

A Magic Bullet

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Six days ago, on a dreary dismal depressing December in beautiful Boston, one of my closest childhood friends, Jerry, phoned me completely out of the blue. Growing up we were inseparable, but I hadn't spoken to my buddy in almost fifteen years. We lived only two short city blocks from each other, he on Fayette Street and I on Williams Avenue. We attended the same schools, went to the same parties and played on the same baseball and basketball teams. I even had my first "real" kiss, at a spin-the bottle party in Jerry's basement.

Our friendship, the closeness of our relationship declined rapidly over the course of our senior year of high school. Both Jerry and I fell madly in love, infatuated with the adorable red-headed tall, slender transfer student who also possessed brains and a delightful southern drawl. The complete package. We each competed extremely hard, which strained our friendship, to capture the heart of our mutual affection. As our senior year progressed both Jerry and I were rejected in our amorous endeavors by the Adonis, athletic captain of the football team who ultimately won the prize. Our intense competition caused a huge dent in our bromance.

After high-school I attended Harvard and he went South to Duke. I remained in Boston after graduating, finished Harvard Medical School and started working at Mass General. After completing his law degree at Duke, Jerry began a successful law career in Raleigh. He married, had a family, and through a mutual acquaintance, I heard that he had accepted a partnership with Mintz Levin, a prestigious downtown

Boston law firm. He moved his family to Beacon Hill, one of the most expensive areas in which to reside in the country.

Jerry's voice was raspy, his speech slurred. He complained of severe debilitating migraines and dizziness. "Wait, wait" I said. "How long have you been experiencing these migraines?" "A few months," he explained. "Initially my problems were sporadic occurring once every five to seven days, he told me. I blamed my ills on the stress of a new job coupled with a new home. About two weeks ago I saw a family doctor, recommended by one of my partners, who prescribed Antivert for my dizziness and Imitrex for my migraines. But the daily occurrence and severity of my unrelenting throbbing headaches and nausea are *increasing*, nothing works, and I'm petrified. At 60 my father in good health developed a brain aneurysm, deteriorated rapidly over the next month and died." "Get to the emergency room", I shouted over his trembling voice. After listening to his story, I was concerned, very concerned.

During my career, which has spanned nearly three decades I have heard countless similar painful, heart wrenching stories and many, no most have ended very poorly. Maybe I'm being silly, this could be nothing. Today wasn't one of my better days. A week ago, a patient that I liked, a young vibrant man in his late 30's, on whom the team had performed a successful operation, one that eliminated his cancerous brain tumor, developed complications, suffered a massive stroke, and died last night. Such a shame.

When I met Jerry after he was first admitted and given a preliminary exam, he looked exhausted displaying absolutely no flame in his eyes. I spent some time reminiscing with Jerry while I ordered an expensive batch of lab tests one being a comprehensive

brain scan. He tried to smile but it was forced. He looked horrible. Stepping away from my doctor's persona I attempted to calm him down as his blood pressure and other vitals rose. I blurted out, hoping to brighten Jerry's mood, "I miss you buddy, do you remember the great times we had growing up, meeting girls, and just getting into good trouble?". "I believed those times would last forever," Jerry replied in an expressionless voice. Inside a million unanswerable questions attacked his brain, the scariest, will I live and if I do will I be a vegetable, a useless burden on my family. Time remained motionless. Finally, the nurse assistant arrived and wheeled a frightened Jerry to the elevator and down four floors where he would be administered a battery of tests, some invasive. As I walked to my office my brain was exploding with clashing diagnosis none positive.

Later that day the lab results were gathered and read. The news was as bad as it gets. Jerry had an advanced glioblastoma multiforme cancer lying on his brain stem which is in the posterior part of the brain. The brain stem connects the cerebrum with the spinal cord and plays a vital role in conduction. Motor and sensory neurons travel through the brain stem allowing for the relay of signals between the brain and the spinal cord. Your cardiovascular systems, respiratory control, pain sensitivity control, alertness and awareness are all affected. Damage to the brain stem is life-threatening. To successfully remove my friend's tumor in this precarious location of the brain and save his life has about as much success as winning the lottery.

My job stinks. I met Jerry's family, his wife Ruth and their two sons, in the visitor's lounge and proceeded to deliver the "Death is staring you in the Face" speech. Even after all these years practicing medicine it is still gut-wrenching to convey these words. I look squarely into Ruth's eyes, with mine filling up, and attempt to explain

that her husband, their father had 6-9 months at best to survive, with his condition worsening daily. The only option, Jerry has, is to undergo a grueling unpredictable operation where the survival rate was worse than Frosty the Snowman surviving in South Florida. "Why, she screamed, why my Jerry". Ruth's tears gushed uncontrollably down her ashen face. Her ear-splitting scream shattered my senses and her piercing blue eyes decimated my soul. I remained immobilized, like a statue, at a loss for words. There is no answer to her "Why". Nothing I can say, I thought, will lessen the shock, or take away Jerry's family's intense pain. Powerless, with a heavy heart, I left the grieving family alone to cry and think.

