

*Protesi, espansori e chirurgia oncoplastica: quale approccio nell'impostazione del trattamento radioterapico?*



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# RT e ricostruzione mammaria

- Studi retrospettivi o retrospettivo controllato
- Eterogeneità dati: modalità ricostruttive, delayed-immediate reconstruction, timing RT
- numero limitato di pazienti
- mancanza di studi R → metanalisi, review sistematiche
- Dati più recenti migliori → miglioramento tecnica chirurgica e trattamento RT

## DIBATTITO

- ✓ Quale tipo di ricostruzione migliore se RT?
- ✓ Timing ricostruzione/RT prima o dopo?
- ✓ Modalità RT

Chen SA et al. *Radiat Oncol* 2013

Sensus-Konefka E et al. *Cancer Treat Rev* 30:671-682, 2004

Barry M, Kell MR. *Breast Cancer Res Treat* 127:15-22, 2011

Rozen WR, Ashton MW. *Gland Surgery* 2012

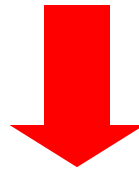
Berbers J et al. *Eur J Cancer* 2014

Walsh SM et al. *The Surgeon* 2014

Rochlin DH et al. *J Surg Oncol* 2015

# Meccanismi del danno radioindotto

- Danno cellule endoteliali
- Alterazione della microcircolazione  
diabete, fumo, età...
- Fibrosi
- Atrofia cutanea



- Alterazione letto protesico
- Danno vascolare lembo

# Fattori relativi alla paziente interferenti con risultato cosmetico e complicanze

- Età
- Obesità/BMI
- Ipertensione arteriosa/Vasculopatie
- Diabete
- Fumo

NB selezione pazienti candidabili ≠ modalità

Chawla et al, Int J Radiat Oncol Biol Phys, 2002

Williams et al, Ann Surg, 1995

Lipa et al, Plast Reconstruct Surg, 2003

McCarthy CM et al Plast Reconstr Surg 121:1886-1892, 2008

Aristei C et al. Strahlenther Onkol 188:1079-1074, 2012

Chiru MR, Lascar I JMed Life, 6:462-463, 2013

Khansa I et al. Plast Reconstruct Surg, 131:443-452, 2013

Carnevale A et al Radiol Med 118:1240-1250, 2013

Eriksson M et al Breast Cancer Res Treat 142:591-601, 2013

Hanwright PJ et al Breast 22:938-945, 2013

Fischer JP et al J Am Coll Surg 217:780-787, 2013

# Fattori relativi al trattamento interferenti con risultato cosmetico e complicanze

- ✓ RT e modalità trattamento radiante
- ✓ Timing ricostruzione-RT
- ✓ Tipo di ricostruzione
- ✓ Esperienza operatore
- ✓ Infezione perioperatoria
- ✓ Terapia sistemica      chemiotp      → radiosensibilizzazione  
   ormonotp      → TGFβ modulatore fibrosi

Chawla Ak et al Int J Radiat Oncol Biol Phys 54:520-526, 2002  
Tallet et al, Int J Radiat Oncol Biol Phys, 2003  
Cowen D Breast Cancer Res Treat 121:627-634, 2010  
Khansa I et al. Plast Reconstruct Surg, 131:443-452, 2013  
Eriksson M et al Breast Cancer Res Treat 142:591-601, 2013  
Li L et al. J Plast Reconstruct Aesthet Surg, 67:461-7, 2014  
Lam TC et al. Plast reconstr Surg 2013

