

Tebbetts, J.B. Letter to the editor PRS:

Wishes and Tissues: A Concern about Dimensional Planning Systems that Lack Volume Restrictions and Do Not Prioritize Long-Term Soft-Tissue Coverage

Sir:

I am writing to advise colleagues of my concerns regarding an important aspect of dimensional systems to help make implant selection decisions. Specifically, any dimensional system must (a) incorporate some type of limit or warning to limit excessive weight or volume and (b) prioritize optimal long-term soft-tissue coverage above all other considerations, if minimizing reoperations and protecting patients' tissues long term are goals.

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While attending the most recent meeting of the American Society of Plastic Surgeons in Philadelphia, I heard presentations by two international surgeons detailing their personal modifications of existing dimensional systems. In two cases, I heard experienced surgeons say that when designing a breast according to dimensional principles using a system that I originated (the BioDimensional System), they simply chose the dimensions of implant required to produce the desired result and ignored volume considerations in the process. Having addressed this issue in a peer-reviewed publication, I inquired whether either surgeon was familiar with the second-generation system that I published in April of 2002 in *Plastic and Reconstructive Surgery*, the TEPID system,¹ which addresses many of the limitations of the first-generation system. My concern for the utmost priority—patients' tissues and outcomes—prompts this letter.

In 1993, I authored the first Dimensional System for breast augmentation,² later licensed by McGhan and subsequently named as the BioDimensional System. The purpose of the system was to offer surgeons a process for quantifying certain breast parameters, so that they could make more logical decisions and produce more predictable outcomes. The system allows surgeons to design a desired result dimensionally and then select an implant of appropriate dimensions to produce the desired result. This system has been used worldwide for the past decade.

Clinical experience, especially a decade of clinical experience, always points out the strengths and limitations of every technique or system. The strengths of the Dimensional and BioDimensional systems are as follows: (1) they were the first attempt to quantitate dimensions and patient tissue characteristics; (2) decisions

are based on quantifiable parameters; (3) surgeons have the ability to more scientifically evaluate quantified parameters; and (4) surgeons are able to produce more consistent and predictable results. After using the BioDimensional System for augmentation for more than 5 years, and seeing many patients in long-term follow-up with larger implants (more than 350 cc) that were *required* to achieve a desired result using the system, I have become aware of some limitations and even potential hazards of this first-generation system: (1) The system prioritized achieving a specific result instead of optimal long-term soft-tissue coverage (it did not include specific, quantifiable parameters that mandate optimal tissue coverage); (2) the system and current revisions by other surgeons have no guidelines or restrictions on volume limits; (3) the system is two-dimensional, omitting a critical third dimension—tissue stretch—that affects decisions about optimal volume for a specific patient’s envelope and provides information about risks of excessive stretch with bottoming or traction rippling; and (4) the system was originally designed to be specific to one manufacturer’s family of anatomic implant products.

The original BioDimensional System allows patients and surgeons to define a result and then forces the tissues to deliver that desired result, instead of recognizing what the tissues will allow or what they require to achieve an optimal long-term result with minimal negative tissue consequences.

For example, if patient or surgeon desired a wider base width to the breast compared with preoperatively, to narrow the intermammary distance (cleavage), the system allowed surgeons to select implants of a base width substantially greater than the base width of the patient’s existing parenchyma. If the implant was placed in a submammary position (or if placed subpectorally and dividing the medial origins of the pectoralis along the sternum to narrow the intermammary distance), this meant that the edges of the implant were covered only by subcutaneous tissue and skin. In thin patients, and in virtually all patients as they age, these tissues do not improve in thickness and quality. With thin subcutaneous tissue and skin over any breast implant, there is a risk of visible implant edges and visible traction rippling as the weight of the implant pulls on the capsule that is attached to the thin overlying tissues. Many of these deformities result from compromised preoperative decisions and failure to prioritize optimal, long-term tissue coverage above all other priorities in breast augmentation.