That evening while lying in bed wide awake, I suddenly remembered that one of my teammates had recently returned from a medical symposium in Beijing with the latest Chinese Medical Association journal. One of the articles spoke about two Chinese doctors who had successfully operated and removed a tumor on a patient with a similar condition to Jerry's. Could this be the magic bullet? I reread the article and contacted Dr. Warren Chen and Dr. Larry Chew, two of the world's preeminent neurosurgeons, to discuss how they were able to remove the glioblastoma and not damage the brainstem.

They explained that they kept the patient semi-awake, known as an awake craniotomy, using local anesthesia to make opening the skull painless. Dr. Chew had discovered a sterile anesthetic gel which could be used around the outer portion of the skull/ occiput bone where the first incision would be made. Subsequently they would bath the soft tissue and brain matter with this agent to render it completely numb while they monitored the patient and carefully excised the tumor. Intravenous sedation was also employed. By using this revolutionary surgical procedure, the

patient was able to follow simple commands and assist them in this complicated twelve hour agonizing surgical operation. Now the best news. The patient after nine months is alive and home with his family. A ray of sunshine in a pitch-black sky.

Even before I had a chance to give Jerry's family some glimmer of encouragement, they had already decided unanimously to opt for an operation. I was conflicted, afraid to raise their fading hopes. If I failed, for a million different reasons, wouldn't that cause even more intense excruciating pain? Jerry's family tried to have a brave façade, even with their swollen, puffy eyes and sad muted voices, as I explained what was going to transpire. Over the next 48 hours my team quizzed, no grilled Dr. Chen and Dr. Chew, my Chinese brothers, on every aspect of Jerry's pending surgery. Their articulate, insightful answers emboldened us. Maybe there is a light at the end of this tunnel. My fellow neurosurgeons agreed to copy their formula for success.

We then prepared Jerry. It was imperative for him to be responsive, to inform us if he was experiencing pain, answer any questions that occurred during this difficult, near-impossible surgery. He wouldn't be able to speak, only hear our commands. He could respond by tapping his index finger once for "yes," twice for "no". During this twelve-hour marathon ordeal, the team would need his assistance. I really wanted my Chinese colleagues' bodies and brilliant minds to be with my team in the operating room but unfortunately time was of the essence. Jerry's condition was deteriorating rapidly. Through the wonders of technology, the team was able to utilize Dr. Chen's and Dr. Chew's marvelous minds. We set up a Video conferencing console in the operating room which enabled them to be with us even though they were 7300 miles away.

Waking up early the next morning, a positive feeling of success in my gut excited me. Maybe, just maybe my surgical team can save Jerry's life. The surgical team consisted of three neurosurgeons, an anesthesiologist, a CRNA (certified registered nurse anesthetist, two operating nurses, a scrub nurse, two residents and a physician assistant. We commenced surgical scrubbing with antimicrobial soap for at least 5 minutes. This procedure was done to remove any debris and transient microorganism from our nails, hands, and forearms. We needed to prevent (SSIs), surgical site infections, which could be devastating for Jerry. Dressed in surgical gowns and reinforced nitrile gloves we walked with purpose into battle amid high anticipation coupled with justifiable trepidation. My time-tested team, who were internally praying, quietly entered the sterile operating room. Countless machines with tubes protruding everywhere partnering with their corresponding monitors encompassed our workplace.

At seven AM the anesthesiologist began administering the sterile anesthetic gel along with intravenous sedation. Jerry's head was placed in a fixed position to ensure surgical accuracy My team waited for a few moments to make sure Jerry was in a semiconscious state. My colleagues then made a skin incision and proceeded to cut across the temporal bone. A twinge, no, more like an avalanche of anxiety confronted me as we placed "keyhole" craniotomies, quarter-size holes in which precision placed instruments were inserted into Jerry's skull. We conducted pin-point brain mapping along with 3-d computer images that allowed us to safely remove the brain tumor without damaging the areas that control vision, speech, and movement.

For the next twelve hours we performed like Bernstein conducting the NY Philharmonic, like Michael Phelps swimming in the Olympics. It was tedious, delicate, exhausting and when complications arose my doctor friends across the world were there to assist and guide the team. Immediately following the operation, although totally exhausted, we raced to the X-Ray room to review the post-surgery scans. My colleagues, in my humble opinion, a team of brilliant neuro-surgeons each from a top-notch medical institution working with me at Massachusetts General, were stunned at what they were witnessing as they read the results of Jerry's brain scan. The tumor was completely eradicated. The surgery was successful. On that day my team won on the battlefield of life. An outstanding victory.

I wanted you, my readers, to know that Jerry after some minor complications from surgery made a complete and successful recovery. We rekindled our friendship and soon became inseparable buddies. But the best news- after 7 years Jerry's brain scans reveal no cancer!