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FROM OUR PRESIDENT

STEFANO M. SINICROPI, MD, FAAOS

A warm welcome to our audience. We have discussed the topic of difficult pathways in our fourth issue. In this, our sixth issue, we re-visit the topic of difficult pathways. The brain or spine surgeon often work in deep locations near vital surrounding structures, increasing the risk of damaging healthy tissue. Using naturally occurring anatomic corridors and specialized tools allows the surgeon to reach deep areas and perform surgery safely while avoiding hazards.

We present two such cases: a suboccipital craniectomy and resection of a large cerebellopontine angle meningioma, and a trans-oral resection of odontoid process for resection of calcium pyrophosphate deposition, and decompression of the upper cervical cord.

We welcome your questions or outreach regarding these or past case presentations.



Cerebello-pontine angle meningioma

ERIC S. NUSSBAUM, MD, DABNS
COLLIN M. TOROK, MD

HISTORY

This 72-year-old man had a remote history of resection of a large frontal parasagittal meningioma roughly 30 years ago. He did well from that surgery, and was in his usual state of health until several months prior to admission, when he fell and was evaluated at an outside hospital. On physical examination, he was found to be neurologically normal. However, CT scan of the head showed an approximately 3.1 x 4.0 cm left cerebello-pontine angle mass (Figure 1a, b). MRI of the brain revealed a large infratentorial mass lesion, which appeared to be tentorial-dural based, filling the cerebellopontine angle (Figure 2a, 2b, 2c). Medially, the lesion was compressing the left middle cerebellar peduncle, anteriorly, the lesion was abutting the facial/vestibulocochlear nerves (Figure 2a, 2d), inferiorly the lesion was abutting the glossopharyngeal, vagus, and accessory nerves as well as the jugular bulb (Figure 2e, 2a).

The lesion was deemed to be consistent with meningioma given the imaging characteristics and apparent tentorial-dural base. Surgery was recommended given the large size of the tumor with associated signal change in the cerebellum. The patient was referred to Dr. Collin Torok for preoperative angiogram and embolization, in part to better understand the venous anatomy given the tumor's proximity to the transverse and sigmoid sinuses. Cerebral angiogram showed that the meningioma was supplied by an enlarged transosseous branch of the left occipital artery, a distal, tentorial/petrosal branch of the left middle meningeal artery (Figure 3a, 3c) as well as minor supply from the stylomastoid artery.

The transosseous branch of the left occipital artery was embolized using polyvinyl alcohol (PVA) particles (Figure 3a, 3b), and the middle meningeal artery was occluded using coils (not shown). Following embolization of the tumor, the patient underwent suboccipital craniectomy and resection of his cerebello-pontine angle tumor by Dr. Eric Nussbaum. The patient was placed in the lateral decubitus position with the left side up. Stereotactic navigation was used to aid in planning the incision. Electrophysiologic neuromonitoring was also established in standard fashion.

After skin incision, a standard suboccipital craniotomy was created; bone was drilled out flush with the edges of the transverse and sigmoid sinuses. Dura was opened right up to the transverse and sigmoid sinuses to provide optimal exposure. The edge of the cerebellum was found and gently retracted back under microscope magnification. The large cerebello-pontine angle tumor was resected by first central debulking of the lesion using combination of bipolar electrocautery, micro-scissors, suction, and ultrasonic aspirator. Using this technique, the tumor capsule was gradually dissected from the cerebellum and from the inferior surface of the tentorium. Medially, the tumor edge was dissected from the lateral aspect of the pons. Anteriorly, the tumor edge was dissected free from the neighboring cranial nerves. Tumor was sent to pathology for evaluation (Figure 4a, 4b). The findings of spindled and epithelioid meningothelial cells, syncytial growth and nuclear pseudo-inclusions were felt to be consistent with the diagnosis of meningioma.

After gross total resection was achieved, intraoperative neurophysiologic monitoring showed that motor and sensory evoked potentials had remained stable. Meticulous hemostasis was achieved and the dura was closed primarily. Exposed mastoid air cells were packed with bone wax. The free bone flap was plated to the occiput with titanium plates and screws, and remaining bone gaps were filled with hydroxyapatite cement. The scalp was closed in multiple layers.

