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Case Report

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A CASE REPORT ON EXPLORING SENSORIMOTOR DYSFUNCTION AND MUSCLE PERFORMANCE IN NECK PAIN

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ABSTRACT

Neck pain is one of the most common musculoskeletal conditions, often contributing to significant economic and functional burdens. Persistent or recurrent neck pain can be influenced by biomechanical, functional, proprioceptive, and postural factors, as well as psychosocial components such as anxiety, catastrophizing, depression, and fear. This case report presents a 24-year-old male, David, who has experienced recurrent neck pain. Recently graduated from university and yet to begin working, David maintains an active lifestyle, exercising twice a week at the gym and playing non-strenuous cricket. His gym routine primarily focuses on cardiovascular fitness, with machine-based weight training targeting various muscle groups. He previously participated in hockey and is considering returning to the sport. This report explores the potential contributing factors to his neck pain and discusses the implications for rehabilitation and management strategies.

KEYWORDS: Neck pain, Rehabilitation, Exploring sensorimotor dysfunction, Muscle performance.

INTRODUCTION

Neck pain is one of the most common musculoskeletal conditions and is associated with a significant economic burden. Persistent or recurrent neck pain can result from various factors, including biomechanical, functional, proprioceptive, and postural changes, as well as psychosocial components such as anxiety, catastrophizing, depression, and fear. Neck pain is a common condition and one of the leading causes of disability worldwide, with a mean point prevalence of 7.6% (range: 5.9%–38.7%), an annual prevalence of 37% (range: 16.7%–75%), and a lifetime prevalence of 48.5% (range: 14.2%–71%).[1] Although neck pain can result from traumatic disorders (such as whiplash-associated injuries), as well as metabolic, neoplastic, inflammatory, or infectious diseases, most cases have no discernible cause and are considered idiopathic. Similar to chronic low back pain, studies have failed to establish a consistent relationship between structural pathology and neck pain.[2]

CASE REPORT

This case report discusses a 24-year-old male, David, who has experienced recurrent neck pain. He recently graduated from university and has not yet started working. Currently, he exercises twice per week at the gym and plays recreational cricket, which is not particularly strenuous. In the past, he also played hockey and is considering returning to the sport. His gym routine primarily focuses on cardiovascular fitness, including stationary biking, treadmill running, and rowing. His weight training is predominantly machine-based, targeting the legs, back, arms, chest, and core.

History of presenting condition

David initially injured his neck at the age of 13 during a rugby scrum. At the time, he experienced significant neck pain (VAS = 9/10). However, the pain resolved without treatment, and he remained symptom-free for the next three years.

At 16, David began bowling in cricket and subsequently developed neck pain again (VAS = 8–9/10). He described a pinching sensation in his lower cervical spine. Due to the pain, he was unable to continue bowling and transitioned to playing as a wicketkeeper.

Since then, he has experienced persistent neck pain. Although he is able to perform all activities of daily living and most sports, he reports constant, low-grade neck pain. His symptoms worsen with prolonged poor posture, such as spending long hours in front of a computer or device (VAS = 4/10), or during sports like hockey, which require a flexed posture**.** (Note: Some patients with neck pain report a distinct 24-hour pattern, such as worsening stiffness in the morning or increased discomfort in the evening due to muscle fatigue; however, David does not describe a specific pattern).

He frequently feels the urge to click his neck and describes his movements as "jolty and stiff" rather than "fluid." While his pain levels have decreased over the past couple of years, the condition remains an ongoing inconvenience.

Previous treatment

David has seen three different osteopaths over the past few years, typically seeking treatment when his neck feels particularly sore.

Each osteopath provided a different diagnosis, and while their treatments offered short-term pain relief, they had no lasting effect. Research has shown that manual techniques are essential for diagnosing neck pain and can effectively reduce pain; however, they have little impact on neuromuscular and sensorimotor function. A 2022 randomized controlled trial by Sremakaew et al. found that while manual therapy and exercise can reduce neck pain in both the short and long term, incorporating sensorimotor training helps maintain pain relief and reduces disability over time.[3]

Possible diagnoses from osteopaths

- **Leg length discrepancy and quadriceps nerve firing focus:** This treatment provided the longest-lasting benefit, with a significant reduction in pain for approximately six months.
- **Alignment issue:** No further details are provided.
- **Pain related to the initial injury:** This osteopath used manual techniques that provided the most effective short-term relief. David saw this practitioner multiple times, with his last appointment occurring about 10 months ago.

David is now seeking a long-term solution. He does not have a structured self-management plan beyond attempting to improve his posture.

Past medical history

David reports good overall health. He has not undergone any surgery, experienced any major illnesses, and is not taking any medications. His weight remains stable.

He does not report experiencing double vision, fainting, pins and needles, or numbness. Additionally, he has no history of stress, either at the time of his initial injury or when his pain worsened.

