MIDWEST SPINE & BRAIN INSTITUTE

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FROM OUR PRESIDENT

STEFANO M. SINICROPI, MD, FAAOS

Trauma can strike suddenly and without warning, changing the course of a life in an instant. When the brain or spine is involved, even a small injury can have profound consequences, disrupting movement, sensation, speech, or cognition. The margin for error is small, and the impact can be lasting.

Brain and spine trauma requires specialized expertise, rapid coordination, and decisive intervention. Timely evaluation and appropriate surgical management can make a critical difference in outcomes, particularly when minutes matter. Advances in imaging, microsurgical techniques, and minimally invasive approaches have expanded our ability to stabilize injuries, preserve function, and support meaningful recovery.

At Midwest Spine & Brain Institute, our trauma-focused neurosurgeons and spine specialists work in close collaboration with emergency physicians, primary care providers, orthopedists, and trauma teams across the region. Through streamlined transfer processes, clear communication, and comprehensive follow-up care, we remain committed to delivering expert, evidence-based treatment when it is needed most.

Nail Gun Injury to the Superior Sagittal Sinus

ERIC S. NUSSBAUM, MD, DABNS
PATRICK GRAUPMAN, MD, DABNS

HISTORY

This now 59 year old male was 45 years old on February 1, 2012, when he sustained a nail gun injury to the head while working at a construction site. He was working in the basement while a co-worker was on the first level. As the co-worker lowered the nail gun down, the patient reached up and turned, and the trigger was inadvertently activated while the safety mechanism was disengaged, causing the nail gun to discharge. The patient recalls being momentarily stunned but remained neurologically intact and was initially incredulous he had been injured. He was first evaluated at an outside hospital and subsequently transferred to our institution for definitive management.

On physical examination, the patient was neurologically normal. A large framing nail was seen embedded through the midline of the calvarium, almost flush with the skin (Figure 1). Plain x-rays of the head on February 1, 2012 showed the nail obliquely penetrating the skull from a posterior to anterior direction (Figure 2a, 2b), nearly completely midline. CT of the head on February 1, 2012 showed the nail apparently penetrating the superior sagittal sinus (Figure 3a, 3b, 3c), coming to rest in the right medial cingulate cortex (Figure 3a, 3d). Venous phase of cerebral angiogram showed the nail penetrating the lateral edge of the superior sagittal sinus (Figure 4a, 4b).

It was felt a craniotomy with preparation for superior sagittal sinus repair was indicated. On February 1, 2012, the patient underwent a parasagittal craniotomy for removal of the nail with Doctors Eric S. Nussbaum and Patrick Graupman. Skin was prepped and draped, and a curvilinear incision was made, incorporating the head of the nail (Figure 5a.). A drill was used to abrade and create a circumferential margin around the shank of the nail; this was followed by performing a standard parasagittal craniotomy, allowing for elevation of the bone flap with minimal disturbance to the embedded nail (Figure 5b.). Parasagittal dural opening on the right then allowed visualization of the shank, traversing the interhemispheric fissure and the cingulate cortex (not shown). Having two neurosurgeons allowed one surgeon to gradually remove the nail while the other surgeon was able to quickly repair the defect in the superior sagittal sinus. This incremental process allowed for a complete, water-tight repair of the superior sagittal sinus.

Immediately after surgery, the patient remained completely neurologically intact. Immediate post-operative MRI scan showed slightly increased T2 signal in the right cingulate cortex, but there was no other obvious neurologic injury (Figure 6a, 6b). The patient was discharged home after a brief hospitalization. The incision appeared well healed at one month follow up (not shown).

DISCUSSION

We describe an interesting case of a patient injured by a nail gun. In general, there are several types of nail guns: finish, pin, palm, and the heavier duty flooring and framing nailers. Judging by the size of the nail removed, our patient suffered an injury from a heavy duty framing nailer. A typical cordless framing nailer can deliver 100 to 120 joules of energy, more than enough energy to penetrate the skull and cause intracranial injury. For comparison, a .22 rimfire bullet can deliver approximately 145 joules of energy.

Several case reports of nail gun injuries to the head have been described (1-8). Deficits range from normal (1, 3, 6, 7, 8), transient weakness (2), ataxia and cranial nerve dysfunction (3), loss of visual acuity (5), transient change in level of consciousness (4), to death (3), depending on the location of the nail (and whether the nail caused an intracranial hemorrhage).

Our patient's nail injury was remarkable because of a near-perfect midline trajectory, causing only a laceration to the lateral wall of the superior sagittal sinus. We describe a technique of direct visualization of the nail shank for the purpose of complete, water-tight closure of the superior sagittal sinus. Our patient was able to achieve an excellent outcome following removal of the nail.

Figure 1a. Preoperative view of the calvarium. The head of a 3" framing nail is seen penetrating the midline of the calvarium. The head of the nail is embedded flush with the scalp.

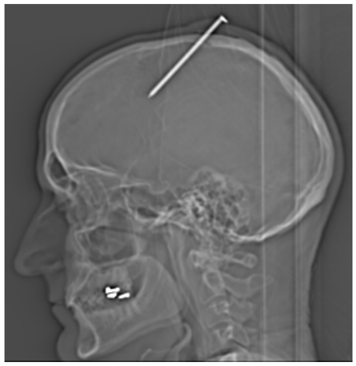

Figure 2a. Lateral scout of head CT, February 1, 2012.

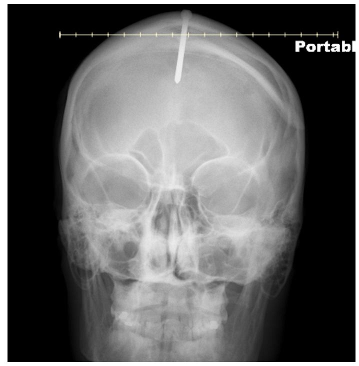

Figure 2b. AP x-ray, February 1, 2012. The nail takes a nearly perfectly midline trajectory.

