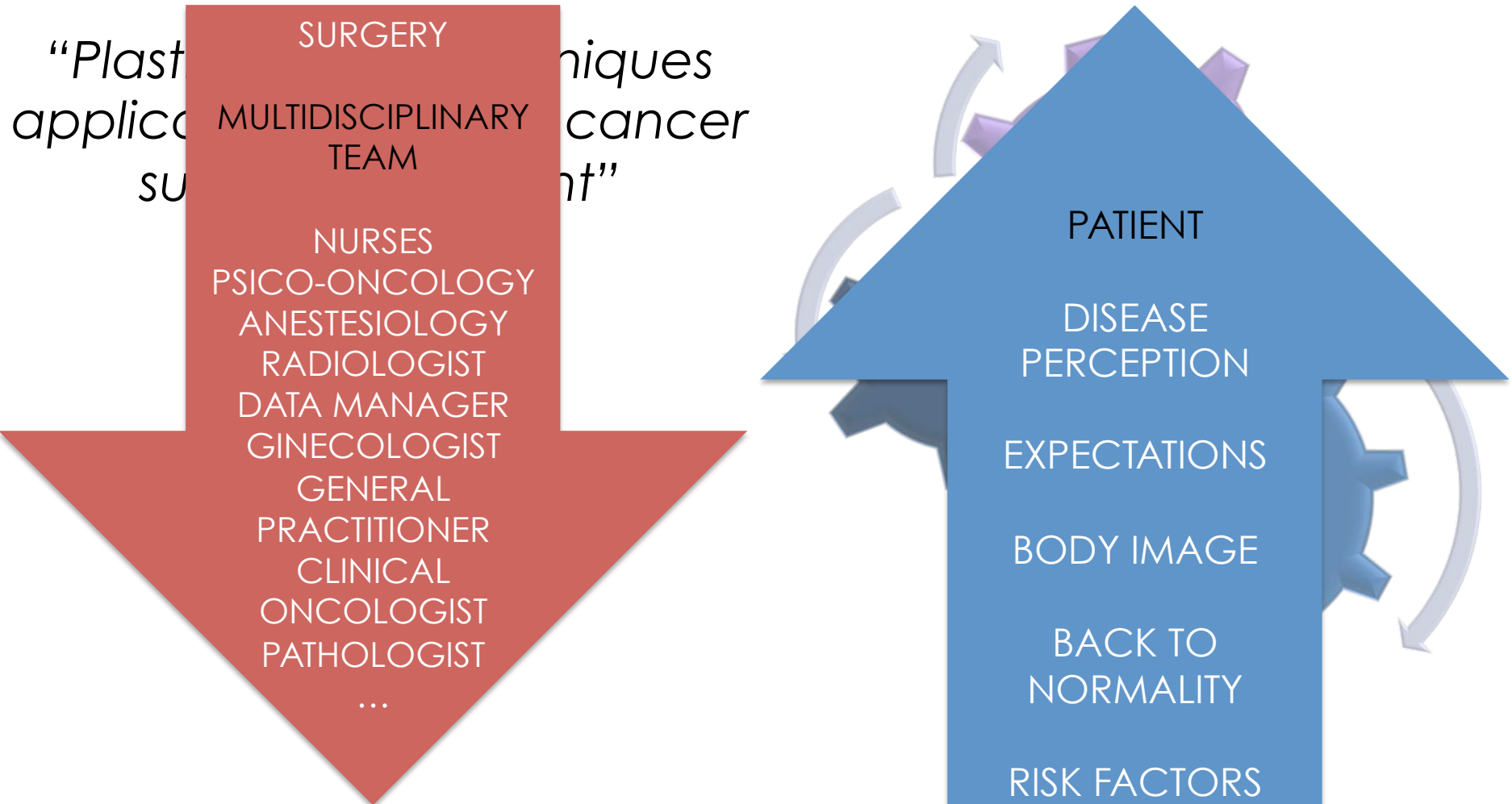
Before 1970

1970-96

Oncoplastic  
Surgery

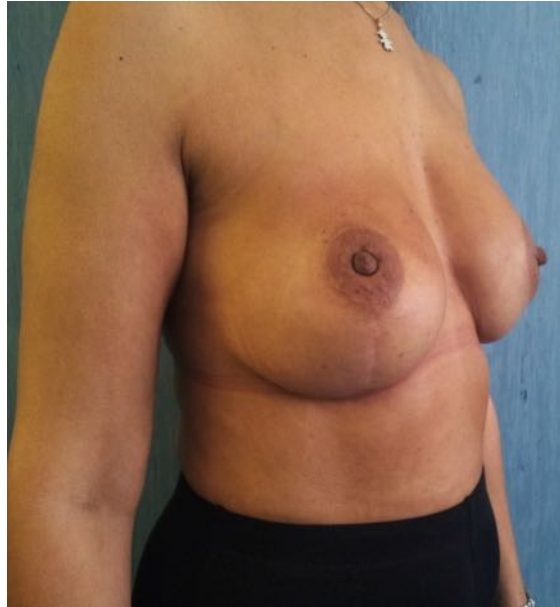


# Oncoplastic surgery - Definition





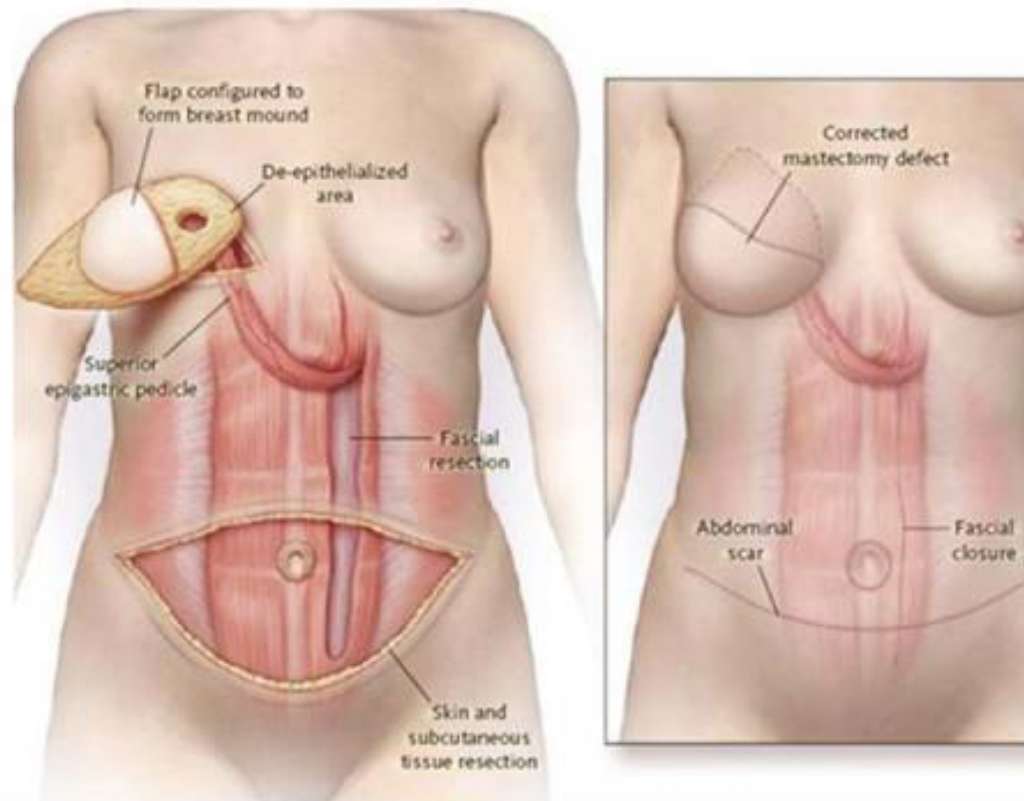
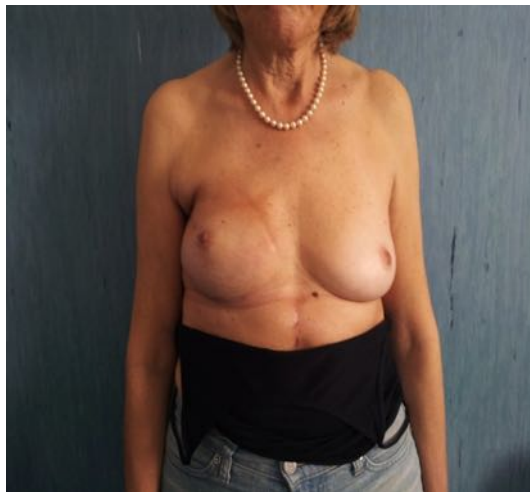
