

INDICATIONS FOR FATGRAFTING IN BREAST CANCER: RECONSTRUCTION AND REPAIR

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Indications

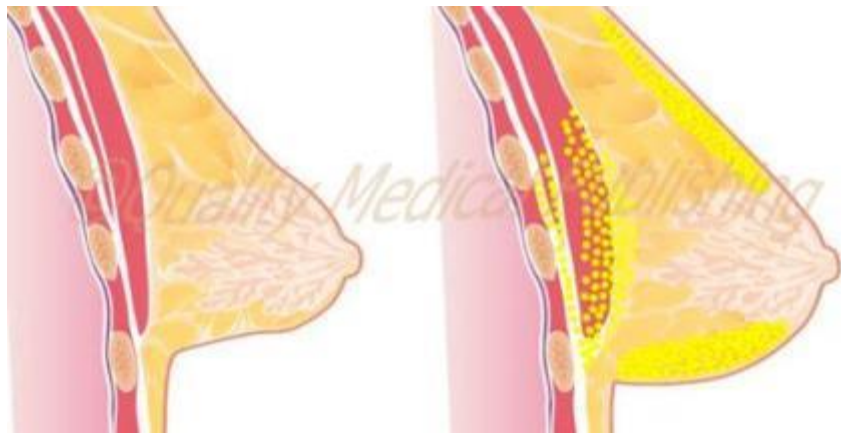
- Breast reconstruction
 - Adjunct to fill defects
 - total BR
- BCT +/- oncoplastic
 - Adjunct to fill defects
 - Release of thigh scar tissue
 - To restore volume
- Post mastectomy
 - Pain relief
 - Release of thigh scar tissue
- Lymphoedema?
 - Pain relief
 - Release of thigh scar tissue
 - Improvement of lymphoedema?

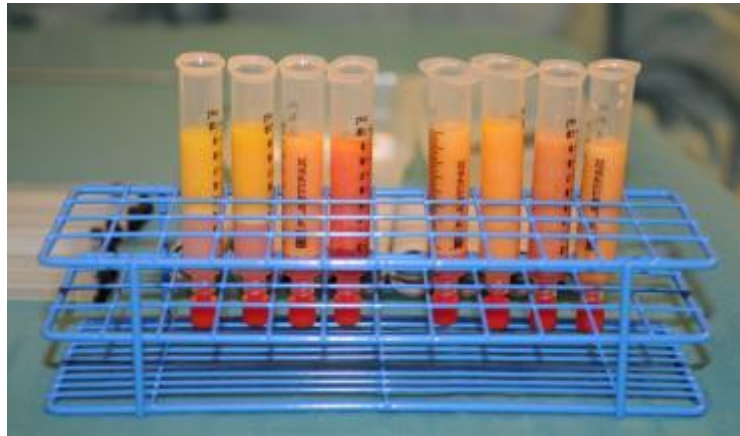
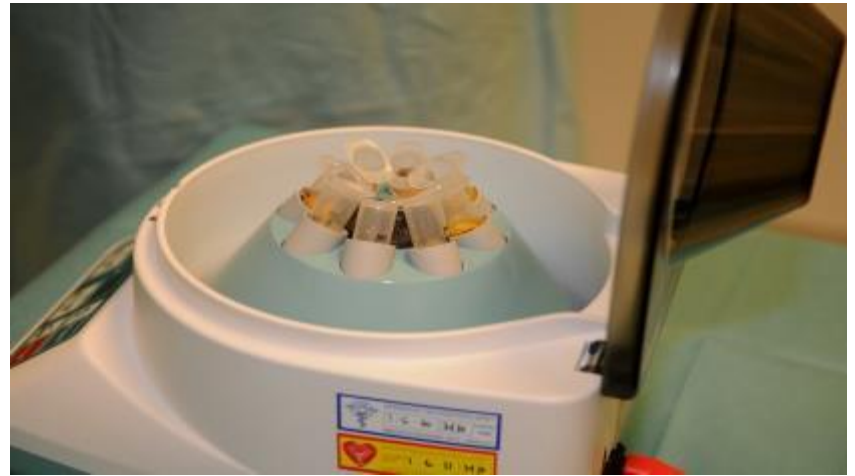


