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LETTER TO THE EDITOR

Comment on: Breast Implant Surfaces and Their Impact on Current Practices: Where Are We Now and Where Are We Going

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Sir:

We read with interest the article by Munhoz et al,[1] that offers a broad overview on breast implant surface characteristics, different methods to assess implant surfaces, implant surface classifications, and potential influences of different surfaces on capsular contracture and Breast Implant Associated-Anaplastic Large Cell Lymphoma (BIA-ALCL) risk.

We applaud the authors for presenting a thorough even though not systematic review of the literature on this topic, analyzing many aspects of the controversy surrounding breast implants surface characteristics and their impact on the incidence of capsular contracture and BIA-ALCL.

The authors underline how textured implant shells were introduced in the 1970s to minimize the occurrence of capsular contracture, assuming that an irregular surface would avoid the parallel alignment of collagen fibers causing capsular contracture. Since then, many studies have shown how textured surface implants are associated with reduced capsular contracture rates in subglandular breast augmentation. A systematic review by Wong et al. including 6 randomized controlled trials showed a significantly reduced risk of capsular contracture evaluated with Baker scale at 1 year (Relative risk 4.16; 95% CI, 1.58–10.96) with textured when compared with smooth implants.[2] Another systematic review and meta-analysis by Barnsley et al including 7 trials concluded for a protective effect of surface texturing on the rate of capsular contracture (OR 0.19; 95% CI, 0.07–0.52). Submuscular placement was the only subgroup in which significance was not achieved, even though this subgroup only included a single study.[3]

It is noteworthy that no randomized controlled studies comparing the use of textured with smooth implants positioned with the dual plane technique (partially submuscular) are available in literature, despite this technique being widely diffused following the description by Tebbetts.[4]

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Some other studies showed statistically insignificant-differences in terms of capsular contracture between textured and smooth breast implants both in the submuscular and in the subglandular position. For example, Poeppl et al presented the results of a prospective study including 48 women with capsular contracture in submuscular breast augmentation, examining excised capsular tissue. The histological examination showed no statistically significant difference between smooth and textured implants with respect to the development of capsular contracture, while the severity of capsular contracture showed a positive linear correlation with the degree of local inflammatory reactions which were independent of the implant surface.[5]

A recent clinical study by Lista et al[6] concluded that smooth surface implants placed in the subglandular plane were not associated with a significantly increased risk of capsular contracture compared with textured surface implants, concluding that adherence to a surgical technique focused on minimizing bacterial contamination of the implant is of greater clinical significance than implant surface characteristics when discussing capsular contracture.

In this view, we could agree with the authors when they state that the dispute surrounding textured surface implants and whether they reduce the incidence of capsular contracture remains.

However, different point of views could offer different interpretations of the same reality, as well described by the Spanish philosopher José Ortega y Gasset with his ideas of "perspectivism."

The association between bacterial contamination and the occurrence of capsular contracture has been proposed and demonstrated for a long time. Burkhardt et al[7] in 1986 presented the results of a randomized double-blind controlled clinical study on subglandular augmentation mammaplasty concluding that the cause of capsular contracture is periprosthetic bacterial contamination.

Afterwards some studies showed that textured surface could promote a higher growth of bacteria, as higher implant surface area/roughness could be associated to a higher bacterial growth in vitro,[8] but no clinical studies ever demonstrated a higher risk of capsular contracture associated with textured implants use.

These are experimental evidences, as well as the fact that bacteria rarely directly attach to abiotic surfaces, while cytokines and matrix proteins produced by immunological cells impacted by electrostatic charge, pH, and temperature interact with both the foreign body and themselves to promote bacterial adhesion, as the authors themselves underline.[9] For sure this means that it could be difficult to reproduce this complex interplay in vitro and we are far from finding an association between a particular type of implant surface and capsular contracture or BIA-ALCL development.

We absolutely believe that bacterial growth and biofilm formation play a fundamental role in the inflammatory response around breast implants and this could be associated with the etiopathogenesis of capsular contracture and potentially, along the same etiopathogenetic pathway, in genetically predisposed women, with BIA-ALCL development.

This is why we firmly believe that minimizing bacterial contamination during implant surgery remains of primary relevance and the discussion should move from breast implant surfaces, surface measurements methods, surface classifications, terminology, and marketing to more clinically relevant issues, as accurate surgical technique and meticulous methods to reduce contaminations at implant positioning.[10,11]

Implant classifications remains a taxonomic issue, that is absolutely relevant when comparing different implants, but anyway open to misunderstandings and misinterpretations. The authors underline how the term "nano" to address some implant surfaces remains a semantic issue and a question of view and perspective, since there is no consensus about the limits of the micro or nanoscale.

Well, we agree that we must move far from rigid taxonomy, if it has not a clinical relevance, but the difference from the micro-, nano-, pico-, and femto-scale is well defined by fundamental metrology.

We understand that terminologies as nano-texturization, micro-texturization, or macro-texturization should not necessarily reflect that of metrology but only represent a comparison between different types of texturization and remain advertising slogans, but this could lead to misinterpretations.[12]

We know that all market available textures are micro-texturizations according to metrology, but the ISO Classification (14607:2018) itself uses the terms of "smooth" surfaces for roughness (Ra) <10 µm, "microtextured" for Ra from 10 to 50 µm, and "macrotextured" for Ra >50 µm.[13]

In conclusion, we believe that the impact of implants textures on the etiology of capsular contracture and BIA-ALCL is far form being defined, as if we believe to the biofilm theory and to the association of texturization with higher bacterial growth and biofilm formation, we should also have evidences of higher risk of capsular contracture with textured implants use.

DISCLOSURES

Dr. Maurizio Nava is temporary consultant for Allergan and Smith and Nephew. The other authors have no financial interest to declare in relation to the content of this article.

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