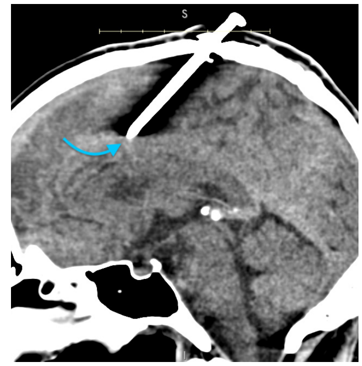

Figure 3a. Sagittal reconstruction of head CT, February 1, 2012. Cyan arrow shows the point of the nail appearing to penetrate the cingulate cortex.

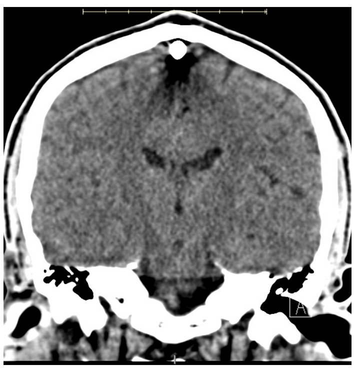

Figure 3b. Coronal reconstruction of head CT, February 1, 2012. The shank of the nail seems perfectly midline and seems to penetrate the superior sagittal sinus.

Figure 3c. Axial head CT, February 1, 2012. The shank of the nail seems perfectly midline and seems to penetrate the superior sagittal sinus.

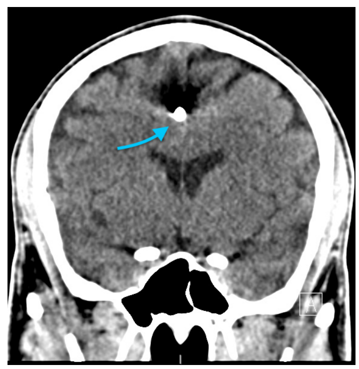

Figure 3d. Coronal reconstruction of head CT, February 1, 2012. Cyan arrow shows the point of the nail coming to rest in the medial right cingulate cortex.

Figure 4a. AP view, venous phase of right carotid angiogram, February 1, 2012. The shank of the framing nail can be seen penetrating through the right lateral wall of the superior sagittal sinus. There does not appear to be significant disruption of venous flow.

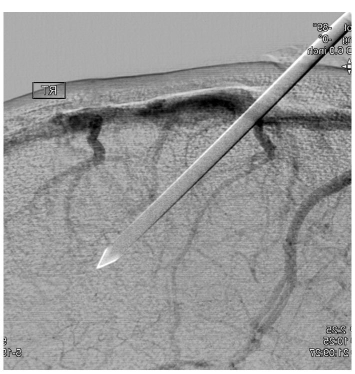

Figure 4b. Sagittal view, venous phase of right carotid angiogram, February 1, 2012.

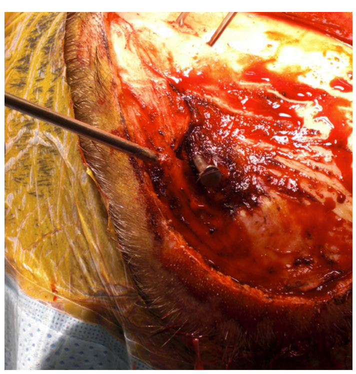

Figure 5a. Curvilinear incision has been made, incorporating the head of the nail.

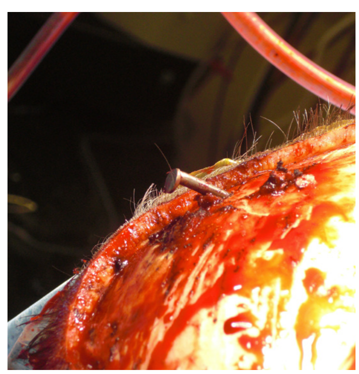

Figure 5b. Bone was abraded away from the head of the nail, and parasagittal craniotomy was performed in order to remove the bone around the nail with minimal disturbance to the nail.

Figure 5c. 3 inch framing nail after removal.

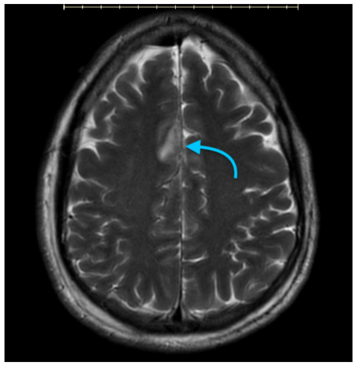

Figure 6a. Axial T2 weighted MRI, February 2, 2012. Cyan arrow shows slightly increased T2 signal in the area of the nail shank.

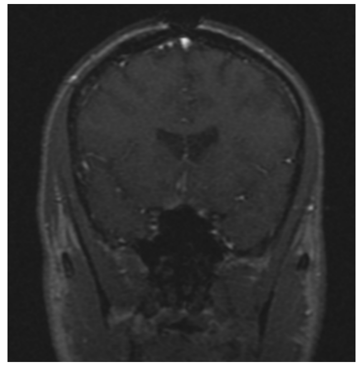

Figure 6b. Coronal T1 weighted MRI with contrast, February 2, 2012. There is no obvious injury to the cingulate cortex or corpus callosum.

RECENT PHOTOS OF THE PATIENT

After sustaining a serious workplace head injury involving a nail gun, the patient underwent successful surgical treatment. He has since made a remarkable recovery and has fully returned to construction work.

During a recent follow-up call, he shared that he is back to using nail guns daily without restriction.

