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ALL THINGS AUTOLOGOUS

By definition, autologous describes any cells or tissues that are obtained from and then used on the same individual. "It means 'from yourself' or the same tissue composition, as opposed to an allogenic procedure, which would be using something foreign or from others, explains New York plastic surgeon David Rapaport, MD. Before their expansion into cosmetic treatments, autologous procedures were used by oncologists treating cancer with a patient's own stem cells and orthopedic surgeons utilizing bone grafting to heal and repair broken bones. Aesthetic medicine has been equally ingenious in the category, finding ways to enhance one's contours with fat harvested from an area of the body that can spare it, improve the results of treatments through the introduction of a patient's own platelet-rich plasma (PRP), and add hair nearly anywhere it's desired, from the top of the head to the eyebrows.

One of the most notable advantages of autologous treatments is the high likelihood that the body will accept one's own tissues and cells with a far lower risk of complications. "Our system was designed to be defensive and have an immune response when it determines something foreign. This is how we react against bacteria, viruses and substances that appear harmful," says Beverly Hills, CA oculoplastic surgeon Raymond Douglas, MD. "Unfortunately, these reactions can also occur when using foreign substances for repair or cosmetic purposes."

Dr. Rapaport concurs, saying, "By using one's own tissues or cells, one need not be concerned about sensitivities, allergic reactions or rejection, and in theory, autologous treatment may save money by not requiring synthetic filler materials."

However, autologous treatments aren't without their disadvantages, from stem cells' lack of clinically proven effectiveness in aesthetic treatments to fat's unpredictable longevity. "The volume you will get is less and may require repeat treatments," according to Wayne, NJ facial plastic surgeon Jeffrey Wise, MD. "The take-rate is 25 to 50 percent, which makes it challenging to predict how much volume the patient will see." That retention, however, will last forever, and fat will also improve the quality of the overlying skin, which does not occur with synthetic fillers.

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PEAK HARVEST

In order to use one's own fat in an area of the body where more volume is desired, it must first be harvested from elsewhere in the body. Denver plastic surgeon Manish Shah, MD says this is done with mini liposuction, during which a saline solution containing lidocaine and adrenaline is injected into fatty areas of the body—usually the thighs, abdomen or anywhere fat deposits tend to be more stubborn throughout weight fluctuation—and then the fat is then removed by suctioning it out through small metal tubes.

One increasingly popular option for harvesting and prepping fat that's heading to another part of the body is a system called Revolve. Allergan touts it as "the only all-in-one fat-processing device that harvests, filters, actively washes, and removes [collagen] strands," (these strands can can clog the syringes used for injection). Studies have shown that, in addition to rapidly concentrating adipose tissue, Revolve thoroughly washes it for higher-quality fat.

There are a number of ways harvested fat can be used in the face, many of which echo the way a plastic surgeon or dermatologist might use a hyaluronic acid–based filler to enhance cheek shape or lip size. However, in addition to the harvesting process, the injection process is different as well.

"Typically, fat transfer is injected with a microcannula—not needles—and in a 1:1 ratio, because we know some of the fat will not take," Dr. Wise explains. There's also a few days of downtime with fat transfer, whereas fillers have no downtime.

"Patients who get fat transferred for facial contour often get it simultaneously with other procedures, such as

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SCIENCE SUBJECTS

LOCATION, LOCATION, LOCATION

HAIR TRANSPLANTS, SKIN-TRANSFORMING TREATMENTS, STEM CELLS AND A WHOLE LOT OF PRP BUZZ MAKE UP THE LIST OF FORWARD-THINKING INNOVATIONS.

1 HAIR TRANSPLANTS

Hair transplants have come a remarkably long way since their inception. The two most common versions are follicular unit strip surgery (FUSS) and follicular unit excision and extraction (FUE). "With FUSS, a thin strip of tissue is taken from the back of the head and then slivered and dissected into the individual naturally occurring follicular units," explains Beverly Hills, CA hair restoration specialist Dr. Craig Ziering. "During an FUE procedure, the follicular units are harvested one graft at a time using either a handheld device or the hair surgery robot," which will leave tiny individual scars, in contrast with FUSS's thin, linear scar across the back of the head. One of the most exciting autologous developments in restoring hair has come in the form of PRP, or platelet-rich plasma, which involves drawing a patient's blood and reinjecting the portion of the plasma that's most rich in platelets and growth factors into the scalp.

2 SKIN REJUVENATION

In addition to hair growth, PRP is being used to improve skin, too. It is typically added as a topical preparation or injected superficially after a controlled injury is made to the skin, such as laser resurfacing or dermabrasion. "Sometimes it can be combined with filler to improve the longevity of the treatment," Dr. Wise says. Perhaps the most buzzed-about use of PRP in skin care, despite a lack of valid studies about its safety and efficacy, is the "vampire facial." Dr. Rapaport says that after the initial part of treatment, which typically includes microneedling, PRP is massaged onto the face. "The one benefit that has been proven is that the skin does heal more quickly after wounding when PRP is applied," he adds. However, "true rejuvenative effects have yet to be demonstrated scientifically." PRP as simply a topical preparation without a controlled injury first has no effect.

3 STEM CELLS

Stem cell treatments are arguably some of the most controversial available, as there is little scientific evidence of their effectiveness for certain uses. That hasn't dimmed the hopes of plastic surgeons who see enormous potential in them, but currently, the marketing is ahead of the science. "With stem cells, the main issue is that, aside from leukemia, right now there are virtually no approved therapies in the United States. But, that is likely to change soon, with hundreds of advanced studies taking place all around the world," says Dr. Rapaport, who has been working with a company called Forever Labs to bank patients' stem cells for future use. "I strongly believe that in the not too distant future, techniques will be developed for reinfusing stem cells, whether intravenously or into local tissues, and that this will result in real rejuvenative effects."

DISCLAIMER: As of press time, the FDA is paying particular attention to PRP and stem cell treatments. It is important to note that, aside from potential FDA regulation, state licensing boards may discipline physicians who make claims of outcomes with these products.

THE FUTURE OF FAT: WHAT'S NEXT?

Autologous cosmetic treatments have come leaps and bounds, but it seems that there is room for even more developments in the future, whether it's new takes on fat grafting—or entirely different types of transfers. San Diego plastic surgeon Joseph Grzeskiewicz, MD is especially excited about one particular development: "We can now create 'nanofat,' which essentially behaves as a liquid, allowing us to inject using the same size needles we use for Botox! This is a huge advance."

Dr. Baldenhofer says, "I think we will be hearing more about nanofat procedures where emulsified fat is either injected into the skin or used in conjunction with microneedling to improve the appearance, texture and thickness of the skin." Dr. Shah echoes the enthusiasm. "I am very excited about the role nanofat injections will have in the future in terms of stem cell treatments on the skin and scars," he adds. "Additionally, amniotic membrane-sourced growth factors for hair treatment and wound healing," while not FDA-approved, "are showing some interesting results."