

Dr Con Man: the rise and fall of a celebrity scientist who fooled almost everyone

Surgeon Paolo Macchiarini was hailed for turning the dream of regenerative medicine into a reality - until he was exposed as a con artist and false prophet



Doctor Macchiarini fooled everyone, for a time. Photograph: TT News Agency/Press Association Images

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Scientific pioneer, superstar surgeon, miracle worker - that's how Paolo Macchiarini was known for several years. Dressed in a white lab coat or in surgical scrubs, with his broad, handsome face and easy charm, he certainly looked the part. And fooled almost everyone.

Macchiarini shot to prominence back in 2008, when he created a new airway for Claudia

Castillo, a young woman from Barcelona. He did this by chemically stripping away the cells of a windpipe taken from a deceased donor; he then seeded the bare scaffold with stem cells taken from Castillo's own bone marrow. Castillo was soon back home, chasing after her kids. According to Macchiarini and his colleagues, her artificial organ was well on the way to looking and functioning like a natural one. And because it was built from Castillo's own cells, she didn't need to be on any risky immunosuppressant drugs.

This was Macchiarini's first big success. Countless news stories declared it a medical breakthrough. A life-saver and a game-changer. We now know that wasn't true. However, the serious complications that Castillo suffered were, for a long time, kept very quiet.

Meanwhile, Macchiarini's career soared. By 2011, he was working in Sweden at one of the world's most prestigious medical universities, the Karolinska Institute, whose professors annually select the winner of the Nobel prize in physiology or medicine. There he reinvented his technique. Instead of stripping the cells from donor windpipes, Macchiarini had plastic scaffolds made to order. The first person to receive one of these was Andemariam Beyene, an Eritrean doctoral student in geology at the University of Iceland. His recovery put Macchiarini on the front page of the New York Times.

Macchiarini was turning the dream of regenerative medicine into a reality. This is how NBC's Meredith Vieira put it in her documentary about Macchiarini, appropriately called *A Leap of Faith*: "Just imagine a world where any injured or diseased organ or body part you have is simply replaced by a new artificial one, literally manmade in the lab, just for you." This marvelous world was now within reach, thanks to Macchiarini.

Last year, however, the dream soured, exposing an ugly reality.

Macchiarini gave his "regenerating" windpipes to 17 or more patients worldwide. Most, including Andemariam Beyene, are now dead. Those few patients who are still alive - including Castillo - have survived in spite of the artificial windpipes they received.

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In January 2016, Macchiarini received an extraordinary double dose of bad press. The first was a *Vanity Fair* article about his affair with Benita Alexander, an award-winning producer for NBC News. She met Macchiarini while producing *A Leap of Faith* and was soon breaking one of the cardinal rules of journalism: don't fall in love with the subject of your story.

By the time the program aired, in mid-2014, the couple were planning their marriage. It would be a star-studded event. Macchiarini had often boasted to Alexander of his famous friends. Now they were on the wedding guest list: the Obamas, the Clintons, Vladimir Putin, Nicolas Sarkozy and other world leaders. Andrea Bocelli was to sing at the ceremony. None other than Pope Francis would officiate, and his papal palace in Castel Gandolfo would serve as the venue. That's what Macchiarini told his fiancée.



Macchiarini at work. Photograph: TT News Agency/Press Association Images

But as the big day approached, Alexander saw these plans unravel, and finally realised that her lover had lied about almost everything. The pope, the palace, the world leaders, the famous tenor - they were all fantasies.

Likewise the whole idea of a wedding: Macchiarini was still married to his wife of 30 years.

Macchiarini's deceit was so outlandish, *Vanity Fair* sought the opinion of the Harvard professor Ronald Schouten, an expert on psychopaths, who gave this diagnosis-at-a-distance: "Macchiarini is the extreme form of a con man. He's clearly bright and has accomplishments, but he can't contain himself. There's a void in his personality that he seems to want to fill by conning more and more people."

Which left a big, burning question in the air: if Macchiarini was a pathological liar in matters of love, what about his medical research? Was he conning his patients, his colleagues and the scientific community?

The answer came only a couple of weeks later, when Swedish television began broadcasting a three-part exposé of Macchiarini and his work.

Called *Experimenten* (The Experiments), it argued convincingly that Macchiarini's artificial windpipes were not the life-saving wonders we'd all been led to believe. On the contrary, they seemed to do more harm than good - something that Macchiarini had for years concealed or downplayed in his scientific articles, press releases and interviews.