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Cervical Spine Trauma: Self-Inflicted Crossbow Injury to the Neck

MEYSAM KEBRIAEI, MD, MBA, DABNS
JENNIFER RICKARD, MD, MPH, FACS
KETAN PATEL, PHD, DDS
NICHOLAS DAVIS, MD, FACS

HISTORY

This is a 60-year-old male with a history of depression and suicidal ideation. He attempted suicide by shooting himself in the neck with a crossbow on March 1, 2024. At the scene, he was awake and able to communicate. Per EMS report, he was moving all extremities. He was intubated at an outside hospital for airway protection. On arrival, he was hemodynamically stable. CT of the cervical spine showed a mechanical broadhead arrowhead embedded in the cervical spine, penetrating through the C6 vertebral body, with the tip lodged in the spinal cord (Figure 1a, 1b).

The patient was taken immediately to surgery and underwent a combined Trauma/ Oral Surgery/ Neurosurgery procedure with Jennifer Rickard, MD, MPH FACS, Ketan Patel, PDD, DDS, and Meysam Kebriaei, MD, MBA, DABNS. The arrow shaft was unthreaded from the arrow head; anterior neck exploration showed the arrow head had penetrated through and exited both the trachea and esophagus (Figure 2a). Left hemi-thyroidectomy performed in order to provide wide access to deeper tissues. The arrowhead was removed from the C6 vertebral body, confirming that the arrow was tipped with a mechanical broadhead (Figure 2b). Inspection showed that fortunately, the blade retention band was still intact, and the retractable blades had not deployed. A comprehensive review of vendors showed that this broadhead was a Swhacker #207 © (FL Outdoors) (Figure 2c.)[1] Trachea exit wound was debrided and repaired primarily. Esophagus entry and exit wounds were debrided and repaired primarily. Both the trachea and esophagus wounds were covered using a strap muscle flap. Nasogastric tube placed for anticipated period nasogastric feeding. Inspection of the C6 vertebral body showed absence of significant bone fracture, and no evidence for spinal fluid leak. Nevertheless, prophylactic measures were taken to prevent spinal fluid leak by injecting polyethylene glycol hydrogel (DuraSeal, Integra) and sealing the hole with bone wax. It was felt that further cervical spine surgery was not indicated. Tracheostomy was created over the existing trachea entry wound. He was admitted to the intensive care unit to manage ventilation and maintain his mean arterial pressure over 80mmHg.

Immediate postoperative MRI scan showed the linear arrow tract through the C6 vertebral body, puncturing the anterior dura, and penetrating into the cervical spinal cord parenchyma (Figure 3a, 3b). Immediate postoperative CT scan showed cylindrical arrow tract through the vertebral body of C6 without any other obvious fracture (Figure 4a, 4b, 4c). Despite these potentially devastating radiologic findings, the patient was able to move all extremities weakly on postop day 1. Over the course of several days, it became evident that he had developed left hemiparesis, with 5/5 strength on the right and 3/5 strength on the left. Approximately 2-3 weeks after surgery, he developed generalize weakness and headache. He also developed Streptococcal bacteremia, with purulent drainage from the tracheostomy site. Cervical MRI scan +/- contrast on March 24, 2024 showed enhancement of the C6 vertebral body, anterior paraspinous tissue enhancement with likely prevertebral abscess (Figure 5a), increased spinal cord signal (Figure 5b), and possible epidural or subdural empyema (Figure 5c). He was treated with broad spectrum antibiotics, but his generalized weakness worsened. Repeat cervical MRI scan +/- contrast on March 27, 2024 showed significant worsening of all of the aforementioned findings (Figure 6a-c), consistent with worsening infection.

It was felt that surgical debridement of all infected tissue was indicated. On March 29, 2024, the patient underwent a combined Trauma/ Neurosurgery procedure with Nicholas Davis, MD, FACS, and Meysam Kebriaei, MD, MBA, DABNS. Previous incision was opened, purulent material was evacuated and the C5-7 vertebral bodies were exposed in standard fashion. C6 corpectomy was performed in standard fashion. Under high power magnification, anterior cervical dura was opened, whereupon inflammatory granulation tissue was found; granulation tissue was debrided.

Dura was closed in a water tight fashion, and sealed using gelatin sponge (Gelfoam, Pfizer) and polyethylene hydrogel (DuraSeal, Integra). The corpectomy defect was reconstructed using an expandable titanium interbody cage and plate (T2 Stratosphere and Zevo, Medtronic) (Figure 7a, 7b). Immediately postoperatively, his right side strength improved to 5/5. However, he continued to suffer left hemiparesis, although the left lower extremity gradually improved to 4-/5. The left hand remained profoundly weak, with 0/5 in the hand intrinsics. He was treated in the intensive care unit to maintain mean arterial blood pressure > 85mmHg. He was also treated with broad spectrum antibiotics, and eventually transitioned to intravenous ampicillin sodium/sulbactam (Unasyn, Pfizer). His postoperative course was complicated by symptomatic pulmonary embolism, which was treated with enoxaparin (Lovenox, Sanofi-Aventis), and eventually rivaroxaban (Xarelto, Johnson & Johnson). He was discharged to an inpatient rehab facility on April 15, 2024. At the time of discharge, his left upper extremity strength was 4+/5 in the biceps, 4/5 in the hand, and the left wrist had improved to 4+/5; the left lower extremity was diffusely 4/5. He was eventually discharged to an inpatient psychiatric facility. About 2 months after discharge (June 2024), the patient described that his left leg had improved to the point where he was able to ambulate independently, albeit with a knee brace. He also suffered bilateral upper extremity parasthesias and anesthesia below the right knee. The patient was eventually lost to follow up.

[1] The authors thank Mark Sams for his technical expertise in explaining the mechanics of broadheads and for identifying the manufacturer of the broadhead arrowhead used by the patient.