# Expander/implant (E/I) reconstruction



# Autologous Reconstruction (AR)



**TRAM flap** *Transverse Rectus Abdominis Musculocutaneous*



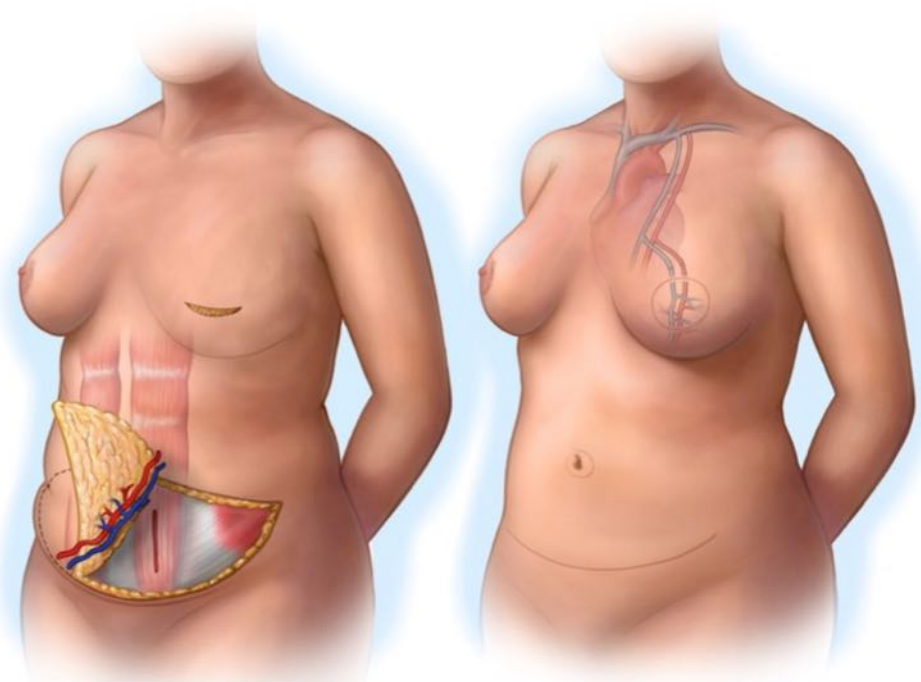
Courtesy of Donato Casella, MD – University of Florence



