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NEUROSURGERY PREOPERATIVE ADMISSION HISTORY

March 14, 2025

PATIENT: Mark Lawrence
DATE OF PREOPERATIVE VISIT: 03/14/2025
DATE OF BIRTH: 03/10/1975
DATE OF MOTOR VEHICLE CRASH: 12/27/2019
DATE OF PLANNED SURGERY:
PLACE OF PLANNED SURGERY: Skyway Surgery Center, St. Petersburg, Florida.
ATTENDING NEUROSURGEON: Joel Ira Franck, M.D.

PREOPERATIVE DIAGNOSES: Posttraumatic post-whiplash C1-C2 lateral ligamentous instability with C1 capsulosynovitis, cerebellar tonsillar ectopia, cervicomedullary dynamic compression, flexion and extension, vertebral artery dynamic compression, flexion and extension, cerebrospinal fluid, craniocervical obstruction, foremen magnum stenosis, severe craniocervical syndrome.

PLANNED PROCEDURES: C1-C2 posterior transarticular lag screw fixation with advanced image-guided technology, suboccipital decompressive extradural micro craniectomy, C1-C2 posterior and posterolateral autograft fusion with morselized craniectomy bone, and autograft and allograft fusion with adult stem cells, and crushed cancellous bone.

HISTORY: Mark Lawrence is a 50-year-old right-handed gentleman who presented to the office alone.

The patient's objective chief complaint during this the initial part of this examination included, exhaustion, fatigue, severe headaches, left-sided tinnitus, cervical pain, bilateral lower extremity weakness, feeling of spontaneous hot and cold in his extremities, right leg pain and numbness, nausea, bladder and bowel dysfunction, visual obscuration, ataxia, vertigo, dyspnea, tachycardia, discoordination, sensitivity to light and sound, insomnia, lower back pain, and short and long-term memory issues with brain fog.

The patient states that he has been an extremely active individual his entire life. He previously was a super athlete, in that he would climb mountains in various parts of the United States including Alaska and ascend 5000 feet up and then ski down.

The patient had multiple other hobbies like fishing, hunting, kayaking and ice climbing and various career involvements.

Unfortunately, on December 27, 2019, the patient was involved in a motor vehicle crash. It was a rainy evening at 8:30 p.m. The patient was driving a 2019 Nissan Altima that he rented from Lyft. He was on highway A1A merging into traffic. He was at a yield sign. His head and shoulders were rotated to the left and he was leaning forward. He was restrained and seat belted. He was hit from behind by a Jeep SUV driven by a mother and her daughter was a passenger. They apparently had no injuries. He remembered seeing the overhead grab bar on the ceiling of his car. His left knee was violently pushed against the bottom of the dashboard and significantly injured. There was damage to the back of the car.

At the time of the crash, police came. There was no EMS.

The driver of the other vehicle, that is the Jeep SUV was apparently cited by the police for driving offense. At the time of the crash the patient complained of pain in his right eye. He felt disoriented. He had severe headache, nausea, and knee pain.

His car was drivable, and he drove to St. Augustine Hospital emergency room. There, he was diagnosed with a whiplash injury to his cervical spine. He also complained of right eye pain. Whenever he turned his head to the right, he had severe pain, he is not sure if he had a brief loss of consciousness. He was confused and disoriented to the point where he thought he vomited on the police officer’s shoes when he opened the door at the crash site.

The patient had a CT scan of the brain at the hospital. He was discharged home.

At that time, the patient was living in Jacksonville with his soon to be wife who hails from Germany, and they were running an Airbnb.

Currently the patient lives in Saarland, Germany, with his wife and their daughter of 2.5 years of age. He currently is a full-time father unable to work due to the disabilities imparted to him by this crash.

His wife's name is Mary Schoeneberger. She is a Municipal Assessor, their child's name is Clementine Matilda.