The literature

- Low level evidence!
- Few studies with long term data
- Suffers from difficulty in measuring effect
 - 3D volume measurements
 - MRI measurement
 - Clinical evaluation

Principle for fat transplantation





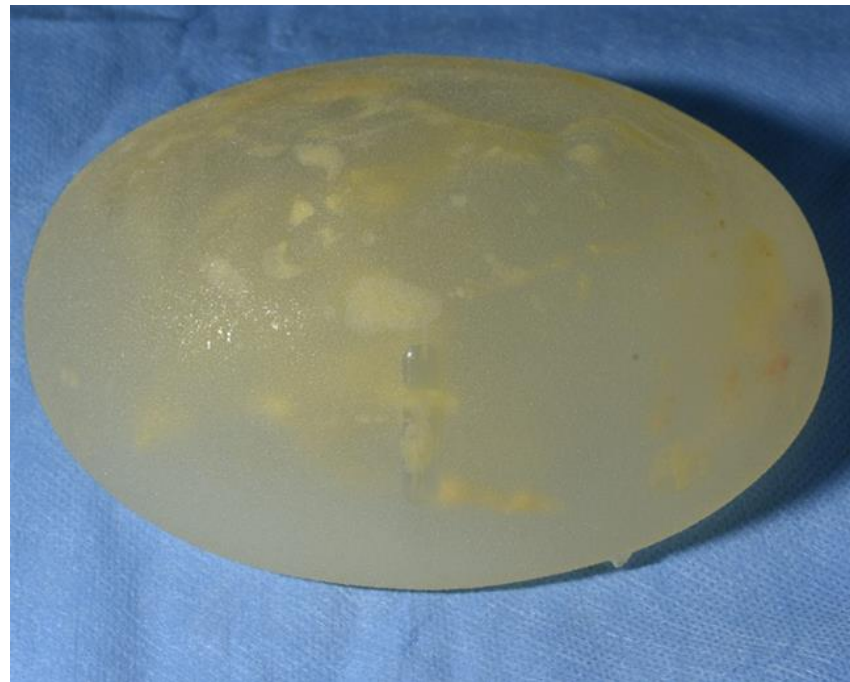
Fan-shaped injection with stump cannula in different layers



