

Chronic Neck Pain and Low Level Headaches Secondary to Pituitary Adenoma: A Case Report

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Introduction

Pituitary tumors are a relatively common group of CNS tumors that are present in an estimated 16.7% of the population. Classifications for pituitary adenomas are based on size (micro < 1 cm, macro > 1 cm) and functional status. Slow growing, nonfunctional adenomas are usually picked up on routine examination as an incidental finding while large, rapidly-proliferating, or functional adenomas can present with symptoms related to adenoma mass effect and hormonal imbalances. Among patients with pituitary adenomas, as many as 33-72% suffer from chronic headache secondary to suprasellar expansion causing dural traction or invasion into the cavernous sinus. Among these chronic headaches, the most common classes of headache are migraine and cluster. Further studies indicate that a genetic predisposal could possibly contribute to development of pituitary adenomas and related headaches.

Here, we present a sentinel case of a 28-year-old male with chronic symptoms of headache and neck pain with a diagnosis of a chronic C4 radiculopathy and cervical stenosis. Due to his pain, he received multiple cervical epidurals and cervical medial branch radiofrequency ablations without benefit and subsequent implants of a spinal cord stimulator and an intrathecal pump. In this case, the patient’s pain level began to decrease after removal of a 12 mm nonfunctional adenoma that was found after bloodwork demonstrated low testosterone levels warranting a brain MRI.

History

CC: Chronic deep cervical pain
HPI:

28 year old male with a history of chronic C4 radiculopathy due to degenerative disk disease, nerve irritation, spondylosis, multiple level cervical stenosis, bariatric surgery and spinal cord stimulator referred to outpatient specialty clinic per referral from PCP for management of chronic deep axial cervical pain radiating to the top of his head. Pain is a deep, constant, dull, and aching pain in his neck that radiates outwards that is graded a 7/10 on average and 10/10 at its worst. The pain began 2 years ago without any inciting incident. It is alleviated with medication and rest, exacerbated by bending, lifting, walking, and straining.

Medications:

At the time of initial consult, medication regimen included Hydrocodone/Acetaminophen 7.5/325mg tablet PO Q6H prn for pain, Gabapentin 800mg tablet TID, Amitriptyline HCL 10mg tablet QHS, and Cyclobenzaprine 10mg tab TID prescribed by his primary

Procedural History:

Bilateral C2-C3, C3-C4, C4-C5, C5-C6 facet injections done under monitored anesthesia care (MAC), bilateral C3, C4, C5, C6, C7 medial branch block under MAC, and left C3-C4, C5-C6 rhizotomy with MAC under fluoroscopic guidance

Patient reported relief with previous rhizotomies that lasted 3 months but did not provide any relief when repeated.

Pertinent Physical Exam

General: WDNW male in no distress

Mental Status: Alert and Oriented x 4

Cranial nerves: EOMs intact, PERRLA, sensation to light touch intact in CN VI, V2, and V3 distribution bilaterally, hearing intact bilaterally, uvula midline, trapezius strength 5/5 bilaterally

Neuro: DTR +2/4 at Patellar and Biceps tendons bilaterally, muscle strength +5/5 in upper and lower extremities bilaterally. No focal motor or sensory deficits noted

MSK: tenderness to palpation over the greater occipital nerve distribution and the cervical paraspinals throughout the spine. AROM limited by pain with cervical flexion and extension. Other movements within normal limits.

Specialized Tests: positive facet loading test bilaterally L>R. Equivocal Spurling’s maneuver bilaterally

Range of Motion (cervical)	
Right Rotation	80°
Left Rotation	80°
Right Sidebending	40°
Left Sidebending	35°
Flexion	15°
Extension	15°

Medical Course

At initial visit, 7-view cervical x-ray series was obtained and confirmed the placement of a spinal cord stimulator, entry at T1-T2, with leads going up to C3-C4.