# Autologous Reconstruction (AR)

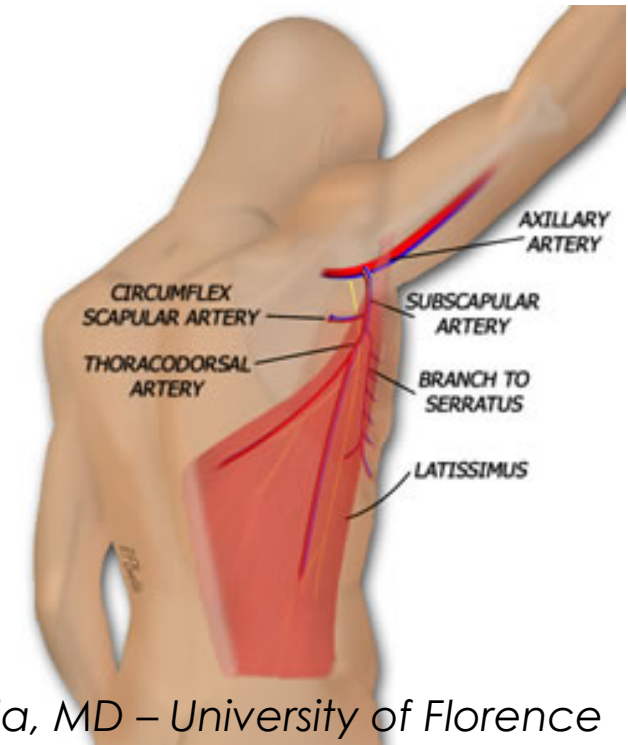
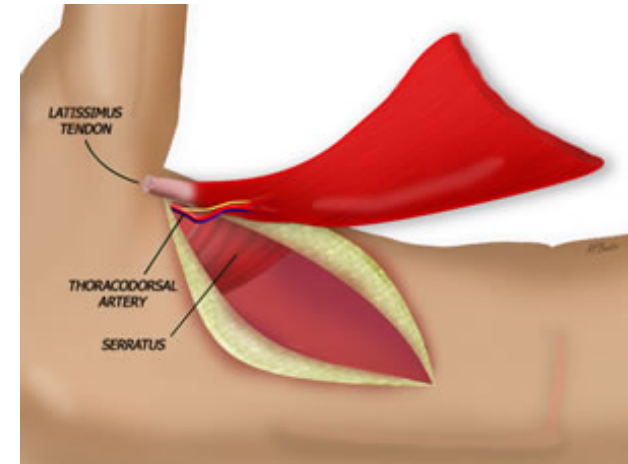
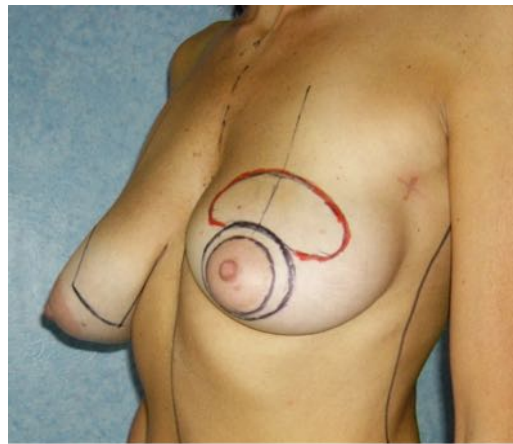
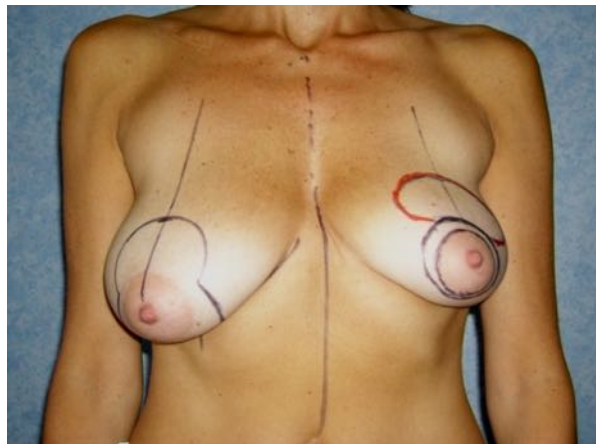


**DIAP flap** *Deep Inferior Epigastric Perforator*



# Autologous Reconstruction (AR)

## *Latissimus dorsi flap*



# Autologous Reconstruction (AR)



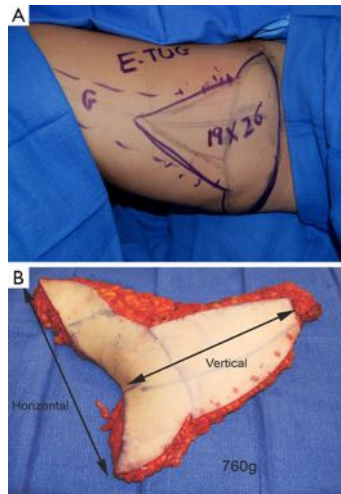
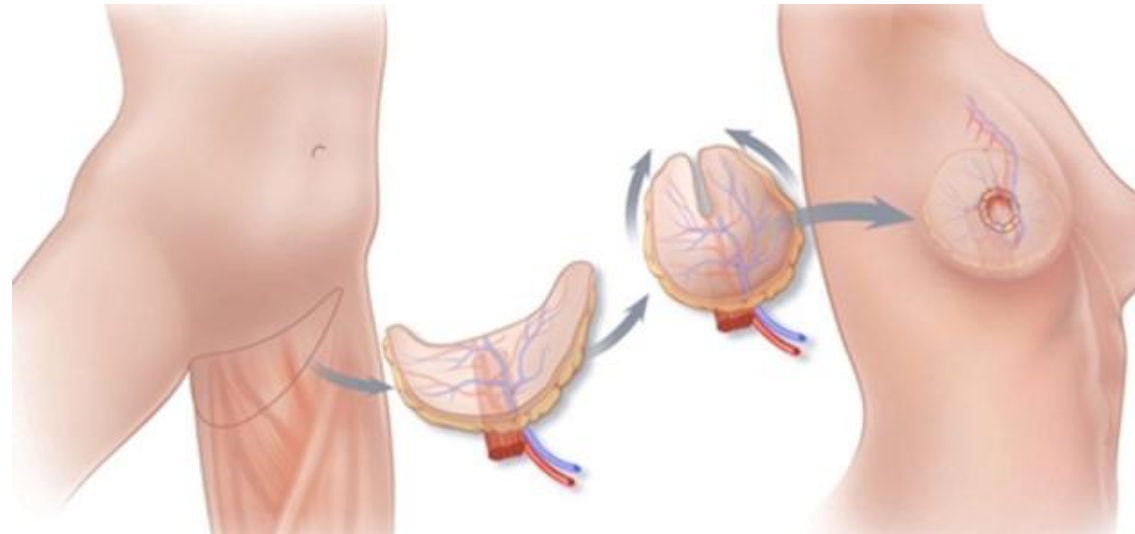
## S-GAP free flap *Superior Gluteal Artery Perforator*