Pre-op and 6 months after fattransplantation to reconstructed right breast



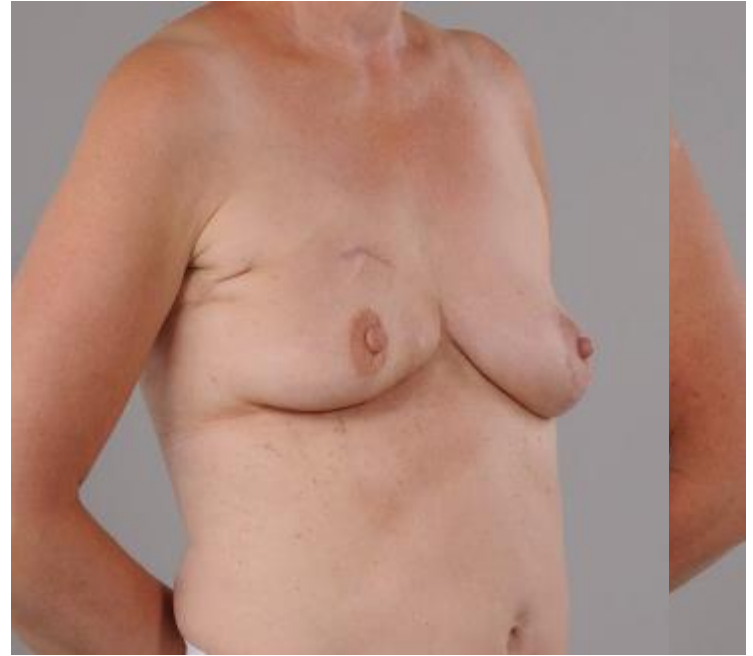
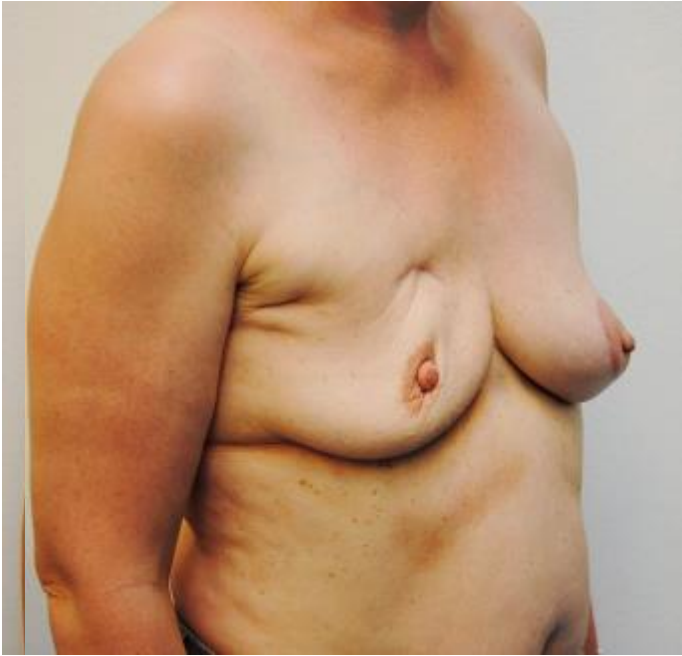
Ups!



LD-flap to defect after BCT + fat transpl.



BCT + 1. session of fat grafting



BCT + 1 session of fattranspl.to right + mastopexy of left breast



Breast Recon

multicenter study, 35 breasts, 28 pts.

- 66 year old BC pt.
- 7 sessions of fat-grafting of
- 250, 250, 200, 150, 300, 100 + 250
- Below 6 month follow-up



4-6 procedures, mean 159 +/- 61 ml over 21 months
(range 9-30)



- 56 year old BC patient
- 4 sessions of fatgrafting of 300, 250, 230, 210 cc.
- Below follow-up after 12 and 18 months

Right side BRAVA + 2 sessions of fat transplantation, left 4 sessions of fat (irradiated) + 3 BRAVA. 2 year postop

Tissue-Engineered Breast Reconstruction with Brava-Assisted Fat Grafting: A 7-Year, 488-Patient, Multicenter Experience

Roger K. Khoury, M.D.
Gino Rigotti, M.D.
Roger K. Khoury, Jr., B.S.
Eusebio Carbone, M.D.
Alexandra Marini, M.D.
Sylvia C. Rosenberg, M.D.
Thomas J. Baker, M.D.
Thomas M. Bagge, M.D.
Hans H. Hahn, PhD, Jan Axel
Wahl, and Thomas Dier

Background: The ability of autologous fat transfer to reconstruct an entire breast is not established. The authors assessed the regenerative capabilities of external expansion and autologous fat transfer to completely reconstruct breasts.

Methods: The authors performed 1877 Brava plus autologous fat transfer procedures on 416 breasts in 488 women to reconstruct 99 hemipneumonectomies, 87 axillary breast reconstructions, and 490 delayed total breast reconstructions. After 2 to 4 weeks of Brava expansion, which increased volume by 100 to 300 percent, the authors diffusely grafted the breasts with 100 to 400 ml (323 ml average) of 15-g-needle, manually harvested liposyringe. The

488 women,
616 breasts

Case Reports in Surgery

Indexed
in Web of
Science

Case Rep Surg. 2015; 2015: 601904.