Immediately postoperatively, the patient was neurologically normal. Postoperative MRI scan showed gross total resection (Figure 5a, 5b, 5c). The patient was discharged home on postoperative day 4. Approximately six weeks after surgery, the patient has been able to fully resume normal activities, and the incision has healed completely.

DISCUSSION

We describe an interesting case of a patient with a large cerebello-pontine angle (CPA) meningioma. The cerebello-pontine angle is defined as the roughly triangular arachnoid cistern bounded by the tentorium, cerebellum, brainstem (pons and medulla), and the petrous part of the temporal bone. The most common lesions occurring in this area include schwannoma, meningioma, and epidermoid cyst (1, 2, 3). Less common entities may include: vascular lesions, arachnoid cysts, lipomas, infections, metastases, or exophytic brain stem tumors (4, 5). Critical vascular structures in exposing the CPA include the transverse and sigmoid sinus (6). After dural exposure, critical brain structures in this area include the cerebellum and brainstem, as well as the following cranial nerves: trigeminal, abducens, facial, vestibulocochlear, glossopharyngeal, vagus, and accessory (6). During surgical resection, critical vascular structures include the anterior inferior cerebellar (AICA) and posterior inferior cerebellar arteries (PICA) and inferiorly, the jugular vein (6).

In this patient, pathologic evaluation was consistent with meningioma, a generally benign tumor of the dura. The cell of origin has historically been attributed to arachnoid cap cells, although more recent transcriptomic and proteomic studies show that there are likely more than one cell of origin (7, 8). Molecular studies have identified the neurofibromatosis-2 (NF-2) gene, as being mutated in up to 60% of meningiomas. Non NF-2 mutations have also been implicated in meningiomas: tumor necrosis factor receptor-associated factor 7 (TRAF7),

Kruppel-like factor 4 (KLF4), AKT serine/threonine kinase 1 (AKT1), Smoothened (SMO), Suppressor of fused homolog (SUFU), protein kinase cAMP-dependent type I regulatory subunit alpha (PRKAR1A), phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha (PIK3CA), and RNA Polymerase II Subunit A (POLR2A) have been discovered in meningiomas without any NF2 alterations; these genetic mutations seem to imply a more benign course (10, 11, 12). On the other hand, mutations in SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily B member 1 (SMARCE1), BRCA1 associated protein-1 (BAP1), and telomerase reverse transcriptase (TERT) seem to imply more aggressive tumors with higher recurrence rate and worse progression free survival (10, 11, 12). Unfortunately, none of these identified genetic mutations have yielded an FDA approved targeted therapy.

Instead, accepted treatment for meningiomas range from observation for small tumors to surgery and adjuvant radiation for large, symptomatic tumors, and stereotactic radiosurgery for intermediate-sized lesions (8, 9). In our patient, the meningioma was essentially asymptomatic. However, given the large size and mass effect with signal change on neighboring critical structures, surgery was a reasonable option. Preoperative embolization was used to decrease blood loss, a useful and well recognized pre-procedural step (13, 14). Using preoperative embolization and careful microsurgical technique, we were able to achieve a Simpson grade 2 gross total resection (15), with an excellent clinical outcome.

FIGURES



Figure 1a. Axial non-contrast CT scan of the head, January 12, 2026. A large approximately 3.1 x 3.9 cm hyperdense lesion is observed in the left cerebello-pontine angle. There is compression of the left middle and inferior cerebellar peduncle. There is slight compression of the fourth ventricle.



Figure 1b. Coronal non-contrast CT scan of the head, January 12, 2026. The large lesion appears to be tentorium-based. There is slight compression of the fourth ventricle, and slightly enlarged lateral ventricles.