DISCUSSION

The neck contains vital structures such as the vascular system (carotid and vertebral arteries, jugular vein), airway, gastrointestinal tract (esophagus), nervous system (cervical spinal cord, lower cranial nerves, cervical nerves, and nerve roots), and orthopedic components (cervical spinal column). These structures are compacted in a relatively small, unprotected area, thus making all of them particularly vulnerable to trauma. Penetrating trauma to the neck has traditionally been categorized into three zones, with recommendations for "surgical exploration" based on the affected zone(s) (1, 2). However, modern treatment relies on advanced imaging techniques such as CT scans and angiography (2, 3).

We present the case of a self-inflicted crossbow injury to the neck resulting in injuries to the trachea, esophagus, C6 vertebral body and cervical spinal cord. Crossbows are known to have higher muzzle velocity than vertical compound bows, resulting in greater energy. Options for arrowheads include non-edged (e.g. field, bullet, blunt, etc.) that are used for target practice or small game, fixed blade, and mechanical broadhead. The mechanical broadhead has blades that remain retracted during flight but open on impact, thus improving accuracy while maximizing soft tissue injury. In our case, the retention ring remained intact, preventing the full deployment of the retractable blades; otherwise the soft tissue injury would have been far worse than what occurred. Crossbow injury to the cervical spine is rare but have been described in the literature (4, 5, 6, 7, 8). In many of these cases, the resulting neurologic deficit have been mild, but in some instances the deficits have been permanent. In our case, the patient developed left hemiparesis, but eventually improved to the point where he was able to ambulate independently with a knee brace; the left hand weakness has not recovered. Our patient also suffered complications including pulmonary embolism, vertebral osteomyelitis, subdural empyema and possibly meningitis, all of which were treated appropriately. This case required a multi-disciplinary approach, but eventually the patient was able to achieve a reasonably good outcome despite the severity of the initial injury.

Meysam Kebriaei, MD, MBA, DABNS

FIGURES

Figure 1a. Sagittal CT of the cervical spine, March 1, 2024 showing a mechanical broadhead arrowhead embedded in the C6 vertebral body, penetrating through the dura and lodged in the intramedullary space.

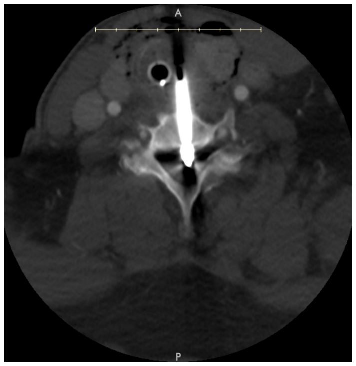

Figure 1b. Axial CT of the cervical spine, March 1, 2024 showing the tip of the arrowhead in the intramedullary space.

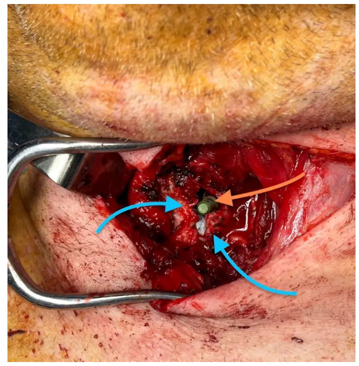

Figure 2a. Intraoperative photo of anterior neck dissection. Cyan arrows demonstrate large entry hole to the trachea. Peach arrow shows the threads of the arrowhead.

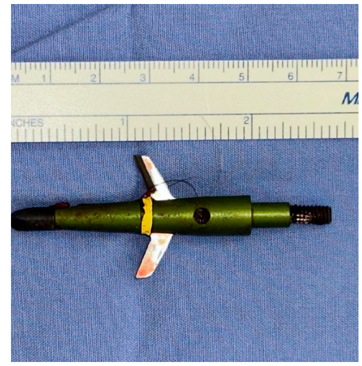

Figure 2b. Approximately 1" diameter x 2-1/2" length mechanical broadhead arrowhead, removed. Note the intact yellow blade retention band.

Figure 2c. #207 Swhacker© (FL Outdoors), 100 grain mechanical broadhead. On the left, the retention band is released and the retractable blades are fully deployed. On right, the retention band is intact and the blades are retracted. Image downloaded from https://floutdoors.com.

Figure 3a. Sagittal T2 weighted MRI of the cervical spine, March 1, 2024. Increased T2 signal intensity delineating linear wound channel, through the C6 vertebral body, puncturing through the dura and near complete pithing of the cervical spinal cord.

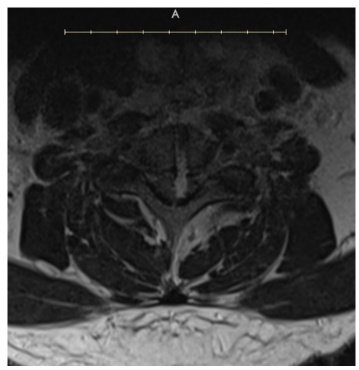

Figure 3b. Axial T2 weighted MRI of the cervical spine, March 1, 2024. There are no radiologic findings suggestive of CSF leak.

Figure 4a. Sagittal CT of the cervical spine, March 2, 2024. Linear arrow tract through the C6 vertebral body can be seen. No obvious fracture of the C6 vertebral body can be appreciated.

Figure 4b. Coronal CT of the cervical spine, March 2, 2024. Circular arrow tract in the middle of the C6 vertebral body can be seen.

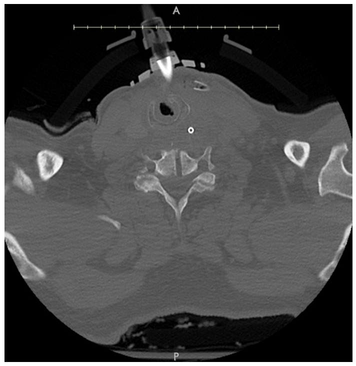

Figure 4c. Axial CT of the cervical spine, March 2, 2024. Linear arrow tract through the C6 vertebral body can be seen. No obvious fracture of the C6 vertebral body can be appreciated.

