Physiotherapy management of a patient with neck pain having block vertebra: A case report

Sarah Quais
The Clinic
Ammar Suhail (ammar.19815@lpu.co.in)
Lovely Professional University https://orcid.org/0000-0002-6834-0656

Case Report

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Abstract

Background: Congenital fused/block vertebrae is an accidental finding in most cases. It remains asymptomatic unless struck by any traumatic event or repetitive event occurs. Symptomatic cases can present with several musculoskeletal impairments including one starting from neck pain. It should be addressed properly to help patients recover the mechanical strains on the structures.

Case Presentation: A referred case of a 21-year-old male engineering student who presented with complaints of neck pain (non-radiating) for a week. The intensity of the pain had been intermittently increasing/decreasing for about a year and about 2-3 episodes in a month for approximately one year. He presented with an X-ray which showed C-3/C-4 block vertebrae. The patient was managed using pain education and exercises along with ergonomic advice.

Conclusion: Patient-reported pain was decreased significantly from the initial visit. The patient was able to sit for a longer duration and had a considerable improvement in function.

Background

Anomalies of vertebrae like a congenital fusion/ block are always interesting to locate and evaluate. It is often an accidental finding detected by professionals during a radiologic examination [1]. A block vertebra is asymptomatic until adulthood and sometimes till young adolescence [2]. In literature, cervical spine anomalies such as block vertebrae have been well documented. The most common levels it is found is C2-C3 or C5-C6 [2].The clinical manifestations can vary from a simple neck pain or range of motion restriction to muscular weakness of one or both upper limbs and even complex neurological deficits or myelopathy [3]. Block vertebrae can result in hypermobility and biomechanical stress leading to symptomatic presentations in advanced age. Neck pain as a common complaint is a leading cause of disability. Causes like congenital anomalies with neck pain and musculoskeletal changes should be dealt with caution during a conservative as well as surgical management [4]. Clinically, an early diagnosis can help document changes of ageing, progression of degenerative processes and lifestyle modifications to lead a pain-free life. The purpose of this case report was highlighting the presence of rare block vertebrae and on how conservative intervention can bring improvement to the clinical manifestations of the anomaly mentioned.

Case Presentation

A 21 years old (male), engineering student who was referred by an orthopaedic specialist presented to us with complaints of neck pain (non-radiating) for almost a week. He described his pain to be gradually increasing in intensity every time he sat on a chair and studied. The intensity of the pain had been intermittently increasing/decreasing for about a year and about 2–3 episodes in a month for approximately one year after he participated in a sports event. He presented to us with an X-ray Cervical spine prescribed by the orthopaedician which showed C–3/C–4 block vertebrae. Earlier, he had consulted

a few consultants who had advised him NSAIDs and rest before being referred to physiotherapy. The patient was quite definite about the factors which increased his pain, studying on a chair for prolonged duration and lying with a pillow. His NPRS level ranged between 5 and 8. He emphasized on the inability to sit and study as his examinations were near and were anxious about the same. The most painful position was sitting for a prolonged duration followed by supine lying with a pillow, though a no pillow position helped. There were no red flags identified.

For assessment of the patient, we looked for psychosocial factors as well as physical factors causing pain. On physical examination, his cervical spine range of motion was restricted and painful. Left Rotation was limited to 45 degrees and flexion/extension was equally painful and restricted. He had tenderness over spinous processes of C3, C4 and C5 vertebrae and gross tenderness over cervical facet joints, upper trapezius and cervical flexors. Muscle weakness of deep neck flexors was assumed because of the theoretical concept and chronicity of the pain. On assessing the psychosocial factors, he was anxious and worried about the upcoming examinations as he was not able to focus on the studies. He was also concerned about his performance in the examination. He had a sedentary lifestyle and mainly focused on studies. The ICF health domains are described in figure 1 for the patient.

Diagnosis

For diagnosis, we usually try to classify the case either into a pathoanatomic or impairment based. The case was referred by an orthopaedician with noted diagnosis of non-radiating neck pain. Based on X-ray findings, we diagnosed the patient as having symptomatic block vertebrae. There was fusion at the level of C3-C4. The anteroposterior, lateral views of radiographs are depicted in figure 2. The aims of the physiotherapists ‘diagnostic process should be to find the divergence that exists between the level of function that is desired by any individual and the capacity of the individual to achieve that level. The patient demonstrated reduced functional capacity and muscle performance. Acknowledgement of pathoanatomical diagnosis and its interpretation into modifying the lifestyle of an individual (if applicable) is a must.

