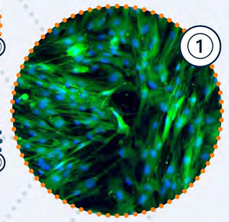
Adipose Stem Cells can differentiate into almost every kind of cells and tissue

Stem cells from adipose tissue can be differentiated into:



1 • Stem cells from adipose tissue
2 • Nerve cells
3 • Liver Cells
4 • Bone cells
5 • Chondrocytes
6 • Cardiomyocytes
7 • Fat cells

Adipose stem cells are multi-potent (can differentiate into multiple tissues) and hold promise for a wide range of therapeutic applications. Because these cells are harvested by liposuction, adipose tissue represents an abundant and readily accessible source of adult stem cells.
Fat tissue contains 40 to 100 times more pluripotent stem cells as compared to bone marrow.

Ongoing clinical studies on adipose stem cells

The major indications in ongoing studies with adipose derived stem cells are
- Treatment of fistula/Crohn`s Disease.
- Ischemic Congestive Heart Failure.
- Scar treatment.
- Development of bone grafts; repair of chondral knee defects; Osteoarthritis; degenerative Arthritis.
- Diabetes Type 1 and 2.
- Spinal Cord Injury.
- Stroke; Brain Lesions; Parkinson`s Disease; Multiple Sclerosis.
- Lower limb ischemia.

Clinical applications for fat stem cells

Adipose stem cells can aid in the regeneration of fat, bone, cartilage and smooth muscle to repair:
- Disease-related tissue damage.
- Injury-related tissue damage.

Adipose Derived Stem Cells can aid re-growing blood vessels to:

- Improve wound healing.
- Restore circulation in tissues damaged by disease or injury.
- Treat circulatory diseases (age-related, diabetes related).
- Treat diabetes-related circulatory damage.
- Repair heart muscle damaged by heart attack or disease.

The future of stem cell applications

- Clinical therapies in the field of Regenerative Medicine will enter into a new dimension with the availablitiy of approved stem cell isolation and application systems.

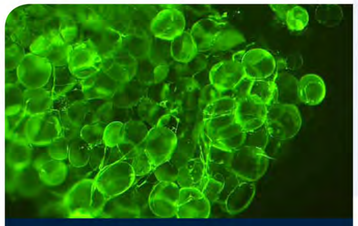
New focus of human med AG
- human med has successfully introduced an approved system for autologous fat transfer, worldwide.
- human med AG will launch a new innovative system for the isolation and application of fat stem cells for regenerative medicine and clinical applications in plastic, reconstructive and general surgery.

Healing with Fat: the Therapeutic Power of Adipose Tissue-Derived Stem Cells (ADSC)*

By Professor M.C. Harmsen University of Groningen , Cardiovascular Regenerative Medicine Research Group, Department of Pathology & Medical Biology, University Medical Centre Groningen, Groningen, Netherlands

„The adventitia of the vasculature of adipose tissue harbours mesenchymal stem cells with potent regenerative capacity, the so-called Adipose Tissue-derived Stem Cells (ADSC). In practice, ADSC are isolated as the plastic-adherent cells in the stromal vascular fraction of fat tissue. Their frequency is around 100x106 per litre of lipoaspirated fat. ADSC can differentiate into multiple lineages including fat, bone, cartilage, smooth muscle cells and pericytes. Yet, their main virtue resides in the secretion of a plethora of paracrine factors such as cytokines, chemokines, growth factors and non-proteinaceous factors that greatly augment healing of damaged tissues. ADSC have been successfully employed in various regenerative medicine-based strategies that range from tissue-engineering of bone and cartilage to cardiovascular repair.
Plastic surgeons have long noted that lipotransfers reduce local scars and rejuvenate skin. We hypothesized that the ADSC present in fat, have scar-reducing i.e.anti-fibrotic potential. We tested our hypothesis by subjecting differentiating (i.e.TGFb treated) human dermal fibroblasts (HDF) to conditioned culture media of ADSC (ADSCcm). We showed that ADSCcm not only suppressed the TGFb-driven differentiation of HDF, but that also their contractile activity was reduced significantly. Furthermore, ADSCcm reduced the production and secretion of extracellular matrix by HDF, while the secretion of active matrix remodelling enzymes (MMP1, 2, 3 and 9) was upregulated.
We conclude that ADSC may be suitable therapeutic cells to harness (hypertrophic) scarring."