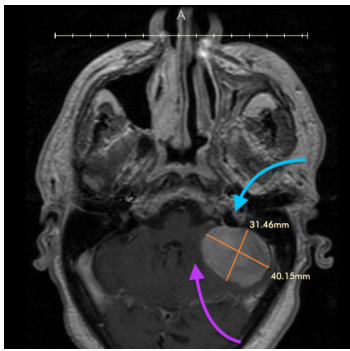


Figure 2a. Axial T1 weighted MRI of the brain with contrast, January 13, 2026. Large, 3.1 x 4.0 cm lesion is seen in the left cerebello-pontine angle. Mauve arrow indicates compression of the middle cerebellar peduncle. Cyan arrow indicates the left sigmoid sinus-jugular vein.

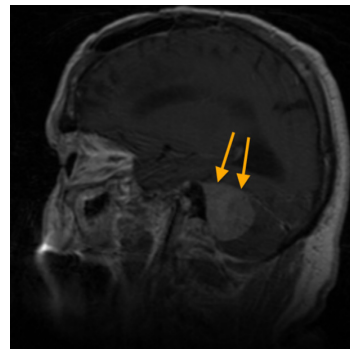


Figure 2b. Sagittal T1 weighted MRI of the brain with contrast, January 13, 2026. Large cerebello-pontine angle lesion is seen. Peach arrow indicates tentorial base, consistent with meningioma.

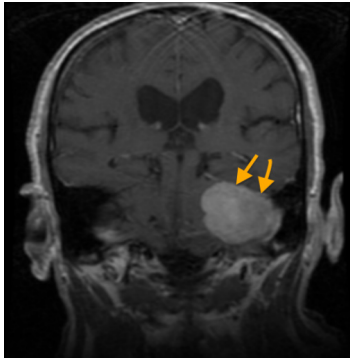


Figure 2c. Coronal T1 weighted MRI of the brain with contrast, January 13, 2026. Large lesion is seen filling the entire left cerebello-pontine angle. Peach arrow indicates tentorial base, consistent with meningioma.

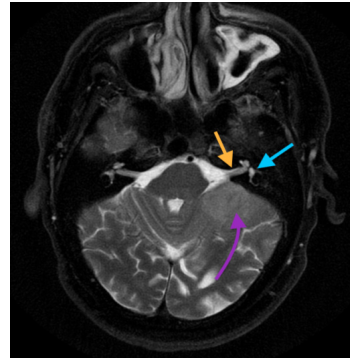


Figure 2d. Axial T2 weighted MRI of the brain without contrast, January 13, 2026. Mauve arrow indicates the un-enhanced left cerebello-pontine angle meningioma. The tumor is seen abutting the facial/ vestibulocochlear nerve complex. Peach arrow indicates the internal auditory canal; cyan arrow indicates the cochlea and semi-circular canals.



Figure 2e. Axial T2 weighted MRI of the brain without contrast, January 13, 2026. Again, mauve arrow indicates un-enhanced left cerebello-pontine angle meningioma. White arrow indicates the vagus, glossopharyngeal and accessory nerves.

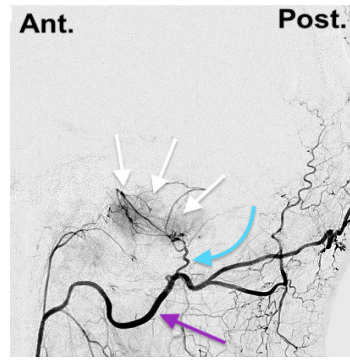


Figure 3a. Lateral view, digital subtraction, selective angiogram of the left occipital artery, June 23, 2026. Mauve arrow indicates the occipital artery. Cyan arrow indicates an enlarged, transosseous branch. White arrows indicate the tumor blush.

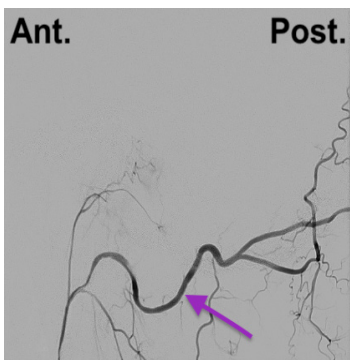


Figure 3b. Lateral view, digital subtraction, selective angiogram of the left occipital artery, post-embolization. Mauve arrow indicates the occipital artery; the transosseous branch as well as the tumor blush are now absent after embolization with polyvinyl alcohol particles. Minor tumor perfusion from the styloid artery could not be embolized, as the styloid artery also supplies the facial nerve (personal communication, Dr. Collin Torok).