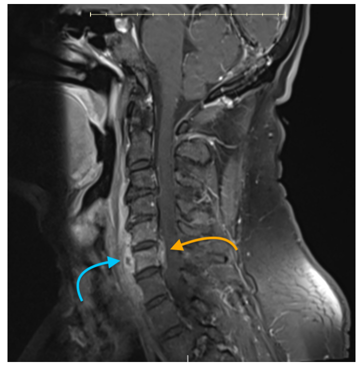

Figure 5a. Sagittal T1 weighted MRI, post contrast, March 24, 2024. Increased signal intensity is seen the C6 vertebral body. Cyan arrow indicates contrast enhancing material in the pre-vertebral space. Peach arrow indicates enhancement in the subdural space at C6, consistent with subdural empyema.

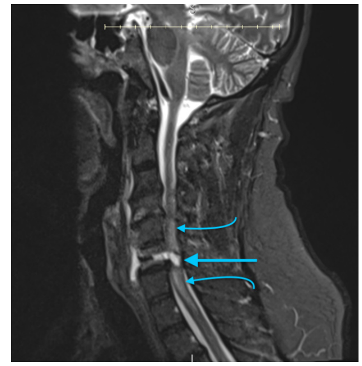

Figure 5b. Sagittal T2 weighted MRI, March 24, 2024. Large cyan arrow shows intramedullary fluid, communicating with fluid in the vertebral body. Small cyan arrows show increased signal intensity above and below the injury consistent with spinal cord edema.

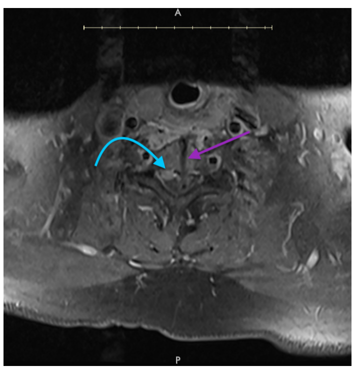

Figure 5c. Axial T1 weighted MRI, post contrast, March 24, 2024. Cyan arrow shows enhancing fluid in the right subdural space at C6. Plum arrow shows the arrowhead tract.

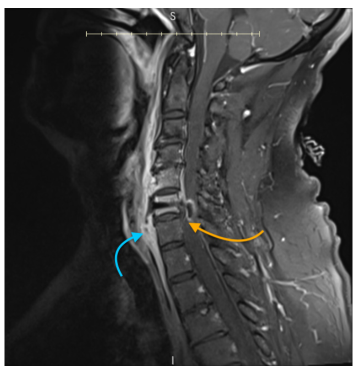

Figure 6a. Sagittal T1 weighted MRI, post contrast, March 27, 2024. Increased signal intensity is seen the C6 vertebral body. Cyan arrow shows enlargement of contrast enhancing material in the pre-vertebral space. Peach arrow shows enlargement of the enhancing area in the subdural and intramedullar space at C6, consistent with worsening of subdural empyema and intramedullary abscess.

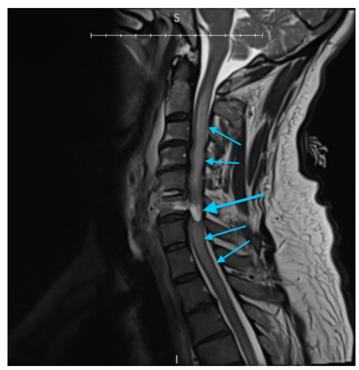

Figure 6b. Sagittal T2 weighted MRI, March 27, 2024. Large cyan arrow shows increase in intramedullary fluid. Small cyan arrows show significantly increased signal intensity above and below the injury consistent with worsening spinal cord edema.

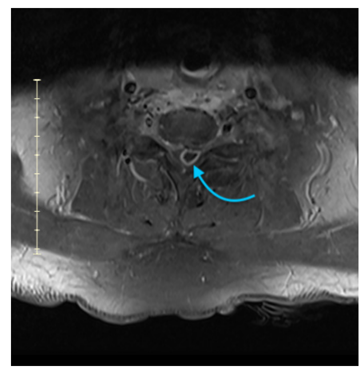

Figure 6c. Axial T1 weighted MRI, post contrast, March 27, 2024. Cyan arrow shows worsened enhancing intramedullary material at C6, consistent with intramedullary abscess.

Figure 6a. Postoperative sagittal CT scan, showing C6 corpectomy, and reconstruction using expandable titanium cage and plate, C5-7.

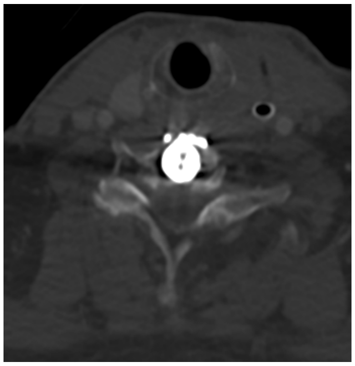

Figure 6b. Postoperative axial CT scan, showing midline placement of cage.

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GUEST SURGEONS

JENNIFER RICKARD MD, MPH, FACS, FCS(ECSA), FSIS

Dr. Rickard is an Associate Professor of Surgery at University of Minnesota with a clinical focus on trauma, surgical critical care, and emergency general surgery. Dr. Rickard completed her medical school at University of Wisconsin and surgery residency at Rush University. She completed the Paul Farmer Global Surgery Fellowship at Harvard and a Surgical Critical Care Fellowship at University of Minnesota.

Dr. Rickard is an NIH-funded investigator with over 120 publications. She has spoken at multiple national and international conferences with a focus on global health and surgical infections. Dr. Rickard has worked in the Trauma Department at North Memorial Hospital for almost 10 years. In her spare time, Dr. Rickard enjoys triathlons and other endurance sports.

