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Innovative Technology Revitalizes Autologous Fat Transfer Procedure

It seems obvious that using a patient's own fat as a tissue filler would be advantageous. In scientific terms, the use of autologous fat in this manner solves a host of problems, but for aesthetic practitioners it is not so simple. Various factors such as tissue trauma and exposure to air and contaminants significantly reduce the viability of fat harvested via traditional, mechanical methods. As a result, physicians have the unpleasant task of asking patients to endure two uncomfortable procedures all over again – mechanical harvesting and implantation of fat. However, Eclipsemed, Ltd. (Dallas, Texas) has revolutionized this procedure with a new device that facilitates the collection of refined, viable autologous fat for improved results.

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Body Shaping Review

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Body-Jet with AquaShape LipoCollector II Reshapes Future of Fat Grafting

By Kevin A. Wilson, Contributing Editor

Body-Jet was brought to the U.S. aesthetic market via a partnership between Human Med AG (Schwerin, Germany) and Eclipsemed. Using a spray irrigation and aspiration method known as water-assisted liposuction (WAL), the device gently dislodges adipocyte clusters and rinses them out of the treatment site, while simultaneous low-pressure suction removes the fat, offering smoother results and minimal downtime. Additionally, Body-Jet creates a resource of high quality injectable fat that is harvested for transfer by the AquaShape LipoCollector II.

Energy-assisted liposuction techniques are nothing new to the aesthetic community, and laser-assisted liposuction is currently a popular choice. However, water-assisted liposuction is in a class of its own, according to Gordon H. Sasaki, M.D., a plastic surgeon in Pasadena, Calif. "WAL requires physicians to change their conceptions about traditional or energy-assisted liposuction because it represents a whole new algorithm on the continuum of liposuction technology development. While technically Body-Jet is an energy-assisted method, it is much gentler than current alternatives."

Gordon H. Sasaki, M.D.
Plastic Surgeon
Pasdena, CA

"Fat cell clusters are similar to grapes on a vine," explained Todd K. Malan, M.D., F.A.C.O.G., director of Innovative Cosmetic Surgery Center in Scottsdale, Ariz. "In essence laser- or ultrasound-assisted techniques use energy to rupture

Todd K. Malan, M.D., F.A.C.O.G.
Director of Innovative Cosmetic Surgery Center
Scottsdale, AZ

the cells, thereby releasing liquid fat for easy aspiration. But there is some leftover tissue debris that causes swelling during the natural healing process. What Body-Jet does," he continued, "is actually knock the 'grapes' off the vine while leaving the surrounding structures intact." In the case of the body this means blood vessels, lymphatics, connective tissue, nerves and other structures. "This greatly minimizes blood loss and trauma to the tissue, which in turn reduces the inflammatory response, thus improving healing and decreasing recovery time. It also promotes skin retraction. AquaShape LipoCollector II additionally washes and separates the extracted fat, in a sense, for safer and more effective collection."

Originally, Dr. Malan brought the Body-Jet into his practice to harvest fat, but was won over by the fat removal results he witnessed firsthand in his patients. "I was very excited about the atraumatic harvesting of fat for grafting, which I knew would improve fat cell survival rates, but we also noticed right away that our clients healed much more rapidly than you'd see with other liposuction techniques. Furthermore, we saw one month improvement that rivaled results typically seen several months after traditional liposuction. To me, this highlights the value of reducing the tissue trauma that challenges natural healing processes by creating excessive swelling and bruising."

"WAL requires physicians to change their conceptions about traditional or energy-assisted liposuction because it represents a whole new algorithm on the continuum of liposuction technology development."

Before Tx

After Body-Jet Tx

Photos courtesy of Gordon H. Sasaki, M.D.

"Since the fluid dynamics with WAL are completely different, surgeons could theoretically remove more fat than the current guideline of 5,000 cc set forth by ASPS."

Before Tx

One month after Body-Jet Tx

Photos courtesy of Barry DiBernardo, M.D., F.A.C.S.

Since surrounding tissue and functional structures are spared with Body-Jet, downtime and post-operative discomfort are considerably reduced compared to other liposuction techniques, Dr. Sasaki shared. "This makes Body-Jet useful for localized and generalized, primary and secondary liposuction procedures."