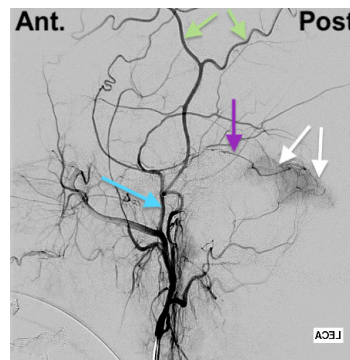


Figure 3c. Lateral view, digital subtraction selective angiogram of the left external carotid artery, June 23, 2026. Cyan arrow indicates the middle meningeal artery. Mauve arrow indicates a terminal petrous-squamosal branch of the middle meningeal artery. White arrows indicate the tumor blush. Green arrows indicate branches of the superficial temporal artery.

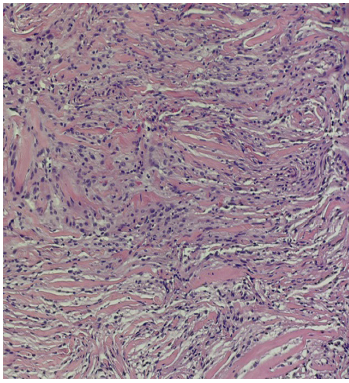


Figure 4a. Medium power micrograph of hematoxylin and eosin (H&E) staining of the tumor. Spindled and epithelioid meningeothelial cells can be seen associated with dense collagen.¹

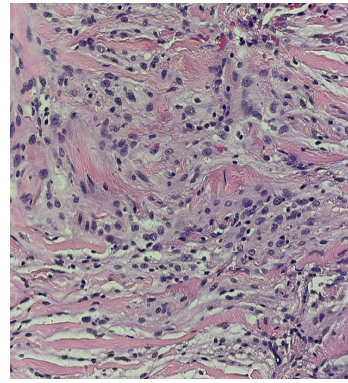


Figure 4b. High power micrograph of hematoxylin and eosin (H&E) staining of the tumor. Nested epithelioid meningeothelial cells and spindle cells in a background of dense collagen bundles. Occasional pseudonuclear inclusions can also be seen.

¹ Photomicrographs of pathologic specimen were generously provided by Dr. Tareek Salem, Department of Pathology, North Memorial Hospital, Robbinsdale, Minnesota.

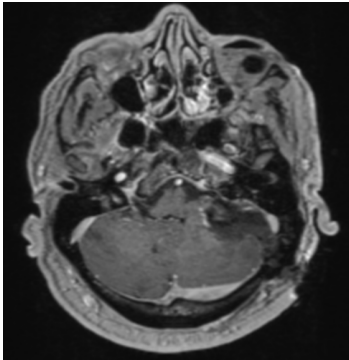


Figure 5a. Axial T1 weighted MRI of the brain with contrast, June 30, 2026. There is complete absence of contrast enhancement, consistent with gross total resection.

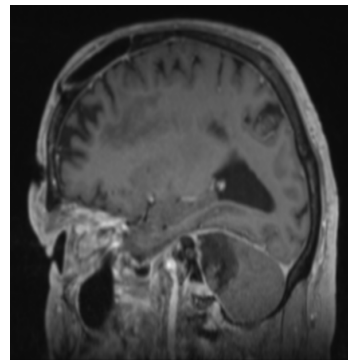


Figure 5b. Sagittal T1 weighted MRI of the brain with contrast, June 30, 2026. There is complete absence of contrast enhancement, consistent with gross total resection.

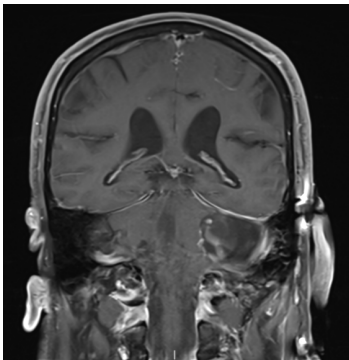


Figure 5c. Coronal T1 weighted MRI of the brain with contrast, June 30, 2026. There is complete absence of contrast enhancement, consistent with gross total resection.