KETAN PATEL, PHD, DDS

Dr. Patel is Chief of Oral and Maxillofacial Surgery and Hospital Dentistry at North Memorial Health and serves as Physician Lead of Head and Neck Oncology and Microvascular Reconstructive Surgery. He completed dental school at the University of Birmingham (England), earned his PhD from the University of Minnesota in molecular genetics of head and neck cancers, and completed Oral and Maxillofacial Surgery training at the University of Maryland, including the Adam Cowley Shock Trauma Center.

He completed fellowships in Head and Neck Oncology, Microvascular Surgery, and Craniomaxillofacial Trauma and Reconstruction. Board-certified by the American Board of Oral and Maxillofacial Surgeons, Dr. Patel has authored numerous publications and book chapters and lectures nationally and internationally. He currently practices at North Memorial Hospital and Twin Cities Oral and Maxillofacial Surgery.

NICHOLAS DAVIS MD, FACS

Dr. Davis is a trauma critical surgeon at North Memorial Health. He completed his medical school training at Medical College of Wisconsin and did his general surgery residency at Baylor University Medical Center. Dr. Davis completed his surgical critical care fellowship at the University of Minnesota. Prior to working at North Memorial Health, he was an active duty surgeon in the United States Air Force. In his free time, he enjoys cooking and any outdoor activity with his dog and family.

Meysam Kebriaei, MD, MBA, DABNS

Thoracic Fracture-Dislocation, Treated with Lateral Retro-pleural Reduction and Interbody Fusion

HART GARNER, MD, DABNS

HISTORY

This is a 46 year-old with history of morbid obesity who suffered a motor vehicle accident on April 23, 2024. He was a seatbelt restrained driver at a stop light when he was rear ended by a school bus traveling at 55 miles per hour. His vehicle ended up impacting a dump truck, causing his vehicle to become wedged underneath the dump truck. There was severe damage to his vehicle, requiring an hour long extrication process. Per EMS, his right leg had an obvious open wound, and his left leg was twisted by the dashboard. In the emergency room, he reported severe pain in the lower back as well as right leg. His neurologic exam was normal, with the exception of weakness of both ankle dorsiflexion and plantarflexion: 4-/5 on right, and 2/5 on the left. The patient was too obese to undergo an MRI scan, as he weighed over 700 lbs (722 lbs, BMI ~88). Lumbar and thoracic CT scans showed obviously unstable T11-12 fracture-dislocation (Figure 1a-c). X-rays of both feet showed dislocation of the first metatarsal phalangeal joint and displaced fractures of second through fourth metatarsal necks on the left, and fractures of the proximal first and second metatarsals on the right (not shown).

On April 29, 2024, the patient underwent lateral retro-pleural approach for T11-12 discectomy, interbody graft and fixation and fusion. The patient's weight (>700 lbs.) exceeded the maximum weight of all available surgical tables at our institution, North Memorial Hospital at Robbinsdale. Efforts to borrow surgical tables with higher maximum weight from neighboring institutions (including The University of Minnesota, The Mayo Clinic, and even the Minnesota Zoo) were to no avail. Ultimately, the patient had to be positioned on 2 surgical tables (Figure 2a, 2b). Unfortunately, neither intraoperative fluoroscopy nor intraoperative CT scan was feasible given the patient's large body habitus. At surgery, significant disc disruption was found. T11-12 discectomy was performed, and interbody graft was placed by direct visualization. Antero-lateral pedicle screw and rod construct (Vantage, Medtronic) was performed using anatomic landmarks and visual judgement. Gradual compression of the pedicle screw tulip heads across the rod allowed for reduction and apposition of the T11-12 dislocation.

Postoperative CT scan showed excellent reduction and appropriate placement of hardware (Figure 3a-e) (CT scan from 6/12/24). On May 1, 2024, the patient underwent closed reduction and fixation of the left metatarsal phalangeal joint dislocation, and open reduction and fixation of the right foot fractures (not shown). Following surgery, the patient was admitted to the intensive care unit to maintain high mean arterial pressure. The motor strength of his feet and ankles was difficult to assess because of severe soft tissue injury as well as placement of K-wires in both feet. He was unable to bear weight on his feet because of the reduction and fixation of bilateral foot injuries. He was transitioned to a regular hospital room after about 1 week, and was eventually discharged to a transitional care unit after about 2 months.

At 3 months following surgery, the patient was able to ambulate independently with a walker; he continue to feel subjective bilateral leg weakness. Objective testing revealed at least 4/5 strength in both left and right ankle dorsiflexion and plantarflexion. At 9 months following surgery, the patient had lost about 120 lbs, and was able to ambulate several hundred feet with a walker. MRI's of the thoracic and lumbar spine have been scheduled, but it remains unclear if he can fit inside an MRI machine despite the 120 lb weight loss.

DISCUSSION

The thoracic spine is generally felt to be stable compared to the cervical and lumbar spine, as there is a stabilizing effect from the rib cage. Therefore, only high energy impacts can cause fracture-dislocation. In this case, the patient was rear-ended by a bus at highway speed, causing his vehicle to be wedged underneath a dump truck. This patient's T11-12 fracture-dislocation is immediately proximal to the conus medullaris; it's very likely that a cord injury at this level resulted in his physical finding of bilateral dorsi- and plantar-flexion weakness. The obviously unstable fracture-dislocation required surgical stabilization and fusion. This patient's massive body habitus (over 700 lbs) unquestionably made every aspect of management much more difficult (1, 2, 3, 4, 5).

In fact, recent studies have shown that spine surgery in so-called "super morbidly obese" patients (BMI > 50) require much greater operative imaging radiation, experienced longer hospital stays and experienced more post-operative complications (neurologic, hardware-related, wound healing, infection, general medical, etc.) compared to morbidly obese (BMI 40-50). It should be noted that this patient's BMI was 88.