# Autologous Reconstruction (AR)

## TUG flap *Transverse Upper Gracilis*



# OVERVIEW



*Breast reconstructive surgery: generality*

## **Breast reconstructive techniques: pros and cons**

*Reconstructive surgery and RT*

*Oncoplastic, RT and conservative surgery*

*Conclusions*



# Expander/implant reconstruction



## ADVANTAGES

E/I reconstruction remains much **more common** than AR

→ nearly **70%** of all reconstructions

<http://www.plasticsurgery.org/Media/stats>

Best modality in case of:

- **bilateral** reconstruction

→ To obtain *symmetry* is easier

- **smaller** breast size

*Nahabedian MY. Plast Reconstr Surg, 2009*



# Expander/implant reconstruction



## DISADVANTAGES

An absolute contraindication to tissue E/I reconstruction is **lack of available skin envelope** for tension-free coverage

## **Complications** rate

Long term: infection, capsular contracture, pain, skin necrosis, skin fibrosis and progressive asymmetry

**Comorbidities** → Higher complications rate

- *Obesity*
- *Hypertension*
- *Age*
- ...



# Autologous reconstruction (AR)



## ADVANTAGES

- Methods using abdominal donation have the added benefit of a **concomitant abdomen-plastic**, which increases general **satisfaction** rates

## DISADVANTAGES

- Common complications are **early toxicities** (<90 days), related to surgery (*thromboembolism*)
- Complete **flap loss** necessitating further surgery (*rare, 1-4%*)
- Longer **recovery time** and potential **donor-site morbidity**



Craft RO et al. *Plast Reconstr Surg*, 2011  
Andrades P et al. *Ann Plast Surg*, 2008  
Spear SL et al. *Plast Reconstr Surg*, 2008

# E/I vs AR - Cosmesis Outcome



For unilateral mastectomy with reconstruction, **AR** is associated with **higher rate of general satisfaction** (vs E/I)

*Craft RO et al. Plast Reconstr Surg, 2011*

Woman undergoing AR are more **pleased** with their **cosmetic** results at **longer follow up**

*Christensen et al. Acta Oncol, 2011*

*Nahabedian et al. Plast Reconstr Surg, 2009*

*AR had better cosmetics outcomes than E/I*

**BUT**

→ Lack of standardized objective assessment criteria

→ None prospective trial

# E/I vs AR - Cosmesis Outcome



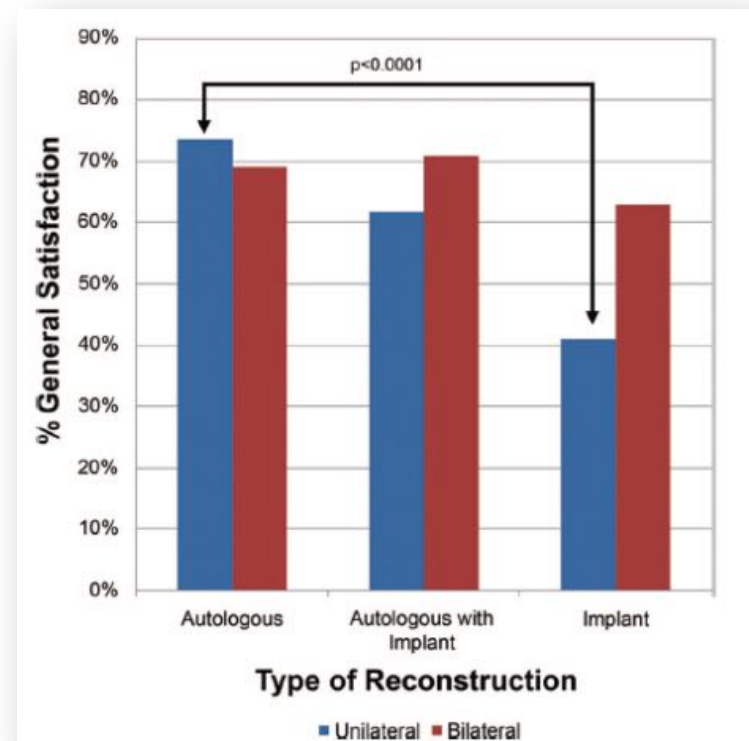
702 women - **910** breast reconstructions (494 unilateral, 416 bilateral)

**Complication rates** were **similar** between **unilateral and bilateral** reconstruction

Patient satisfaction was **highest** in **unilateral patients** with **AR** compared with E/I

(general satisfaction, 73.9 vs 40.9%,  $p < 0.0001$ ; aesthetic satisfaction, 72.3 vs 43.2%,  $p < 0.0001$ )

**Bilateral** reconstruction had **similar general and aesthetic satisfaction** scores across AR, AR with implant, and E/I reconstruction