* 43. Jahrestagung DGPRÄC, 17. Jahrestagung VDÄPC 13.-15.10.2012, Bremen, Germany, Abstract V05



Viable WAL fat cell cluster (vital staining, Institute of Cell Biology, Universtiy of Rostock)

New studies on adipose stem cells (ASC, SVF) in water-jet fat aspirate

More and more in-vitro studies are published showing data on adipose stem cells (stromal vascular fraction) in fat tissue. However, very often the details of examined fat tissue, harvesting technology, preparation of samples, infiltration and vacuum parameters, applied suction cannulae and method of stem cell preparation are not sufficiently documented, and thus cannot be compared.

A new study on adipose stem cells directly isolated from lipoaspirate harvested by water-jet assisted liposuction has been started by several plastic surgeons using the body-jet® and/or PAL (pressure assisted liposuction).The isolation, characterization, cell count and determination of viability of the adipose stem cells was done by the Center of Cell Biology of the University of Rostock, Germany, and DIN ISO certified laboratory facilities. Some of the first results are shown here.

a) The influence of the WAL cannula configuration on adipose stem cell count and viability Among other study end points, the influence of the applied WAL cannula type has been investigated (Table 1). The results show that the number of viable adipose stem cells in water-jet fat correlates well with the results of the Dutch cell biologist Prof. M.C. Harmsen (see publication on this page).

b) The effect of the new body-jet® evo water-jet modes on adipose stem cell (ASC) count and viability Also, the effect of the three body-jet® evo water-jet modes SHORT, MEDIUM and LONG on the number and viability of stem cells has been investigated*. (MEDIUM is the previous body-jet® mode.)

a) WAL cannula type and adipose stem cell (ASC) number and viability (per 100 ml Lipoaspirate)*

WAL Cannula type	3.8 rapid	3.5 rapid	3.5 blunt
ASC count/100ml	11.820 million	15.335 million	17.278 million
ASC Viability (%)	94.86 %	95.51 %	95.75%

(*Patient: female, 27 years; prouction from thighs; body-jet®evo RANGE 2 during infiltration, RANGE 1 during suction; vaccuum -500 mbar) Source: University of Rostock, Department of Cell Biology; results by FACS analysis: Seracell Lab, Instrument SN: AM07032 SW VersionCXP v2.2

Conclusion: The WAL/BEAULI method provides high numbers (> 10 million) of viable stem cells with all three cannula types. The vitality of the harvested stem cells is 95 %.

b) Effect of the new water-jet modes on stem cell number and viability (per 100 ml Lipoaspirate)*

body-jet® evo mode	SHORT	MEDIUM	LONG
ASC count/100ml	25.868 million	16.552 million	19.540 million
ASC Viability (%)	96.80%	95.96%	97.23%

(*Patient: female, 59 years; liposuction from abdomen; body-jet®evo RANGE 2 during infiltration, RANGE 1 during suction; suction vaccuum -500 mbar; WAL cannula 3.8 rapid) Source: University of Rostock, Department of Cell Biology; results by FACS analysis: Seracell Lab, Instrument SN: AM07032 SW VersionCXP v2.2

Conclusion: The new body-jet® evo modes provide high numbers of viable stem cells in all three water-jet modes. The SHORT mode and the LONG mode seem to be superior to the MEDIUM mode.

human med AG • Wilhelm-Hennemann-Str. 9 • 19061 Schwerin • Germany • Fon: +49 (385) 395700 • Fax: +49 (385) 3957029 • info@humanmed.com
human med inc. • 271 Madison Ave, Suite 1104 • 10016 New York, USA • Phone: 212.725.7100 • Fax: 212.725.7101 • sales@humanmed.com
Editor: Inge Matthiesen Ph.D. • Production & Print: diedruckerei.de
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LATEST NEWS FROM MEDICAL SCIENCE

hydro surgery news

Volume 6

body-jet® evo: Captivating technology - Your stake in the future of aesthetic and reconstructive therapies

The new body-jet® evo represents the innovative advancement of the approved and reliable body-jet® which made water-jet assisted liposuction (WAL) a successful and meanwhile established method for gentle fat harvesting and autologous fat transfer. In published clinical studies, the volume that survived after breast augmentation with the WAL/BEAULI method was 67 % as quantified by pre- and postoperative MRI controls*.
body-jet® evo is the optimum tool for current and future applications of small, medium and large fat volumes for the correction of surgical soft tissue defects and scars, rejuvenation of the face and hands, as well as augmentation of buttocks and calves.