The patient had previously lived in Alaska for 20 years in Anchorage. He was involved in the information technology business. He was raised in Phoenix. His father is a neurologist named William Lawrence, MD. The patient as noted was an exceptional skier, cross country mountain runner and athlete. After the crash the patient sought

multiple medical relief. He saw a chiropractor and then a pain management physician, Dr. Pagan in Jacksonville, Florida. He had some injections in his cervical spine, which helped somewhat with the pain, providing short term temporary relief. He also had PRP injections in his cervical spine.

The patient then, saw a neurologist named Dr. Emas in Jacksonville, complaining of brain fog, short-term memory. On neuropsychological testing, he was told he had a concussion. The patient also complained of occipital pain and underwent occipital nerve ablations, which led to brief improvement in his headaches, which then occurred.

The patient had difficulty with gait and severe lower back pain spasms.

The patient then consulted with Dr. Moore, an orthopedic spine surgeon. At that time, the patient worked for the United States Census Bureau. In 2020, the patient was given hearing aids by Dr. Greene, after consultation due to the onset of posttraumatic tinnitus and hearing loss. They seemed to help a little bit.

The patient was diagnosed as having multiple herniated discs and underwent L5-S1 laminectomy and discectomy in December of 2020. He was placed on Tramadol for pain control. He had anaphylaxis from Toradol after surgery.

The lumbar discectomy seemed to help a bit, but then within a few months, got worse.

The patient began to develop worsening vertigo, severe headache, cervical pain and radiation to his trapezius muscles along with left hand numbness.

He underwent an MRI of the cervical spine and was evaluated and diagnosed with herniated cervical disc at C4-C5, C5-C6, C6-C7. In September 2021, he underwent C4-C5-C6-C7 anterior cervical discectomy and fusion, at Ascension Hospital St. Vincent's in Jacksonville. The surgery made him much worse. At that time, he had to travel for family reasons to Germany.

He saw a German neurologist and was placed on pregabalin. He also had nerve conduction studies in Eutin. He does not know the results. He continued to get worse.

In September of 2022 the patient was sitting in his garden and rotated his head to the left and had the onset of extreme severe pain in his cervical spine and lower back pain. He felt like there was a vice-grip around his head. He was prescribed muscle relaxants and Tylenol as well as physical therapy. He attended physical therapy in Germany twice a week for three years. It helped to some extent. Techniques included the use of Chiropractic manipulation of C1-C2 and that actually instantly made him better. However, then when he rotated his neck in lateral movements, he got worse. He returned

to using a hard cervical Aspen collar to sleep and a soft collar in the car which seemed to help to some extent, but it was very difficult to continuously wear.

The patient saw Dr. Omar Moore (distinct from the previous orthopedic surgeon) who is a neurologist in Jacksonville. The patient was diagnosed as having a traumatic brain injury from the car crash in 2019. The patient does not recall having any specific brain MRI with the specific protocol to look for said injury.

The patient had neuropsych evaluations and he was diagnosed as having a traumatic brain injury.

He was placed on donepezil drug that is used to ameliorate symptoms of mild Alzheimer's disease. It did not help him at all having taken it for three months.

The patient has been complaining of short-term and long term memory loss, and brain fog. He has difficulty focusing. He cannot multitask. He attempted to get a permanent residency card in Germany and he could not pass the language exam which is unusual for his level of intelligence.

He had difficulty with reading, simple mathematics, and word finding anomia is noted. The patient is fluent in English but struggles to retain German words and has difficulty with language functions. He cannot follow a TV show or cannot read a novel. He has to take notes on paper or on his phone or computer in order to remember what to do all day long. Overall, he is getting a lot worse.

The patient's pain diagram demonstrates that he has severe headaches, cervical pain, radiating pain into his trapezius muscles in both upper extremities and pain in his lower back, radiating into his lateral right side and anteriorly into both lower extremities and both upper extremities. He rates pain in his back and neck is 9/10 on visual analog scale. He states he has right foot throbbing and weakness, feels his legs are heavy and his right foot drags. Standing upright makes him worse. Laying down seems to help. Lying in a warm baby pool helps, and application of ice and heat helps.

