Clinical Pharmacy

Cryptogenic Stroke: Part 2

Even when it was happening, I was convinced that it could not be a stroke, that it had to be something else, even though I had the three hallmark signs (arm weakness, facial droop, slurred speech).

Alex Poppen, PharmD

Oct 30, 2024 • 6 min read

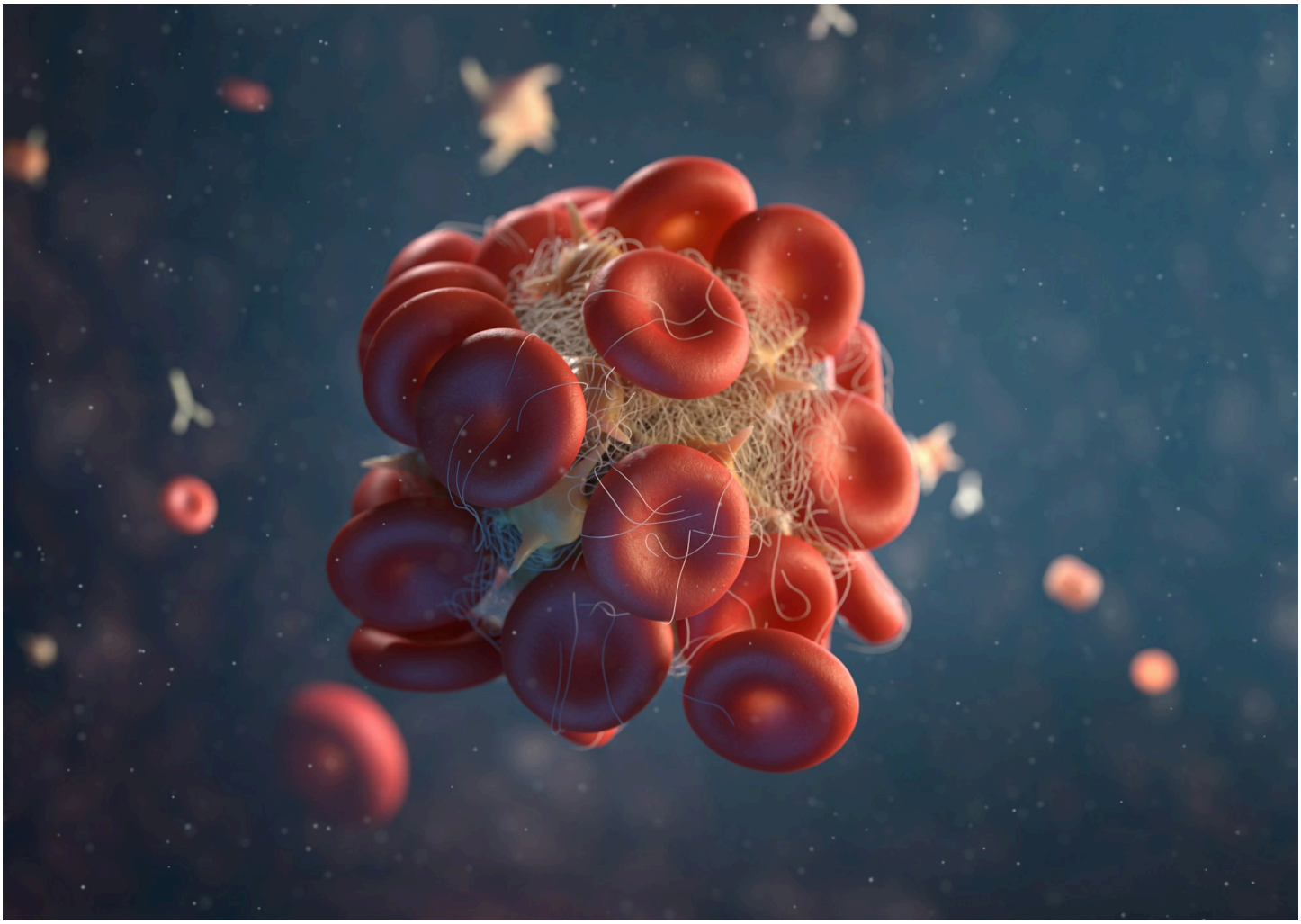


Photo by digitale.de / Unsplash

For part 1, please click HERE or to watch the video interview, click HERE

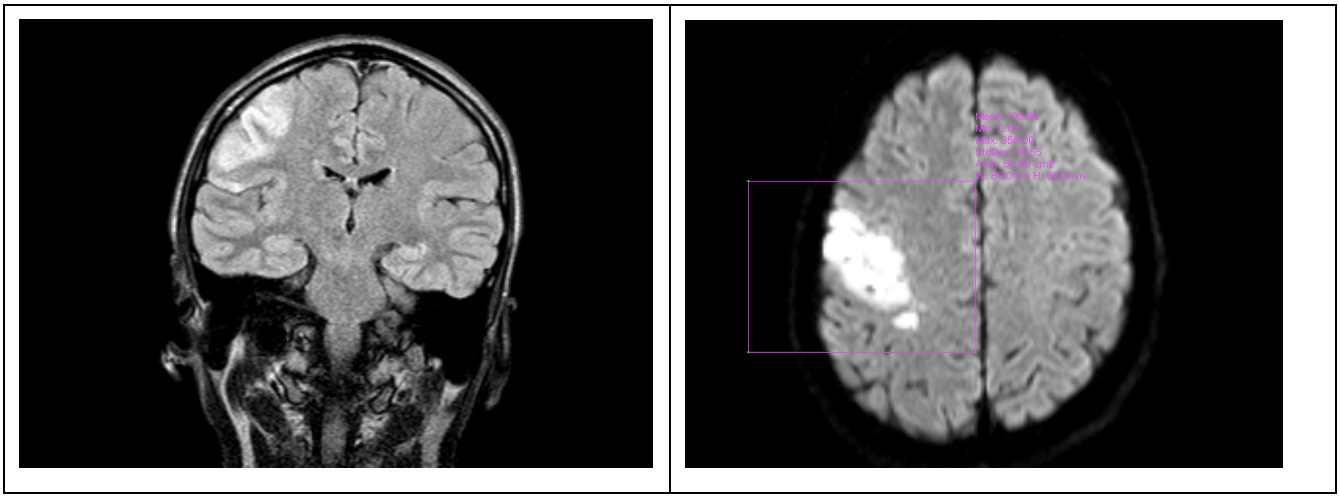
My name is Alex Poppen, I am a drug information pharmacist, I am 30 years old and last year I had a stroke.

This was not something I had ever thought about happening, especially at my age. I have always had good health, I didn't have any known risk factors for heart disease or stroke, I exercised regularly and I had a healthy body weight.

Even when it was happening, I was convinced that it **could not** be a stroke, that it had to be **something else**, even though I had the **three hallmark signs** (arm weakness, facial droop, slurred speech).

https://www.stroke.org/en/professionals/stroke-resource-library/prevention/five-key-facts-about-stroke

But after getting to the emergency room and having imaging done, it was indeed **confirmed** as an **ischemic stroke**.



^Bright region represents the area of the brain affected by the stroke (area of infarct).

Cardiology, neurology and hematology were all consulted to help with my case and over the next several days in the hospital a litany of tests and procedures were performed to try and identify the **cause** of the stroke.

This included over twenty blood draws, heart rhythm monitoring, several echocardiograms, cerebral angiography and more.

It all came back “normal”, no significant findings. Heart, brain and blood work were all “healthy”. The stroke was ruled to be **cryptogenic**, a type of ischemic stroke with **no clear cause**.

I was put on a few medications (statin, clopidogrel and aspirin) and discharged home after three days. I was connected with a rehabilitation clinic to help with my recovery.

Over the next several weeks, I was lucky to recover well and regain the majority of the lost functionality in my speech and left arm movement. However, the numerous outpatient follow-up visits did **not** yield any further insight as to why this happened.

My wife and I were very motivated to try and figure out what caused this (and hopefully address it), so we got a referral to a vascular stroke neurologist at a large teaching hospital to get a second opinion…in **three months**.

I had hoped to get seen sooner, but that was the very earliest available. So I spent that time doing my rehab exercises and getting back to work (thankfully I work from home at a desk).

