THE ORTHOPAEDIC FORUM

What's Important: Honesty and Humility

Brian Shaw, MD

He was a strapping, handsome teen, and the only child of a poor farming family in the south of Virginia. At the age of 16 years, he competed on his high school varsity basketball, football, and track teams. And he had scoliosis.

I was an experienced spinal deformity surgeon, and he was my first spinal fusion surgical patient in my new job at a new hospital that was unfamiliar to me. During our first clinic appointment, it was clear that Jerome (not his real name) was going to need surgery for the severe curve that had been discovered by his primary care physician on a routine preparticipation sports physical examination. His parents asked if he could complete the football season prior to the surgery. I said that would be fine, especially since Jerome said that his team was unlikely to extend the season by making the playoffs. The delay would also give me time to prepare my new team for the procedure.

I met with our perioperative team members, including nursing, anesthesia, and electrophysiology, to cover the usual bases: the preoperative routine, including having intravenous antibiotics, the intraoperative shed blood salvage device, and 2 units of packed red blood cells ready; the implant type and its availability; the intraoperative routine, including skin preparation, positioning, diluting of the bupivacaine hydrochloride with epinephrine for the incisional injection, spinal cord monitoring, type of anesthesia, and possible Stagnara wake-up test; and the postoperative routine, including the continuation of antibiotics for 24 hours, rapid mobilization, respiratory therapy, multimodal pain management, and discharge planning. By November, at the end of Jerome's football season, we were prepared.

I greeted Jerome and his family in the preoperative area, and shortly thereafter, he was asleep in the operating room. I reviewed my checklist with the scrub technician, the anesthesiologist, the circulating nurse, the resident, and the implant representatives. We positioned Jerome prone on the spinal frame, and I scrubbed his back with alcohol. I asked for the diluted bupivacaine hydrochloride with epinephrine, which the circulating nurse handed to me. The liquid appeared a little more viscous than usual. I briefly questioned that, but was assured that it was the solution that we had discussed during our preoperative planning meeting. Shortly thereafter, I began injecting it into the midline, and the anesthesiologist shouted, "What did you just give him? His blood pressure is 300, no wait, 350, and there is bloody foam coming out of his endotracheal tube." I had injected pure 100% epinephrine.

We aborted the procedure, started intravenous nitroglycerin and other antihypertensive agents, and transferred Jerome to the intensive care unit. I took a moment to regain some composure and found his parents in the waiting room. I explained that I had injected an overdose of epinephrine and that he was very sick as a result. I brought them to his bedside; there was still pink froth being suctioned from the endotracheal tube, but his systolic pressure was now down to 180. I asked the intensive care unit nurses if his parents could remain at his bedside, which they allowed.

Fortunately, Jerome survived. He was extubated after several hours and stayed in the hospital for 2 days while we ruled out myocardial infarction, stroke, and the other potential sequelae of a hypertensive crisis. I did not go home during those 2 days, checking in on Jerome 8 to10 times per day.

In our root cause analysis, we discovered what is usually discovered when major mistakes occur (whether in aviation, medicine, or other potentially high-risk procedures): several simultaneous or sequential system failures had occurred,

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resulting in a catastrophic error. First, the operating room pharmacist was not working that day, and had not communicated our plans to the substitute pharmacist. Second, the circulating nurse had assumed that the substitute pharmacist had given her the correct solution and had labeled it as such in the operating room. Third, I noticed that the solution appeared unusually viscous, briefly questioned it, but did not pursue the matter further. And fourth, most importantly, even though I had safely performed this procedure hundreds of times previously and the hospital was a large established tertiary care center, the team was new to one another and to the procedure.

I saw Jerome and his family in my office 2 weeks later and explained what we had found in the root cause analysis, including my major role in making this error. I explained that he still needed the surgery, and that I would be happy to refer him to any of 3 nearby centers with scoliosis surgeons. To my surprise, they quickly stated that they wanted me to do the surgery. "You were straight with us and took good care of him when he was sick," Jerome's mother said. They were sure that I wouldn't make this or any other mistake again with their son's care. We completed the surgery uneventfully several weeks later.

I learned several things from this painful episode:

1. When giving medications, always view the actual originating bottle and do not trust relabeling by anyone.

2. When operating outside of your normal "home court," prepare thoroughly and assume nothing.

3. Trust your instincts; when something does not seem right, question it until you are completely satisfied.

4. Honesty and humility in the face of complications are difficult but necessary, and sometimes rewarding. ■

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