# Tipo di ricostruzione

- **Ricostruzione con tessuto autologo**

Incidenza complicanze 7-88%

Soddisfazione pazienti e cosmesi buono 17-100%

Tran et al, *Plast Reconstruct Surg*, 2001

Zimmerman et al, *Am J Clin Oncol*, 1998

Hunt et al, *Ann Surg Oncol*, 1997

Sensus-Konefka E et al *Cancer Treat Rev* 30:671-682, 2004

Jhaveri Jd et al. *Int J Radiat Oncol Biol Phys* 2008

Hughes K et al. *Anticancer Res* 2012

Pestana IA et al. *Ann Plast Surg* 2013

- **Ricostruzione con espansore/protesi**

Incidenza complicanze 17-80%

soddisfazione pazienti e cosmesi buono 7-88%

Krueger et al, *Int J Radiat Oncol Biol Phys*, 2001

Tallet et al, *Int J Radiat Oncol Biol Phys*, 2003

Spear et al, *Plast Reconstruct Surg*, 2000

Sensus-Konefka E et al *Cancer Treat Rev* 30:671-682, 2004

Aristei C et al. *Strahlenther Onkol* 188:1079-1074, 2012

Kronowitz SJ *Plast Reconstr Surg* 130:513-523, 2012

LamTC et al. *Plast reconstr Surg* 2013

Pestana IA et al. *Ann Plast Surg* 2013

**Table 1** Cosmesis and risk of complications in patients undergoing prosthetic reconstruction and radiotherapy.

References	Method of reconstruction	Timing of radiotherapy	Irradiated patients		Non-irradiated patients	
			Acceptable cosmesis	Complications	Acceptable cosmesis	Complications
Chu <sup>28</sup>	Prosthetic	After R	28/32 (88%)	NR	—	—
Ryu <sup>67</sup>	Prosthetic	After R	5/7 (71%)	2/7 (29%)	—	—
Halpern <sup>66</sup>	Prosthetic	After R	1/7 (14%)	NR	—	—
von Smitten <sup>65</sup>	Prosthetic	After R	1/15 (7%)	12/15 (80%)	13/15 (87%)	3/15 (20%)
Kraemer <sup>64</sup>	Prosthetic	Before R	11/35 (31%)	23/35 (66%)	71/111 (64%)	31/111 (28%)
Forman <sup>63</sup>	Prosthetic	Before R	4/10 (40%)	3/10 (30%)	—	—
Vandeweyer <sup>62</sup>	Prosthetic	After R	0/6	1/6 (17%)	114/118 (96.6%)	11/118 (9%)
Rosato <sup>57</sup>	Prosthetic	After R	4/15 (27%)	NR	171/190 (90%)	NR
Victor <sup>54</sup>	Prosthetic	After R	7/13 (54%)	NR	—	—
Krueger <sup>22</sup>	Prosthetic	Various	NR	13/19 (68%)	NR	19/62 (31%)
Contant <sup>50</sup>	Prosthetic	Various	NR	14/28 (50%)	NR	10/87 (11%)
Chawla <sup>21</sup>	Prosthetic	Various	7/18 (39%)	10/18 (55%)	—	—
Paulhe <sup>61</sup>	Prosthetic	Before R	13/26 (50%)	NR	17/24 (71%)	NR
Stabile <sup>7</sup>	Prosthetic	Before R	7/9 (78%)	0	—	—
Fodor <sup>69</sup>	Prosthetic	Before R	NR	50%	NR	40%
Ramon <sup>52</sup>	Prosthetic	After R	NR	6/11 (54.6%)	NR	3/41 (7.3%)
Olenius <sup>19</sup>	Prosthetic	Before R	5/11 (45%)	NR	25/31 (78%)	NR
Noone <sup>9</sup>	Prosthetic	After R	NR	7/12 (58%)	—	—
Barreau-Pouhaer <sup>70</sup>	Prosthetic	Before R	NR	3/22 (27.3%)	NR	12/109 (11%)
		After R	NR	6/11 (54.6%)	NR	3/100 (3%)
Tallet <sup>56</sup>	Prosthetic	Various	45%	28/55 (51%)	80%	3/22 (14%)
Schuster <sup>53</sup>	Prosthetic + autologous flap	Various	17/51 (33.3%)	NR	—	—
Evans <sup>68</sup>	Prosthetic + autologous flap	Various	NR	16/39 (41%)	NR	39/338 (12%)
Speier <sup>4</sup>	Prosthetic + autologous flap	Various	NR	21/40 (53%)	NR	4/40 (10%)
Total			110/255 (43%)	165/328 (50%)	411/489 (84%)	138/1043 (13%)

NR – not reported, R – reconstruction.