As Barry DiBernardo, M.D., F.A.C.S., medical director of New Jersey Plastic Surgery in Montclair, N.J. observed, patients previously treated with traditional liposuction report that, in comparison, Body-Jet brings improvements in results, recovery, downtime and the overall treatment experience. "This is a remarkable, unique technology that physicians should get to know."

Barry DiBernardo, M.D., F.A.C.S.
Medical Director
New Jersey Plastic Surgery
Montclair, NJ

"Body-Jet is so gentle that patients with excessive scarring and lumpiness from previous liposuction procedures can be successfully treated for noticeably improved results," added Dr. Malan. "About 60% of my practice is me using Body-Jet to give someone else's liposuction patient better results."

First-time results tend to be impressive, reported Dr. Sasaki. "Although WAL with Body-Jet would be classified as a super-wet technique, the fluid load is actually quite minimal because the spray and suction basically occur together. This allows the surgeon to have a much better feel for the result during the procedure, leading to a better assessment of what the final outcome should be. In the end you're not leaving as much fluid in the body to be eliminated, which means less residual anesthetic; therefore, potential toxicity issues are much less likely as well. There is almost no loss of blood. The procedure is also far less labor intensive for the surgeon."

In addition, Body-Jet may challenge the current philosophy of how much fat can be safely removed during a single procedure. Build-up of anesthetic in the system, a danger with other forms of liposuction, contributes to limiting removable volume. "Since the fluid dynamics with WAL are completely different, surgeons could theoretically remove more fat than the current guideline of 5,000 cc set forth by the *American Society of Plastic Surgeons* (ASPS)," said Dr. DiBernardo.

"We also minimize drug exposure because we use a lower concentration of anesthetic in the solution with WAL," Dr. DiBernardo further explained. "Additionally, we remove more than 85% of the solution that we introduce, which helps mitigate the possibility of fluid or electrolyte imbalances. With traditional liposuction we're lucky to get 50% of the fluid back out. These new dynamics will require physicians with liposuction experience to reorient their thinking, but Body-Jet is a well-built, well-designed device that can handle large volume fat removal and harvesting with a great deal of precision."

The WAL procedure with Body-Jet may be performed under local anesthesia in an office setting, or general anesthesia. Pre-treatment protocols are similar to those of any other liposuction

technique, Dr. Sasaki advised. "After treatment, I will implant a quarter inch Penrose drain to promote drainage early in recovery. Other openings may be closed with a single suture, or left to heal by themselves. The standard prophylactic three day course of antibiotics and pain medications are prescribed. A foam sponge insert and compression garment must be worn for a few weeks but most patients are able to resume normal activities within a few days."

Satisfaction with Body-Jet treatment is high, Dr. Sasaki emphasized. "This is due to a combination of important factors," he explained. "There isn't much need for revision because initial results are very smooth and skin retraction, especially in patients with higher quality skin, is good. Simultaneous infiltration and aspiration during the procedure reduces treatment time somewhat. Additionally, our own patient tracking data shows that the use of medication within the first 24 hours post-op is practically nil, which suggests a more tolerable recovery."

"The numbers speak for themselves," Dr. Malan stated. "The touch-up rate with Body-Jet is less than 1% in my experience. You can't minimize the fact that a more tolerable procedure appeals to patients, as does the rapid recovery. It's remarkable to patients that they're pain free after a day or two. There's minimal interruption in their professional and personal lives. Instead of waiting months for the final result to appear, patients see results within about a month."

From a physician standpoint, happy patients spread the good news. "It's a lot easier to sell patients on WAL because of the gentler procedure and faster recovery," said Dr. Malan. "We tell prospective laser lipolysis patients that they'll be swollen six to eight weeks after the procedure and they still come back surprised that it takes so long, even after the warning."

