Prediction in 3D

Breast imaging technology helps project outcomes, set patient expectations

Three-dimensional imaging scans of 28-year-old female who desired breast reduction shown (left) before and (right) after surgery. The pre-operative scan showed the left breast volume to be 705 cc and the right 590 cc, a difference of 155 cc. In the OR, 425 g was resected from the left breast and 270 g from the right, a difference of 155 g, the same as the difference on the pre-operative scans. The post-operative scan shows the breasts are now equal.

Montclair, NJ  Three-dimensional breast imaging is an asset to surgeons for breast augmentation, reduction and reconstruction, say these surgical experts. “Two-dimensional imaging systems allow us to see and simulate some changes, but 3D actually let’s us predict what we can achieve with surgery in real time,” says Allen Rosen, M.D., medical director of The Plastic Surgery Group, Montclair, New Jersey, and assistant clinical professor in the Department of Plastic Surgery at the University of Medicine and Dentistry of New Jersey (UMDNJ).

Decision Tool  Dr. Rosen utilizes Canfield Scientific Inc.’s Breast Sculptor Surgical modeling software with its VECTRA 3D camera. He says the system, which is programmed with data from a series of real patients, essentially enables him to perform “virtual surgery” ahead of time in his office with the patient present. The software application provides a visual comparison in 3D of different implant scenarios to help guide the implant selection. Dr. Rosen electronically “selects” a saline or gel implant from the complete catalogues of two major suppliers, and the result is instantly displayed on the system’s screen. “It was specifically developed to allow the surgeon to present a realistic expectation of outcomes and to communicate with the patient during the initial consultation,” Dr. Rosen tells Cosmetic Surgery Times. “We can change out implant sizes, widths, projections. It helps patients decide what’s right for them, and is particularly helpful in cases where the fit isn’t easy or standard.”

Case Report  Dr. Rosen describes his use of the Breast Sculptor 3D imaging system in the case of complex breast asymmetry associated with severe chest wall deformity. “Although minor to moderate breast asymmetries are typical and can be seen in a large portion of the general population, severe breast asymmetries associated with congenital deformities of the breasts are less common and require expertise in reconstructive techniques to achieve reasonable symmetry,” explains Dr. Rosen. “Underlying chest wall asymmetries are also common, but often times they are masked by the overlying breast and soft tissues. Deformities such as pectus excavatum, pectus carinatum and other chest wall asymmetries can be camouflaged with breast augmentation,” he adds.

That was the case in the instance of a 23-year-old female who presented with a severe chest wall asymmetry characterized by a prominent
serpentine ridge arising out of the right anterior thorax along the costochondral and costal sternal junction. This resulted in a prominence of the right chest in deference to her concavity on the left. She presented complaining of breast asymmetry and desired options for correction. The 3D imager allowed for a virtual selection of several different implant types pre-operatively. "The Breast Sculptor software was invaluable in pre-operative planning," states Dr. Rosen. "Digital implant selection helped in choosing the size, shape, position and projection of the final implant used at the time of surgery."

The patient was taken to the operating room, and via a mammary fold incision, an Allergan Style 68 HP Natrelle, saline filled, mammary prosthesis was placed on the left and inflated with 500 cc of saline. On the right side, Allergan Style 68 MP implant was placed and inflated with 425 cc of injectable sterile saline. "In asymmetry, one of the primary challenges is assessing how big of a difference there is between the two breasts, so you can determine how much of a differential in the implants is needed. In this case, the 3D imager enabled us to determine in advance exactly what size implants were needed," he explains. "I went into surgery having picked out my implants based on what I decided to use with the imager, but I also had back-ups on hand just in case. In the end, it turned out that what I did on the imager was exactly what I used in surgery."

This, says Dr. Rosen, highlights the 3D imaging system's strengths: achieving patient goals, increasing surgical efficiency and increasing surgical safety. "There are fewer intraoperative decisions to make, so it takes less time in the OR, and we are better at achieving the patient's goals and safe outcomes by reducing revision rates," he explains.

BARE FACTS New York Plastic surgeon, Nolan Karp, M.D., also relies on the 3D system and has done so for approximately 300 cases over the past 18 months. "We use it for breast augmentation, reduction and reconstruction. It gives us real, objective data whereas before we just had subjective data to work with. In breast reduction surgery, for example, given that most women are asymmetrical, the 3D imager can get a volume of both sides and we can figure out what the difference is between the two sides," explains Dr. Karp. The same holds true for augmentation, he points out. "In a recent case, we knew the patient had slight asymmetry just from what we could see, but Breast Sculptor enabled us to pinpoint exactly what we needed and we ended up putting a larger implant on one side and a smaller one on the other." Dr. Karp is director of plastic surgery service at Tisch Hospital, and an associate professor of plastic surgery at NYU School of Medicine where he also heads the Breast Plastic Surgery Service.

Dr. Karp confirms the benefits of enhanced efficiency and safety afforded by the 3D system, but adds that the imaging software offers patients a more tangible perk, as well. "If you put a sizer inside a patient's bra, they'll have an idea of what they'll look like with clothes on post-operatively, but with this system they can actually see an image on screen of what their breast will look like unclad post-operatively," he explains.

Another benefit of the system, according to Dr. Karp, is that its predictive value is anatomically realistic because it is based on a series of real patients. "This system takes into account that anatomical relationships are not linear, and, in doing so, it accurately predicts the realistic projection of an implant," he explains. "For instance, you would think that if you add an implant and the projection of the implant is four centimeters, then that should add four centimeters to the projection of the breast, but it doesn't. In reality, it only adds about 80 percent of that, and this is realistically interpreted by the 3D Imager and reflected on the screen image shown to the patient."

Neither of the surgeons sends patients home with a printout from the 3D imaging system, however. "I don't make a habit of printing out the image to send home with the patient, but I do keep it in my archives in case they'd like to refer to it again," notes Dr. Rosen. "It's a great way to communicate to the patient that, if they like this image, they'll like the outcome."

DISCLOSURES Drs. Rosen and Karp report no relevant financial interests.