The new body-jet® evo

Efficient.
Versatile.
Intuitive.

Powerful technology and new functions

- State-of-the-Art future-oriented fluid technology and design.
- Revolutionary infiltration drive system.
- New functions and adjustable pulse effects.
- New water-jet operating modes: • SHORT • MEDIUM • LONG
- New special LipoCollection Mode
- Advanced water-jet technology for gentle fat harvesting.
- Technological concept allowing integration of future functions and applications.

Advanced performance

- Speed of operation: Fast and time-saving liposuction and fat harvesting due to new operating modes.
- Fat Quality: Provides highly viable fat tissue and included stromal vascular fraction/stem cells.
- High flexibility and operating comfort.
- Adaptable from small to (very) large volumes.
- Advanced monitoring and operating functions.
- Detection of application-related accessories.

Easy handling

- Comprehensive touch screen guiding through the operation.
- Self-explanatory user interface with interactive programs.
- Instantly available help functions on touch screen.
- Easy choice of program functions.
- Sterile, closed loop fat tissue harvesting and transfer.

More safety

- Intelligent water-jet control for • flow • occlusion • air.
- Innovative suction control for smooth and safe aspiration.
- Convenient measurement of tumescent fluid consumption.
- Complete System with Applicator, Cannulae and LipoCollector™.
- Based on 8 years experience with water-jet applications and the body-jet®.

Platform for future applications

- Ready for all present and future applications.
- Developed for future system extension for stem cell isolation and application.
- Prepared for upgrades regarding new functions and applications.

Comprehensive, self-explanatory touch screen functions

New water-jet operating modes for fat harvesting and autologous fat transfer

SHORT Short

- Fast and easy liposuction
- Short and quick water-jet pulses for fast and smooth-running fat harvesting.
- Most effective for gentle liposuction and body contouring and fat harvesting.
- Very easy working and guiding of the cannula, especially in fibrotic tissue.
- Most efficient body shaping.
- Even lower pain induction.
- Easy learning curve.

MEDIUM Medium

- Most successful water-jet mode of the 1st body-jet® generation.
- Gentle, cell saving fat tissue harvesting.
- Scientifically proven clinical results.

LONG Long

- Optimum mode for cell saving and effective harvesting of vital fat tissue including viable stromal vascular fraction/stem cells.
- Long spray intervals with short interruptions.
- Fast, time-saving infiltration of larger volumes of tumescent solution.
- Designed for quick tissue expansion.

LC LipoCollection

- Special program for gentle fat grafting, closed loop with LipoCollector™.
- Special configuration of infiltration and aspiration parameters for harvesting viable fat cells for subsequent lipofilling.

(*Ueberreiter, K., von Finckenstein, J. G., Cromme, F., et al.: BEAULI - a new and easy method for large-volume fat grafts. Handchir Mikrochir Plast Chir 42: 379-385, 2010)

Breast augmentation after silicone implants: Fat grafting instead of implant exchange

Interview with **Klaus Ueberreiter M.D., Ph.D.,**
Park-Klinik Birkenwerder, Germany

Matthiesen: Dr. Ueberreiter, you are routinely treating patients suffering from capsular contracture with autologous fat collected by water-jet assisted liposuction, the so-called BEAULI Method. Can you tell us something about your experience?

Dr. Ueberreiter: With increasing numbers of patients with silicone implants for breast augmentation or reconstruction we are confronted by more and more cases of capsular contracture and other problems. For most patients this means disfiguration and pain, and frequently the constant fear of reoccurrence. Removing the implants and fat grafting by the BEAULI method is far the best solution to be offered to those patients.

Matthiesen: What are the advantages of this new method?

Dr. Ueberreiter: This one stage procedure of implant removal and lipofilling proved to be highly efficient and fast with good to excellent results and high patient satisfaction. The time of the overall procedure is 70 ± 15 min.

Matthiesen: Can you give us some details on your treatment?

Dr. Ueberreiter: In our first 30 patients we removed the implants and grafted an average gross volume of 260 ml of fat tissue per breast without performing capsulectomy. We observed that the shape of the breast changed to a more natural form and feel. Negative side effects like oily cysts did not occur, in two cases we saw small granulomas with a diameter of about 5 mm which mostly disappeared spontaneously after one year.