Published online 2015 Feb 22. doi: 10.1155/2015/601904

PMCID

Delayed Total Breast Reconstruction with Brava

Niels Hammer-Hansen,* Thomas Bo Jensen, and Tine Engberg Damsgaard



Total BR with fat-transplantation: 7 cases, mean age 41

- Expander + weekly inflation
- After 8 weeks, 1/3 of volumen was removed and on avarage 160 cc fat transfer/session
- 4 fat transplantation procedures/patient, 3 months in between
- MR after 9 months: Breast volume = 386 ml (231-557 ml)

Journal of Plastic, Reconstructive & Aesthetic Surgery (2016) 69, 1579–1587



ELSEVIER



Intratissular expansion—mediated, serial fat grafting: A step-by-step working algorithm to achieve 3D biological harmony in autologous breast reconstruction[☆]



Filip B.J.L. Stillaert^{a,*}, Casper Sommeling^a, Salvatore D'Arpa^a, David Creytens^b, Koenraad Van Landuyt^a, Herman Depypere^c, Rudy Van den Broecke^c, Stan Monstrey^a, Phillip N. Blondeel^a, Wayne A. Morrison^d

^a Department of Plastic and Reconstructive Surgery, University Hospital Ghent, Belgium

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^c Department of Gynecology, University Hospital Ghent, Belgium

^d O'Brien Institute, Melbourne, Australia

100 ml injected fat \approx 50 ml in 3D

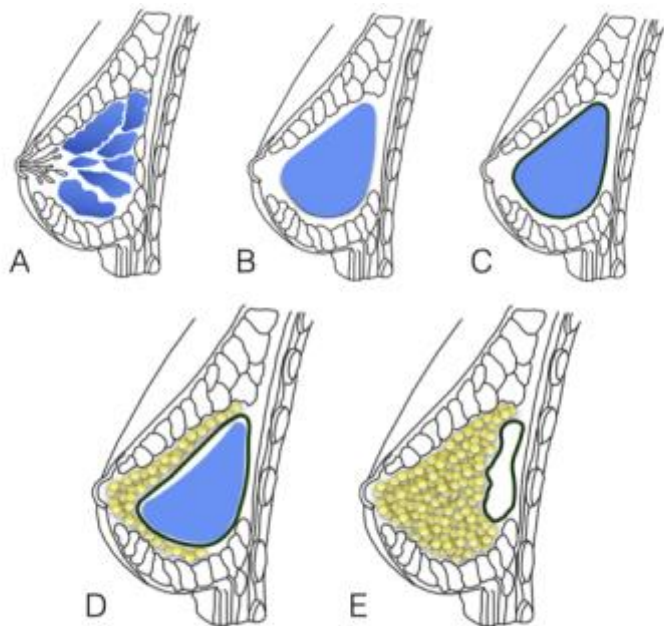


Fig. 1 Normal breast anatomy (A). An expander is positioned in the prepectoral plane (B). Capsule formation as a biological response (black line) (C). Serial deflation and fat grafting in the subcutaneous plane (D). Removal of the expander, with the capsule retained (E).

