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WOULD YOU PUT *THIS* IN YOUR FACE?

A NEEDLE-FULL OF STEM-CELL-RICH FAT FROM YOUR THIGHS IS BEING TRIALLED AS THE NEWEST ANTI-AGER. BUT NOT ALL SURGEONS ARE CONVINCED. ALICE HART DAVIS INVESTIGATES

It's the Holy Grail of plastic surgery: a multi-tasking natural substance that can be injected to make your face look younger *and* add a cup size to your breasts. It's made from fat that's extracted from your own stomach or thighs, so no silicone is required. It's a non-surgical procedure (just about), takes only half a day, you don't need a general anaesthetic, and if it works well, you should never need a top-up.

Sounds impossible? Not if the promise of a new procedure called Stem Cell Enriched Fat Transfer (SCEFT) holds good. It's already being tried out in the UK to plump up faces, augment breasts, and reshape breasts previously left distorted by lumpectomies.

First, fat is removed from the thighs or stomach. This has to be done carefully using a syringe and a large needle; using liposuction is too rough, killing the all-important stem cells (so-called because they can become multiple other tissues in the body). Stem cells are extracted from half your fat, while the other half is purified; the two mixtures are then re-combined into a supercharged, fatty mixture that can be injected.

You've probably heard of fat-grafting, one of the earliest plastic-surgery techniques, where fat is injected to boost sagging faces, breasts or even buttocks. The problem is, it's always been a bit hit-and-miss. Usually, up to half the fat dies off in the process, which means that surgeons tend to use too much and 'over-correct' in order to end up with a decent result (that's what leads to so many cases of 'pillow face' in the US, where fat is a more popular face-filler than it is over here).

It's claimed that, using SCEFT, a lot more fat survives, and – even more excitingly – the technique appears to have a rejuvenating effect on surrounding skin tissues, too, because of the effect of the stem cells.

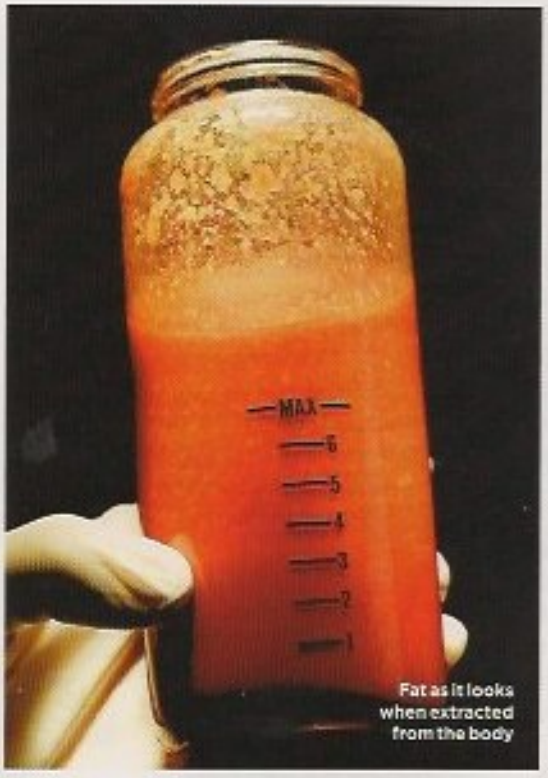
The technology, which is beginning to become available in Britain, is called Celution; it has been developed by the respected US biotech company Cytori, and is currently going through the (American) Food and Drug Administration's (FDA) approval process. The possibilities are endless: it could replace facial fillers, provide huge scope for body-sculpting and eliminate the need for silicone breast implants – except in women who are too skinny to have enough of their own fat to harvest, of course.

So, is it time to book in? A handful of private practitioners in London are ☛

starting to offer the treatment. However, given the lack of regulation in the medical-aesthetics industry, that is not necessarily a plus point. More interesting to anyone concerned with the science behind the procedure is the fact that, for the past 18 months, British NHS hospitals have been trialling the new techniques.

Cytori are running a multinational clinical study into the use of this technology in post-breast-cancer reconstruction. 'So far, the results are very encouraging,' says Eva Weiler-Mithoff, reconstructive surgeon at Canniesburn hospital in Glasgow, and one of the programme's lead investigators, 'though it will be 2011 before our final results are published.'

In the private sector, Dr Aamer Khan, of the Harley Street Medical Skin Clinic, is the first practitioner to offer SCEFT for face and body enhancement, and he claims good results. Nine months after her treatment, his first facial-rejuvenation patient, Linda Shepherd, 45, is still delighted. 'I was quite swollen for a week and the bruising was bad at first, but there are no scars,' she says. 'It has turned the clock back 10 years.' She was particularly pleased to be able to use her own fat; like many women, she feels that's preferable to anything manmade, however good the safety record of synthetic fillers.



Fat as it looks when extracted from the body

Other doctors claim the technology is being over-hyped, and has an exceptionally high price tag – it is just as expensive for facial enhancement as it is for breast-boosting. At the Private Clinic in Knightsbridge, Dr Mike Comins has been experimenting with breast augmentation using the Cytori technology. 'So far, the results are okay, but if I was a woman, I wouldn't pay £6,000 for this,' he says. 'So the way I intend to offer the treatment is as an add-on to Vaser liposculpture. If you are having your stomach and thighs sculpted, instead of throwing the fat away, we can process it, and use it to give some volume to the breasts. It will give a good enhancement, but only up to a cup-size. It won't suit anyone who wants a major augmentation.' Another practitioner, who didn't want to be quoted for this article, says he has been obliged to refund some of his breast-augmentation patients after some initially promising results failed to last.