Matthiesen: What are the key points of the new procedure?

Dr. Ueberreiter: The procedure includes implant removal and lipofilling of the subcutaneous and intramuscular space in one step. The procedure consists mainly of two principles, fat harvesting and fat collection. For harvesting we use water-jet assisted liposuction with the body-jet®, a device for simultaneous infiltration with a water beam and aspiration. A basic infiltration was applied by means of the body-jet® using RANGE 2-3. The solution used is the classical Klein`s tumescence solution which is warmed to 37 to 38 °C (98-100 °F). After 10 minutes we started liposuction using a 3.8 mm cannula with effective suction openings of 0.9 mm. By adjusting the negative pressure of the body-jet® to -0.5 bar (7 PSI) we avoid damaging the cells. Lower negative pressure is usually ineffective.

For fat collection, the LipoCollector™ is used, a sterile fat collection device which separates the fat from water (tumescence fluid and drugs), rough connective tissue and other cell debris in a sterile container on the instrumentation table. The washed fat is thus ready for reinjection.

Matthiesen: Do you need centrifugation of the fat tissue before reinjection?

Dr. Ueberreiter: Centrifugation is not necessary, it costs a lot of time and destroys part of the cells.

Matthiesen: What is your conclusion regarding this new method?

Dr. Ueberreiter: Water-jet assisted fat transfer offers a safe, time sparing and effective procedure to treat cases of capsular contracture in which the patients want a soft, natural breast, and do not want new implants.

Lipofilling – an emerging field of new applications

Interview with **Hilkka Peltoniemi M.D.,** Helsinki University Hospital, Plastic and Reconstructive Surgery, Finland, and
Yves Surlemont, M.D., Clinique Saint Antoine, Chirugie plastique et esthétique, Rouen, France

Lipofilling today holds much promise in plastic and reconstructive surgery. Autologous fat tissue is now considered as ideal filler for soft-tissue augmentation because it is biocompatible, versatile, natural-appearing, readily available, abundant, inexpensive, and can be harvested and reinjected easily and repeatedly by water-jet assisted fat transfer, with minimal trauma to the donor sites.

Matthiesen: Dr. Peltoniemi, what kind of indications do you treat with water-jet assisted autologous fat transfer in your clinic?

Dr. Peltoniemi: There are various applications. I do fat grafting for breast augmentation, and for treatment of breast asymmetries, breast anomalies, and for reconstruction after mastectomy. I also use autologous fat transplantation as salvage procedure during implant removal after problems with encapsulated or ruptured implants.

In addition to that, autologous fat from water-jet assisted liposuction is very well suited for the correction of surgical soft tissue defects and scars, rejuvenation of the face and hands, and augmentation of buttocks and calves. I have also treated patients with scoliosis deformities and general soft tissue defects.

Dr. Surlemont: I do fat grafting every time when there is a lack of volume - either reconstructive (breast malformations, breast asymmetry, thoracic breast deformities, breast reconstruction) or aesthetic (breast augmentation) or complications after breast implants.

Of course there must be enough fat to be harvested, the BMI should be 20 at least or rather over 22. Autologous fat is a biological and long lasting material. In contrast to the use of implants there is a very low rate of complications, and it is a very precise material, which you can graft exactly where it is needed. This also applies for the rest of the body and especially for the face.

And don't forget that the fat increases the skin quality which is not the case with implants or hyaluronic acid!

Matthiesen: From what donor areas do you harvest the fat tissue for autologous transplantation?

Dr. Peltoniemi: The fat is taken from several areas like lateral and medial thighs, waist, axillary rolls and then transferred to breasts, face and hands.

In many cases, the patients had other liposuction or Smartlipo treatments before, with uneven results which I have corrected with a combination of liposuction and transplantation.

Matthiesen: How many patients did you treat up to now?

Dr. Peltoniemi: I have treated approximately 130-140 patients representing 160-170 procedures. Patients are coming back for another transfer whenever they have got extra fat. Now they know what to do with it! Altogether I did about 500 liposuction procedures.

Dr. Surlemont: I have been treating patients with fat grafting since 1999 and I'm doing a lot of procedures with either fat grafting alone or combined with other surgical procedures for the breast or the face or the buttocks or other indications with an average of 5 fat grafting procedures per week - during 40 weeks per year this makes around 200 per year!

