

An indoor ice hockey rink with a glass barrier in the foreground. A player in a dark jersey is skating on the ice, holding a stick. Another player is visible in the background. The rink has a yellow and blue border. A Coca-Cola logo is visible on the wall behind the rink, and an NFP logo is also present. The scene is lit with bright overhead lights.

AFTER A HORRIBLE ACCIDENT, SURGERY SAVED  
TUCKER MARR'S LIFE, BUT LEFT HIM WITH A  
DEFORMED AND VULNERABLE SKULL. A REMARKABLE  
NORTHWELL PROGRAM RESTORED HIS APPEARANCE  
AND HIS LUST FOR LIFE.

# RECONSTRUCTING TUCKER





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In October 2022, Tucker Marr woke up in a hospital in Minnesota with nearly half his skull missing. His brain was so injured, he could say only three words. He had pneumonia and dangerously low blood oxygen levels, and he was in excruciating pain.

And he had no idea how he'd ended up in that kind of trouble.

His doctors and his girlfriend, Mary Cobble, filled him in: Days earlier, he had been a perfectly healthy 26-year-old in peak condition, an avid hockey player who was in the final phase of training for the New York City Marathon. But while attending a friend's out-of-town wedding — Marr lives in New York — he fell down a flight of stairs at the hotel.

He hit his head as he tumbled and was non-responsive when emergency personnel arrived. They rushed him to a nearby hospital, where a CT scan revealed that he had a major bleed in his brain. To save his life, surgeons stopped the bleed — and removed a large piece of his skull, which allowed room for his brain to swell without it getting squeezed to a potentially lethal degree.

Considering how unlucky he had been, the next few months proved to be extremely fortunate for Marr. He regained his speech and his pain eventually abated. Three months after the accident, he was back home in New York, spending time with Cobble and catching up with friends, although he remained on medical leave from his position as a technical consultant with Deloitte.

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**"I FEEL LIKE I'M BACK TO THE PERSON I WAS BEFORE.  
I'M BACK TO DOING EVERYTHING THAT I LOVE TO DO."**

**- Tucker Marr**



**Above: Tucker Marr was undaunted after the emergency surgery that saved his life — but he wasn't immune to the stares he got from strangers. Below: After reconstruction, he feels whole again.**

But Marr still faced one major issue: The left side of his skull was missing — it looked as though his head was caved in.

A handprint-sized piece of skull was simply gone. The night of his accident, the surgeons had removed the bone to allow his brain to swell; they'd saved the piece of skull, but it would be months before it would be safe to think about reattaching it. The only barrier left to protect his brain was skin; a simple stumble could be life-threatening.

Whenever he left his apartment, he put on an impact-absorbing helmet. Marr's close circle — his family, friends and girlfriend — let him know they found the helmet charming or entertaining. But strangers on the streets of New York were wary.

"People look at you, you look at them, they look away. It can make you feel almost like a zoo animal," says Marr. "You can feel the devils of low self-esteem. I started to get more and more interested in finding a way to recover from this completely."

### **A ground-breaking program**

Marr started his search for a solution at the right time. Just a couple of months after his accident, Northwell Health had launched New York State's first neuroplastic surgery program, based at Lenox Hill Hospital. The Neuroplastic & Reconstructive Surgery program is one of only four neuroplastics programs in the country. The discipline combines the techniques of neurosurgery with those of reconstructive surgery to restore a person's appearance after they undergo a disfiguring head trauma or brain surgery.

Marr is not the only one to find himself with a serious skull deformity after an accident or life-saving surgery: Thousands of people in the United States each year end up in a similar position.

Many of them simply accept that they will never look the same. "Patients who have cancer or who have gone through a major trauma are often so grateful for the

surgery that has saved their lives that they overlook the scars and deformities that are left behind," says neurosurgeon Netanel Ben-Shalom, MD, FNPS, who leads the new program. "But self-confidence is a crucial factor in a patient's outcome and in their quality of life going forward."

Others try to improve their appearance through a cranioplasty — skull repair surgery — but that procedure has a high complication rate. That's partly due to the fact that over the past century or so, neurosurgeons rightfully focused their research efforts on the brain; there wasn't the same scientific exploration devoted to getting into and out of the brain and reconstructing the skull and scalp, says Dr. Ben-Shalom. As a result, patients are vulnerable to a host of long-term problems that range from deformities and scalp breakdown to infection, leaks of cerebrospinal fluid, hair loss, pain and more.

