Christopher R. Good, M.D., F.A.C.S.

I have the pleasure of introducing you to Christopher Dann who is the focus of the spine tumor case study in this issue of Spinal Research Foundation. Mr. Dann is a forty-six year old healthy active man who first noticed pain in his back after sledding in December 2009.

As time passed, his low back pain worsened and he was seen by his chiropractor. With exercises, his back pain somewhat improved and Mr. Dann continued to work and stay active. However, the pain worsened again over the next four months. This prompted Mr. Dann’s chiropractor to order x-rays in May 2010. On the x-rays, an unusual appearance of one of the bones in the spine was noted with a small amount of compression (a change in the shape of the bone). Because of the appearance on the x-rays, Mr. Dann’s medical doctor ordered an MRI scan. The MRI scan showed an unusual appearance of the bone at the T12 level with compression fracture of the bone in that area. Ultimately, his chiropractor suggested that he see the physicians at Virginia Spine Institute for further evaluation.

When Mr. Dann was seen, he had severe back pain with loss of flexibility and pain with even small amounts of movement of the low back. Because of the severity of his pain and concern about the appearance of the x-rays and MRI scan, a full medical evaluation was initiated (Figure 1). Mr. Dann had a whole body bone scan which is an x-ray taken of the entire body, looking for abnormal areas of bone activity. This bone scan confirmed an irregular appearance at the T12 vertebral body consistent with fracture and possibly tumor. Also noted was an area of unusual activity in the rib which had not previously been identified. Brace treatment started during this time. Ultimately, the doctors recommended to Mr. Dann that a needle be inserted into the bone at T12 for a biopsy to determine the cause for the broken bone in that area. Mr. Dann underwent the biopsy, but unfortunately, the tissue that was examined under the microscope did not give a specific answer to the question.

Mr. Dann continued to have worsening pain in his back. New x-rays and a MRI scan showed the deteriorating of the broken bone at T12 with tumor growing in the bone. The doctors explained to Mr. Dann and his wife that a cancer growing inside the bone had weakened the structure of the bone, causing the fracture. At that point, the doctors elected to bring the patient into the hospital for a rapid evaluation.

In the hospital, he had x-rays of his entire body, as well as a CT scan to look for a potential source of tumor in his spine bones and look for tumors in other areas. The doctors were assisted by doctors specializing in medicine, radiology, and oncology. The thorough work-up revealed that tumors were present in multiple areas of his body including the spine, hip, and pelvis as well as the ribs. As the tumor in the T12 vertebra had increased in size, some of the tumor had begun to push against the front of the spinal cord (Figures 2 and 3). Because the situation was worsening, the decision was made that surgery would be necessary to prevent compression or damage to the spinal cord as well as stabilize the area of the spine that had been eroded away by the tumor.

First, the doctors performed surgery through a small incision made just underneath the ribcage to remove the broken bone and tumor at the T12 level. A titanium cage was used to replace the T12 vertebra in order to realign the spine in the area that had been...
destroyed by tumor. Once that part was completed, the doctors performed surgery through the back of the spine, placing titanium screws and rods to stabilize and fuse the spine, restoring normal spinal alignment. Also, additional bone and tumor were removed to take all pressure off the spinal cord (Figures 4 and 5).

Figure 2. MRI image of the spine showing tumor in the bone at T12 (arrow) with compression of the spinal cord behind T12.

Figure 3. Cross-sectional MRI scan showing a normal amount of space around the spinal cord (left picture, white dotted line). On the right, tumor has invaded the space around the spinal cord causing compression (arrow).

Figure 4. X-rays after surgery taken from the back and the side showing removal of the T12 vertebra with titanium cage placement and titanium instrumentation holding the spine in proper alignment.

Figure 5. X-rays of the spine taken from the side before and after surgery show restoration of spinal alignment.
After the surgery, Mr. Dann did well in the hospital. He worked with physical therapy and began to walk. Pain medications were needed to help control the pain from his surgery as well as for the pain from tumors in other bones.

During the surgery, the doctors had removed the tumor at T12 so that it could be examined under a microscope. After a thorough pathology evaluation, Mr. Dann finally had the answer to what was causing his problem. He had a disease called multiple myeloma and tumors had formed in his bones in various locations. A tumor had led to destruction of the bone in the spine causing his pain and change in spinal alignment.

As Mr. Dann recovered from surgery, full medical evaluation of his myeloma was performed. One of the tumors in the pelvis was large enough that there was concern that a fracture of the pelvic bone may occur. For a period of time, he was placed in a wheelchair to avoid placing weight on his pelvis.

Mr. Dann and his family worked with the oncology team regarding his options. He chose to be very aggressive, moving forward with treatment for his disease. Mr. Dann ultimately chose to enroll in a study protocol and he underwent treatment with double autologous stem cell transplantation as well as an aggressive chemotherapy regimen with multiple medications. After completing the second transplant, he was declared to be in near-complete remission from his disease.

At this point, Mr. Dann is on a maintenance dose of chemotherapy medication in an effort to prevent any recurrence of his tumors. Mr. Dann has returned to walking and full activities without any limitations and reports complete improvement of his back pain (Figure 6). Mr. Dann and his family are enjoying their time together and he is happy to be able to return to more normal activities. He and his family will continue with his treatment, working to fight the potential return of his multiple myeloma in the future.

Mr. Dann’s story serves as an inspiration to all patients and families who are fighting against cancer. With the use of revolutionary surgical techniques and medication treatment including autologous stem cell transplantation, Mr. Dann is now in complete remission.

**Figure 6.** X-rays of the entire spine at the last visit show healing of the bones and excellent spinal alignment.

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Dr. Good is a spine surgeon at the Virginia Spine Institute. He has extensive training and experience in the treatment of complex spinal disorders with special expertise in non-operative and operative treatment of adult and pediatric spinal deformities including scoliosis, kyphosis, flatback, and spondylolisthesis. Dr. Good has co-authored numerous articles and has been invited to lecture nationally and internationally at the Scoliosis Research Society, the International Meeting on Advanced Spinal Techniques, the American Academy of Orthopaedic Surgeons, and the North American Spine Society.