Faced with this public relations disaster, the Karolinska Institute immediately promised to investigate the allegations but then, within days, suddenly announced that Macchiarini's contract would not be extended.

Macchiarini's fall was swift, but troubling questions remain about why he was allowed to continue his experiments for so long. Some answers have emerged from the official inquiries into the Karolinska Institute and the Karolinska University hospital. They identified many problems with the way the twin organisations handled him.

Macchiarini's fame had won him well-placed backers. These included Harriet Wallberg, who was the vice-chancellor of the Karolinska Institute in 2010, when Macchiarini was recruited. She pushed through his appointment despite the fact that he had some very negative references and dubious claims on his résumé.

This set a dangerous example. It showed department heads and colleagues that they should give Macchiarini special treatment.

He could do pretty much as he pleased. In the first couple of years at Karolinska, he put plastic airways into three patients. Since this was radically new, Macchiarini and his colleagues should have tested it on animals first. They didn't.

Likewise, they didn't undertake a proper risk assessment of the procedure, nor did Macchiarini's team seek government permits for the plastic windpipes, stem cells, and chemical "growth factors" they used. They didn't even seek the approval of Stockholm's ethical review board, which is based at Karolinska.

Though Macchiarini was in the public eye, he was able to sidestep the usual rules and regulations. Or rather, his celebrity status helped him do so. Karolinska's leadership expected big things from their superstar, things that would bring prestige and funding to the institute.

They also cited a loophole known as "compassionate use". Macchiarini, they claimed, wasn't really doing clinical research. No, he was just caring for his patients who were, one and all, facing certain death with no other treatment options available and no time to waste. In such dire circumstances, new treatments can be tried as a last resort.

This argument didn't wash with those who later investigated the case. In their view, Macchiarini was certainly engaged in clinical research. Besides which, compassionate concerns don't override the basic principles of patient safety and informed consent. Macchiarini, meanwhile, said he "did not accept" the findings of the disciplinary board.

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As it turned out, Macchiarini's patients weren't all at death's door at the time he treated them. Andemariam Beyene, for instance, had recurrent cancer of the windpipe but, aside from a cough, was still in good health. But even if his days had been numbered, this didn't necessarily justify what Macchiarini put him through.

Beyene's death two and a half years after the operation, caused by the failure of his artificial airway, was a grueling ordeal. According to Pierre Delaere, a professor of respiratory surgery at KU Leuven, Belgium, Macchiarini's experiments were bound to end badly. As he said in *Experimenten*: "If I had the option of a synthetic trachea or a firing squad, I'd choose the last option because it would be the least painful form of execution."



Claudia Castillo with Dr Paolo Macchiarini. Photograph: REX/Shutterstock

Delaere was one of the earliest and harshest critics of Macchiarini's engineered airways. Reports of their success always seemed like "hot air" to him. He could see no real evidence that the windpipe scaffolds were becoming living, functioning airways - in which case, they were destined to fail. The only question was how long it would take - weeks, months or a few years.

Delaere's damning criticisms appeared in major medical journals, including the *Lancet*, but weren't taken seriously by Karolinska's leadership. Nor did they impress the institute's ethics council when Delaere lodged a formal complaint.

Support for Macchiarini remained strong, even as his patients began to die. In part, this is because the field of windpipe repair is a niche area. Few people at Karolinska, especially among those in power, knew enough about it to appreciate Delaere's claims. Also, in such a highly competitive environment, people are keen to show allegiance to their superiors and wary of criticising them. The official report into the matter dubbed this the "bandwagon effect".

With Macchiarini's exploits endorsed by management and breathlessly reported in the media, it was all too easy to jump on that bandwagon.

And difficult to jump off. In early 2014, four Karolinska doctors defied the reigning culture of silence by complaining about Macchiarini. In their view, he was grossly misrepresenting his results and the health of his patients. An independent investigator agreed. But the vice-chancellor of Karolinska Institute, Anders Hamsten, wasn't bound by this judgement. He officially cleared Macchiarini of scientific misconduct, allowing merely that he'd sometimes acted "without due care".

For their efforts, the whistleblowers were punished. When Macchiarini accused one of them, Karl-Henrik Grinnemo, of stealing his work in a grant application, Hamsten found him guilty. As Grinnemo recalls, it nearly destroyed his career: "I didn't receive any new grants. No one wanted to collaborate with me. We were doing good research, but it didn't matter ... I thought I was going to lose my lab, my staff - everything."

This went on for three years until, just recently, Grinnemo was cleared of all wrongdoing.