Matthiesen: Why did you choose water-jet assisted fat transfer with the body-jet® and the LipoCollector™ as your method?

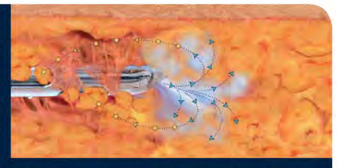
Dr. Peltoniemi: I use water-jet assisted fat transfer because this method is efficient, atraumatic, safe, easy and simple. I appreciate its good fat quality and cell vialbility, and that there is no need for processing like centrifugation. The body-jet® system offers good possibilities for body contouring - not just for the collection of fat. Besides, it is an efficient tool for a woman who does not have masculine muscles.

Dr. Surlemont: For very small volumes I am using the Coleman technique but as soon as I need more than 20 – 40 cc I use the water jet technique because:

1. It goes faster. I need an average time of 5 minutes to get 100 ml of fat + solution under general anesthesia, and 15 minutes under local anesthesia with sedation.
2. It is a closed system and there are very few manipulations (no centrifugation) of the fat before grafting.
3. The fat is liquid and very easy to graft precisely without any pressure.
4. As shown in the (published) MRI volumetry study, you may be able to predict your result for breast augmentation.
5. There is less pain and less hematoma on the donor sites, so the patients will come back without any fear if a second procedure is needed!

Matthiesen: Are you planning any new clinical studies on water-jet assisted fat grafting?

Dr. Peltoniemi: A retrospective clinical trial on the „De novo" breast reconstruction with autologous fat grafting in postmastectomy patients has just been completed. Three European centers participated in this study, with Dr. Ueberreiter in Germany, Dr. Surlemont in France, and our center in Helsinki. Autologous fat grafting was done by water-jet assisted fat transfer according to the standardised protocol of the BEAULI Method. The study will be published this year.



Top: Simultaneous infiltration and suction - the water-jet technology
Left: LipoCollector™ 3: easy, sterile fat grafting - closed loop, autoclavable system (CE/FDA cleared)

„De novo" breast reconstruction with autologous fat grafting in postmastectomy patients*

by D.L. Hoppe[1], K. Ueberreiter[1], S. Kauhanen[2], Y. Surlemont[3]
[1]Park - Klinik Birkenwerder, Birkenwerder, Germany, [2]Helsinki University Hospital, Plastic and Reconstructive Surgery, Helsinki, Finland, [3]Clinique Saint Antoine, Chirugie plastique et esthétique, Rouen, France

Introduction

„Fat tissue transplant is been approved as a safe and reliable method for breast reconstructive issues in oncologic patients. Various clinical applications for autologous fat grafting to the breast have been described in literature (1). Correction of soft tissue defects and deformaties after breast cancer or insufficient reconstruction can be achieved (2). However complete breast reconstruction after total mastectomy is mentioned in few cases (3,4). Our multicenter study investigates in larger series the aspect of lipotransfer for total breast reconstruction after primary ablative surgery.

Material/Methods

In a retrospective clinical trial we analysed the data of 3 centers in Europe including a total of 54 patients (62 breasts) after uni - or bilateral radical mastectomy. Over 300 procedures were performed between 2008 and 2012. Inclusion criteria were fulfilled by 21 patients. Autologous fat grafting was done according to standardised protocol of the BEAULI Method (4). Clinical outcomes, patient satisfaction and aesthetic results were evaluated after a 6 months follow-up period. If available, comparative MRI volumetry was done for quantification (5).

Results

All patients showed remarkable increase of subcutaneous fat. On average 3,8 procedures with a single median volume of 150 ml (± 57,4 ml) were performed till the end of treatment. A lipotransfer of 600 ml (± 177 ml) was required for complete breast reconstruction. The median operation time was 40 min, but ranged to 60 min (± 29 min) when additional operative steps (NAC reconstruction, abdominal advancement, contralateral mammaplasty) were carried out. 44,7 % of the patients underwent their intervention in analgesic sedation. As a postoperative complication small singular oilcysts were estimate in 4 (2,6 %) cases. Once granuloma was detached, but no infections. The majority of patients was very satisfied with the final result.