**Table 2** Cosmesis and risk of complications in patients undergoing autologous reconstruction and radiotherapy.

References	Method of reconstruction	Timing of radiotherapy	Irradiated patients		Non-irradiated patients	
			Acceptable cosmesis	Complications	Acceptable cosmesis	Complications
Zimmerman <sup>80</sup>	TRAM	After R	18/20 (90%)	0	—	—
Kuske <sup>5</sup>	TRAM	Before R	7/8 (88%)	5/8 (63%)	—	—
Williams <sup>46</sup>	TRAM	Before R	NR	27/108 (25%)	NR	98/572 (17%)
Williams <sup>55</sup>	TRAM	After R	NR	10/19 (53%)	NR	98/572 (17%)
Tran <sup>17</sup>	TRAM	After R	NR	≥ 88%	—	—
		Before R	NR	≤ 23%	—	—
Moran <sup>36</sup>	TRAM	Before R	"Excellent cosmesis"	2/16 (13%)	—	—
Chawla <sup>21</sup>	TRAM	Various	26/30 (87%)	5/30 (17%)	—	—
Tran <sup>23</sup>	TRAM	After R	7/41 (17%)	NR	—	—
Jacobsen <sup>64</sup>	TRAM	Before R	NR	7/47 (15%)	NR	33/112 (29%)
Hartkamp <sup>16</sup>	TRAM	Before R	NR	6/52 (11.5%)	NR	13/248 (5%)
Watterson <sup>49</sup>	TRAM	Before R	NR	34/91 (37.4%)	NR	98/465 (21.1%)
Disa <sup>74</sup>	TRAM	Before R	8/8 (100%)	2/8 (25%)	—	—
Missana <sup>82</sup>	TRAM		100%	NR	—	—
Schuster <sup>53</sup>	TRAM	Before R	7/8 (87.5%)	NR	—	—
Hunt <sup>79</sup>	TRAM	After R	16/19 (84%)	2/19 (10.5%)	—	—
Proulx <sup>12</sup>	TRAM	Various	14/15 (93.3%)	1/15 (6.7%)	—	—
Kroll <sup>81</sup>	TRAM	Before R	54/82 (66%)	22/66 (33%)	NR	33/158 (21%)
	LD	Before R		10/16 (63%)		18/44 (41%)
Disa <sup>74</sup>	LD+prosthetic	Before R	1/3 (33%)	2/3 (67%)	—	—
Missana <sup>82</sup>	LD+prosthetic	After R	29%	NR	—	—
Nash <sup>83</sup>	LD+prosthetic	Before R	29/29 (100%)	0	—	—
Rogers <sup>24</sup>	DIAP	After R	NR	17/30 (56.7%)	NR	0
Kuske <sup>5</sup>	Other autologous or prosthetic	Various	34/61 (56%)	29/63 (46%)	—	—
Total			221/324 (68%)	181/591 (31%)	NR	293/1599 (18%)

DIAP – deep inferior epigastric perforator flap, LD – latissimus dorsi myocutaneous flap, NR – not reported, R – reconstruction, TRAM – transverse rectus abdominis myocutaneous flap.



# Tipo di ricostruzione e RT

Radiotherapy and breast reconstruction: a meta-analysis.

11 studi, 1105 pts, ≠ modalità ricostruzione

Ricostruzione con tessuti autologhi minori complicanze

OR 0.21, 95% CI, 0.1-0.4 autologo vs E/I

**Table 3** Effect of radiotherapy on implant versus autologous breast reconstruction

Author	TOR	Patient no.	MOR	Radiotherapy	Complications (%)
Anderson et al. [11]	Immediate	35	Autolog.	Yes	0
	Immediate	50	Implant/Ex	Yes	5
Jhaveri et al. [29]	Immediate	23	Autolog.	Yes	8.7
	Immediate	69	Implant	Yes	55
Wong et al. [10]	Immediate	47	Autolog	Yes	9
	Immediate	15	Implant based	Yes	40
Stralman et al. [22]	Immediate	59	Autolog	Yes	13.5
	Immediate	82	Implant	Yes	34
Total	Immediate	164	Autolog	Yes	7.8
Total	Immediate	216	Implant	Yes	33.5

TOR timing of reconstruction, MOR method of reconstruction, Ex expander, Autolog autologous reconstruction

# Tipo di ricostruzione

## Ricostruzione E/I + RT

### Incidenza complicanze

- Infezione 37-3.7%
- Necrosi 12.7%
- Reintervento 37-3.6%

Barry M, Kell MR. Breast Cancer Res Treat 2011  
Hughes K et al. Anticancer Res 2012  
Lam TC et al. Plast reconstr Surg 2013

- > chirurgia non pianificata o correttiva con RT
- Maggioranza mantengono impianto
- Solo minoranza conversione ad autologo
- Circa 1/3 pz continua a sviluppare contrattura capsulare Baker III or IV

Kronowitz SJ. Plast Reconstr Surg 2012

# Contrattura capsulare

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<i>Grado</i>	<i>Classificazione di Baker</i>
<i>I</i>	<i>Impianto protesico non palpabile e non visibile</i>
<i>II</i>	<i>Impianto protesico lievemente indurito, palpabile ma non visibile</i>
<i>III</i>	<i>Impianto protesico indurito con iniziale alterazione della forma, poco mobile, palpabile e visibile</i>
<i>IV</i>	<i>Impianto protesico di consistenza dura con distorsione marcata della morfologia, dolente e dolorabile</i>