Therapeutic Intervention

The patient was treated according to impairments and functions which were most affected irrespective of the congenital anomaly present. Since there were only musculoskeletal impairments which we could identify, we stuck to our goal to achieve improvement in the impaired function and muscle performance. We focused on the endurance of cervical muscles to treat the inability to sit and study. The patient was seen in physiotherapy for 10 visits for 2 weeks. Each time reassessment of significant impairments and post-treatment subjective evaluation was done. Ergonomic education was an important part of each therapy session, and the patient was told not to sit for prolonged duration and was advised to move out of painful postures whenever it becomes painful due to prolonged sustenance. Patient education was an

important factor to let the patient acknowledge the pathoanatomical diagnosis and remain active to lead a pain-free life.

Low load motor control exercises for the upper quarter were initiated along with manual traction to the cervical region. Pre- and post-exercise program, hot pack was administered. Home exercise program focused on a structured set of exercises focused on mobility and strength. The exercise protocol is summarized in table 1. The pain and sitting duration were significantly better after a week of therapy sessions. After two weeks of supervised management, he was advised for a regular home exercise program for 8 weeks. Home exercise program was necessary to remove the mechanical stressors of pain and improve lack of strength to maintain a sustained posture for a long period of time.

Outcome Measures

We used two outcomes for the patient, numeric pain rating scale was used to rate pain intensity during rest and at siting. The other being sitting duration without getting discomfort. On the initial visit, the pain intensity on NPRS was 7 which eventually decreased to 3 on the tenth session. The second outcome was documented as time, on an initial visit he described that after ten minutes of sitting the discomfort started which on the tenth session improved to 30 minutes.

Table 1 Rehabilitation protocol (Each exercise was performed as 3 sets * 10 repetitions and gradually the sets and repetitions were increased)

Rehabilitation Protocol	
Supine Lying Chin tucks	The patient head was supported on the couch. The patient is asked to pull the chin towards the sternum or neck area without holding the breath. The position was maintained for five seconds
Middle-Trapezius Hold Relax	The patient head is held in side flexion (mid-range) supported on a pillow and the patient is asked to apply pressure on the therapist's hand which is placed on the side of the patient's head and hold for 10 seconds and then relax it.
Rotations End Range (Pain-Free)	Patient's head is supported on the pillow and rotation of the neck is done to the maximum available range of the neck which is painless. Holding the range for 10 seconds each side.
Extension Hold	Patient's head is supported on the couch and the patient was asked to apply pressure on the pillow and holding the contraction for 5 Seconds and repeating it for 5 times
Prone extensions	The patient made to lay face down, hands parallel to trunk, the patient lifted the chest and shoulder till the level of full available extension of the spine and maintained the position for 10 seconds
Planks on hands with head neutral	Patient's feet hip-width apart, hands shoulder-width apart and directly under shoulders. Form a straight line from shoulders to heels by lifting your body maintaining the position for 10 seconds.
Prone lying Alternate leg and arm lift	Patient's head in neutral in face-down position, alternate lifting of arm and opposite leg together holding the position for 10 seconds.
Prone lying scapular retractions T/Y	Patient's head kept neutral in face-down position, both shoulders in abducted to 90 degrees 'T' and doing retractions 10 repeats AND With head kept neutral in face-down position, both shoulders in Flexed to 120 degrees in thumbs-up position 'Y' and doing retractions 10 repeats
ROM Exercises	All ROM exercises for neck and shoulder to be performed in the seated position

Discussion

The case report demonstrated a significant decrease in the intensity of pain after 2 weeks of supervised PT management. The pain intensity decreased from 7 (NPRS) to 2 (NPRS) which shows a meaningful clinical change [5], [6]. The patient reported sitting duration without discomfort also showed a significant improvement. To our knowledge, this is the first study that describes physiotherapeutic intervention for neck pain associated with block vertebra. Literature supports the findings of our case report and suggests that exercise alone or combined with manual therapy does result in significant pain reduction [7], [8]. The authors used a specific patient-reported issue as an outcome measure, the sitting duration showed improvement. This change can be attributed to improvement in muscle performance as individuals with neck pain have been found to have lower muscle strength compared to their healthy controls [9]. Though there was no direct measurement of muscle performance in the study.

The protocol used demonstrates that exercise regimen using strengthening exercises can be effective in reducing the patient's pain and discomfort. The advice for not sustaining a posture prevented loading and helped in the reduction of pain. A recent study demonstrated the use of ergonomic advice combined with exercises improved the health productivity of the individuals at their workplace [10]. Our case report has similar findings in terms of improvement of patient's ability to do his daily chores. As block vertebra is usually an accidental finding, the authors suggest more case reports and case series to further explain the therapeutic interventions that can be used for this specific subset of neck pain population.

