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A clinical case

Atypical Presentation of Cervical Disc Herniation in a Young Adult Leading to Tetraparesis: A Case Report and Surgical Management

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Abstract

Cervical disc herniation, resulting from direct nerve root impingement and associated inflammatory processes, frequently presents with neck and arm discomfort. Symptoms are typically unilateral and correspond to the side of the herniation.
We report the case of a 36-year-old male with rapid functional decline and atypical bilateral manifestations. Clinical history, neurological examination, and diagnostic imaging were utilized to evaluate the patient. In July 2021, the patient sudden bursting, burning, and throbbing pain in the cervical and lumbar spine, which he associated with prior hypothermia and a neck injury sustained three years earlier. The pain subsequently radiated to the fingers of both upper and lower extremities before partially subsiding. Multiple physicians prescribed various analgesics, but his condition progressed to gait disturbance and restricted finger movement. On admission in December 2021, neurological examination revealed peripheral paresis of the lower limbs and spastic paresis of the upper limbs, resulting in a spastic gait.
This case highlights the importance of considering cervical disc herniation in the differential diagnosis of young adults with progressive bilateral neurological deficits. Early imaging and timely surgical intervention are essential to prevent permanent impairment and optimize recovery.

Keywords: cervical, disc herniation, tetraparesis.

1. Introduction

Cervical disc herniation is a common degenerative spinal disorder that significantly impacts patient quality of life due to neck pain, radiculopathy, and motor dysfunction caused by nerve root compression and inflammatory processes [1,2]. The condition most frequently affects the C5-C6 and C6-C7 levels and is typically associated with symptoms such as upper back pain, muscle weakness, and sensory disturbances in the corresponding dermatomes [2,3]. Although cervical disc herniation predominantly occurs in middle-aged and older adults, recent studies have identified an increasing incidence among younger individuals,

drawing attention to early-onset cervical spondylosis and its implications [3,4].

Despite the extensive documentation of clinical features and treatment algorithms in older patients, there remains a notable knowledge gap regarding the disease course, diagnosis, and outcomes of cervical disc herniation in young adults [4,5]. In particular, atypical manifestations such as bilateral symptoms or rapid progression to myelopathy are often misdiagnosed or underestimated, resulting in delayed management and poorer prognoses [3,5,6]. Furthermore, the variability in clinical signs challenges early decision-making regarding surgical intervention, especially when socioeconomic factors limit access to advanced diagnostics and treatment [7].

This case report presents a 36-year-old patient with an unusual bilateral and progressive presentation of cervical disc herniation resulting in tetraparesis. The goal is to underscore the importance of early imaging, correct interpretation of atypical signs, and timely surgical treatment to prevent irreversible neurological damage and improve functional recovery in younger patients.

2. Case report

We present the case of a 36-year-old male who experienced a rapid decline in functional activity. In July 2021, he developed sudden, severe burning, aching, and bursting pain in the cervical and lumbar spine regions, which he associated with a history of neck trauma and hypothermia three years earlier. Over time, the pain radiated to the fingers of both upper and lower extremities before partially subsiding. Despite consulting multiple physicians and being prescribed various analgesics, his symptoms persisted. He later developed progressive difficulty in walking and limited finger mobility.

In October 2021, upon evaluation at the National Center for Neurosurgery, cervical spine Magnetic Resonance Imaging (MRI) revealed two-disc herniations: a right paramedian herniation at the C4–C5 level and a central herniation at the C5–C6 level. These were accompanied by spinal cord compression and signs of myeloischemia (Figure 1).