Positioning of this patient required the extraordinary effort of using 2 surgical tables in order to distribute his body weight, as his weight far exceeded the table maximum. Retro-pleural, lateral approach to the thoracic spine has been well described in the spine literature (6, 7). Techniques for scoliosis correction involving anterior vertebral body single rod (8) and dual rods (9, 10) have been described. Here, we describe the successful reduction and fusion of a traumatic T11-12 fracture-dislocation in an extraordinarily obese patient (722lbs, BMI = 88). Despite the known higher intraoperative risk and postoperative morbidity risk in "super morbidly obese" patients (5), our patient was successful in avoiding such complications, other than the original neurologic injury. It remains to be seen how much he recovers from the initial trauma-related dorsiflexion/plantarflexion weakness.

FIGURES

Figure 1a. Sagittal reconstructed CT of the thoracic and lumbar spine, showing fracture-dislocation of T11-12, causing obvious anterior disc disruption and resulting in hyper-extension at T11-12. Cyan arrow indicates small avulsion fracture of the T12 anterior-superior endplate.

Figure 1b. Axial CT of T11 vertebral body; there is no obvious fracture.

Figure 1c. Axial CT of T12 vertebral body; there is no obvious fracture.

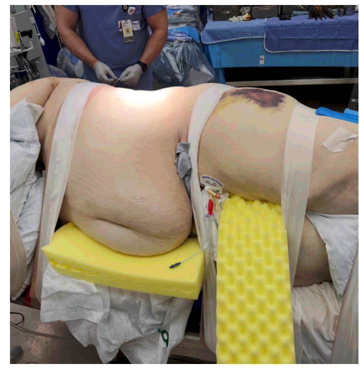

Figure 2a. Anterior view of the patient positioned in lateral decubitus, with left side up. Note the large traumatic ecchymosis at the proximal lateral thigh. Massive laceration and soft tissue injury to the right leg is not seen because of positioning.

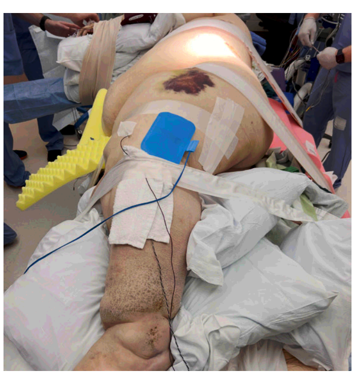

Figure 2b. Inferior-superior view of the patient positioned in lateral decubitus. Note the use of two surgical tables, with the patient's trunk and torso straddling both tables.

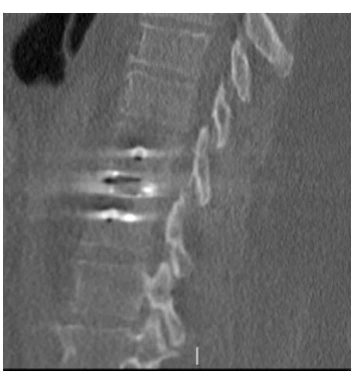

Figure 3a. Postoperative sagittal reconstructed CT, showing excellent reduction of the T11-12 dislocation.

Figure 3b. Postoperative anterior-posterior reconstructed CT, showing complete side to side coverage of the T11-12 endplate, as well as bi-cortical purchase of the pedicle screws.

Figure 3c. Postoperative axial CT of T11, showing appropriate bi-cortical purchase of the pedicle screw.

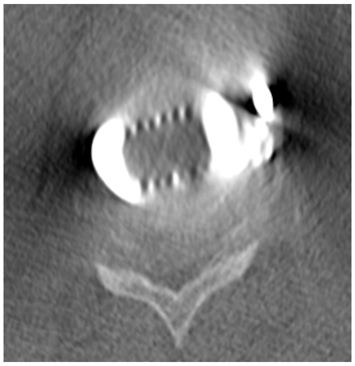

Figure 3d. Postoperative axial CT of T11-12 disc space, showing appropriate placement of the interbody cage.

Figure 3e. Postoperative axial CT of T12, showing appropriate bi-cortical purchase of the pedicle screw.

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Hart Garner, MD, DABNS

CONDITIONS & TREATMENTS

Spinal Conditions	Spinal Treatments	Neurosurgical Conditions	Neurosurgical Treatments
• Bone Spurs	• Artificial Disc Replacement	• Arteriovenous Malformations	• Chiari Decompression
• Degenerative Disc Disease	• Corpectomy	• Brain Aneurysms	• Craniotomy
• Facet Joint Pain	• Decompression	• Brain Bleed	• Craniotomy for Arteriovenous Malformations (AVMs)
• Failed Back Surgery Syndrome	• Discectomy	• Brain Tumors (Adult/ Pediatric)	• Craniotomy for tumor Resection
• Herniated Disc	• Foraminotomy	• Brain Vascular Lesions	• Craniotomy for Aneurysm
• Kyphosis	• Instrumentation Removal	• Carotid Disorders	• Epilepsy Surgery
• Myelopathy	• Laminectomy	• Cerebral Ischemic Disorders	• Hydrocephalus Surgery
• Pinched Nerve	• Laminoplasty	• Cerebrovascular Disorders	• Pituitary Surgery
• Sacroiliac Joint Disease	• Laminotomy	• Chiari Malformation	
• Sciatica	• Microdiscectomy	• Pediatric Brain and Central Nervous System Cancers	
• Scoliosis (Juvenile/Adult)	• Minimally Invasive Surgery	• Pediatric Cerebrovascular Disorders	
• Spinal Arthritis	• Revision Spine Surgery	• Skull Base Tumors	
• Spinal Cord Trauma	• Scoliosis Correction	• Stroke	
• Spinal Fracture	• Second Opinions		
• Spinal Infections	• SI Joint Fusion		
• Spinal Stenosis	• Spinal Cord Stimulators		
• Spinal Tumor	• Spinal Fusion		
• Spine Trauma			
• Spondylolisthesis			
• Spondylosis			
• Stenosis			
• Vertebral Tumors			

OUR SURGEONS

STEFANO M. SINICROPI, MD, FAAOS

Renowned as a nationally recognized authority in spine surgery, Dr. Sinicropi, a Board-Certified orthopedic spine surgeon, Dr. Stefano Sinicropi prioritizes integrating cutting-edge motion-sparing and minimally invasive techniques into his practice, leading to improved patient outcomes, accelerated recovery, diminished pain, and enhanced mobility for various spinal procedures such as disc replacements, spinal decompressions, and fusions. Beyond his clinical proficiency, Dr. Sinicropi deeply values the relationships he builds with his patients, recognizing the life-altering impact of spinal surgery and considering it a privilege to assist.