Conclusion

Patient-reported pain was decreased significantly from the initial visit. In the current case report, patient education and structured exercise program demonstrated an improvement in self-reported function deficit. The patient was able to sit for a longer duration and had a considerable improvement in pain associated with prolonged sitting. Supervised exercise program combined with patient education should be the ideal PT management for the case of Neck pain associated with findings of block vertebra.

Declarations

1. Ethical Clearance and Institutional Review Board Statement During the conduct of the case study, human ethical principles were followed as per the Declaration of Helsinki (2013) and the guidelines of Good Clinical Practice (Indian Council of medical research) were observed.

2. Patient Consent The participant was informed about the procedure of data collection and the written consent form was obtained from all the participant.

3. Conflict of Interest The authors declare no competing interests.

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Figures

(a)

(b)

Figure 1

(a) & (b) Anteroposterior, Lateral views of radiographs showing C3-C4 block vertebrae

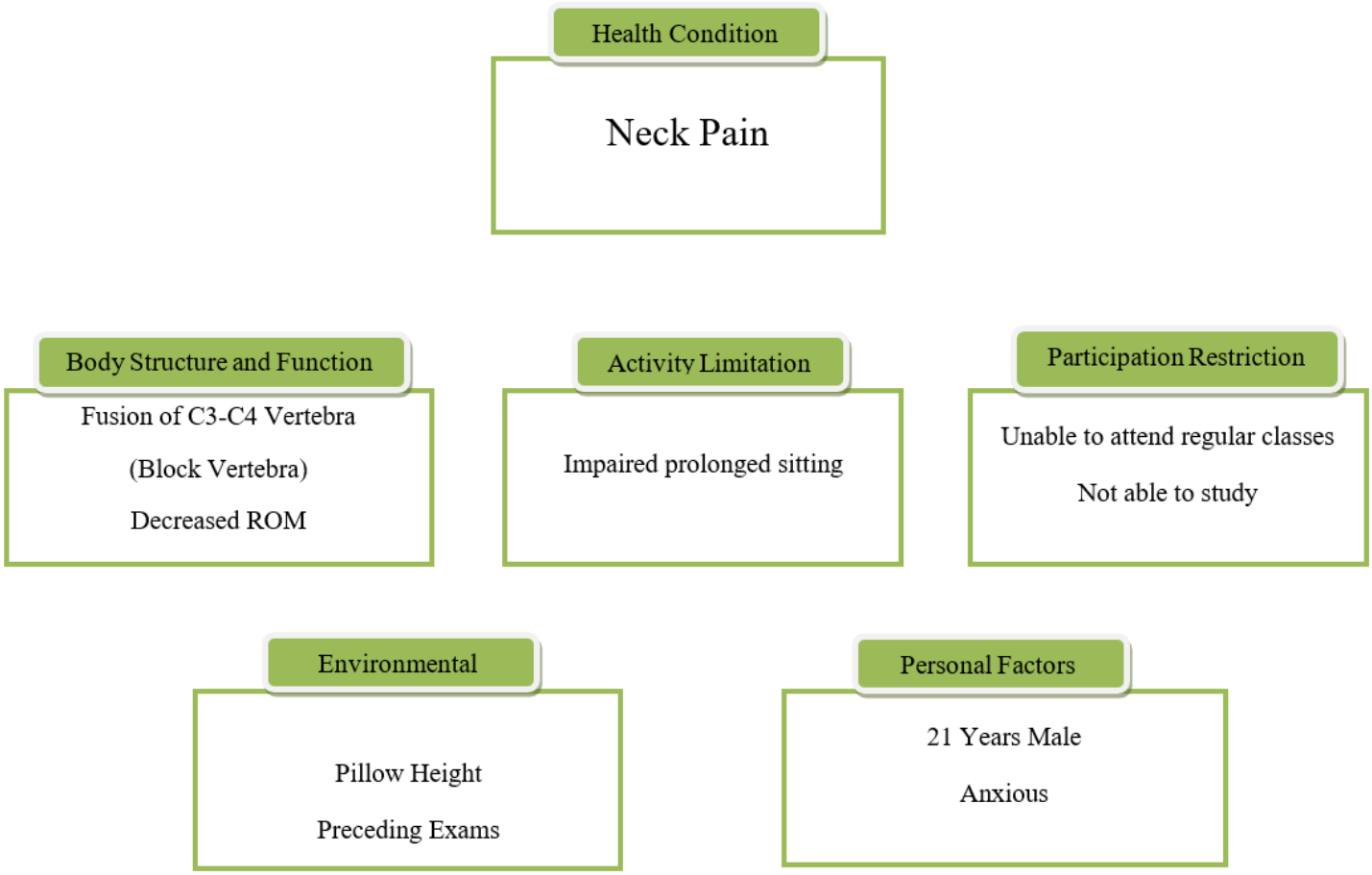

Figure 2

Description of ICF health domains according to the patient