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# Is the Mastectomy Flap Thickness a Good Predictor of Nipple Areolar Complex Suffering? A Radiological Study of 73 Breasts before Nipple Sparing Mastectomy.

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**Is the mastectomy flap thickness a good predictor of nipple areolar complex suffering?**

**A radiological study of 73 breasts before nipple sparing mastectomy.**

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Mastectomy skin flap necrosis (MSFN) has a reported incidence of 5%–30%, with a higher rate for nipple sparing mastectomy (NSM) (1) (2) (3). Rancati and al. (4) suggested that thickness of subcutaneous tissue might contribute to the vitality of the NAC after surgery.

Our objective was to evaluate if the preoperative determination of this thickness could be a good predictor of NAC necrosis for NSM.

We retrospectively reviewed the oblique lateral preoperative mammograms of 49 patients between november 2013 and may 2018 who underwent nipple sparing mastectomies with a minimum follow-up of postoperative 3 months. Our main objective was to determine a correlation between the thickness of cutaneous and subcutaneous tissues and the areolar survival rate with the same method as Rancati et al. (2). The subcutaneous tissue thickness is uneven on the mammogram, it was arbitrarily decided to carry out this measurement at half the distance between the supra-mammary fold and the nipple.

These measurements were then classified into three types (<1cm, 1-2cm, >2cm) following Rancati et al. (4)

We collected others measurements and datas: the upper area (surface between the superior fold to the upper aspect of the nipple areolar complex (NAC)) and the lower area (surface between sub-mammary fold to lower aspect of the NAC). The length between the supra-mammary fold and the nipple (superior length) and the length between the infra-mammary fold and the nipple (inferior length).

We evaluated the skin necrosis (NAC or mastectomy flap) with the following classification:

- Stage 0: no necrosis.
- Stage 1: any skin alteration and/or NAC necrosis <50%..
- Stage 2: necrosis of > 50% of the NAC.

As results, 49 patients and 73 NSM with immediate reconstruction were performed. We used an implant (definitive or expander) associated with a dermal matrix in 58 cases (79.45%), an implant alone in 10 cases (13.69%) and free flap (DIEP) in 5 cases (6,86%) including two double DIEP and one simple DIEP.

<b>Patient population</b>	
No. of patients	49
NSM reconstructions	73
<b>Demographics</b>	
Age (yr)	
Mean	41,8
Median	43
Range	[19;62]
Smoking	9 (18,4%)
Radiotherapy	6 (8,2%)
Mastectomy weight (g)	
Mean	395
Median	334
Range	[76;1000]
Indication	
Prophylactic	63 (86,3%)
Therapeutic	10 (13,7%)
Laterality	
Unilateral	46 (63%)
Bilateral	27 (37%)
Mastectomy incision	
Submammary	55 (75,3%)
Wise pattern	3 (4,2%)
Inferior hemiareolar	15 (20,5%)
Type of reconstruction	
Implant alone	10 (13,69%)
Implant with dermal matrix	58 (79,45%)
DIEP flap	5 (6,86%)

**Table 1:** Demographic datas

Complications reported 24 NAC suffering (32.88%) with only 4 total necrosis (5,5%), 10 seromas (13.70%), 4 infections (5.48%), 3 hematomas (4.11%).

17 NACs suffering patients needed spontaneous healing, one excision suture and implant wash, 2 patients required an implant change with pocket washing and excision of less than 50% of the NAC surface and 3 patients required hematoma evacuation. Finally, no reconstruction failure or implant loss during all these procedures.

The patients were divided into three groups according to the thickness of the subcutaneous tissue (32 types I, 36 II, 5 III).

The *Table 2* reports the distribution of areolar suffering such as defined as previously.

	I	II	III	Overall
0	21	26	2	67,12%
1	10	7	3	27,40%
2	1	3	0	5,48%

**Table 2:** Distribution of 73 mastectomies by subcutaneous tissue thickness and type of areolar suffering

We report 11 NAC skin vitality alteration (partial and total) in group I, 10 in group II and 3 in group III. The average thickness of the subcutaneous tissues found a similar thickness regardless of the type of areolar suffering [11.2-12.4mm].

The analysis of the occurrence of an areolar suffering according to the types I, II and III does not show to be significant predictors of areolar suffering.

The study by Rancati et al. (4) (5) is the first to evaluate the value of measuring subcutaneous tissue on preoperative mammograms with a method not described in their article and does not seem to be standardized. They showed that no necrotic complication has occurred after selecting patients into group III (> 2cm tissue).

Our measurement method is simple, reliable and reproducible and the mammography technique remains standardized for all patients with a measurement scale interpretable between individuals.

We did not find any correlation between pre op evaluation of the mastectomy thickness on mammograms and the risk of NAC necrosis.

This is, to our knowledge, the first study looking for a correlation between the risk of NAC necrosis after mastectomy with immediate reconstruction and the thickness of subcutaneous tissue determined on preoperative imaging. Pre operative measurement of mastectomy flap thickness on mammograms is not a good predictor, alone, of the skin vitality of the NAC.

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