The Macchiarini scandal claimed many of his powerful friends. The vice-chancellor, Anders

Hamsten, resigned. So did Karolinska's dean of research. Likewise the secretary-general of the Nobel Committee. The university board was dismissed and even Harriet Wallberg, who'd moved on to become the chancellor for all Swedish universities, lost her job.

Unfortunately, the scandal is much bigger than Karolinska, which accounts for only three of the patients who have received Macchiarini's "regenerating" windpipes.

The other patients were treated at hospitals in Barcelona, Florence, London, Moscow, Krasnodar, Chicago and Peoria. None of these institutions have faced the same kind of public scrutiny. None have been forced to hold full and independent inquiries. They should be.



Paolo Macchiarini at a press conference in 2008. Photograph: REX/Shutterstock

If the sins of Karolinska have been committed elsewhere, it is partly because medical research facilities share a common milieu, which harbours common dangers. One of these is the hype surrounding stem cells.

Stem cell research is a hot field of science and, according to statistics, also a rather scandal-prone one. Articles in this area are retracted 2.4 times more often than the average for biomedicine, and over half of these retractions are due to fraud.

Does the "heat" of stem cell research - the high levels of funding, prestige and media coverage it enjoys - somehow encourage fraud? That's what our experience of medical research leads us to suspect. While there isn't enough data to actually prove this, we do have some key indicators.

We have, for example, a growing list of scientific celebrities who have committed major stem cell fraud. There is South Korea's Hwang Woo-suk who, in 2004, falsely claimed to have created the first human embryonic stem cells by means of cloning. A few years ago, Japan's Haruko Obokata pulled a similar con when she announced to the world a new and simple - and fake - method of turning ordinary body cells into stem cells.

Hwang, Obokata and Macchiarini were all attracted to the hottest regions of stem cell research, where hope for a medical breakthrough was greatest. In Macchiarini's case, the hope was that patients could be treated with stem cells taken from their own bone marrow.

Over the years, this possibility has generated great excitement and a huge amount of research. Yet, for the vast majority of such treatments, there is little solid evidence that they

work. (The big exception is blood stem cell transplantation, which has been saving the lives of people with leukemia and other cancers of the blood for decades.)

It's enough to worry officials from the US Food and Drug Administration (FDA). They recently published an article in the *New England Journal of Medicine* admitting that stem cell research has mostly failed to live up to its therapeutic promise.

An alarmingly wide gap has grown between what we expect from stem cells and what they deliver. Each new scientific discovery brings a flood of stories about how it will revolutionise medicine one day soon. But that day is always postponed.

An unhappy result of this is the rise of pseudo-scientific therapies. Stem cell clinics have sprung up like weeds, offering to treat just about any ailment you can name. In place of clinical data, there are gushing testimonials. There are also plenty of desperate patients who believe - because they've been told countless times - that stem cells are the cure, and who cannot wait any longer for mainstream medicine. They and their loved ones fall victim to false hope.

Scientists can also suffer from false hope. To some extent, they believed Macchiarini because he told them what they wanted to hear. You can see this in the speed with which his "breakthroughs" were accepted. Only four months after Macchiarini operated on Claudia Castillo, his results - provisional but very positive - were published online by the *Lancet*. Thereafter it was all over the news.

The popular press also has a lot to answer for. Its love of human interest stories makes it sympathetic to unproven therapies. As studies have shown, the media often casts a positive light on stem cell tourism, suggesting that the treatments are effective and the risks low. It did much the same for Macchiarini's windpipe replacements. A good example is the NBC documentary *A Leap of Faith*. It's fascinating to rewatch - as a lesson on how *not* to report on medical science.

It is fitting that Macchiarini's career unravelled at the Karolinska Institute. As the home of the Nobel prize in physiology or medicine, one of its ambitions is to create scientific celebrities. Every year, it gives science a show-business makeover, picking out from the mass of medical researchers those individuals deserving of superstardom. The idea is that scientific progress is driven by the genius of a few.

It's a problematic idea with unfortunate side effects. A genius is a revolutionary by definition, a risk-taker and a law-breaker. Wasn't something of this idea behind the special treatment Karolinska gave Macchiarini? Surely, he got away with so much because he was considered an exception to the rules with more than a whiff of the Nobel about him. At any rate, some of his most powerful friends were themselves Nobel judges until, with his fall from grace, they fell too.

If there is a moral to this tale, it's that we need to be wary of medical messiahs with their promises of salvation.

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