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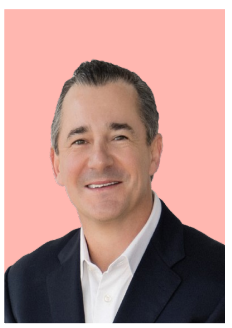
GUEST SURGEONS

COLLIN M TOROK, MD



Dr. Collin M. Torok is a Neurointerventional Surgeon at Allina Health Brain and Spine Institute and The John Nasseff Neuroscience Specialty Clinic. He completed fellowship in Neuroendovascular Surgery at Massachusetts General Hospital/Harvard Medical School (CAST and ABMS/ABNS-RFP certified) with additional subspecialty experience in Pediatric Neurointerventional Surgery at Boston Children's Hospital. Prior to this, he completed a residency in Diagnostic Radiology and fellowship in Diagnostic Neuroradiology (CAQ certified) at the Johns Hopkins Hospital. He and his team perform elective and emergent endovascular treatments of a multitude of vascular disorders of the brain and spine, including: acute stroke, cerebral aneurysms, arteriovenous malformations, dural arteriovenous fistulas, carotid cavernous fistulas, spinal vascular malformations, as well as the complete spectrum of pediatric vascular malformations. His practice philosophy is to treat every patient with the same dedication as a family member. In his spare time, Dr. Torok enjoys fishing, hockey, brewing and spending time with his family. Dr. Torok is also fluent in Japanese, and is involved with the Japanese Society of Neuroendovascular Therapy (JSNET).

Authorship Note: This article was written in its entirety by humans, without the use of generative AI.



Trans-oral Odontoidectomy for Resection of C1-2 Pannus

MICHAEL A. FINN MD, DABNS

HISTORY

This 78 year old male who presented in 2014 with arm numbness and the development of severe gait instability after doing sit-ups. On physical examination, he was found to have mild weakness in the upper extremities, a significant sensory deficit in the hands and forearms bilaterally and profound deficits in upper extremity coordination, balance and proprioception. He was markedly hyperreflexic and had positive Hoffman's and Babinski signs with sustained clonus. Cervical MRI scan showed large C1-2 mass posterior to the odontoid process with severe compression of the upper cervical cord/medulla

(Figure 1a). There was also significant hypertrophy in the posterior C1-2 ligamentum flavum (Figure 1b). Cervical CT scan showed calcification and spontaneous fusion of C2 to C6 consistent with diffuse idiopathic skeletal hyperostosis (DISH) (Figure 2a). Significant spontaneous fusion of the cervical facet joints was also observed (Figure 2b). Extensive serologic studies were all normal: the patient had normal serum calcium, magnesium, phosphate, alkaline phosphate, parathyroid hormone, ferritin, iron, and thyroid hormone levels. Given the physical finding of myelopathy, and the radiologic finding of severe spinal cord compression, surgical decompression and stabilization was recommended. On June 5, 2014, the patient underwent anterior trans-oral odontoidectomy and resection of the mass and a posterior occiput to C3 fusion and decompression.

Immediately postoperatively, the patient noted some improvement in sensation and coordination. Postoperative plain film x-rays as well as CT scan showed gross total resection of the C1-2 pannus, and appropriate placement of hardware (Figure 4, 5). Pathologic examination of the pannus tissue showed birefringent, rhomboid-shaped crystals embedded in inflammatory granulation tissue (with macrophages and giant cells) and synovial tissue (not shown). These pathologic findings were consistent with the diagnosis of calcium pyrophosphate dihydrate (CPPD) crystal deposition disease.

The patient was kept NPO for 24 hours and then advanced to a clear fluid diet for three days, after which he was permitted to resume a normal diet. He was discharged, and continued to follow up for several years. His symptoms resolved almost completely over the 6 months after the surgery.