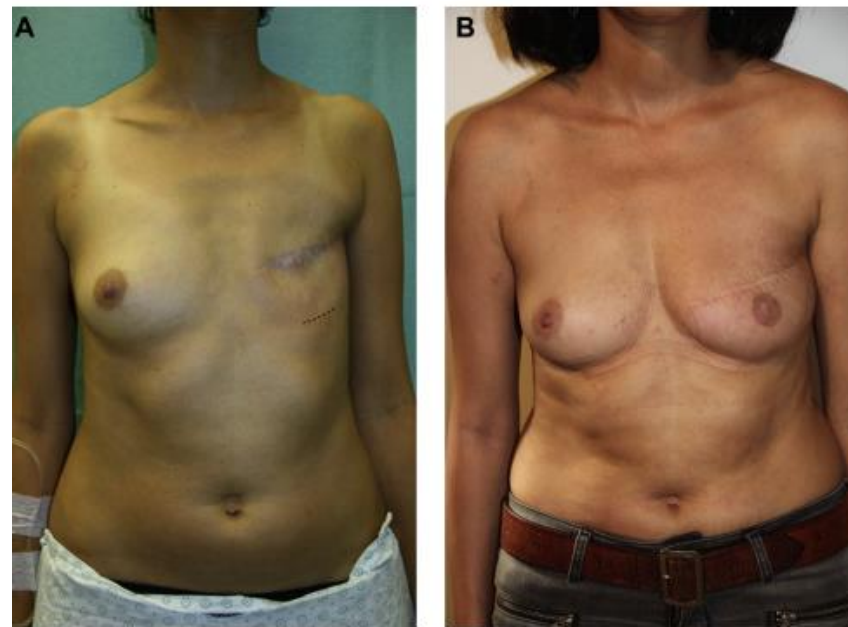


Fig. 2 Primary breast reconstruction in a 29-year-old patient (A). An expander was inserted in a prepectoral plane through an imaginary inframammary fold (IMF) incision (dotted line). She had 4 fat-grafting sessions with a total volume of 620 ml. Magnetic resonance imaging was used to calculate a final volume of 262 ml at 2-year follow-up (B).

57 patients, 4.1 procedures in irradiated, 2.5 in non-irradiated. Mean 318 ml / procedure

Journal of Plastic, Reconstructive & Aesthetic Surgery (2017) 70, 1537–1542



'Reverse expansion': A new technique of breast reconstruction with autologous tissue



L. Fabiocchi^a, G. Semprini^{a,*}, F. Cattin^a, L. Dellachiesa^b,
T. Fogacci^a, G. Frisoni^a, D. Samorani^a

^a Breast and General Surgery Unit, "A. Franchini" Hospital, Via Pedrignone 3, Santarcangelo di Romagna, Italy

^b General Surgery Clinic, University of Ferrara School of Medicine, Via Aldo Moro 8, Ferrara, Italy

Table 1 Results of aesthetic evaluation of the post-operative pictures (Four surgeons).

	Poor	Fair	Good	Excellent
Surgeon 1	0	7	10	40
Surgeon 2	0	0	15	42
Surgeon 3	0	1	18	38
Surgeon 4	0	0	22	35



Figure 4 a–c: Number of sessions: 3. Total injected volume: 1300 cc. Maximum injected volume per session: 470 cc. Maximum injected volume per session: 430 cc. Clinical check after 3 years.

Factors that indicate lower viability of pericytes/ADSC and adipocytes

- Smoking
- Increasing age
- Increased BMI
- Diabetes mellitus
- Tamoxifen
- Previous radiation

Varghese et al. *Stem Cell Research & Therapy* (2017) 8:45
DOI 10.1186/s13287-017-0483-8

Stem Cell Research & Therapy

REVIEW

Open Access



Systematic review of patient factors affecting adipose stem cell viability and function: implications for regenerative therapy

Jajini Varghese^{1*}, Michelle Griffin^{1,2†}, Afshin Mosahebi^{1,2} and Peter Butler^{1,2}

41 studies

Patient selection

- Normal mammogram/no sign of recurrence
- Non-smoker (at least for 6 weeks, probably longer)
- No material comorbidity (no diabetes, no lung problems)
- Min.12 months after radiation therapy
- Adequate donorsite
- Age?

Lipomodelling Guidelines for Breast Surgery

Joint Guidelines from the Association of Breast Surgery, the British Association of Plastic, Reconstructive and Aesthetic Surgeons, and the British Association of Aesthetic Plastic Surgeons

21 studies; 1011 breast reconstructions in 834 women



Review

Efficacy of breast reconstruction with fat grafting: A systematic review and meta-analysis

Mikkel Herly^{a,*}, Mathias Ørholt^a, Andreas Larsen^a,
Christian B. Pipper^b, Rikke Bredgaard^a, Christina S. Gramkow^a,
Adam J. Katz^c, Krzysztof T. Drzewiecki^a,
Peter V. Vester-Glowinski^a

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- Mean number of procedures to complete reconstruction:
- Non-irradiated: 2.84 - 2.93 for mastectomy vs skin-sparing mastectomy
- irradiated: 4.27 - 4.66 after mastectomy vs skin-sparing mastectomy
- no difference whether skin-sparing or not, but significantly more in irradiated breasts
- 1.72 after BCT

