

The Use of Consistent Language in Reporting Fat Necrosis in Autologous Fat Grafting of the Breast: A Systematic Review



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Introduction

- Autologous fat grafting (AFG) is a widely adopted approach to optimize outcomes in breast reconstruction and augmentation.
- Although fat necrosis is a well-known consequence of AFG, it remains poorly and inconsistently defined in the literature.
- In late 2014, FDA released draft guidance to avoid future AFG – a statement that was permissively modified with restrictions in late 2017.
- The language and descriptions of fat necrosis are inconsistent in the literature.

Methods

- Five databases were queried for studies reporting fat necrosis following AFG for breast reconstruction or augmentation from inception to August 11, 2022.
- Studies were temporally stratified according to released FDA guidelines: pre-2015, 2015-2017, and 2018-2022.

Results

- 61 articles met inclusion criteria.
- Pre-2015, 6 of 21 studies (28.6%) offered clear definitions of fat necrosis.
- In contrast, 2015-2017 lacked clear fat necrosis definitions (0 of 13 studies, p=0.03).
- 2018-2022 period in annual publications compared with the pre-2015 period (5.4 vs. 1.9, p= 0.04) was not matched by a rise in clear fat necrosis reporting (14.8% studies, p=0.45).
- Across all periods, 16.4% of articles offered clear definitions, which exhibited wide heterogeneity.

Table 1: Studies Reporting Autologous Fat Grafting Outcomes

Comparisons	Time Period		
	Pre-2015	2015-2017	2018-2022
Study characteristics (n)			
Studies ^a	21*	13	27*
Patients ^b	2590	913*	3578*
Breasts ^c	1711	906*	6311*
Quality of evidence (%) ^a			
High	4.8	15.4	11.1
Moderate	23.8	23.1	33.3
Low	47.6*	53.8*	37.0
Very low	23.8	7.7	18.6
Study design (%) ^a			
Prospective	28.6	30.8	22.2
Retrospective	71.4	61.5	77.8
Clinical trial	0	7.7	0
Indication for autologous fat grafting (%) ^a			
Reconstruction			
With implant	61.9*	46.2	55.6*
Without implant	4.8*	15.4	18.5*
Augmentation			
With implant	14.3*	23.0*	14.8
Without implant	19.0	15.4	11.1

Conclusions

- The number of studies clearly defining fat necrosis following AFG of the breast have fluctuated in the context of changes in FDA guidance.
- Despite increasing popularity of AFG, fat necrosis remains inconsistently defined.
- Failure to use consistent definitions of fat necrosis limits the ability to compare surgical outcomes across studies.

Table 2: Impact of FDA Guidelines on Fat Necrosis Definitions in AFG Breast Procedures

Comparisons	Time Period		
	Pre-2015	2015-2017	2018-2022
Fat necrosis criteria clearly defined (%)	28.6*	0*	14.8
Fat necrosis diagnostic modality (%)			
Clinical exam	23.4	46.2	51.9
Ultrasound	42.9	53.8	55.6
CT	4.8	0	0
MRI	28.6	23.1	29.6
Biopsy/histopathology	23.8	30.8	33.3
Mammography	47.6	30.8	33.3

^a Student’s t-test performed comparing average number of studies and type of studies per year
^b Student’s t-test performed comparing number of *patients* per study
^c Student’s t-test performed comparing number of *breasts* per study
* Denotes a significant difference (*p* <0.05) between labeled values within a row

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