David occasionally feels lightheaded when standing up quickly. While this symptom can be associated with sensorimotor dysfunction, he notes that his mother experiences the same issue.

Objective Assessment

A large body of research supports the notion that dysfunction of the cervical afferents can cause dizziness, unsteadiness, visual disturbances, and changes in balance, as well as affect head and eye movement following neck trauma. This is especially true for patients with persistent symptoms. Therefore, the objective assessment of this patient must include an examination of the neck and shoulders, as well as head control and balance.[4]

Neck pain also leads to changes in sensorimotor function, which do not always resolve as pain decreases. Thus, a detailed assessment should include an evaluation of sensorimotor function.

Additionally, it is essential to assess muscle performance, as patients with neck pain have been shown to exhibit reduced strength, decreased endurance, and quicker fatigue.[5]

Diagnosis

The diagnosis in this case study is likely facet joint dysfunction with some sensitization. The cervical facet joints are well recognized as a common cause of neck pain, headaches, and referred pain in the upper limbs. It is estimated that the prevalence of facet joint dysfunction in chronic axial neck pain ranges from 25% to 66%.

While there is limited evidence to support the use of clinical tests when assessing the cervical spine in adults with neck pain, a recent systematic review by Lemeunier and colleagues suggests that the extension rotation test may be reliable and has adequate validity to rule out pain generated by the facet joints. Moreover, a cluster of three tests has been found to be 94% sensitive and 84% specific in diagnosing cervical facet joint dysfunction. These tests are:

- The extension rotation test
- Manual spine examination
- Palpation for segmental tenderness.

David's balance and postural control tests were unremarkable. However, when testing proprioception on the right side, he showed a deviation greater than 6.5 cm, which is considered a positive test (see video below for a reminder on how to perform this test). Testing on the left side did not reveal any significant impairment, nor did the eye movement tests (he experienced no dizziness, blurry vision, or saccadic eye movements).

When neck pain originates from facet joints in the upper cervical spine, sensorimotor dysfunction is often more pronounced. This is because the upper cervical region contains more muscle spindles, has greater connections

to the visual and vestibular systems, and exhibits more reflex activity than the lower cervical region.

David experienced segmental pain on palpation. Additionally, his muscle performance tests showed weakness and reduced endurance/control. He was able to reach 30 mmHg on the cranio-cervical flexion test, a reliable and valid clinical test. However, this test should be used with caution as a discriminative test or outcome measure. David found the test provocative and was unable to hold the position for 10 seconds, which is typical for individuals with neck pain.

Muscle performance issues were most pronounced during the neck flexor endurance test (see video below for a reminder on how to perform this test). David was only able to hold the position for 15 seconds and reported a VAS score of 3–4/10. According to Domenech et al. (2011), the average endurance hold for males without neck pain is 38.9 ± 20.1 seconds, while for females, it is 29.4 ± 13.7 seconds.[6]

Following the assessment, David noted that his neck felt weak and vulnerable rather than powerful. He reported experiencing concordant pain during all muscle performance tests.

Treatment

The treatment should focus on strengthening and improving muscle performance. Notably, research suggests that deep neck flexor training can help reduce pain, which is particularly relevant for David. In addition to his usual gym routine, the recommended exercises include:

- Shoulder shrugs
- Lateral raises

REFERENCES

1. Kazeminasab S, Nejadghaderi SA, Amiri P, Pourfathi H, Araj-Khodaei M, Sullman MJM, et al. Neck pain: global epidemiology, trends and risk factors. BMC Musculoskelet Disord, 2022; 3, 23(1): 26.
2. Mendes-Fernandes T, Puente-González AS, Márquez-Vera MA, Vila-Chã C, Méndez-Sánchez R. Effects of global postural reeducation versus specific therapeutic neck exercises on pain, disability, postural control, and neuromuscular efficiency in women with chronic nonspecific neck pain: study protocol for a randomized, parallel, clinical trial. Int J Environ Res Public Health, 2021; 12, 18(20): 10704.
3. Sremakaew M, Jull G, Treleaven J, Uthaikhup S. Effectiveness of adding rehabilitation of cervical related sensorimotor control to manual therapy and exercise for neck pain: A randomized controlled trial. Musculoskeletal Science and Practice, 2022; 102690.
4. Reid SA, Rivett DA, Katekar MG, Callister R. Comparison of Mulligan Sustained Natural Apophyseal Glides and Maitland Mobilizations for treatment of cervicogenic dizziness: a randomized controlled trial. Physical Therapy, 2014; 94(4): 466-476.
5. Jull G, Trott P, Potter H, Zito G, Niere K, Shirley D. A randomized controlled trial of exercise and manipulative therapy for cervicogenic headache. Spine, 2002; 27(17): 1835-43.
6. Domenech MA, Sizer PS, Dedrick G, McGalliard MK. The Deep Neck Flexor Endurance Test: Normative Data Scores in Healthy Adults, PM&R, 2011; 3(2): 105-110.