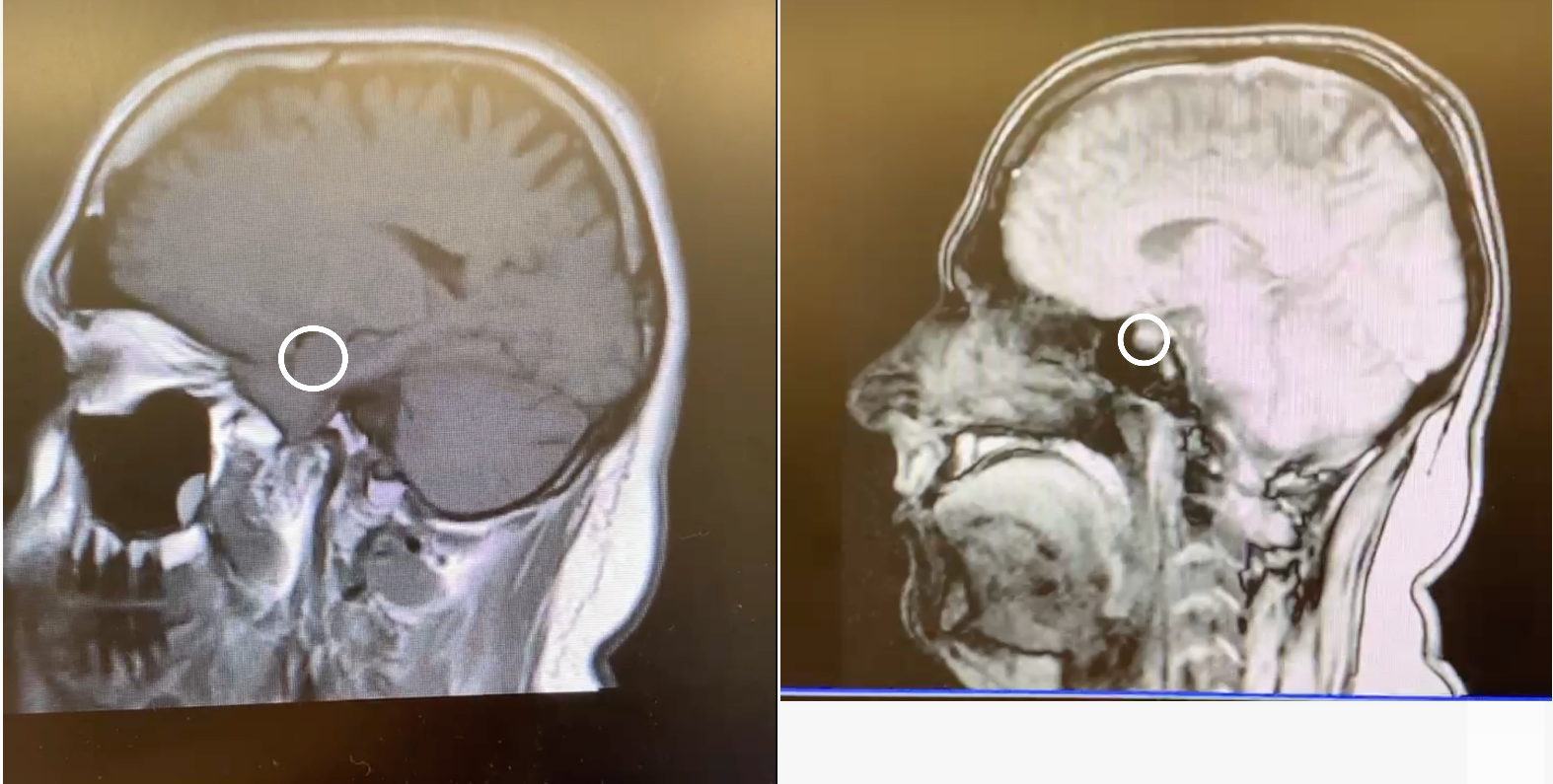
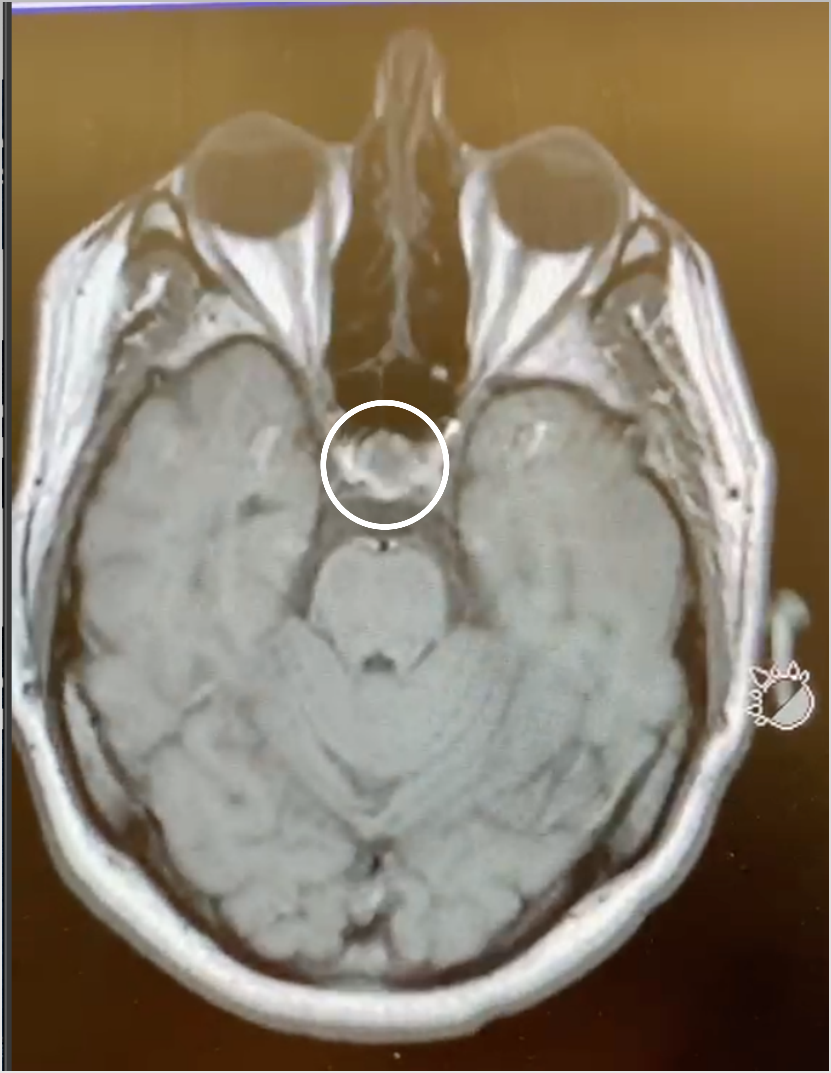
He was evaluated for an intrathecal pump as a referral, and thus passed the prerequisite psychology and medical clearances. Patient successfully passed the intrathecal trial, experiencing 24 hours of relief after a 4 hour trial, and a flowonix pump was installed with catheter at T1/T2. He was followed monthly thereafter for pain pump refill. Roughly 11 months after initial consult, patient was found to have a 12 mm nonfunctional pituitary adenoma on brain MRI after bloodwork showed markedly low testosterone levels. Patient had no other symptoms of pituitary adenoma-related mass effect. Patient is currently status post surgical removal of the adenoma, and his pain has been steadily decreasing since. At the 1-year visit, patient pain has decreased to 5/10 from a 7/10 3 weeks after his adenoma removal, suggesting a relationship between his adenoma and chronic cervico-cranial pain. He continues to be followed by his pain management physician for this complaint and follows monthly for refill of his pain pump.