He has had great difficulty sleeping. His appetite has dropped. He cannot work. He has a lot of stress at home that he states even could at times had led to possibly a near divorce. He has limited typical activity. He can be upright at the most four hours.

Overall, he complains of headaches, uncontrollable pain, inability to control his bowel and bladder with incontinence of bladder, fevers and chills, unexplained weight loss, loss of appetite, erectile his dysfunction, clumsiness in his hands, heavy sensation in his legs, frequent stumbling and falling, inability to stand upright, difficulty walking. He feels weakness in his hands and feet and has severe neck, back and head pain.

He has had drop attacks. He has been told he has traumatic brain injury and some form of dementia. As a result of that, he has cognitive difficulties as mentioned. He has had heart rate variability and insomnia.

Physical therapy helped him somewhat. Injections in the occipital area and cervical spine helped him somewhat but not long term. Back and neck exercise programs and chiropractic treatments made him worse. He had little improvement from trigger point injections and massage.

The patient had seen multiple physicians including Dr. Pagan for pain management, a neurologist Dr. Dan Mircea Constantin, Dr. Moore, orthopedic surgeon. He states another Dr. Moore, who is a neurologist, Dr. Toric, an orthopedic surgeon, and Dr. Gilete a neurosurgeon in Barcelona, Spain that we will discuss in detail after the review of systems.

PAST MEDICAL HISTORY AND REVIEW OF 14 SYSTEMS:
CARDIAC: The patient denies any significant cardiac disease other than palpitations and a feeling of tachycardia.
RESPIRATORY: Denied.
GASTROINTESTINAL: Diarrhea, uncontrollable bowel movements, loss of appetite and some nausea.
GENITOURINARY: The patient has intermittent bladder incontinence and erectile dysfunction.
NEUROLOGICAL: As noted above.
ENDOCRINOLOGICAL: Negative.
BLEEDING DISORDER: Negative.
The remainder of 14 review of systems and past history is negative.

CURRENT MEDICATIONS: Pregabalin 600 mg per day, baclofen 20 mg per day, methocarbamol muscle relaxant 100 mg per day, donepezil daily for memory, Tilidin, a synthetic opioid which is a German medication 200 mg daily for pain, Tylenol for flareups, multivitamins and melatonin.

MEDICATION ALLERGIES: Anti-inflammatories.

PAST SURGICAL HISTORY: L5-S1 discectomy in December 2020. C4-5-6-7 anterior cervical discectomy and fusion in September 2021, Dr. Moore. Hernia operation 1993.
SCREENING EXAM: None taken.
FAMILY HISTORY: Alzheimer's disease in three or four plus 90 year old grandparents.

SOCIAL HISTORY: He does not smoke or take illegal drugs. He never smoked. Drank alcohol occasionally times 20 years but quit 3 years ago. He is unemployed other than being a full-time parent. He is married. He has a bachelor's degree.

The patient had an extensive consultation in-person in Barcelona, Spain with a specialist in cervical spine issues named Dr. Vincenc Gilete. The extensive report was reviewed by myself.

The patient presented with similar symptoms that are described above. The details of these complaints are reviewed with Dr. Gilete in detail.

The patient reveals during the car crash his head and body were hyper rotated looking over his left shoulder when he was hit from behind. Surgical history and current medical history was reviewed.

Dr. Gilete found that the patient had 4/5 weakness in the upper and lower extremities on the right side. Hyporeflexia was noted with an absent right Achilles tendon reflex. Toes were down to Babinski testing.

The patient underwent evoked potential testing by Dr. Sola on October 07, 2024 which, demonstrated evidence of right L4-5 lumbosacral radiculopathy and delayed somatosensory evoked potentials in the right upper and lower extremity suggesting alteration of function of the posterior spinal columns. The right upper extremity motor evoked potentials were also abnormal.

Dr. Gilete also performed a variety of other radiological evaluations and the final diagnoses were as follows:

1. An occult tethered spinal cord.
2. Right-sided L5-S1 recurrent disc herniation or fibrosis.
3. Craniocervical instability (CCI).
4. Atlantoaxial instability (AAI).