Discussion

Breast lipografting in oncological patients is still considered as a delicate and riskful surgical approach. However this study supports the use of standardized protocols for autologous lipoaspirate grafting with longterm experience in order to provide optimized cosmetic outcome. It emphazises, that a „de novo" breast reconstruction is possible within 3-5 procedures of BEAULI Method. These are combinable simultaneously with other oncoplasty techniques. Our reconstructive treatment is gradually attained after 12 -18 months at least. Patients, who declined immediate reconstructive, prothesis - based approaches or experienced numerous complications after breast surgery are very satisfied with BEAULI Method. In 4 years of experience we notice an increasing demand. Although further studies are certainly required to determine definitive guidelines for lipotransfer in breast surgery, it might be regarded as an evolving and promising alternative to conservative methods."

References

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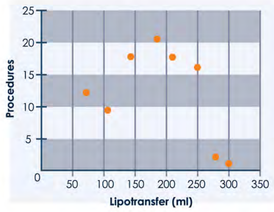

* 43. Jahrestagung DGPRÄC, 17. Jahrestagung VDÄPC 13.-15.10.2012, Bremen, Germany, Abstract FV32

Fat cells are delicate – successful lipofilling depends on choosing a gentle and effective fat harvesting and transfer technique

Many studies show a negative effect for centrifugation (the water-jet method does not require centrifugation!):

"Unprepared samples are more viable than the samples that were washed or centrifuged...The less one manipulates the fat graft and the more quickly it is reinjected, the higher the chances of survival are." P. Smith et al.: Autologus Human Fat Grafting: Effect of Harvesting and Preparation Techniques in Adipocyte Graft Survival. PRS, 117: 1836-44 (2006)

"Presence of greater amounts of pre-adipocytes in the non-centrifuged adipose tissue cultures and more distinctly expressed cell proliferation. - Our data suggests that with transplantation of non-centrifuged adipose tissue more active pre-adipocytes are applied which could possibly lead to better potential chances of survival and even de novo development of fat." Khater et al.: Clinical and Experimental Study of Autologous Fat Grafting After Processing by Centrifugation and Serum Lavage. Aesth Plast Surg 33:37-43 (2009).

Cell counts per high-powered fields of intact adipocytes and nucleated adipocytes and adipocyte cross-sectional area were significantly greater in samples processed by sedimentation, compared with those by centrifuging and washing".

Rose et al.: Histologic Comparison of Autologous Fat Processing Methods. Opht Plastic & Reconstr Surg. Vol. 22, 3:195-200 (2006).

The viability of water-jet fat cells: Results of an immuno-histopathological study

- A very high percentage of fat cells (90%) remains intact in the body-jet® RANGEs 2 and 3.
- The integrity of blood and lymph vessels also remains preserved (see table below).
- The desired dissociation of the aspirated fat tissue increases with the selected infiltration RANGE.

Conclusion

The results of the immuno-histopathological study support the strength of clinical experience that water-assisted liposuction with the body-jet® has a very gentle effect on fat tissue and fat cells.

Therefore, water-assisted liposuction can be considered as an ideal method for harvesting vital fat cells for subsequent autologous fat transfer.

Immuno-histophathological study*

body-jet RANGE	Number of spray jets in one spot	Viability of fat cells (%)	Integrity of blood vessels	Integrity of lymph vessels	Hema-toma	Dissocia-tion of fat tissue
2	3	90	0	0	0	(+)
2	5	90	0	0	0	+
3	3	90	0	0	0	(+)
3	5	70	0	0	0	+
4	3	70	0	0	0	+
4	5	50	0	0	0	++

0 = without histological changes; (+) = minor, + = some, ++ = remarkable, +++ = impressive histological changes

* D. Krahl M.D., Institute for DermatoHistoPathology, Heidelberg (2010)

Does stem cell enrichment enhance fat uptake in jet-assisted fat transfer for breast augmentation?*

by H. Peltoniemi, A. Salmi, R. Mikkonen, S. Miettinen, K. Saariniemi, H. Kuokkanen:

"Body-Jet-assisted fat transfer for augmentation and reconstruction of breasts is popular in Finland. Overall, more than 100 breast augmentation procedures by lipotransfer (BEAULI method) have been performed by the author with mean follow-up of 18,9 months (4-36). The purpose of the study was to determine if enriching the transferred fat with autologous stem cells will enhance uptake of BEAULI fat. In a prospective study, eleven women had breast augmentation with enrichment with Cytori Celution method and seven women had non-enriched, normal BEAULI transfer.

