

A Fixating Dilemma: Unusual Presentation of Anterior Head Tilt and Spasms after Anterior Cervical Fusion Surgery

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Abstract

A 67-year-old male presented to our clinic with a history of severe pain, persistent involuntary spasm of neck and upper back muscles with accompanying forward head tilt and decreased cervical range of motion bilaterally. His past surgical history was significant for anterior cervical spine fusion C6-T1 and posterior spine fusion C4-T3 to correct his medical history of cervical myelopathy and degenerative disc degeneration. Botox was used to help the history of spasm, anterior head tilt, decreased cervical rotation and severe pain. This report aims to analyze the background behind anterior and posterior cervical spine fusion surgery, its potential complications, and offer an insight on how Botox can help solve similar clinical cases.

1. Introduction

Neck pain is a common condition among older patients that make a visit to their health care professional. There can be many causes of neck pain and many treatments for the cause of the neck pain. In this case report, our patient has a past medical history that was positive for cervical myelopathy and degenerative disc degeneration that posed an urgent need for spine surgery.

Cervical myelopathy is the term used to describe the cascade of degenerative spondylotic abnormalities in the spine that directly compress the spinal cord within the cervical spine [1]. Early stages of cervical myelopathy may include local neck pain and stiffness that would have been contributing to the initial cause of neck pain in the patient [2]. Degenerative disc disease is the term for degenerative changes in the discs of the spine. Spinal discs function as shock absorbers in between spinal vertebrae. They support the flexibility of the spine, allowing one to twist and bend. The discs may begin to exhibit indications of deterioration as you age. As these discs start to degrade, they can stop functioning properly as well. Pain in the back, neck, and extremities that radiates can be caused by disc degeneration and herniation [3]. Given the seriousness of the medical history of the patient, the patient elected to go for a cervical spinal fusion by anterior and posterior technique to correct the neck pain and impingement of the spinal

cord within the cervical spine. Cervical spine surgery can quickly relieve neck discomfort in individuals with degenerative cervical radiculopathy or myelopathy, according to a large body of clinical data [4].

A significant surgical procedure called cervical fusion includes employing rods, screws, and plates to fuse one or more spinal bones together. The hardware may be positioned anteriorly or posteriorly in the cervical spine [5]. It is common practice to remove the disc between the spinal bones and replace it with a spacer or bone transplant. In both anterior and posterior approaches, a cut is made in the front and back of the neck allowing the surgeon to remove the discs and screws, then plates are positioned at the front of the neck [5]. Persistent axial pain (19–38%) and limb numbness or weakness (26%) are problematic side effects for a large percentage of cervical spine post-surgical patients [6-8]. In this case study, we look at potential complications to anterior cervical spinal fusion surgery that was relieved using Botulinum toxin A. We also propose that part of the pain and spasm in neck and occipital areas is secondary to splenius capitis syndrome. Splenius Capitis Muscle Syndrome typically mimics the respective pain reference patterns of temporal tendinitis and migraine headache. The painful headache starts at the lateral margin of the superior nuchal line and medially to the mastoid process [9].

2. Case

The patient is a 67-year-old male that came into the clinic for neck and back pain. The patient has fusions anteriorly from C6-T1 and posteriorly from C4-T3. The location of his pain was in the cervical and lumbar spines. The patient describes the pain as a sharp, aching, spasm that started 11 years ago. On the Visual Analogue Scale (VAS) for pain, the pain is rated a 6/10 in severity. The patient stated the pain was exacerbated by activity and nothing helped to relieve the pain. Our patient had tried and failed physical therapy, dry needling as well and medications. He also tried Trigger Point injections that provided a short-term benefit for a few hours. The past medical history is positive for arthritis, depression, diabetes, hypercholesterolemia, hypertension, actinic keratosis, cervical myelopathy, lumbar facet joint arthropathy, lumbar disc degeneration, cervicobrachial syndrome, displacement of lumbar intervertebral discs, gout, lumbar spondylosis, Lyme disease, testicular hypogonadism, and upper limb muscle weakness. Past surgical history for the patient is positive for colonoscopy, cervical spinal fusion by anterior and posterior approach, Lumbar laminectomy, cervical laminectomy, lymph node biopsy, and tonsillectomy. He has known allergies to amoxicillin that causes a rash, lisinopril that causes a cough, oxycodone that causes an unknown reaction. Active medications for the patient included allopurinol, amlodipine, aspirin, cannabis, cyclobenzaprine, duloxetine, hydrochlorothiazide, losartan, simvastatin. The patient complained of hypertension, back pain, stiffness, numbness, paresthesia in bilateral hands, tingling, weakness, and depression.