By the time the specialist visit came around, I was back to working out, jogging with our two dogs and doing all my usual activities (a true testament to the importance and benefit of adhering to rehab exercises).

The meeting with the vascular stroke neurologist went well. He asked me to recount the events leading up to the stroke to provide some added background information.

I told him that I was about to feed our dogs dinner, and that the symptoms happened right as I **bent down** to grab the scoop out of their food bin.

He told me that this stroke presentation is largely consistent with those who have a **patent foramen ovale** (PFO), as bending over **increases** the amount of pressure in the chest and can cause any abnormal gaps or connections between heart chambers to briefly open further.

*Note: PFO is a congenital heart condition where a **small opening** or **flap** in the heart's atrial septum, which usually closes shortly after birth, remains partially or completely open. This opening can allow blood to bypass the lungs and potentially carry **small blood clots** or debris from the venous circulation to the arterial circulation, increasing the risk of stroke and other cardiovascular issues.*

I told him that PFO had been **ruled out** through several imaging studies (TEE and TTE with bubble studies) during the initial hospitalization.

He said those studies are generally sufficient to detect PFO. However, there is a much more sensitive study that he would like to perform, called a **transcranial Doppler** (TCD) with a bubble study.

A TCD is a **non-invasive** imaging technique that uses sound waves to assess blood flow in the brain.

https://viasonix.com/products/transcranial-doppler/dolphin-max/

A **bubble study** is when a saline solution with tiny bubbles (microbubbles) is injected into a vein, usually in the arm. These microbubbles **normally** travel to the lungs, where they are filtered out.

To detect for a **PFO**, the patient is asked to perform the Valsalva maneuver (bearing down or clenching their abs) to **increase pressure** in the chest, temporarily altering blood flow patterns.

If there is a PFO, the increased pressure can cause the microbubbles to **bypass** the lungs and cross from the **right side** of the heart to the **left side**, eventually reaching the brain. The TCD detects these microbubbles, indicating the presence of a PFO.

So, about a month later the TCD and bubble study was performed…and it resulted **positive**, indicating the presence of a PFO.

This was a confusing finding for me, since I had been **assured** during the initial hospitalization that there was **no** PFO.

This led to **another** referral to cardiology within the teaching hospital to determine the need for a repeat echocardiogram. So two months passed, and at the first visit with the cardiology team they reviewed the initial TTE and TEE imaging studies (took a long time for the records request to arrive).

Apparently, these studies were **not** the best quality…and the original TEE actually **did** show evidence of a PFO (which was apparently missed by the previous cardiologist).

We end up doing a **repeat** TEE a few weeks later at the teaching hospital to obtain a better image and *hopefully* confirm the PFO. And the final result was indeed **positive** for PFO.

So at this point, we are about **8 months** after the stroke and the PFO is the only potential cause.

It was a little frustrating to learn that the previous cardiologist did not notice the PFO and felt confident enough in the imaging study to rule it out, since it would have answered the question of "what caused this?" very early on (and could have been corrected much sooner).

But thankfully, no harm, no foul in this case. I'm very thankful that the stroke was relatively minor to begin with and that there was no recurrent event in that interim period.

But now that we know that there **is** a PFO and that it is the leading probable cause for **why** the stroke happened in the first place, **what's next**?

*Note: PFOs are actually **quite common** (roughly one in four adults have them) and for the vast majority it causes no symptoms or health problems.*

*However, a PFO can be a potential **pathway** for blood clots to travel from the veins to the brain. This is because clots that would normally be filtered by the **lungs** can pass through the PFO (right atrium to left atrium) and reach the brain.*

There were **two main options** discussed:

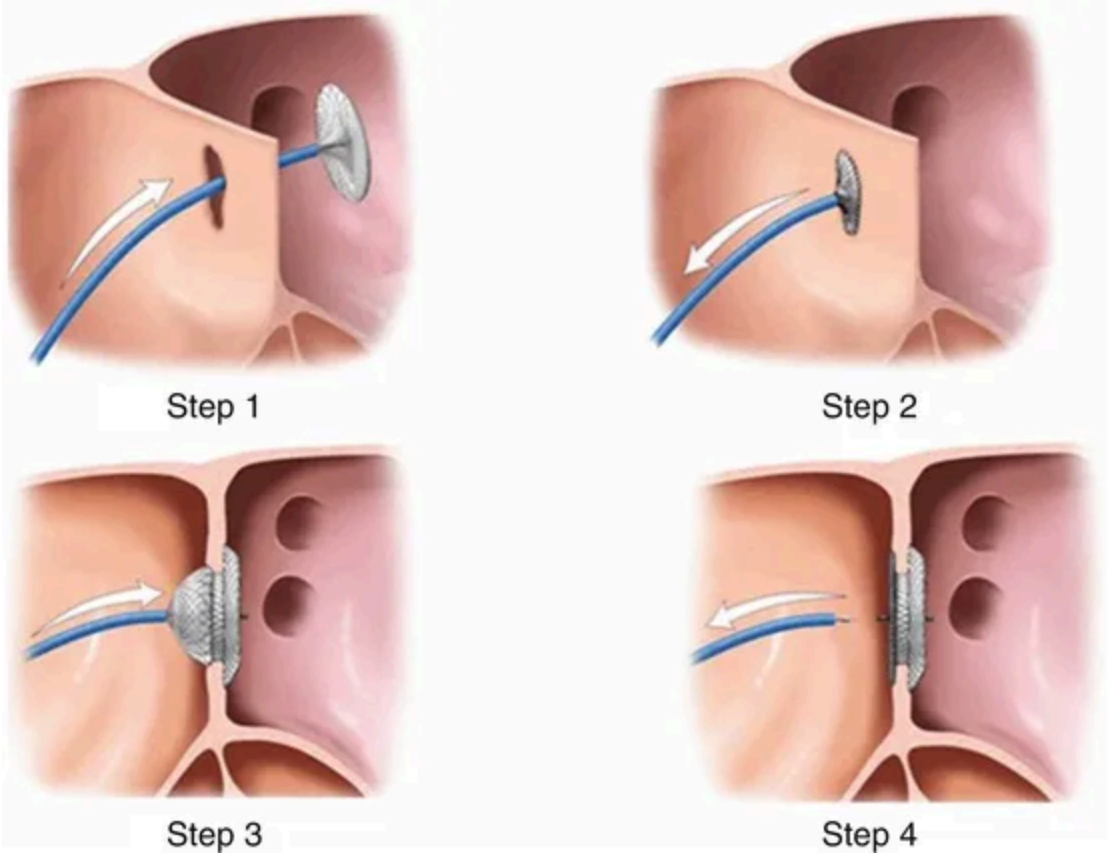
1. Continue antiplatelet therapy (likely indefinitely)
2. Close the PFO

The cardiologist had a clear preference for the second option, **closing the PFO**, which aligns with the 2021 AHA/ASA Guideline for the Prevention of Stroke in Patients With Stroke and Transient Ischemic Attack.

He explained that the current available data shows that for patients my age, closing the PFO is **more effective** at preventing recurrent events than antiplatelet therapy. Plus, it is minimally invasive and would allow me to stop taking my current medications since the cause would be corrected and I would not have any other clear indications for them.

So together we agreed to proceed with the PFO closure plan. Thankfully, I was able to get scheduled about two weeks later.

The procedure involved inserting a **catheter** into a vein in my groin and guiding it up into my heart, along with the closure device. Then, real-time imaging was used to insert the closure device at the site of the PFO **between** the right and left atria. The device was then expanded and the PFO closed shut. Over time, heart tissue grows over the device, effectively sealing the PFO.



https://thoracickey.com/pfo-closure-techniques-and-devices/

The procedure was a success! And a few hours later I was sent home to rest and recover. A month later, they rechecked the device placement (via TTE and bubble study) and confirmed it was still working the way it was supposed to.

More or less, that pretty much brings us to the current day. It is roughly one year later and I am happy, healthy and very thankful to move on with my life!

While what happened was **scary** (especially for my wife) and the journey to discover the cause **frustratingly slow**, I do think of myself as **truly lucky** to still be here and that I still get to do all the things I enjoy.