Complications; total 10.7 – 44.1%

- Palpable lumps most common
 - Mastectomy non-irradiated:
 - 6 % - 11.9 %
 - Mastectomy irradiated:
 - 13 % - 33.9 %
- BCT 15.7 %
- Fat necrosis
- Infection
- Ulceration necrosis
- Oily cysts
- Pneumothorax
- hematoma



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2017 IBR with ADM + impl. Left previously BCT, irradiated (2015)

Blister – after fattranspl. 2018



Developed full skin necrosis



Infection – implant removed



2 months after implant removal



Last week LD flap (+ sunexposure☺)



Donor site morbidity – acute and long term? Not studied!



- Irregularities...
- Asymmetry
- Skin laxity
- Hyper pigmentation
- Chronic pain?

- And worse with several procedures!

89 studies, 5350 patients

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Review

Efficacy of autologous fat transfer for the correction of contour deformities in the breast: A systematic review and meta-analysis

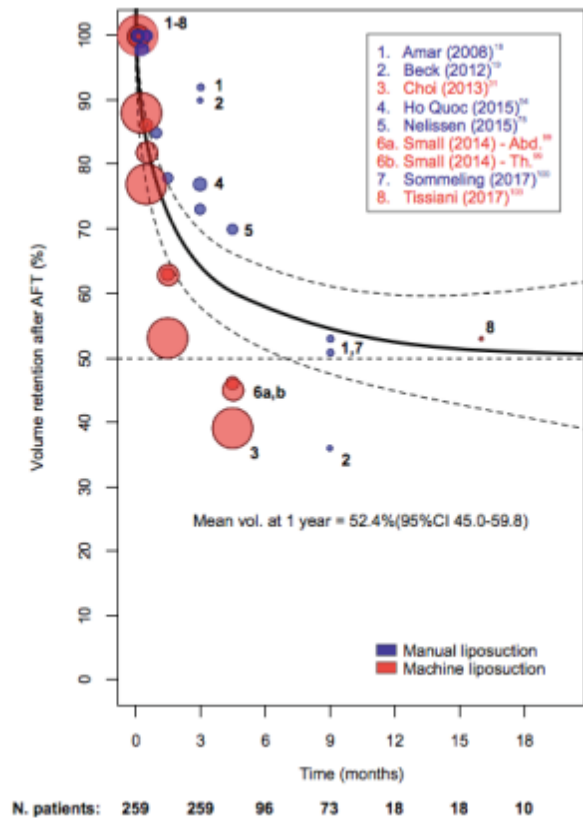
Todor K. Krastev*, Ghufraan A.H. Alshaikh, Juliette Hommes, Andrzej Piatkowski, Rene R.W.J. van der Hulst

Department of Plastic, Reconstructive and Hand surgery, Maastricht University Medical Centre (MUMC+), R. Debyeelaan 25, 6229 HK, Maastricht, The Netherlands



- Mean follow-up 1.9 year
- Patient and surgeon satisfaction 94.3% and 95.7%, respectively
- Mean of 1.5 procedures/patient
- 5% complications (10% in BCT)
- 8.6 % breasts needed biopsy