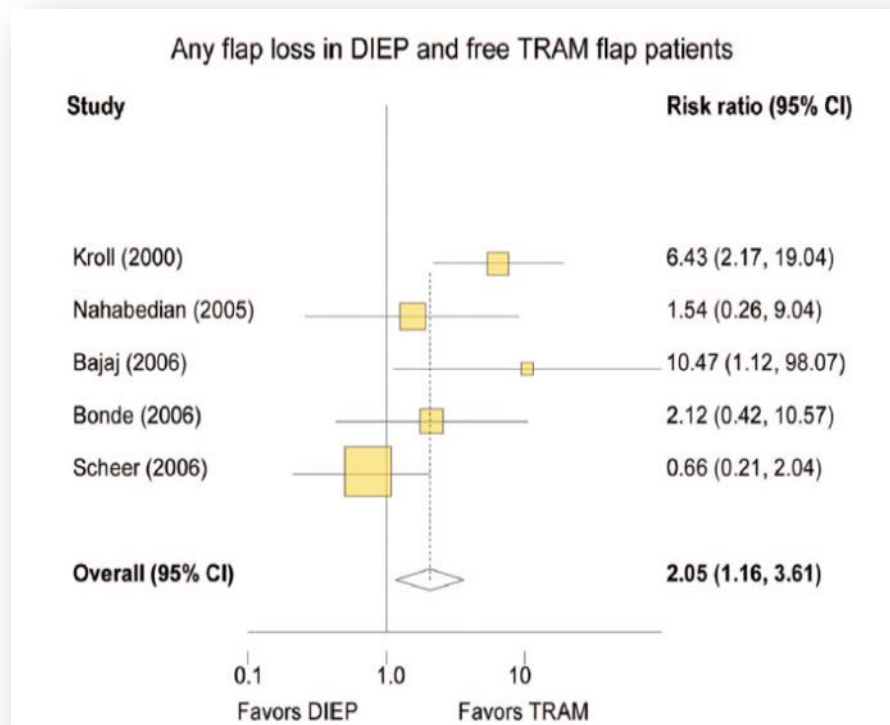




# Autologous reconstruction (AR) - Flap complications



Ischemic complications such as **fat necrosis** and **thrombosis** resulting in **flap loss** appear to be **higher in a DIEP flap** when compared with a free TRAM flap



**DIEP flap reduces abdominal morbidity**

**BUT**

**increases flap-related complications compared with the free **TRAM** flap**

# OVERVIEW



*Breast reconstructive surgery: generality*

*Breast reconstructive techniques: pros and cons*

## **Reconstructive surgery and RT**

*Oncoplastic, RT and conservative surgery*

*Conclusions*

# TIMING - Approach

## Expander/Implant (E/I)



### Immediate:

Permanent prosthesis during 1<sup>st</sup> surgery (*RT 3-6 months later*)

### Delayed:

1<sup>st</sup> surgery: expander

2<sup>nd</sup> surgery: permanent prosthesis

*(RT at the end of expanding process median time to 2nd surgery 4-8 months)*

## Autologous reconstruction (AR)

### Immediate:

During 1<sup>st</sup> surgery

### Delayed:

1<sup>st</sup> surgery: mastectomy

2<sup>nd</sup> surgery: AR (*6 months later*)



# RT impact on QoL - E/I



Mean follow-up of 3.3 years for **irradiated patients** ( $n=219$ ) and 3.7 years for **non-irradiated patients** ( $n=414$ )

Patients **irradiated** had significantly **lower**:

- ✓ **satisfaction** with breasts (58.3 vs 64;  $p=0.01$ )
- ✓ **psychosocial well-being** (66.7 vs 70.9;  $p=0.01$ )
- ✓ **sexual well-being** (47 vs 52.3;  $p=0.01$ )
- ✓ **physical well-being** (71.8 vs 75.1;  $p=0.01$ )

Evidences to be used in **discussion** with patients to **educate** them about the effect that **RT** can have on their **satisfaction** and **QoL** after E/I reconstruction

# RT impact - E/I vs AR



1037 patients who underwent **postoperative RT**

Overall **complication rate** was **31.8%** for **E/I** vs **24.4%** for **AR**

RT was associated with:

-Significant **increase** of **complications** in **E/I** group ( $p < 0.001$ ), not in the **AR** group ( $p = 0.51$ )

**-Multi-factorial influence** on major complication outcome

Probability of Major Complication

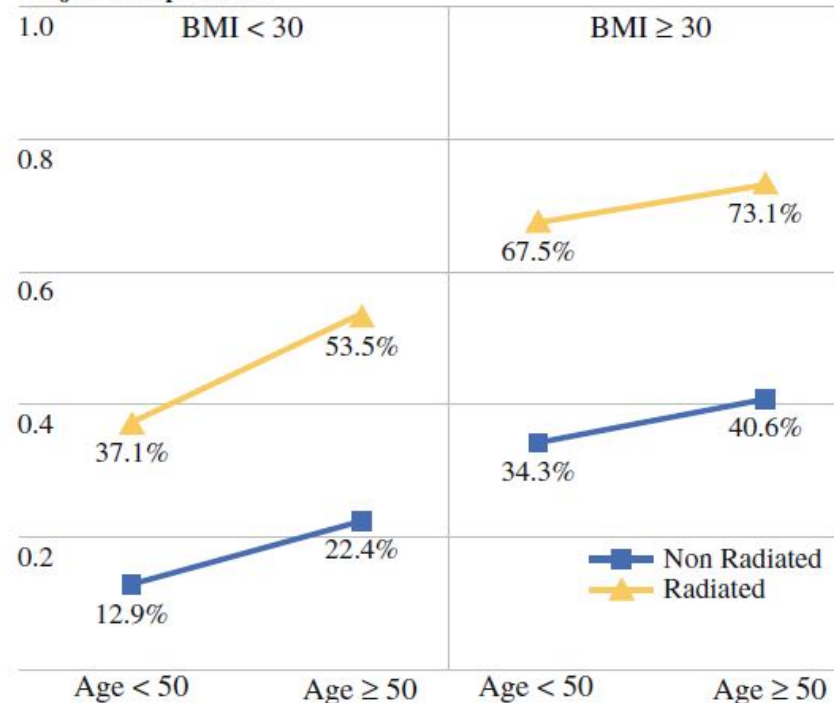


FIG. 1 Incidence of major complication rates for tissue expander/implant reconstruction for BMI and age controlling for radiation