Other doctors point out that the technology isn't ready to be offered commercially. 'I first used fat transfer in the US 20 years ago, but stopped because the results were unpredictable,' says cosmetic dermatologist Dr Nick Lowe of the Cranley Clinic. 'This new process using stem cells may be useful, but we do not know, because no-one has conducted long-term, placebo-controlled trials. Until I have seen such results compared in a scientific way with the more-dependable, hyaluronic-acid [HA]-based volume-fillers, such as Restylane SubQ or Juvéderm's Voluma, I will continue to use the HA fillers.'

Consultant plastic surgeon Rajiv Grover is a fan of fat transfer in the face, but not a convert to SCEFT. 'Fat is a reliable way to get good results,' he says. 'But, so far, there is no research to show that this new process is better than the well-established Coleman technique [another fat-purification method]. And it is not a facelift. If you have loose skin in the jowls, fat transfer in the cheeks won't make a difference to the appearance in the way that a real facelift would.'

'Fat is a reliable way to get good results, but it is not a facelift'

Nonetheless, the work that's being done on patients through the NHS looks as if it's getting great results. The trial that Eva Weiler-Mithoff is conducting is treating women who had a 'mild-to-moderate defect' of the breast after breast-cancer treatment – the sort of hardened dent that is too small to fill with an implant or a piece of tissue from elsewhere in the body. 'These defects are very common and were difficult to treat,' says Weiler-Mithoff. 'There is a danger, using ordinary fat cells, that if they don't survive, they can leave calcified deposits [which can confuse future mammograms]. Stem cells help the connections of blood vessels because they can turn into blood vessels, so a higher percentage of the fat survives. This has been shown ☛

in animal models; now we are putting it into practice in humans.

'It is potentially a very powerful tool to repair defects and damage in the body,' says Weiler-Mithoff. 'We are enthusiastic about using this technology, but because breast cancer is so common, we need more long-term work to make sure that it is absolutely safe within the breast.'

Over in Hartlepool, Pud Bhaskar, consultant breast and oncoplastic surgeon and clinical director at the North Tees and Hartlepool Foundation Trust, has been using Celution, on the NHS, on post-breast-cancer patients. Since he is not bound by the stringent criteria of the Cytori trial, he has been able to try grafting greater quantities of fat into breasts.

'It has been very promising,' says Bhaskar. 'What we are really impressed with is the regenerative capacity of these cells. They repair the tissue that is damaged. After radiation treatment, the breast becomes fibrous and the fat texture has changed, so it no longer feels soft and natural. When you use stem cells in the reconstruction, it can restore the softness.

'The other impressive thing is that whereas with normal fat transfer you would need to repeat a procedure three or four times to get the right amount of volume in the breast, with this procedure, none of my patients has asked for it to be repeated. The reabsorption rate appears to be less than 20 per cent.'

So far, Weiler-Mithoff has treated 16 patients (the trial is treating a total of 70 worldwide). 'A quarter of my breast was removed in a partial mastectomy in 2004,' says one of them, Irene MacKenzie, now 50. 'I then had an infection, followed by six weeks of radiotherapy, which added scar tissue in the breast. I had one procedure in 2008, then a top-up a year ago, and the results have been very good. The volume has definitely lasted. Where the skin was hardened before, it is now like a normal breast.'

So will we all be booking in for SCEFT for cosmetic tweaks in a few years? 'It's possible that in five or 10 years' time, if it is proven safe enough, if it doesn't cause cancer or calcification that could interfere with mammography, then this could become the standard technique,' says Weiler-Mithoff. 'But it is really too soon to say that. We need long-term trials, and these should be restricted to centres that can offer the back-up of a full multi-disciplinary team, not offered by cosmetic doctors who are not trained in surgery.'

Wendy Lewis, a consultant in cosmetic surgery in the US and the UK, warns that there is a possibility SCEFT won't be used correctly. 'This is an example of a theory that has good science but is in danger of being exploited,' she says. 'The long-term potential is exciting, though a lot of doctors are jumping on the "stem cell" bandwagon when they have not studied the science or done the research to truly understand how this evolving process works.'

In cosmetic surgery, new technology doesn't always turn out to be long-lasting. As one doctor said, explaining why he wouldn't be looking into stem-cell-enriched fat transfer, 'What if it turns out to be another Isolagen?' That particular 'miracle technology', which was based on extracting and cloning your own collagen-producing fibroblast cells, was a big hope among some aesthetic practitioners eight years ago, but the results failed to live up to the product's hype and vanished in a welter of lawsuits.

For now, the process is likely to remain far more expensive than the equivalent tried-and-tested treatments with temporary fillers, at least in the face. So, unless you are invited to take part in a carefully controlled trial, it's probably wise to hold back. After all, it's rarely worth being a patient pioneer when it comes to cosmetic procedures.

'This is a theory that has good science but is in danger of being exploited'

Why fill your face?

As our faces age, the little pads of fat beneath the cheeks and eyes and around the temples gradually vanish, which is what can leave you looking hollowed – and older. 'Ageing is not just a gradual process,' says consultant plastic surgeon Rajiv Grover. 'It can happen in spurts, especially in the mid-face. If you suffer from severe illness, or major stress, such as divorce or job loss, or if you lose more than 5kg, you can actually accelerate volume loss.'

Now, rather than filling out nose-to-mouth lines directly, aesthetic practitioners prefer to add volume to the apples of the cheeks, to the 'tear trough' area beneath the eyes, and also at the lower corners of the nose and mouth, where bone loss – another effect of ageing – causes the skin's tissues to droop. This can be done using fat but, more commonly, fillers. The most popular are temporary ones made from hyaluronic acid (HA), which last up to a year – such as Restylane or Juvéderm – or other, more long-lasting substances.