DISCUSSION

We present an interesting case of calcium pyrophosphate dihydrate deposition disease (CPPD), causing massive C1-2 pannus, resulting in severe compression of the medulla and upper cervical cord. CPPD arises when the body deposits calcium pyrophosphate crystals within joints, resulting in inflammation of the joint. The resulting inflammation can present asymptotically, or as acute or chronic arthritis. Risk factors for CPPD include joint trauma, or associated metabolic conditions (e.g. eg, hyperparathyroidism, haemochromatosis, hypomagnesaemia, and hypophosphatasia). Thus far, no targeted therapy has been found to arrest the process of crystal deposition or induce the reabsorption of deposited crystals. Current therapeutics to treat CPPD have been anti-inflammatory medications (e.g. steroids, NSAIDs, methotrexate, etc.) (1, 2, 3).

The anterior, transoral odontoidectomy was chosen as the most direct means of decompression. The transoral approach for odontoidectomy was first described in 1917, by Dr. Allan Kanavel, to remove a bullet in the cranio-vertebral junction (4, 5). The approach was improved by the addition of specialized oral retractors as well as the use of the surgical microscope (6, 7). Further modifications include mandible splitting, trans-maxilla, and endoscopic approaches (8, 9, 10, 11). These approaches and various modifications offer a direct anterior access to remove the odontoid process and associated pathology. For example the approach has been used to resect/remove tumors, infections, trauma, basilar invagination, non-infectious inflammatory lesions (12, 13, 14, 15). While useful, the approach does carry risk of vertebral artery injury, CSF leak, meningitis, and wound dehiscence/infection (14).

It stands to reason that odontoidectomy can cause C1-2 instability, since the odontoid process is removed, and the transverse, cruciate and apical ligaments can be disrupted in the process.

Indeed, in cadaveric studies, odontoidectomy caused significant translational instability as well as significantly increased angular range of motion during flexion, extension, and lateral bending between C1-2 (16). However, preservation of the C1 anterior arch seems to improve stability after anterior odontoidectomy (17). Given the high rate of instability, our patient's anterior odontoidectomy was stabilized by occiput to C3 fusion. His postoperative course was unremarkable, and he ultimately achieved a good clinical outcome.

FIGURES



Figure 1a. Sagittal T2 weighted MRI of the cervical spine, May 14, 2014. A massive C1-2 pannus can be seen causing near-complete obliteration of the upper cervical spinal cord. The massively hypertrophied pannus was a result of calcium pyrophosphate deposition, inflammation, and hypertrophy of the transverse, cruciate and apical ligaments

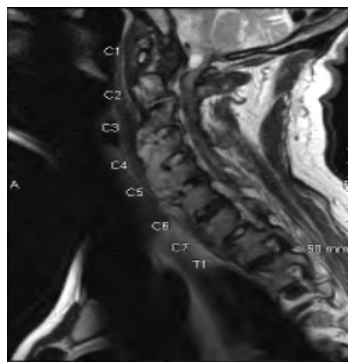


Figure 1b. (b) Sagittal T2 weighted MRI of the cervical spine, May 14, 2014. Large posterior C1-2 pannus can be seen also contributing to compression of the upper cervical spinal cord.

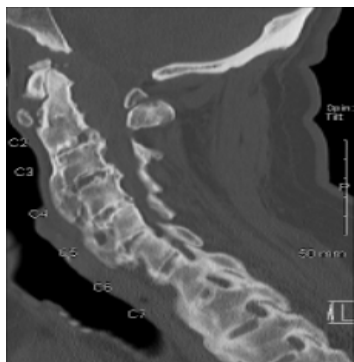


Figure 2a. Sagittal reconstruction CT scan of the cervical spine, May 14, 2014. Large bridging calcification of the anterior longitudinal ligament affecting C3-4, C4-6, and C7 to upper thoracic spine can be seen.

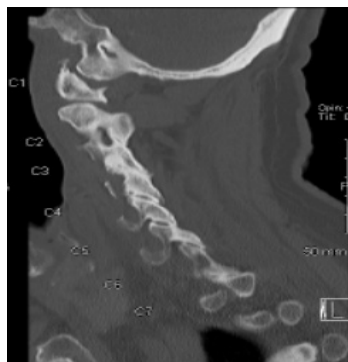


Figure 2b. Sagittal reconstruction CT scan of the cervical spine, May 14, 2014. Fusion of facet joints of C2-3, C3-4, C4-5 and C5-6 can be seen.