# RT impact - E/I vs AR



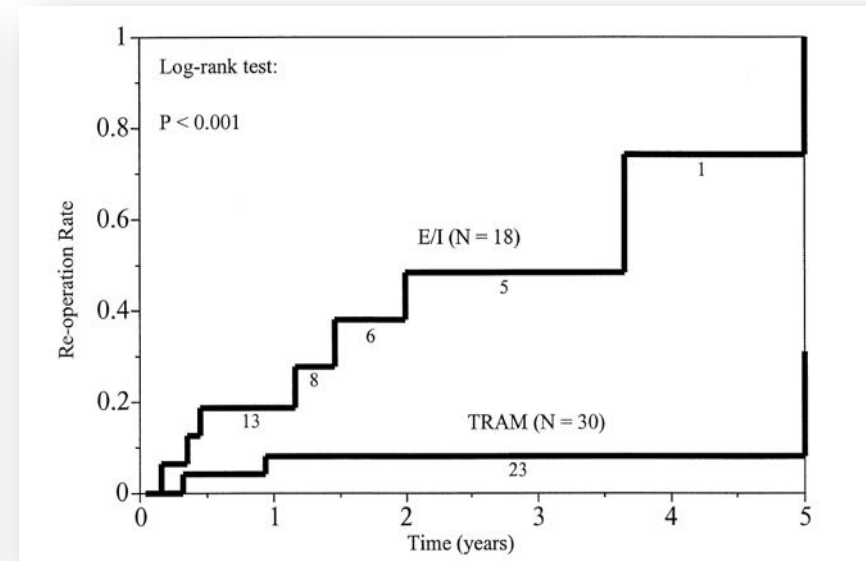
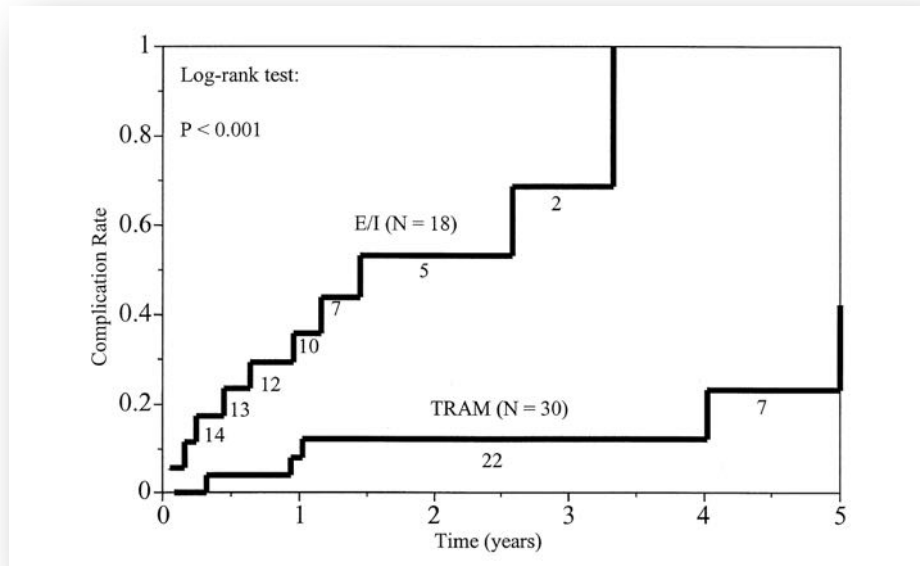
48 patients, assessment at 2 years

## Complication rate

53% (E/I) vs 12% (AR with TRAM)  $p < 0.001$

## Reoperation rate

48% (E/I) vs 14% (AR with TRAM)  $p = 0.01$



# Considerations - E/I vs AR and RT



- ✓Phase II and Observational Studies
- ✓Relative **better outcome for AR** after RT
- ✓Satisfactory outcomes for **immediate** AR and RT: similar prevalence of complications when compared with **immediate AR without RT** or **delayed reconstruction following RT**

*Schaverien et al. JPRAS, 2013*

- ✓Lack of standardized objective assessment criteria

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***Oncoplastic, RT and conservative surgery***

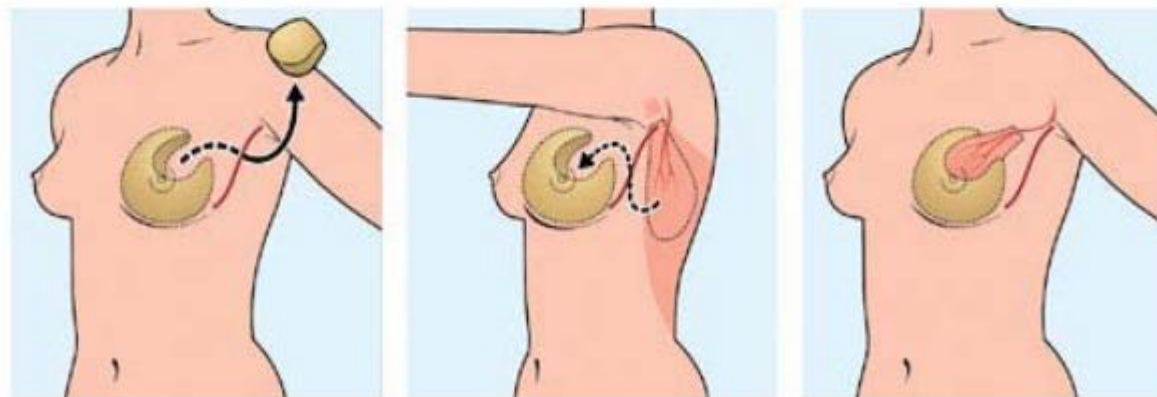
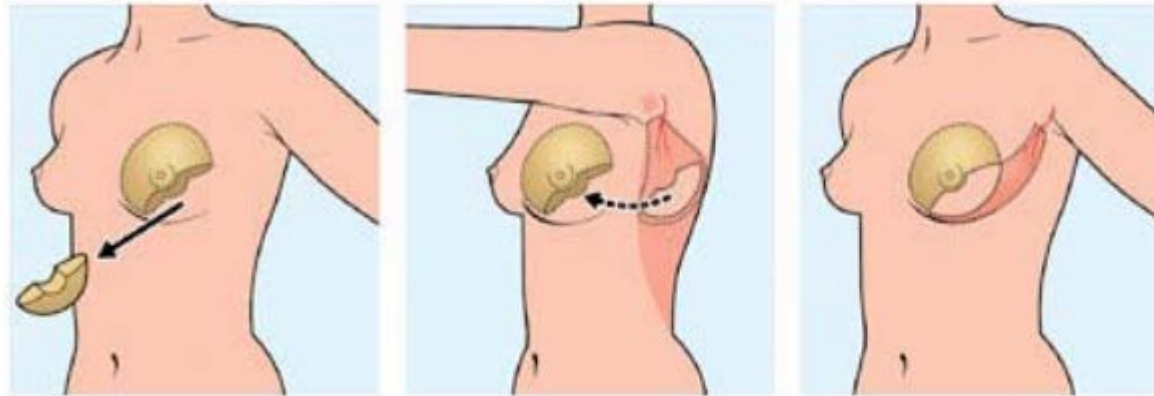
*Conclusions*