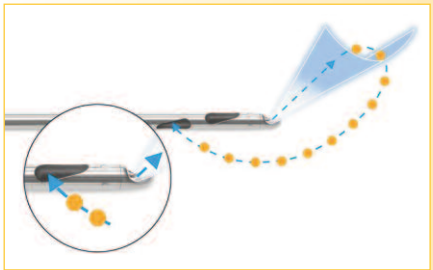
An additional economic impact, Dr. Malan continued, is that physicians may spend a great deal of time providing free touch-ups with other methods. "Patient satisfaction with results is paramount, so if I treat with Body-Jet I offer corrective touch-ups for free, safe in the knowledge that I won't have to exhaust much time doing them. One can spend a great deal of time providing free touch-ups, which is why it's a rare practice. It's also an added assurance for patients."

Body-Jet's novel fat collection system, AquaShape LipoCollector II, is revitalizing the practice of autologous fat transfer. The grafting of one's own fat for use as a dermal filler is not a new idea, but one whose time has come. "There have been a lot of obstacles that have inhibited the practicality of autologous fat grafting," said Dr. DiBernardo, "not the least of which was the ability to harvest an adequate supply of viable, high-quality autologous fat."

Intuitively, one's own body fat would seem to be an ideal alternative to manufactured dermal fillers, but until recently this was not the case. Harvesting has been problematic for two main reasons, the first being the collection of sufficient quantities of viable fat for transfer. "Typically, fat would be taken with a cannula and manually strained with cheesecloth or centrifuged, which is not an ideal

LipoCollector

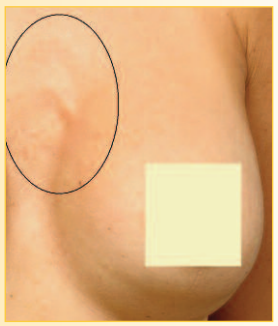

LipoCollector Syringes


Cannula System

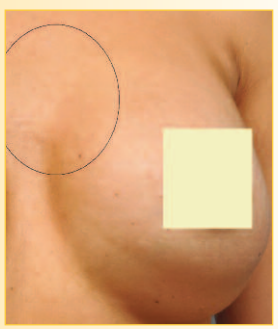
Before Tx

Two weeks after autologous fat transfer to perioral area

Photos courtesy of Roger Bassin, M.D.



27 year old female with fat atrophy before Tx



27 year old female three months after autologous fat transfer Tx

Photos courtesy of Gordon H. Sasaki, M.D.

method of collection," Dr. DiBernardo noted. The second reason was the clumpy nature of traditionally collected fat. "The end product of the old method was not very refined. The consistency of the transferred fat would affect the uniformity of the result."

According to Dr. DiBernardo, autologous fat is an ideal filler because most often, when one is treating laxity or otherwise plumping an area, large or small, fat is most likely what was naturally there in the first place. "Essentially you're replacing fat with fat, and most people want fat removed from somewhere on their body, providing a ready source of material." Research is also beginning to reveal additional positives. "The growth factors and stem cells that come with transferring viable fat from one location to another positively affect surrounding tissues."

AquaShape LipoCollector II collects cells as safely and effectively as possible. Body-Jet gently transfers the aspirated fat into the collector, which has a variety of filters to help separate viable adipocytes from other material, which is important even though the gentle technique minimizes blood loss and tissue trauma. "AquaShape LipoCollector's filtering process includes washing of the fat during collection, which keeps it moist and minimizes exposure to air and other contaminants. A trap catches thicker, fibrous material that may clog the fluid removal system. What you're left with is virtually pure, transferable autologous fat," said Dr. DiBernardo.

What's more, everything from stem cells to pre-adipocyte and mature adipocyte populations are collected in a viable form Dr. Sasaki reported. "Studies have indicated that harvested fat cells need to be implanted within six hours to maximize survival. We did a fat cell viability study using trypan blue dye to stain harvested cells. This is not necessarily the best technique but it is acceptable and accurate enough for this purpose." Fat cells absorb the dye then kick it back out, unless they're dead, in which case they remain stained. "The results showed that traditional, mechanical traumatic cannula harvesting offered about 75% to 80% viability, which confirmed what we expected. Cell populations collected with a laser-assisted technique were between 30% and 50% viable. Those using our WAL method were in the range of 90% viable."