DAVID T. CHANG, MD, PHD, DABNS

As a highly accomplished neurosurgeon, Dr. Chang specializes in intricate spinal procedures tailored to individual patient conditions, prioritizing treatments that offer optimal opportunities for swift recovery and a return to fulfilling lives. Emphasizing less invasive approaches, he excels in cervical and lumbar disc replacement, minimally invasive decompression, fusion techniques, and pioneering advancements in motion-preserving artificial disc replacement for single and multi-level cases. Dr. Chang's dedication extends to ensuring patient comprehension regarding the benefits of recommended surgeries, taking the time to thoroughly educate individuals, enabling them to make fully informed decisions about proceeding with surgical interventions.

TODD E. JACKMAN, MD, FAAOS

Dr. Jackman uses cutting-edge technologies to provide minimally invasive yet profoundly effective treatments for spinal problems, drawing on significant experience in all aspects of spine care. Working as part of a cohesive medical team, he maintains a great respect for the complicated nature and accuracy required by spine care and surgical procedures. Dr. Jackman takes a collaborative approach, working closely with his patients to convey knowledge and build confidence, allowing them to make educated decisions about their spinal health. When surgery is required, he tailors his technique to meet the unique surgical needs of each patient.

EDUARDO J. PEREZ, MD, DABNS

Dr. Perez is a highly skilled and seasoned neurosurgeon renowned for his expertise in employing minimally invasive surgical methods to address a spectrum of brain and spine conditions. His specialization spans from cervical and lumbar disc replacement to spinal decompressions, fusions, and cranial procedures tailored for brain trauma and tumors. Dr. Perez adopts a collaborative approach, working closely with his patients to navigate and recommend the most suitable treatment paths. His primary emphasis lies in achieving outcomes that prioritize swift recovery, enabling patients to swiftly return to a fulfilling and improved quality of life.

HART P. GARNER, MD, DABNS

Dr. Hart Garner is a highly skilled and extensively experienced neurosurgeon specializing in intricate spinal surgery, trauma care for both the spine and brain, and surgical treatment of neurosurgical tumors. Emphasizing personalized patient care, he tailors solutions to individual health conditions and overall situations, aiming to minimize invasiveness while effectively addressing the patient's specific medical issues. Proficient in a broad spectrum of spine surgery, encompassing deformity correction, disc replacement, microsurgery, and minimally invasive techniques, Dr. Garner prioritizes thorough patient education and exploring non-surgical options before considering operative interventions.

OUR SURGEONS

ERIC S. NUSSBAUM, MD, DABNS

Dr. Nussbaum stands among a select cohort of global surgeons specializing in microsurgery dedicated to treating brain aneurysms. Offering consultation and advanced surgical solutions, he extends his expertise to patients worldwide grappling with intricate brain tumors and vascular lesions. Dr. Nussbaum emerges as an accomplished authority in neurovascular surgery, emphasizing collaborative care, he synergizes efforts with neurointensivists, stroke neurologists, interventional neuroradiologists, and diverse medical specialists to ensure optimal patient outcomes and deliver the highest standard of medical attention.

MICHAEL A. FINN, MD, DABNS

Dr. Michael Finn is a highly skilled neurosurgeon specializing in advanced spine surgery, with expertise in minimally invasive techniques, spinal decompressions, fusions, and complex cervical and lumbar procedures. He brings a unique background in both neurological and orthopedic spine surgery, supported by research in biomechanics, surgical innovation, and multiple spine-related patents. Dr. Finn trained at UCLA, the University of Utah, and the University of Wisconsin–Madison, and previously served as an Associate Professor at the University of Colorado School of Medicine, where he contributed to clinical research and surgical education.

MEYSAM A. KEBRIAEI, MD, MBA, DABNS

Specializing in intricate neurosurgical procedures, Dr. Kebriaei employs cutting-edge technology to address brain tumors, aneurysms, and arteriovenous malformations (AVMs). Collaborating closely with interventional neuroradiologists and vascular neurologists, he customizes treatment plans for each patient's unique needs. Dr. Kebriaei also applies advanced techniques in treating spinal conditions, such as motion-preserving cervical and lumbar disc replacement surgeries. Beyond his surgical expertise, he prioritizes establishing connections with patients, offering support throughout their recovery journey, and assisting them in resuming their cherished activities.

GLENN R. BUTTERMANN, MD, MS, FAAOS

Internationally renowned for his prolific research contributions and numerous peer-reviewed journal articles, Dr. Buttermann is deeply committed to advancing medical knowledge through dedicated involvement in fundamental scientific and clinical research endeavors. Focused on the evaluation and surgical treatment of both juvenile and adult scoliosis, as well as intricate deformity cases, he specializes in employing minimally invasive spinal procedures. Notably, he boasts multiple patents associated with innovative motion preservation devices, underscoring his contributions to cutting-edge advancements in the field.

MEET OUR ADVANCED PRACTICE PROVIDERS

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Our goal to building a good connection with you and your office team is shown in our attention to timely communication and simple accessibility. We have streamlined the procedure for your convenience by using online platforms, phone conversations, and faxes.

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