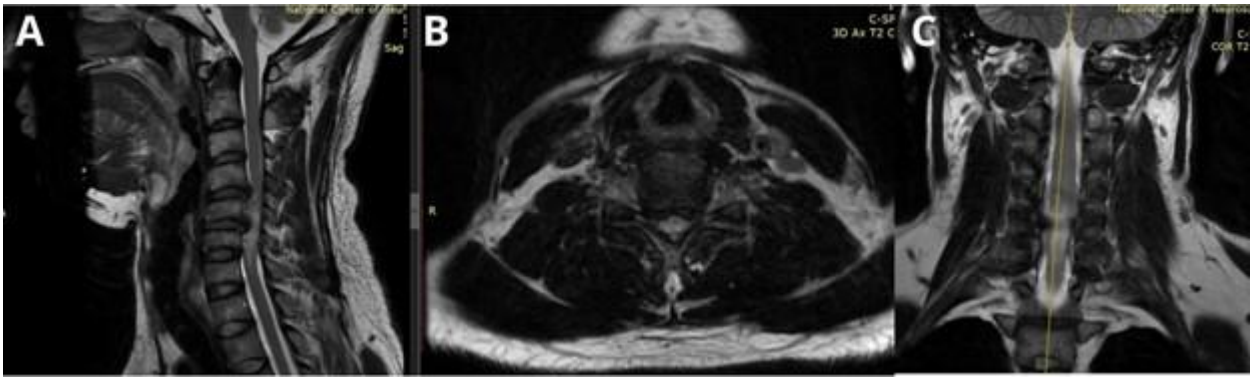

Figure 1 –(A) Saggital T2 MRI T2-weighted image showing a paramedian disc herniation at C4–C5 and a median disc herniation at C5–C6 with spinal cord compression and signs of myeloischemia. (B)- axial view, (C)- coronal view

By December, the patient was hospitalized due to worsening neurological deficits. Neurological examination demonstrated spastic paresis of the upper extremities and peripheral paresis of the lower extremities, resulting in a spastic gait. Muscle strength was graded 2/5 in the lower limbs and 3/5 in the upper limbs. Additionally, he exhibited urinary dysfunction of central origin and a tendency toward constipation. Preoperative management included corticosteroid therapy with dexamethasone 8 mg administered twice daily.

On December 27, 2021, the patient underwent anterior cervical surgery via a right-sided parapharyngeal approach. The procedure included discectomy at C4–C5 and C5–C6, partial corpectomy of the C5 vertebral body, interbody fusion using a mesh cage filled with autologous bone, and anterior cervical plating from C4 to C6. Intraoperative guidance was provided using fluoroscopic C-arch imaging (Figure 2).

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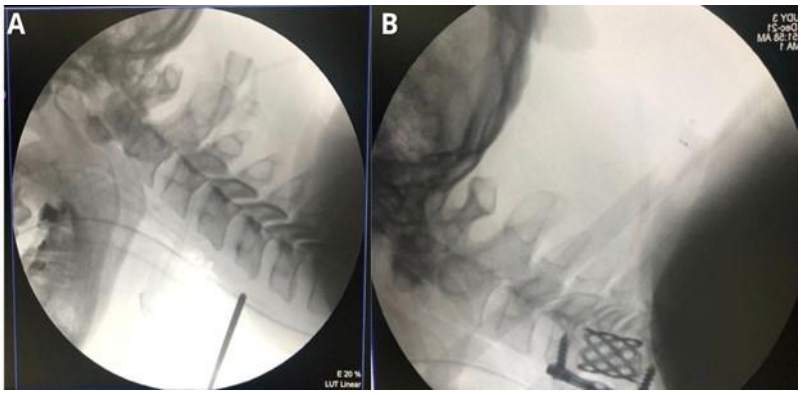

Figure 2 – Intraoperative C-arch fluoroscopy: pre (A) - and (B) post-implantation control

The patient was positioned supine with a shoulder roll. Under C-arch control, the C5 vertebral level was localized, and a transverse skin incision was made 2 cm lateral to the cricoid cartilage. Blunt dissection was performed to expose the carotid sheath and esophagotracheal plane. A wound retractor and Kaspar distractor were used to access the intervertebral space. Using a conchotome, Kerrison rongeurs, curettes, and a high-speed drill, discectomy and corpectomy were performed. An ossified posterior longitudinal ligament compressing the spinal cord at C5–C6 was resected.

