Prophylactic nipple-sparing mastectomy leaves more terminal duct lobular units in situ as compared to skin-sparing mastectomy

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Background
Prophylactic skin-sparing mastectomy (SSM) is associated with major breast cancer risk reduction in BRCA1/2 gene mutation carriers and other high risk patients. In prophylactic nipple- and skin-sparing mastectomy (NSM) it is unknown how much glandular tissue remains behind the nipple-areola complex (NAC) additionally to those behind the skin flap. Therefore safety of NSM can be doubted. We compared amounts of terminal duct lobular units (TDLUs) behind the NAC as compared to the skin flap.

Methods
In prophylactic SSM and conventional therapeutic mastectomy patients, the NAC and an adjacent skin island (SI) were resected as if it were an NSM. NAC and SI were serially sectioned perpendicularly to the skin and analysed for amounts of TDLUs present. Slides of NAC and SI were scanned and slide surface areas (cm²) were measured. TDLUs/cm² in NAC- versus SI-specimen, representing TDLU density, were analysed pairwise.

Results
In total 105 NACs and SIs of 90 women were analysed. Sixty-four NACs (61%) vs. 25 SIs (24%) contained ≥1 TDLUs. Median TDLU density was higher in NAC-specimens (0.2 TDLUs/cm²) as compared to SI-specimens (0.0 TDLUs/cm²; P<0.01). Independent risk factors for presence of TDLUs in the NAC-specimen were younger age and parity (versus nulliparity).

Conclusion
The finding of higher TDLU density behind the NAC as compared to the skin flap suggests that sparing the NAC in prophylactic NSM in high risk patients possibly may increase postoperative breast cancer risk as compared to prophylactic SSM. Studies with long-term follow-up after NSM are warranted to estimate the level of residual risk.