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Modificato 1995

Spear SL, Baker JL *Plast Reconstr Surg* 96:1119-1123, 1995

Incidenza contrattura capsulare	RT	no RT
	38.6%-41.7%	14.1%-14.5%

Contrattura III-IV ~ 20%

Benediktsson L, Perbeck L. *J Plast Reconstr Aesthet Surg*, 2006

Behranwala KA et al. *J Plast Reconstr Aesthet Surg*, 2006

# Tipo di ricostruzione tessuto autologo + RT

Review 25 studi 3900 pz

RT      no RT

- Liponecrosi      23.8% vs 8.5%      **p=0.006**
- Complicanze globali      33.9% vs 28.6%      p=0.59
- Revisione chirurgica      18.3% vs 16.1%      p=0.38

Schaverien MV et al. J Plast, Reconstr Aesthet Surg, 66:1637-1651, 2013



Review 11 studi 337 pz

- Liponecrosi      16.9%
- Revisione chirurgica      24%
- Fibrosi      16.9%
- Contrattura      35.4%

Rochlin DH et al. J Surg Oncol, 2015

# Timing ricostruzione/RT

RT prima o dopo ≠ modalità ricostruzione



Complicanze e difficoltà tecniche RT

- Tessuto autologo
- Espansore impianto

non differenze SS complicanze

≠ tipo complicanze

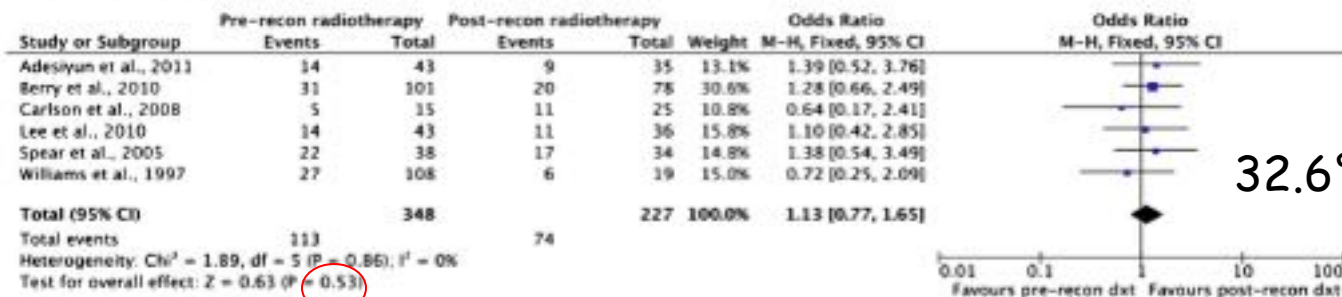
early: Ric pre-RT, late: Ric post-RT

Adesiyun TA et al. Int J Radiat Oncol Biol Phys 2011  
Schaverien MV et al. J Plast, Reconstr Aesthet Surg, 66:1637-1651, 2013  
Kelley BP et al. Ann Surg Oncol 2014  
Momoh AO et al. Ann Surg Oncol 21:118-124, 2014

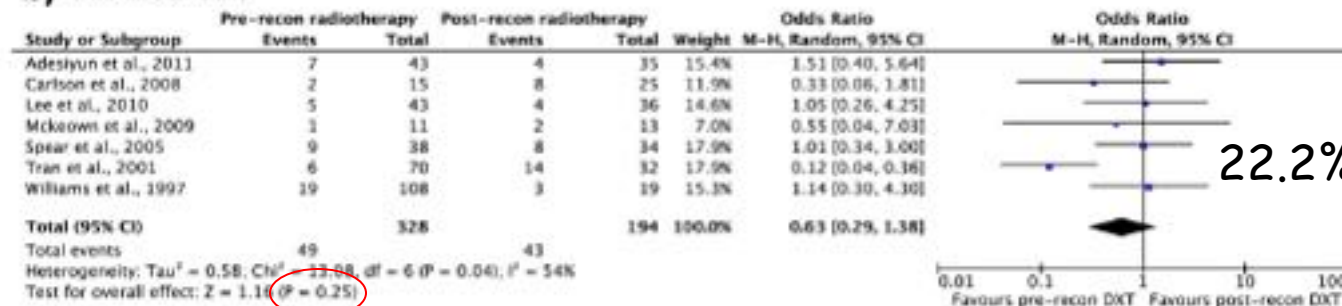
# Autologo: Ricostruzione pre RT vs ricostruzione post RT