Bilateral foraminotomies at C5–C6 were also completed.

A titanium mesh cage was inserted between C4 and C6 and secured with a four-screw anterior cervical plate. A drain was placed in the operative field for 24 hours to prevent hematoma formation. The postoperative course was uneventful, with no complications such as dysphagia, Horner's syndrome, recurrent laryngeal nerve palsy, vagus nerve injury, tracheoesophageal injury, or cervical hematoma.

Postoperative CT confirmed correct implant placement and decompression (Figure 3).

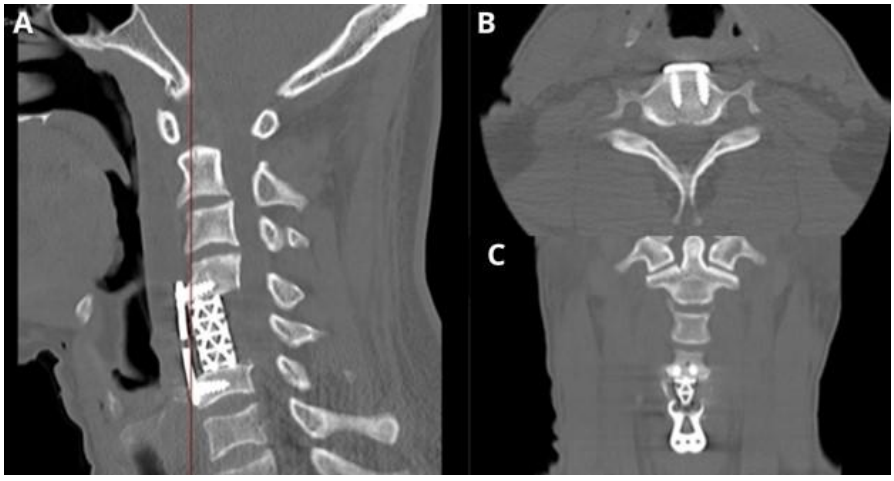

*Figure **2** – Postoperative CT confirming implant position and decompression (A)- Sagittal View, (B) axial view, (C)- Coronal view*

3. Discussion

Cervical disc herniation would arise from the nucleus pulposus of the vertebral disc being displaced at the cervical level. Myelopathy, which results from compression of the spinal cord or impingement of the central cord, may further develop from this disease. It is typically believed to be the outcome of posterolateral annular tension exacerbated by the disc's normal deterioration [8-11]. The incidence in the literature rises in the sixth decade of life [3]. In contrast to this, our patient is still in their fourth decade of life. Our findings

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are more in line with research by Schroeder et al. where the mean age of the patient with cervical disc herniation is around 47–48 years old, with women being affected somewhat more often [12]. Patients with cervical disc herniations would often have acute neck and arm discomfort at the level of their myotomal pattern. The sensory symptoms, on the other hand, such as burning and tingling, have a dermatomal distribution [3]. Additionally, tingling and numbness were experienced.

Numerous investigations also found these various related symptoms. Plain radiography can be utilized to rule out instability or pathologic alterations in the bone but only offers limited information on Cervical Disc Herniation (CHD). Oblique images of the cervical spine may reveal a neuroforamina narrowing brought on by degenerative alterations. Dynamic flexion and extension can be used to detect cervical instability. In our situation, the osteophyte on the cervical vertebrae was visible thanks to the x-ray examination. Osteophytes may result in radiculopathy by anteriorly squeezing the nerve root. Although not frequent, osteophytes that extend from the superior articular process' ventral part may constrict the neuroforaminal region and result in compression. Using MRI, we were able to identify the patient as having CHD. This examination was required in order to thoroughly assess the soft tissue that is thought to be the source of the pain [11,13,14].