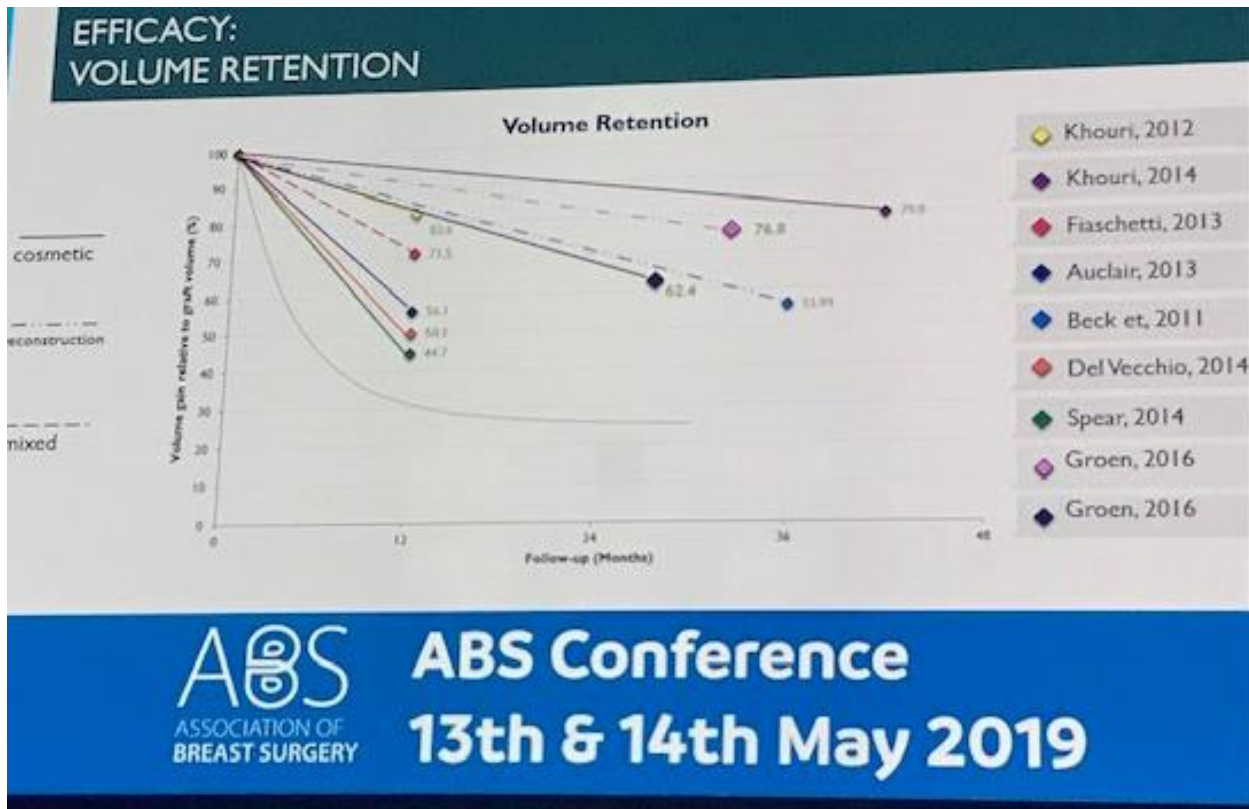
Efficacy – long term survival, 8 studies, 259 pts.



- 50% in the long term (only few patients with long term follow-up)
- Between 30-100% of patients in the studies had radiation therapy

Perhaps even lower take..?

Proff. John Kim, Northwestern Memorial Hospital, Chicago



Still many issues to examine besides donor site morbidity..

Table 2

Recommendations for future research.

Research question	Proposed study design
1. Oncological safety of AFT in the breast reconstruction after cancer	Retrospective matched-cohort studies
2. Factors determining the (long-term) volume retention	Prospective 3D imaging studies
3. Added value of supplements (PRP, SVF) or devices (BRAVA)	RCTs, prospective cohort studies
4. Optimisation of the AFT technique (speed, volume, ↑ survival)	RCTs, prospective cohort studies
5. Effect of AFT on function, fibrosis, pain	RCTs, prospective cohort studies

Journal of Plastic, Reconstructive & Aesthetic Surgery (2020) 71, 1383–1408



Review

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Todor K. Krastev^a, Ghufan A.H. Alshaiikh, Juliette Hommes, Andrzej Platkowski, Rene R.W.J. van der Hulst

^aDepartment of Plastic, Reconstructive and Hand surgery, Maastricht University Medical Centre (MUMC+), P. Debylaan 25, 6229 XZ, Maastricht, The Netherlands

Take home message:

- Fat transplantation is a good adjunct for BR and BCT patients with minor defects
- However, outcome hard to predict
- In Denmark, full BR with fat is not a general offer
- Many patients have (relative) contraindications with bad odds for good effect
- Palpable lumps common
- Quite costly if more procedures are needed

Thank you 😊