Review sistematica 25 studi Da Schaverien MV et al. J Plast, Reconstr Aesthet Surg, 2013

## a) Overall complications



## b) Fat necrosis



## c) Revisional surgery

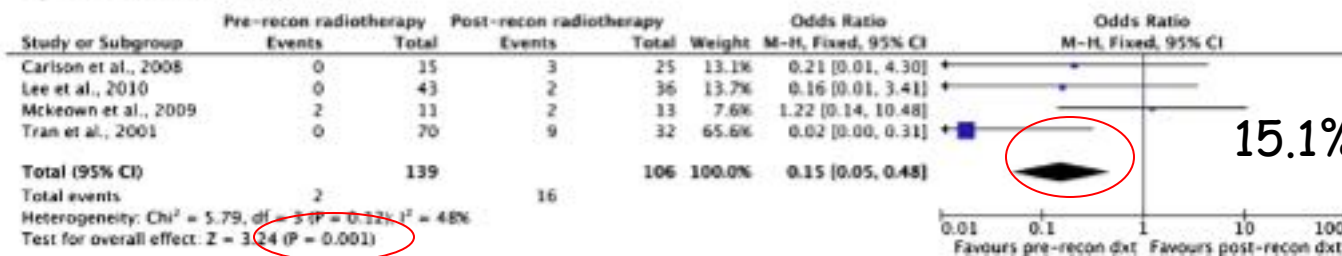


Figure 3 Meta-analysis of pooled data from observational studies comparing patients that received immediate autologous breast reconstruction and postoperative radiotherapy with patients that received radiotherapy before delayed autologous reconstruction included in Table 3; a) Forest plot of prevalence of complications; b) Forest plot of prevalence of fat necrosis; c) Forest plot of prevalence of revisional surgery.

Dati coerenti con review di Kelley 2014

# Timing RT e Ricostruzione E/I

Ricostruzione post RT 42%

Fallimento ricostruzione

Ricostruzione pre RT 25%

Pestana IA et al. Ann Plast Surg 2013



**26 studi, impianto protesico**

- ✓ Complicanze RT-pre vs RT-post ricostr → No diff SS
- ✓ Contrattura capsulare I-II e III-IV → No diff SS
- ✓ Fallimento impianto 19% RT-pre vs 20% RT-post

Momoh AO et al. Ann Surg Oncol 21:118-124, 2014

# Complicanze e cosmesi secondo tipo di ricostruzione e timing RT

Da Berbers J et al. Eur J Cancer 2014

Complication rate and cosmetic outcome categorised by the timing of radiotherapy and subdivided in autologous and implant reconstructions.\*

Complications	Radiotherapy first				Reconstruction first			
	Autologous		Implant		Autologous		Implant	
	Reported incidences	Weighted mean (95%-CI)**	Reported incidences	Weighted mean (95%-CI)**	Reported incidences	Weighted mean (95%-CI)**	Reported incidences	Weighted mean (95%-CI)**
Revision surgery	0 [34], 9.0 [29], 14.9 [28]	11.5 (6.4-16.6)	27.7 [38], 40.9 [28], 45.5 [33], 54.0 [13]	42.4 (32.3-52.5)	0 [55], 0 [57], 0 [58], 2.9 [53], 9.0 [42], 12.0 [34], 47.0 [47], 66.7 [43]	23.6 (5.7-41.5)	6.4 [39], 10.0 [46], 11.1 [11]	8.5 (5.3-11.7)
Complication rate (total)	26.0 [29], 30.4 [12], 31.6 [45], 33.3 [34], 40.0 [41], 47.3 [28]	36.0 (28.2-43.8)	0 [12], 0 [45], 24.0 [40], 45.9 [13], 48.9 [38], 54.5 [28], 58.9 [35]	48.7 (38.8-58.6)	8.7 [57], 9.0 [42], 25.6 [30], 30.8 [55], 34.1 [12], 37.1 [53], 44.0 [34], 50.0 [36], 70.0 [47]	36.8 (22.5-51.1)	11.1 [11], 20.0 [46], 48.0 [40], 62.5 [12]	19.6 (0.9-38.3)
Patient satisfaction	69.2 [12]	69.2 (/)	0 [12], 41.4 [31], 90.0 [40], 92.3 [39]	61.7 (33.8-89.6)	73.3 [12], 80.0 [55], 82.6 [57], 83.0 [47], 92.3 [37]	81.7 (76.8-86.6)	42.9 [12], 67.0 [11], 80.0 [40], 88.9 [39]	78.2 (64.1-92.3)
Physician satisfaction	51.3 [12]	51.3 (/)	0 [12], 62.2 [13], 92.3 [39]	73.5 (49.4-97.6)	66.7 [12], 83.0 [47]	72.1 (57.0-87.2)	42.9 [12], 80.0 [11], 92.1 [39]	83.7 (68.2-99.2)

\* All incidence rates are presented in percentages.