"Neuroplastic and reconstructive surgeons pulled from a variety of disciplines to address these issues," he says. "We developed techniques and methods to optimize wound healing, prevent craniofacial deformities, avoid visible scars, mitigate risks for infections and ensure scalp durability.

"It's a holistic approach, and it's personalized to the needs of the patient."

Dr. Ben-Shalom's team has also refined the implants used in surgery.

"Traditional cranial implants replace the bone, but not the muscle, fascia, fat and other tissue that is missing after you've removed part of the skull," he explains. "In neuroplastics, we developed next-generation implants that not only restore the bone but the soft tissue, as well."

One other benefit: The 3D-printed acrylic implants used by Dr. Ben-Shalom and his colleagues are sonolucent, meaning that sound waves easily pass through them. So Dr. Ben-Shalom can monitor the recovery of a post-op patient's brain simply by holding a small ultrasound machine up to their head.

Neuroplastic surgery procedures appear





Left: Neurosurgeon Netanel Ben-Shalom leads the new neuroplastic surgery program, the first in New York State. Below: Tucker Marr and his girlfriend, Mary Cobble, after his reconstructive surgery.



to be vastly safer and more effective than older methods. During a fellowship at Johns Hopkins School of Medicine, where the surgical specialty was developed, Dr. Ben-Shalom reviewed data gathered on 500 cranioplasties that utilized newer neuroplastics techniques. His analysis showed that the complication rate was 15% — much lower than the 35% complication rate associated with the traditional approach. “That’s a game-changer,” he says.

## A return to normalcy

Marr had no intention of living with a visibly deformed skull, but when he began researching reconstructive options, he was discouraged by the less-than-optimal outcomes and risks of traditional cranioplasty. Then he heard about Dr. Ben-Shalom’s approach.

His first consultation with Dr. Ben-Shalom took place over Zoom, but it was thorough and wide-ranging. “He did an amazing job sharing his process,” says Marr, “and really made it feel like a team — like he was my teammate. And I knew the plan, and I knew the plan would succeed.”

“He really wanted to hear about my wants and desires. I explained that I wanted to return to playing hockey, and he told me he would create the implant with that in mind.”

Marr’s girlfriend, by his side throughout the process, remembers a mix of emotions. “The first surgery was scary enough,” Cobble says. “To then have him go back under the knife ...

everyone obviously was nervous. But we had so much trust in Dr. Ben-Shalom and his team.”

In February 2022, Marr walked himself into the operating room at Lenox Hill Hospital. Dr. Ben-Shalom had spent countless hours in preparation — collaborating with the biomedical engineers as they custom-crafted Marr’s implant, vetting various renderings of the design before it was 3D-printed and carefully determining the precise surgical approach. But the operation itself took less than three hours.

Marr could see the results almost immediately. “I had not imagined that the implant would fit as perfectly as it did,” he says. “Right after surgery I noticed that my head was perfectly symmetrical; there weren’t any bumps or dents. And a few weeks later, once the swelling went down and the stitches came out, I looked completely normal.”

But the implant has done more than just restore his appearance, Marr says — it’s allowed him to throw himself back into life. Within a few weeks, he was playing paddle tennis with friends, and his activity level has ramped up from there. In April, just two months after his neuroplastic surgery, he put his skates back on and grabbed his hockey stick. And this past November, he ran in the New York City Marathon — using the opportunity to fund-raise for Northwell.

His return to full-throttle living is all

thanks to Dr. Ben-Shalom, he says. “He knows I love hockey — he put enough screws in the front left of the implant to make it safe for me to get back on the ice. And he did that as a personal gesture, to say, ‘Hey, you’re going to be extra safe, and you’re going to be all right when you’re out there playing.’”

Marr is beyond grateful for the respect and care provided by Dr. Ben-Shalom and the neuroplastics team, he says. “I feel like I’m back to the person I was before,” he says. “I’m back to doing everything that I love to do. And I owe that all to their team.”

▶ Scan the QR code to learn more about Marr’s remarkable surgery.