There was an extended discussion of various options as regards to surgery, which Dr. Gilete would recommend after further evaluation and possible conservative treatment would involve an occipital C1-C2-C3-C4-C5-C6-C7 extensive posterior instrumentation and fusion. Dr. Gilete indicated to the patient, if this procedure was done, there would be no further neck movement possible.

PHYSICAL EXAMINATION: The patient underwent physical examination by Dr. Franck on this visit March 14, 2025. The patient was in obvious distress.

VITAL SIGNS: DOB 03/10/1975. Blood pressure, right arm sitting 136/86, pulse 73; standing blood pressure 124/100, pulse 100, respiratory rate 24, and temperature 98.2, and O2 sat on room air 99%. The patient is 50 years old. Height: 6 feet 1 inches. Weight: 170.2 pounds. BMI: 22.4. The patient is right-handed. The patient is in obvious distress, very uncomfortable.
HEENT: Normocephalic and atraumatic.
SKIN: Warm, dry and intact.

CERVICAL SPINE EXAMINATION: Severe stiffness in all six axes of movement, severe paravertebral tenderness, tenderness in the trapezius muscles. He had marked limitation in range of motion in all six axes and severe spasm. There are no anterior masses.
BREAST EXAM: Deferred to PCP.
RESPIRATORY: Clear to auscultation and percussion.
CARDIOVASCULAR EXAM: His rate is normal and regular. There were no murmurs, carotid, abdominal, and femoral bruits.
GASTROINTESTINAL: Positive bowel sounds, nontender and nondistended. No abnormal masses palpated. However, there was a palpable pounding aortic pulse, which was nontender. The patient did not have any femoral or abdominal bruits.

(The patient underwent a CT scan of the cervical spine without contrast at Akumin on March 17, 2025 and without contrast and there was no indication of an abdominal aortic aneurysm.)
GENITOURINARY: Normal.
MUSCULOSKELETAL: Normal. Shoulder examination; full range of motion, no impingement, negative Patrick's maneuver. Knee exam, stable. Thoracic spine, normal. Lumbar spine, paravertebral scar noted on the right.
NEUROLOGICAL EXAMINATION: Mental status demonstrates he is somewhat withdrawn, restless, lethargic, has diminished attention span and concentration. He has difficulty with immediate recall and poor short-term memory, mild difficulty with long-term memory. Language function indicated some comprehension difficulty, but otherwise, he was fluent and obviously quite intelligent, understood everything that was transpiring. Cranial nerves II through XII normal. Motor exam: Normal bulk and tone. No atrophy or fasciculations. Full strength in bilateral upper and lower extremities. No tremors, resting or intention. No rigidity or cogwheeling. Motor examination, in the upper extremity, deltoid, biceps, brachioradialis, triceps 5/5 bilateral. Wrist and finger extensors 5 right, left 4. Grip 5 right, left 4. Intrinsics 5 right, left 4. Lumbricals first, second, third and fourth right 5, left 4. Motor exam of the lower extremities, iliopsoas, adductors, quads, anterior tibialis, posterior tibialis, peroneus longus, and gastroc soleus 5/5. Deep tendon reflexes biceps, brachioradialis, triceps, patellar and Achilles tendon 2/4 bilaterally with downgoing toes to Babinski, Chaddock and Oppenheim testing. Negative Hoffman, Meyer and Wartenberg testing.

SENSORY EXAMINATION: Diminished vibration in the distal left upper extremity and diminished pinprick appreciation in the distal left upper extremity.
COORDINATION TESTING: The patient has a positive mild Romberg sign. Gait exam: Significant tandem gait ataxia.