\*\* 95%-CI: 95% confidence interval.

Review sistematica 37 studi, 2683 pts, 1635 autologo, 948 E/I



# Quale metodo e timing migliore tra ricostruzione e RT?

- E/I post RT maggiori complicanze
- Autologo pre RT > chirurgia di revisione e fibrosi



- Ricostruzione immediata → E/I → RT
- Ricostruzione differita → RT → tessuto autologo

Berbers J Eur J Cancer 2014

Ricostruzione tessuto autologo rimuove tessuti danneggiati

Rozen WR, Ashton MW. Gland Surgery 2012

# Timing RT/sostituzione espansore

- Ric immediata one vs two-stage > revisione e peggiore cosmesi
- Ricostruzione two-stage  
sostituzione impianto prima RT > complicanze

Kronowitz SJ Plast Reconstr Surg 2012



- Sostituzione impianto pre RT vs post RT **Non diff SS**
- Sostituzione impianto dopo RT precoce vs tardiva (< vs > 4-6-12 mesi)

Lentz R et al Ann Plast Surg 2013



- Review sistematica

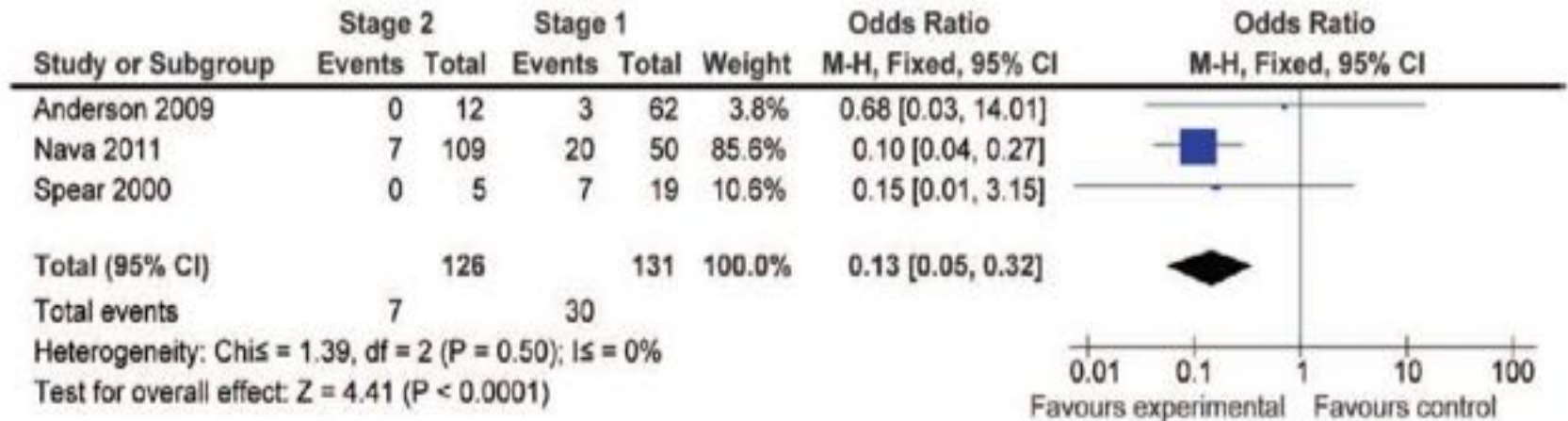


Fig. 5. Odds ratio forest plot of stage 2 (after implant) (5.6 percent) versus stage 1 (after expander) (22.9 percent) immediate breast reconstruction plus adjuvant radiotherapy for failure (prosthesis loss).