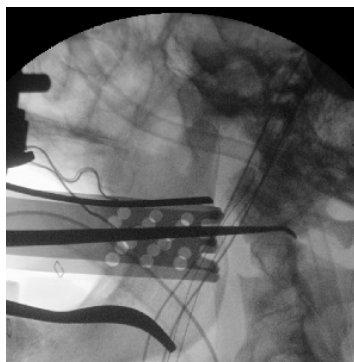


Figure 3. Intraoperative fluoroscopic image. Spetzler-Sonntag retractor has been placed to retract the palate and uvula superiorly, and the tongue inferiorly. Complete odontoidectomy has been performed, sparing the anterior C1 arch. A Penfield instrument can be seen, marking the ventral surface of the dura after gross total resection of the hypertrophied ligaments with calcium pyrophosphate deposits.



Figure 4. Postoperative lateral plain film x-ray showing total anterior odontoidectomy, C1 laminectomy and fixation and fusion via occipital plate, C1, C2 pars/pedicle screws, and C3 lateral mass screws.

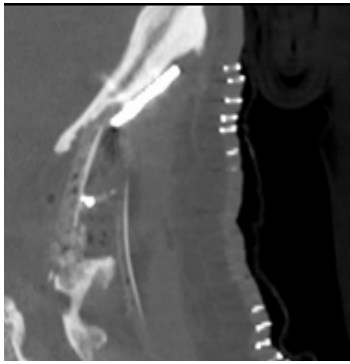


Figure 5. SSagittal reconstructed postoperative CT scan, showing complete odontoidectomy, wide decompression, gross total resection of hypertrophied anterior C1-2 ligaments with preservation of the anterior C1 arch. Also shown is C1 laminectomy, wide decompression, and gross total resection of posterior C1-2 ligamentum flavum with calcium pyrophosphate deposits. An iliac crest allograft was fashioned to fit snugly between the occiput and posterior elements of C2 to provide a conduit for definitive bony fusion.

Authorship Note: This article was written in its entirety by humans, without the use of generative AI.

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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



JACOB G. GUTH, PA-C
Physician Assistant



PHILLIP C. STEWART, PA-C
Physician Assistant



MATTHEW C. HAWKINS, PA-C
Physician Assistant



MARLAND D. GILBERT, PA-C
Physician Assistant



KYLEEN. PERSING PA-C
Physician Assistant



ALYSSA P. EDWARDS, MSN, AGNP, RN
Nurse Practitioner



RYANN M. KUJAWA THOMPSON, PA-C
Physician Assistant



BRIGETTE R. KERBER, PA-C
Physician Assistant



SARAH A. PANCHENKO, PA-C
Physician Assistant



IAN M. JOHNSON, PA-C
Physician Assistant



ERIC S. SALMAN, PA-C
Physician Assistant



PATRICK M. PETROSKY, PA-C
Physician Assistant



WE WELCOME YOUR REFERRALS

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.

To contact us call: 651.430.3800 providing ongoing support beyond regular hours, weekends, and holidays with the help of our dedicated answering staff.



FAX NUMBER

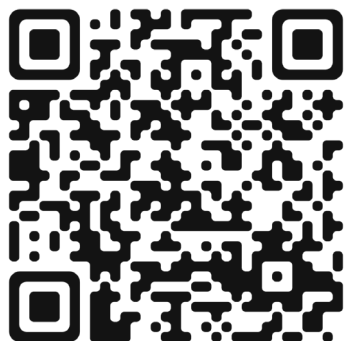
651.430.3827



EMAIL

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SECOND OPINION

We offer second opinions here at MSBI. However, please note that complimentary MRI reviews are not available for government-funded plans, including Medicare and Medicaid.

If your patient is eligible for a complimentary MRI review, our spine and brain surgeon team will reach out to them within two business days. During this consultation, we will discuss their MRI findings and provide recommendations for the next steps.

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