# ONCOPLASTIC TECHNIQUES

Breast conservative surgery



## Volume replacement



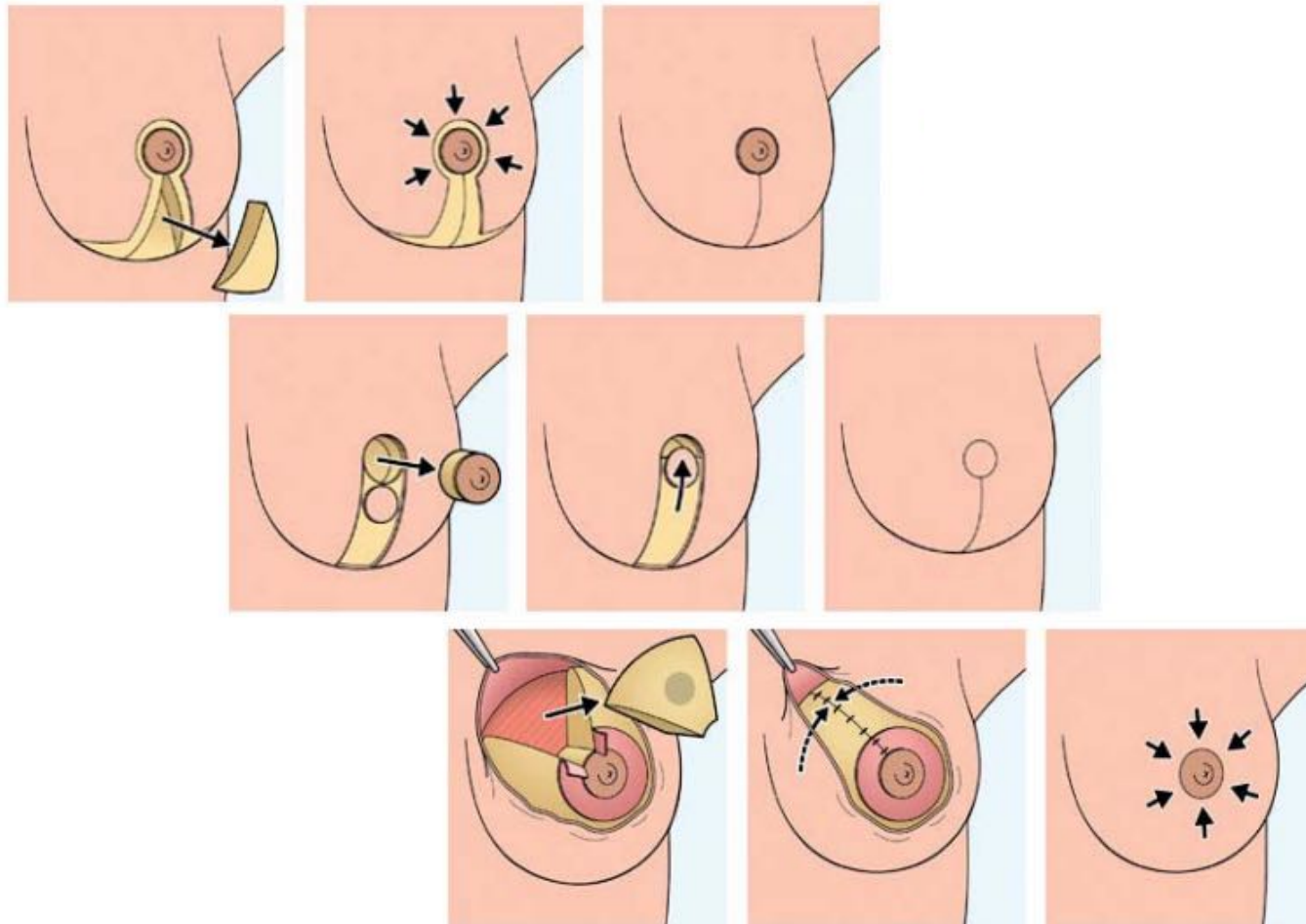
Rainsbury RM. *Nat Clin Pract Oncol*, 2007