Conclusions

While documented, the connection between pituitary disease and bodily pain is still not clear in nonfunctional pituitary adenomas. The similarity between proportion of patients with nonfunctional pituitary adenomas and their functional counterparts who experienced chronic bodily pain in this study points towards a possible correlation between tumor size and the presence of pain [14]. Some present theories propose a mechanism similar to that of chronic headache caused by pituitary adenomas: dural stretch as a result of increased intrasellar pressure can lead to cervical flexion myopathy [9]. Little evidence of root cause for axial pain due to nonfunctional pituitary macroadenomas is currently present, however.

The gradual decrease in overall pain level in this patient post pituitary adenoma removal implies a potential causal relationship between his adenoma and chronic cervical pain. Due to the high prevalence and quality of life impact of not only headaches but also axial and skeletal pain in patients with pituitary adenomas, chronic cervical pain workups should include comprehensive endocrine labs and brain imaging prior to performing advanced procedures or neurosurgical consult.

Brain MRI



Brain MRI displaying a 12 mm pituitary adenoma

Discussion

Pituitary adenomas most often present in patients with disruption of the hypothalamic-pituitary-axis that leads to endocrine dysfunction, mass effect, or chronic headache. Of these presenting symptoms, chronic, refractory headache is the most common. These headaches often present in a migraine pattern that does not abort with medical treatment. Currently accepted mechanisms for pathogenesis of tension or migraine-like headaches as a result of pituitary adenomas include dural stretch, cavernous sinus invasion, and increased intrasellar pressure. Functional pituitary adenomas resulting in excess of growth hormone (GH) have also been associated with arthropathy and arthralgia secondary to uncontrolled growth of the musculoskeletal system. Most commonly, prolactin-secreting and GH-secreting adenomas are associated with increase prevalence of chronic headache refractory to treatment. While the exact nature of the causative relationship between pituitary adenomas and chronic headache has yet to be determined, dural stretching and invasion of the cavernous sinus are well documented hypotheses. Furthermore, increased intrasellar pressure has been correlated to prevalence of migraine and cluster-like headaches in pituitary adenoma patients and is thought to contribute to dural stretch mechanisms of pituitary adenoma-related chronic headache. Similarly, tight dural canals have been implicated in chronic cervical pain secondary to chronic headaches, indicating a similar possible relationship between dural pathology and cervical myopathy.

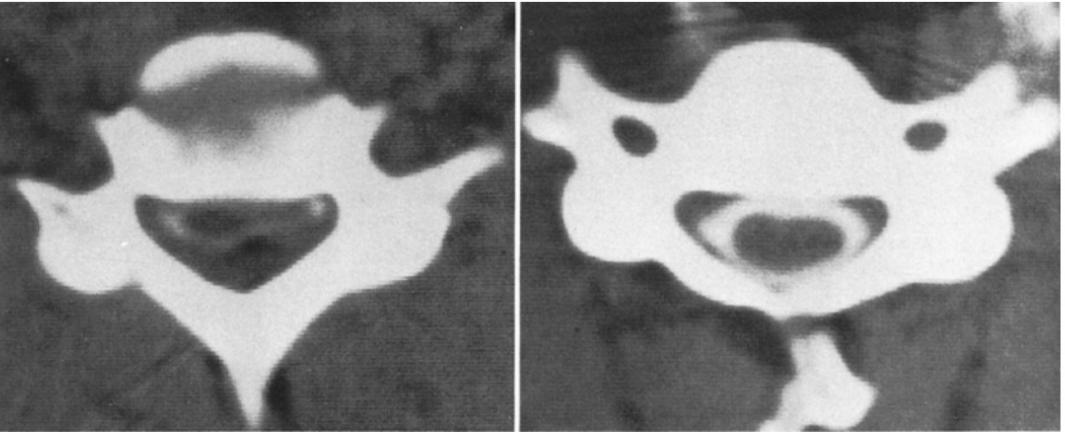


Figure taken from Iwasaki et al., 1987 demonstrating flattening of the spinal cord with cervical flexion on CT myelogram

However, chronic cervical pain caused by pituitary adenoma in a patient without chronic headache, as documented in this case study, is a relatively poorly known, yet pervasive association. A 2014 study done by Dimopoulou et al. assessing pain in 278 pituitary disease patients using the painDETECT scale, German pain questionnaire, and QoL with migraine disability assessments found that 70% of patients with nonfunctional pituitary adenomas experienced pain in their neck or nape of the neck. Furthermore, 58% of patients in that group complaining of pain that is primarily deep in nature.

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