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Stem Cell Collection And Hyperbaric Oxygen Treatment

By Lori Puente

Published: Jan 11, 2011 4:25 pm

My husband was diagnosed in June 2008 with multiple myeloma at the age of 48 after having severe back pain, which turned out to be a vertebral compression fracture.

The local general oncologist started him on a thalidomide (Thalomid) and dexamethasone (Decadron) regimen in addition to radiation on the lesion on his spine to alleviate the tremendous pain. He could move better after each treatment.

When we began consulting for treatment that included stem cell transplantation, we learned that Dave had received “extensive radiation” and that this would make collecting his stem cells “difficult,” “arduous,” and “potentially problematic.” Great! Just great! When I mentioned this to the oncologist still in charge of our care, he blew me off completely. He said, “No, no, we weren’t radiating the ‘long bones,’ which is where most stem cells come from in collection.” That’s funny, his own attending physician from his residency whom he had referred us to, disagreed. Frustrating.

When we got to Little Rock, Arkansas for our consultation, I asked what they do when a patient comes in with lesions and tremendous pain. How do they shrink the lesions and reduce the pain? They said, “We simply start immediate treatment of the multiple myeloma. We never, never, ever, radiate someone who will be doing a transplant, and we have written numerous medical papers on why. It’s incredibly disappointing to us how many patients come here with radiation treatment. Don’t feel bad, you are not alone.”

A dear friend of mine in the horse business in Lexington contacted me and said to get Dave into hyperbaric oxygen treatment (HBOT) before his stem cell collection. Her farm was next door to an equine rehab facility. They had an HBO chamber for horses and had seen some pretty amazing miracles!

I was fascinated, and we had some very interesting discussions about the use of this alternative treatment therapy—from treating strokes to autism and brain injuries as well as the more understood and accepted treatment of fractures and open wounds.

When you are injured or have a wound, stem cells mobilize in

your bone marrow, spill into the blood stream, and travel to the injury to heal it, like a little army. When a wound won’t heal, HBOT can step in and dramatically improve the outcome.

The horse rehab center sent me a paper from the University of Pennsylvania by Dr. Stephen R. Thom called “Stem cell mobilization by hyperbaric oxygen,” which was published in June 2005. I’m not a scientist, but the abstract and the conclusions were clear to me. Including 20 HBOTs for Dave would potentially increase his “stem cell mobilization” eight-fold.

I located a facility near where we live and contacted them for an appointment. When I mentioned it to the doctor in Little Rock, he shrugged and said, “Sure, if you want to do that, go ahead. I’m going to do the collection process the way I always do.”

Honestly, I didn’t really know enough about any of what we were embarking on to make these decisions with full confidence. I worked off what I learned, what made sense (to me), my instincts, and the most important part – HBOT wouldn’t hurt Dave.

In addition to mobilizing stem cells, HBOT can also help heal radiation damage. So it’s a twofer (two for one) as they say. I just couldn’t find the downside, except the out-of-pocket cost.

We decided to go ahead with it. The problem was, Dave was scheduled to begin treatment in Little Rock in mid-November, and it was October. We didn’t have a lot of time to get in 20 treatments, and he was back at work. It was exhausting for him to squeeze treatments in every single day to get the targeted 20. We ultimately only were able to get in 19 before we left for Arkansas.

The actual treatments were easy. He said that his ears would feel pressure, like while flying in an airplane. The chamber was clear, and he could watch TV during his 90 minute sessions. He would be ravishingly hungry when he was done, even though he would have eaten before he went in. Afterward, he was “hyper alert” mentally. Under ideal circumstances, these treatments would not be so condensed.



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During the stem cell collection – for those of you who have not been through it – your immune system is wiped out with chemotherapy. Then you are given Neupogen (growth hormone) shots to help facilitate an overproduction of stem cells so that they spill out into your blood stream and are available for collection. When your white blood cell (WBC) count gets up to 2.0 or higher, they will run a special test called a “ProCOUNT” (CD34 on your labs), which is basically an estimation of how many stem cells you have in your blood for collection. One of the physical manifestations of this process for the patient is some pretty intense bone pain. The cells are building up in the bone marrow; they are jammed in there and are very overcrowded. This causes them to spill out into the blood stream to become available for the aphaeresis process used to capture them and extract them from your blood.

In Little Rock they don’t do the ProCOUNT until your WBC count is over 2.0, but Dave had been up all night in a chair with extra pain meds because of bone pain discomfort. We did not wait for our regular appointment in the infusion center but went in at 6:30 a.m.

Dave’s WBC count jumped from below 2.0 to over 13 during the night! They ran the ProCOUNT test, and Dave’s was at 50 million cells available for collection! The collection doctor said that in 20 years of doing this she had never seen anyone with his extensive radiation history with those numbers!

We were unable to get everything needed done to get the collection started that day. So more drugs, no more growth factor shots, and home we went for the night, ready to collect early the next morning. Overnight Dave developed a very high fever that was gone by the time we got in for collection. They scheduled his collection for only 45 minutes. Normally, collection is a number of hours spread over days.

In Little Rock, they always collect a second day in order to make sure that in case there is a problem, they have another collection. They try to collect enough cells for six transplants, which equates to 20 million cells, with an average of 3 to 4 million per transplant and 2 million the bare minimum. On the second day, they scheduled Dave for only 30 minutes of collection.

Over those 75 minutes, Dave collected 47 million stem cells (11 transplants worth). When they did a post collection ProCOUNT, he had 90 million cells still available in his blood stream for collection! His bone pain, which should normally ease immediately upon collection, was still uncomfortable. He jokingly begged them to please take out more and said they

could throw them away and that he promised not to tell. Within about 24 hours, he was back to normal. All his cells were deemed “viable” for transplant.

I learned later that Little Rock began to experiment with its hard-to-collect patients by sending them to a nearby hospital for HBOT. What I learned was that if they had a patient who could only collect say 30,000 stem cells, after HBOT they were able to collect 300,000. This is still not enough for even one transplant. However, a patient who could collect 300,000 cells before HBOT might be able to produce around 3 million cells after HBOT, as the paper describes.

The more humorous part of this story is that I wrote to Dr. Thom at the University of Pennsylvania and shared with him our experience and results, thanks to his paper. He wrote me back and thanked me for the information. He then said, “This is exactly what our findings were, but we have very little human data.” What a crack up!

The HBO doctor recommended we do 20 treatments post transplants, therapeutically. We are planning to do this. It will presumably help with Dave’s fatigue and low WBC numbers.

I suspect that Dave would have collected enough stem cells over a week’s time, but there was no way for me to know that. All I knew was what I was told: that he would have problems due to his “extensive radiation” (around 12 treatments). The problem with this is you don’t really know if there will be a problem until you try to collect. We were proactive in our complimentary therapy in approaching this potential barrier. We believe there were other benefits, but it is candidly anecdotal.