IMAGING: On March 10, 2025, cervical spine digital motion x-ray performed at Nu-Best which is a video fluoroscopic view of the cervical spine in motion reviewed in detail with the patient. This demonstrates:

1. Loss of Cervical Lordosis.
2. The occipital/C1 junction is stable and in normal limits. There is no occipital cervical instability per se.
3. The patient is status post C4-5, C5-6, and C6-7 anterior cervical decompression and fusion using a unilateral superior and inferior screw fixation technology. The left C4 screw has been apparently removed. These appear to be fused in a straight alignment.
4. The canal is inherently narrow.
5. Lateral coronal tilt testing demonstrates that there is overhang of the C1 lateral mass with respect to the C2 lateral mass with tilting on the left of 5 mm and on the right of 4 mm. This corresponds with the left atlantodental interval changes. These are grossly abnormal indicating significant instability. Normal overhang should be 0-1 mm. The average overhang of over 200 patients we have operated on is 4.7 mm on either side. Rotation is normal. At C0-C1-C2-C3 there is normal rotation but limitation in flexion and extension.

The patient had followup Zoom discussion on March 18, 2025 after having undergone the images of the noncontrast CT abdomen and pelvis.

On March 18, 2025, A CT of the abdomen and pelvis indicated there was no evidence of an aortic aneurysm.

On March 18, 2025, an upright positional MRI scan of the cervical spine with stress position was performed at Akumin, this included a sagittal T2 image, T1 image and STIR image, as well as axial T2 image from C3 to C7 and coronal study from C3 to T1. Axial scans of the cervico-occipital junction were not performed, nor were coronal studies at that level. However, enough information is easily gathered to yield the diagnosis.

1. The patient is status post C4-5-6-7 anterior cervical decompression and fusion and plating. There are no herniated cervical discs. It is well fused and in good alignment.
2. The patient has cerebellar tonsillar ectopia with descent of the 10th lobe of the cerebellum bilaterally as are cerebellar tonsils to McRae's line at the foramen magnum junction.

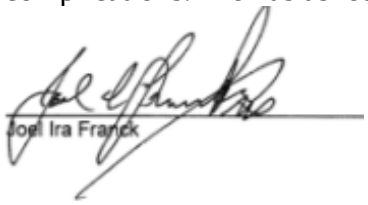
3. The patient has C1 capsulosynovitis due to the injury of the transverse and alar ligament with Grabb-Oake's measurement of 7.5 mm, which is grossly abnormal. The normal measurement should be 1 mm, while 9 mm is considered a critical cervicomedullary junctional compression mass.
4. In neutral and especially in flexion position, there is significant ventral and dorsal compression of the cervicomedullary junction of the lower brainstem and upper cervical spinal cord secondary to the C1 capsulosynovitis from the transverse and alar ligamentous injury and the posterior posttraumatic post whiplash tonsillar descent and herniation, therefore, causing foramen magnum stenosis and dynamic interference in the cerebrospinal fluid flow of the craniocervical circulation, and most obvious and important vertebral artery compression.

ASSESSMENT AND PLAN: This patient is an excellent candidate for surgery.

Dr. Gilete is in complete agreement with that; however, the surgery that we would recommend would be much more limited and therefore not impede the patient's ability to move his neck and have normal cervical spinal function in the future. In particular, the operation we proposed is as noted above.

The limitation and range of motion would be moderate limitation in rotation, without any limitation in flexion versus extension or lateral tilt.

The patient was explained indications, alternatives, risks, techniques, and technology of surgery and has asked us to go ahead and scheduling will occur. The patient has to return to Germany and deal with other issues before we actually perform surgery. He understands the techniques, technology, biology of the nature of the injury and surgery. He understands the risks which include death, myocardial infarction, pulmonary embolism, pneumonia, urinary tract infection, HIV, AIDS, or hepatitis, blood transfusion complications, CSF leak, pseudomeningocele, meningitis, cerebritis, weakness, numbness, paralysis, loss of bowel, bladder or sexual function, chronic pain, requirements for further fusion, fusion instability, fusion failure, hardware failure, epidural, subdural or intraparenchymal brainstem hemorrhage causing coma, death, vegetative state, cognitive dysfunction, and any and all neurological and medical complications. He has asked us to proceed. Workup is continuing.



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