My major concern, and the reason for this letter, is that while the Dimensional and BioDimensional systems allow surgeons to dimensionally design a desired result, neither system offers any volume limitations or guidelines to prioritize soft-tissue coverage long term. Surgeons and patients are free to select any volume or projection required to produce the dimensional result. If surgeons or patients do not have quantifiable limits as *guidelines* (while still being able to go past those limits if they desire and are willing to accept responsibility for the decisions), irreversible

tissue consequences are possible, including stretch and thinning of skin and subcutaneous tissue and atrophy of breast parenchyma. These tissue consequences are, in many cases, irreversible and result from subjective, arbitrary decisions about breast size and dimensions that do not specifically consider quantifiable patient tissue characteristics. Although implant choices and designs are expanding, and some patients and surgeons are happy that they can now order implants with amounts of projection previously unheard of, I am concerned whether patients and surgeons are really aware of the potential consequences of excessive weight and/or projection on their tissues long term. For any base width implant, increasing projection means increasing volume, and that means increasing weight. Weight historically is a negative for the female breast tissue, if optimal longterm outcomes and minimal reoperations are a goal. Excessive pressure caused by excessive projection can produce stretch, thinning, and atrophy of parenchyma and subcutaneous tissue over time—irreversible changes that can produce uncorrectable deformities. In the April 2002 issue of the *Journal*, I published the TEPID system, a system that incorporates the strengths of the original Dimensional System while addressing its limitations.² The TEPID system is different from pre-

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vious dimensional systems in several major areas: (1) It prioritizes optimal long-term soft-tissue coverage above all other priorities. (2) By integrating dimensional with volume considerations, the TEPID system encourages surgeons to avoid implants with a base width greater than the base width of the patient's existing parenchyma (except in constricted lower pole or tubular breasts). (3) By recommending a starting volume for a specific base width, the system still allows the surgeon to choose a width, height, and projection of implant to optimize the result but also signals a warning level for volume while designing a breast dimensionally. (4) The TEPID system considers quantifiable stretch parameters, and (5) consisting of only three measurements and one estimate in its simplest form, it enables surgeons to take all measurements, make decisions in all five critical areas of augmentation (coverage, volume, implant, pocket, and incision), and complete operative planning in less than 5 minutes.

Since publication of the TEPID system in 2002, the system has been refined and simplified even more, and these refinements have been submitted to the *Journal*. This new system has been adopted by a large number of surgeons with busy augmentation practices as well as residents seeking a predictable, quantifiable method of matching implants to patients' tissue characteristics to try to optimize outcomes and minimize reoperations. As our knowledge grows and we gain additional clinical experience, we have a responsibility to advise colleagues of changes in areas in which we have published. More importantly, as older surgeons see the longerterm effects of breast implants on patients' tissues, we

have a responsibility to optimize the information we provide patients and help them make choices to balance their wishes with their tissues. I hope this letter will encourage colleagues to be careful when using any dimensional system that does not incorporate limitations on volume, regardless of what a patient may request. Ultimately, volume is weight, regardless of the excuse for adding more of it to gain width, height, or projection. There is a logical limit of weight/volume, if commonsense exists, beyond which tissues are being asked to tolerate weights and pressures to satisfy patients' or surgeons' arbitrary preferences, sometimes at the expense of patients' tissues.

While surgeons and patients have the right to make choices, each must also assume responsibility for those choices long term and should accept that responsibility in written, signed informed consent documents. It is not the responsibility of any system to overrule patients' and surgeons' right to choice. It is also not the responsibility of any system to pay the consequences of patient and surgeon decisions that exceed tissue tolerance limits. The better the system, the more the system should remind us of the potential price of prioritizing wishes over tissues, and the more it should encourage us to use quantifiable parameters to make objective decisions preoperatively that affect long-term outcomes.

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John B. Tebbetts, M.D.

2801 Lemmon Avenue West, Suite 300

Dallas, Texas 75204

jbt@plastic-surgery.com

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