# Timing RT e sostituzione espansore/impianto

1415 pz ricostruzione protesica ± RT

	RT	no RT
Fallimento impianto	9.1%	vs 0.5% p<0.01
Contrat capsul IV grado	6.9%	vs 0.5% p<0.01
Prob. Fallimento a 12 aa	17.5%	vs 2% p<0.01
Cosmesi buona/eccell.	92%	vs 94.2%

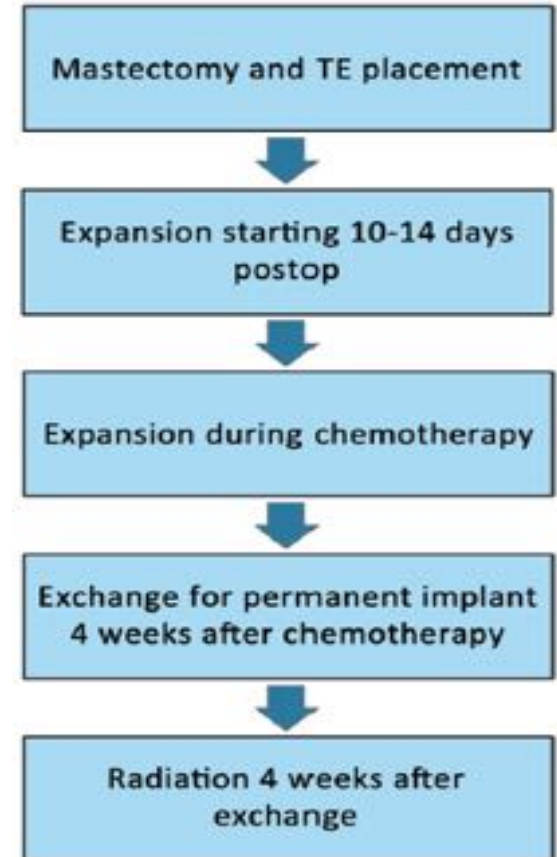
8 sett CT→RT

Cordeiro PG et al. Plast Reconstr Surg 2014

NB: RT con impianto permanente minor rischio fallimento 725 pz

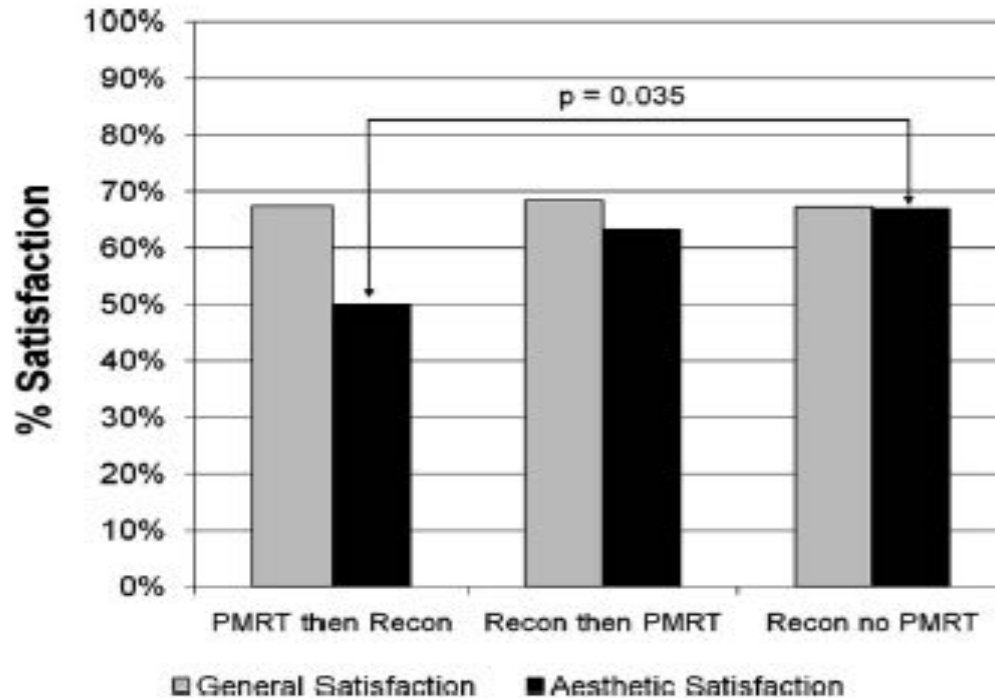
Eriksson M et al. Breast Cancer Res Treat 2013

## Algoritmo MSKCC



# Soddisfazione pazienti e QoL

- Risultati generalmente buoni ≠ modalità e timing RT



Da Lee BT et al. Ann Plast Surg 2010

FIGURE 2. Patient satisfaction.