During his physical exam, the patient was alert and oriented to person, place, and time. He did not have any neurological deficits, and he had 5/5 strength throughout bilateral upper and lower extremity myotomes and full range of motion in all major joints except his cervical spine in all planes. The physical exam found persistent involuntary spasm of the cervical paraspinal, trapezius, occipitalis, thoracic multifidus and longissimus groups bilaterally with anteriorcolis. There was also a significant alteration and disfiguring of the dorsal skin, fascia and paraspinal musculature from C4-T3 bilaterally. We proposed and discussed with the patient that the forward head tilt with persistent involuntary spasm of the multiple muscle groups might be helped by injecting Botox.

3. Management and Outcome

On the day of the initial procedure, after pre-procedure checklists and monitoring were performed, trigger points were identified, marked, and scrubbed with Chlorhexidine. The muscle groups to be injected included the bilateral occipitalis, cervical paraspinal (to include splenius capitis), trapezius, thoracic multifidus and thoracic longissimus groups. Then, ONA injections were performed in bilateral occipitalis, cervical paraspinal (including splenius capitis), trapezius, and thoracic multifidus and thoracic longissimus muscle groups using a 30-gauge 0.5-inch needle, delivering a total of 180 units of ONA 5 units per 0.1ML. Prior to each injection, aspiration was negative for blood and CSF. No complications were noted during the procedure and the patient's

vitals remained stable. That patient was discharged home in good condition.

4. Discussion

This report demonstrates a potential complication to cervical spinal fusion by anterior and posterior approach and a response to its corrective care. In this case, the patient had anterior C6-T1 and posterior C4-T3 spinal fusions that would obviously interfere with the way normal tissues function in concert. Since the vertebrae are fused, there is less room for the true motion of the cervical spine, leading to less motion that leads to the patient having to balance it with anterior head posture. They propose that the compensating for the anterior head posture led to higher strain among the muscles of cervical spine and upper thoracic spine leading to the history of spasms seen in this patient. To help alleviate the symptoms of pain and spasm, it was determined that using Botox might alleviate some of the symptoms and provide a better quality of life for the patient.

Botox replicates the effects of Botulinum Toxin A by preventing acetylcholine from being released at the neuromuscular junction, which causes flaccid paralysis. The most widely accepted theories on the process underlying ONA pain relief entail blocking peripheral and central nerve sensitization, which in turn lessens secondary nociceptive neurons' activity [10]. However, the precise mechanism is still being investigated.

After the 1st round of Botox and before the 2nd round, our patient stated he was "at least 85% improved". Before the 3rd round of Botox, he stated was "85%-90% improved in neck pain, range of motion and spasm" and at 90 days post injection he was "still 80% improved". After the 4th round of Botox, he said his neck pain and spasm was "90% better". Considering these results, we observed that at every long-term follow-up of 90 days, it was found that the patient's structural alterations—a reduced forward head position and a reduction in muscle spasms—remained stable, and the patient was exhibiting no significant symptoms or persistent pain or spasm. We believe the improvement in our patients' condition can be attributed to the effects of Botox and provides an insight into treating similar clinical symptoms.

Although this patient realized great relief from the botox treatment regimen, we'd like to acknowledge that little has been established in the literature concerning the effects of botox on post-surgical complications involving spinal fusion. Thus, it's our hope that this review serves as the impetus for further studies which are needed to get a more comprehensive understanding of Botox's effect on postoperative pain and discomfort.

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