Harvested fat can then be transferred to the implantation site immediately, which is best. "We aspirate the virtually sterile, viable fat into 1 cc syringes and implant it superficially or deeply using a micro droplet technique with microcannulas and minimal injection pressure," Dr. Sasaki advised.

Dr. Malan is among those reintroducing the practice of breast augmentation with autologous fat transfer. "To come back to the issue of tissue trauma, you're looking at a procedure, which just in the harvesting stage was traumatic, adding substantial healing and recovery time. That alone was hard to justify to patients. With previous methods we were looking at possibly 50% survivability of fat, which means patients may need more than one procedure, translating into another round of downtime."

As Dr. Malan explained, in the breast, a woman would typically need at least two or three procedures if they expected the kind of augmentation one looks for in that area. "Additional problems with lower fat survivability include potential cyst formation or calcifications. This is problematic in future mammograms, because these deposits and cysts could confuse radiologists into thinking there may be a cancerous lesion to deal with," he said. "Science has determined that the transferred fat will not cause cancer, but the potential for false positives was still an issue for women, which led to fat transfer breast augmentation's disappearance twenty years ago."

However, the alternative also has associated complications. "Breast implants obscure mammograms by more than 50%, they have a 20% re-operation rate at three years and a 100% re-operation rate at ten years," said Dr. Malan. "If we can do better, we should."

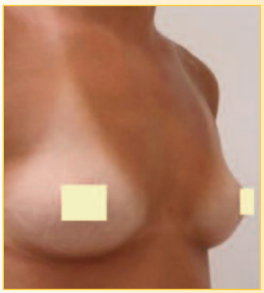
The fact that fat collected with AquaShape LipoCollector II is around 90% viable with the stem cells intact is a huge plus for the procedure, Dr. Malan continued. "Since the success of this procedure depends on fat survivability it's a whole new ballgame. This method of harvesting and implanting fat allows us to achieve a one to two cup size augmentation with a single procedure. Also, mammography has improved to where the ability to differentiate between potentially confounding results is much, much better than before."

Dr. DiBernardo does not see autologous fat grafting as a complete replacement for dermal fillers, "but it's becoming a viable alternative with a lot of growth potential. Each vial of filler costs money. You can now tap into the person's own supply of safe, easy-to-use fat and simultaneously provide liposuction results."

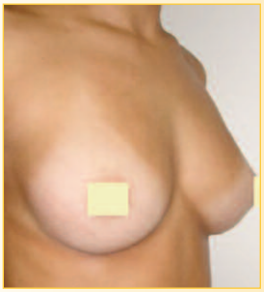
"The fact that fat collected with AquaShape LipoCollector II is around 90% viable with the stem cells intact is a huge plus."

Dr. Malan believes that physicians new to liposuction who learn with Body-Jet will have a much easier time than liposuction veterans. "Newer physicians come into this with fewer preconceived notions about the procedure. Experienced surgeons will have to learn to slow down and let the device do the work, but they're in for a treat when they see how amazing the device and its results are."

"Patients are becoming more and more aware that undergoing a cosmetic procedure doesn't mean dealing with extraordinary amounts of downtime these days," Dr. Malan added, "so naturally they look for procedures that are safer and more tolerable, that can be done under local anesthesia and provide quality results rapidly, with the least downtime and post-procedure pain. That's Body-Jet to a 't'." ■

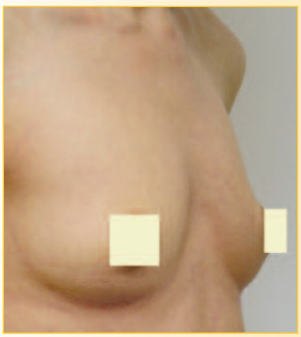


Breasts before Tx

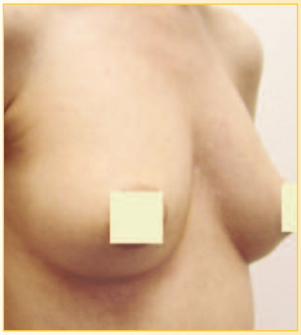


Breasts after autologous fat transfer Tx

Photos courtesy of Todd K. Malan, M.D., F.A.C.O.G.



Breasts before Tx



Breasts after autologous fat transfer Tx

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