Adesiyun TA et al. Int J Radiat Oncol Biol Phys 2011  
Tsoi B et al. J Am Coll Surg 2014

- > soddisfazione per protesi silicone vs salina

McCarthy CM et al. Cancer 2010

# Ricostruzione E/I: QoL e soddisfazione pazienti

**Table 5** Postoperative PROMs after immediate implant-based breast reconstruction in the three groups using five scales of the Breast-Q®

	No RT (n = 274)	Prior RT (n = 35)	Postoperative RT (n = 197)	RT versus no RT p value	Prior versus postoperative RT p value
Satisfaction with breast/s	57.6 (16.7)	48.6 (15.1)	50.9 (15.8)	0.000**	0.414
Satisfaction with overall outcome	70.3 (18.6)	63.1 (18.5)	63.8 (18.9)	0.000**	0.905
Psychosocial well-being	70.9 (23.0)	64.6 (21.3)	63.9 (21.6)	0.001**	0.974
Sexual well-being	54.6 (25.5)	45.6 (25.6)	48.2 (22.9)	0.002**	0.503
Physical well-being	78.3 (16.8)	71.7 (14.6)	75.1 (15.7)	0.005**	0.137

Numbers (N) represent individual patients. RT radiotherapy. Mean (SD)

\* p value <0.05, \*\* p value <0.01

Eriksson M et al. Breast Cancer Res Treat 2013



**TABLE 4** BREAST-Q scores in patients with postmastectomy radiation compared with nonirradiated patients

BREAST-Q scale	Mean BREAST-Q scores (SD)		Mean score difference	p value
	Nonirradiated group (n = 414)	Postmastectomy radiation group <sup>a</sup> (n = 172)		
Satisfaction with breasts	64.0 (21.7)	57.0 (21.8)	7.0	<0.01
Satisfaction with outcome	71.4 (22.7)	64.9 (24.0)	6.5	<0.01
Psychosocial well-being	70.9 (20.5)	65.2 (21.4)	5.7	<0.01
Sexual well-being	52.3 (21.7)	45.4 (20.7)	6.9	<0.01
Physical well-being: chest and upper body	75.1 (17.0)	71.7 (17.8)	3.4	0.01

Unadjusted scores

<sup>a</sup> Includes only patients with radiation to the tissue expander or the permanent implant

Albornoz CR et al. Ann Surg Oncol 2014

# Modalità di trattamento RT

- Tecnica standard buona copertura bersagli, rispetto OAR
- Protesi, espansore o valvola metallica non interferenza con distribuzione di dose
- RT su IMN → > dose polmone e cuore
  - Sensus-Konefka E et al Cancer Treat Rev 30:671-682, 2004
  - Moni J et al. Med Dosim 2004
  - Thompson RCA, Morgan AM. Med Phys 2005
  - Damast S et al. Int J Radiat Oncol Biol Phys 2006
  - Chen SA et al. Int J Radiat Oncol Biol Phys 2013
  - Chang EI et al Plast reconstr Surg 131:1-8, 2013
  - Ohri N et al Int J Radiat Oncol Biol Phys 2012
  - Ho AY et al med Dos 2014
  - Liljegren A et al. Radiat Oncol 9:14-23, 2014
- IMRT
  - Jung AL et al J Med Im Radiat Oncol 2013
  - Koutcher L et al. Radiother Oncol 2010
- HT → completa copertura target < alte dosi OAR, ma > basse dosi tessuti sani...
  - Massabeau C et al. Med Dosim 2012
- IMPT ...
  - Jimenez RB et al Radiother Oncol 2013

# IMRT parete toracica e drenaggi dopo ricostruzione con E/I



# Conclusioni

- ✓ Interferenza RT/ricostruzione è indipendente da tipo di ricostruzione e timing
- ✓ Tipo ricostruzione/Timing RT:
  - E/I immediata → RT,
  - RT → autologo differita
  - RT impianto vs espansore < complicanze
- ✓ Modalità trattamento RT in evoluzione → IMRT
- ✓ Selezione/informazione pazienti ≠ ricostruzioni
- ✓ Training operatore E/I silicone, no ADM, tipo di lembo
- ✓ Valutazione QoL, cosmesi e soddisfazione pz



Grazie dell'attenzione

# Complicanze precoci/tardive

## Precoci:

- Infezione/infiammazione
- Ematoma, Sieroma
- Necrosi
- Rigetto

## Tardive:

- Fibrosi
- Contrattura capsulare
- Estrusione, dislocazione
- Morfologia alterata
- Dolore