In volumetric analysis based on MRI, no superiority of either method could be determined. Individual differences in especially recipient area (elasticity, thickness of subcutaneous fat layer) seem to be of more importance than the amount of stem cells in transferred fat. Healthy breasts contain billions of stem cells, and atraumatically collected fat contains millions, so enrichment may not be necessary or even cost beneficial in BEAULI fat transfer. In scarred or damaged stem cell poor tissue, enriching might be beneficial."

* 43. Jahrestagung DGPRÄC, 17. Jahrestagung VDÄPC 13.-15.10.2012, Bremen, Germany, Abstract V08

Comparison: different methods of fat transfer

Discussion by Herold C, Ueberreiter K, Vogt PM. (Plast Reconstr Surg. 2012;130(3):479-80.)

"With great interest we read the work „Brava® and Autologous Fat Transfer Is a Safe and Effective Breast Augmentation Alternative: Results of a Six-Year, Eighty-One Patients Prospective Multicenter Study" by Khouri and coworkers (1). It is of high impact that the additional application of the Brava® wear, as it is more expensive and somewhat elaborate for the patients, is able to produce superior postoperative results in comparison to all other techniques of autologous fat transplantation until now. After all there are only 4 studies in the literature with qualitative and quantitative progresscontrol based on MRI examinations after autologous fat transplantation to the breast. The study by Khouri with a yield of 82+18 %, a study by Del Vechio, who also used the Brava® system in 25 patients with a volume survival of 64+13 %. These results have to be compared to the results after fat transplantation with the BEAULI technique (10). *(The BEAULI technique or water-jet assisted fat transfer does not require the Brava® system.)* Results have been published in 2010, with a volume survival of 72+11 % in the first ten patients (4) and later in larger cohort of 36 patients of 76+11 % (10). It has to be noted that the plain adipose phase was calculated, as the BEAULI technique abstains from centrifugation, like it is performed in the protocols combined with the Brava® system described by Del Vecchio and Khouri (1,11)."

1. Khouri, R. K., Eisenmann-Klein, M., Cardoso, E., et al. Brava(R) and Autologous Fat Transfer Is a Safe and Effective Breast Augmentation Alternative: Results of a Six-Year, Eighty-One Patients Prospective Multicenter Study. Plast Reconstr Surg epub, 2012. 2. Herold, C., Knobloch, K., Stieglitz, L. H., et al. Magnetic resonance imaging-based breast volumetry in breast surgery: a transfer from neurosurgery. Plast Reconstr Surg 125: 17e-19e, 2010. 3. Herold, C., Knobloch, K., Rennekampff, H. O., et al. Magnetic resonance imagingbased progress control after autologous fat transplantation. Plast Reconstr Surg 126: 260e-261e, 2010. 4. Herold, C., Ueberreiter, K., Cromme, F., et al. [The use of mamma MRI volumetry to evaluate the rate of fat survival after autologous lipotransfer]. Handchir Mikrochir Plast Chir 42: 129-134, 2010. 5. Herold, C., Ueberreiter, K., Cromme, F., et al. [Is there a need for intrapectoral injection in autologous fat transplantation to the breast? - An MRI volumetric study]. Handchir Mikrochir Plast Chir 43: 119-124, 2011. 6. Wang, H., Jiang, Y., Meng, H., et al. Sonographic assessment on breast augmentation after autologous fat graft. Plast Reconstr Surg 122: 36e-38e, 2008. 7. Zocchi, M. L., Zuliani, F. Bicompartmental breast lipostructuring. Aesthetic Plast Surg 32: 313-328, 2008. 8. Delay, E., Garson, S., Tousson, G., et al. Fat injection to the breast: technique, results, and indications based on 880 procedures over 10 years. Aesthet Surg J 29: 360-376, 2009. 9. Yoshimura, K., Asano, Y., Aoi, N., et al. Progenitor-enriched adipose tissue transplantation as rescue for breast implant complications. Breast J 16: 169-175, 2010. 10. Ueberreiter, K., von Finckenstein, J. G., Cromme, F., et al. [BEAULI--a new and easy method for large-volume fat grafts]. Handchir Mikrochir Plast Chir 42: 379-385, 2010. 11. Alexander Del Vecchio, D., Bucky, L. P. Breast Augmentation Using Pre-Expansion and Autologous Fat Transplantation– A Clinical Radiological Study. Plast Reconstr Surg, 2011.