# ONCOPLASTIC TECHNIQUES

Breast conservative surgery



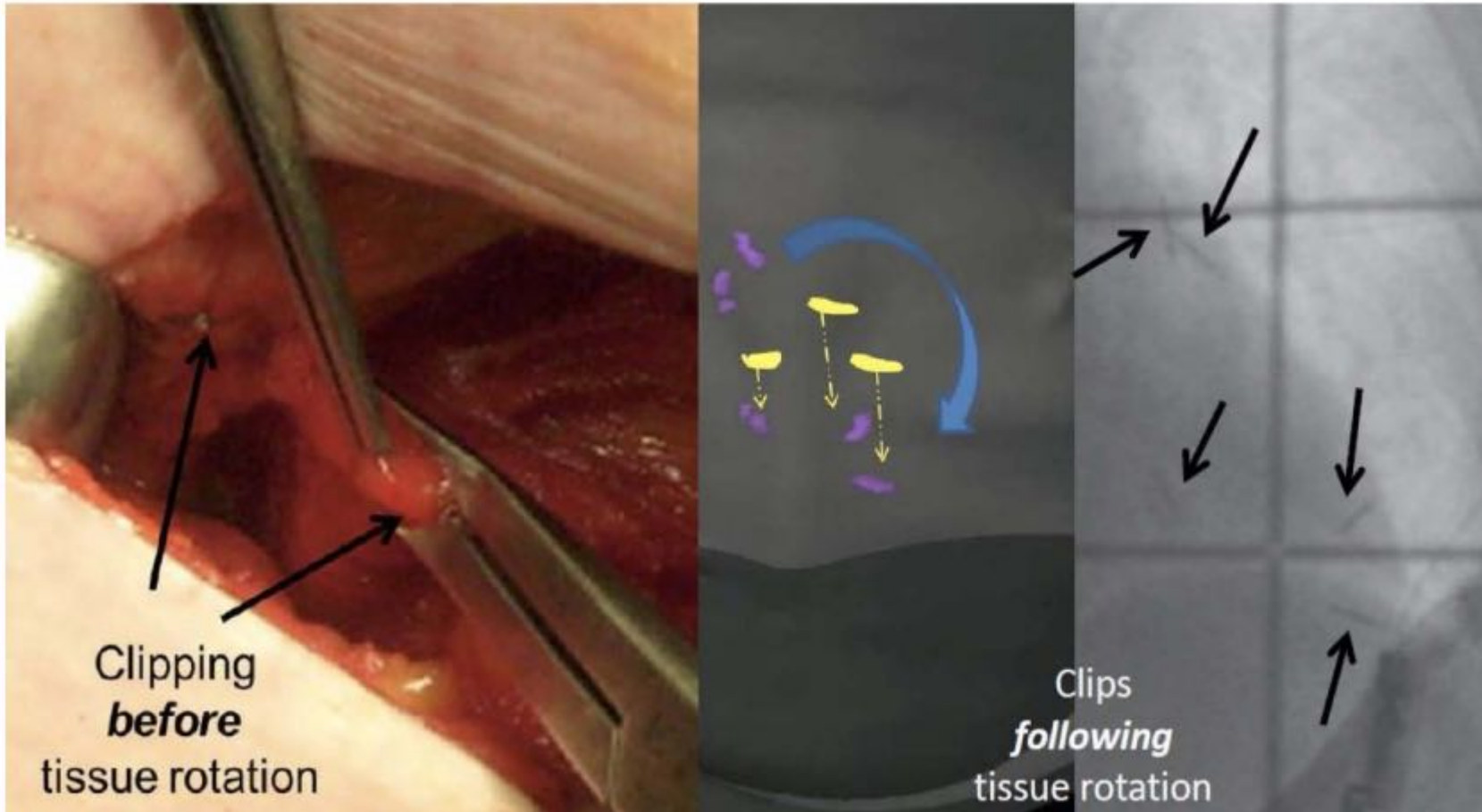
## Volume displacement



Rainsbury RM. Nat Clin Pract Oncol, 2007



# CTV boost/APBI delineation



# RT and oncoplastic surgery

Impact on cosmesis



Breast conserving therapy over time:

Conventional fraction → Hypofractionation

Conventional surgery → Oncoplastic surgery

Retrospective analysis on **125** patients with stage I-II **BC**  
**treated with BCS**

Influence *hypofractionation* and *oncoplastic surgery* on  
**cosmetic outcome**



Lansu J, et al. Eur J Surg Oncol, 2015

# RT and oncoplastic surgery

Impact on cosmesis



<i>Score (SD)</i>	<b>Conventional fractioning (n=15)</b>	<b>Hypofractionation (n=18)</b>	<b>P value</b>
<b>BCCT.core score</b>	2.45 (0.52)	2.25 (0.62)	0.4
<b>YBT</b>	26.94 (15.03)	29.2 (18.5)	0.71
<b>C30Functioning scale</b>	75.90 (22.57)	86.91 (22.18)	0.19
<b>C30Symptom scale</b>	17.31 (10.22)	17.97 (12.85)	0.88
<b>C30QOL</b>	63.45 (35.77)	75.00 (22.24)	0.29
<b>BR23Functioningscale</b>	70.19 (16.30)	84.72 (16.91)	0.02
<b>BR23Symptom scale</b>	20.51 (12.35)	17.06 (13.30)	0.46

<i>Score (SD)</i>	<b>Traditional surgery (n=27)</b>	<b>Oncoplastic surgery (n=18)</b>	<b>P value</b>
<b>BCCT.core score</b>	1.83 (0.76)	2.40 (0.52)	0.01
<b>YBT</b>	28.11 (20.55)	26.48 (15.48)	0.8
<b>C30Functioning scale</b>	87.44 (18.20)	77.78 (22.48)	0.19
<b>C30Symptom scale</b>	16.25 (12.59)	16.67 (10.39)	0.92
<b>C30QOL</b>	82.08 (16.94)	62.5 (37.18)	0.05
<b>BR23Functioning scale</b>	82.14 (13.19)	71.18 (16.62)	0.04
<b>BR23Symptom scale</b>	13.42 (9.71)	18.85 (11.28)	0.15

# RT and oncoplastic surgery

Impact on cosmesis



## **Conclusions**

### Cosmetic outcome:

Conventional fraction > Hypofractionation

Conventional surgery > Oncoplastic surgery

### Quality of life:

Hypofractionation > Conventional fractionation

Conventional surgery > Oncoplastic surgery





# OVERVIEW



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# CONCLUSIONS



**Tolerance** and **cosmetic outcome** of breast reconstruction for BC patients in previously or subsequently irradiated sites depends significantly on the **type of reconstruction**

**AR** have **fewer complications, reduced reoperation rate,** and **improved cosmesis** compared to E/I reconstruction

**Sequence of reconstruction and RT,** duration between these interventions, and RT technique, showed **conflicting results** and seems not to be the main or exclusive predictive factor for outcome

# CONCLUSIONS



To clarify **predictive factors** of overall outcome **larger prospective studies** or **pooled multi-institutional data** are strongly required

Patients should be always **appropriately counseled** regarding the **cosmetic results** and **complication rate** and **educated** about the **potential effect of RT** on their **satisfaction** and **QoL after E/I**

→ To ensure **realistic preoperative expectations** and to **optimize** informed **decision-making** process

# CONCLUSIONS



If target v

Target v  
challenge

**recom**

**Close**

a bigger

**choice**

**logist**



...thanks for your attention



**Azienda  
Ospedaliero  
Universitaria  
Careggi**



FONDAZIONE FIRENZE RADIOTERAPIA ONCOLOGICA  
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