Additionally, previous studies claimed that magnetic resonance imaging was equally sensitive to a sick segment as CT-myelography [15]. Degenerative cervical spondylosis was listed as a possible diagnosis. Regarding degenerative cervical spondylosis, patients tend to be male and between the ages of 40 and 60 when it develops. Usually, a manual laborer with a history of hard work, the patient Three clinical symptoms are frequently present in patients, including axial neck pain, cervical radiculopathy, and cervical myelopathy. Axial neck pain symptoms are frequently accompanied by headaches and uncomfortable neck motions. As cervical radiculopathy presents with radicular pain to arms, neck and scapular region, sensory numbness and motor weakness. Cervical myelopathy presents with clumsiness in hand and awkward gait. From the x-ray examination can be found narrowing of disc space, osteophyte formation, facet degeneration, vertebral subluxation, bony abnormalities, and ossification in posterior longitudinal ligaments [16].

The standard treatment for cervical radiculopathy is Anterior Cervical Discectomy and Fusion (ACDF). It can improve the squeezed cervical foramen and remove the damaged disc materials. Fusion would offer stability and take away the dynamic component that causes discomfort [15]. Although multilevel fusion has been shown to have positive outcomes, it also has downsides, including a considerable reduction in the cervical spine's ability to move normally. Additionally, it would change neighboring-level kinematics, increasing biomechanical stresses and hastening the degeneration of nearby segments [17]. After all of the disc material was eliminated from this patient, the osteophyte at the front and posterior vertebral bodies of C5 and C6 were removed. This operation is necessary to ensure that the spinal cord is decompressed from posterior spur development and that a good plate purchase will be made later on the anterior body.

Osteophyte excision may ease symptoms brought on by it and make it easier to insert the right screw for anterior stability. Another alternative for a less invasive method is cervical artificial disc replacement (CADR). According to research, a single level CADR provided a clinical result that was equivalent to a multilayer anterior cervical discectomy and fusion (ACDF) [18]. In a different trial employing cervical arthroplasty, multilevel therapy of CADR performed better clinically than single-level anterior cervical discectomy and fusion [19]. Despite the positive results of these treatments, disc replacement is frequently unavoidable at our facility because of socioeconomic and insurance issues.

An MRI can provide some guidance for clinicians and patients about the potential for improvement. Based on a systematic review of MRI findings by Tetreault et al. [20] in 2013: High-intensity changes on T2 and low intensity on T1: poorer recovery rate, worse motor symptom improvements.

A high ratio of T2 signal intensity between non-compressed and compressed (C7 through T1) was associated with a poorer JOA recovery rate.

More frequent high signal intensity on T2 predicts worse recovery.

4. Conclusions

This case highlights the rare but severe manifestation of cervical disc herniation in a young adult, resulting in progressive tetraparesis and necessitating urgent surgical intervention. Although cervical disc herniation is more common in older adults, clinicians should maintain a high index of suspicion in

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younger patients presenting with atypical bilateral symptoms and rapid neurological decline. Early MRI evaluation and timely surgical decompression, such as ACDF with vertebral resection and stabilization, can lead to significant neurological recovery and prevent irreversible deficits. This case underscores the importance of early diagnosis and multidisciplinary management in achieving favorable outcomes.

Conflicts of interest. The authors declare no conflicts of interest.

Author contributions: Conceptualization & methodology – M.O.; validation – T.K.; formal analysis – O.M., A.M & T.K.; writing (original and draft preparation) – A.M.; writing (review and editing) – T.K.

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Ethical issues. Informed consent was obtained from the patient.

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Жас ересек науқаста мойын омыртқаларының жарығының атипиялық көрінісі: Клиникалық жағдай мен хирургиялық емдеу

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Түйіндеме

Жүйке түбіршелерінің тікелей қысылуы және оған байланысты қабыну үдерістері мойын омыртқасы жарығына тән, бұл науқастарда көбінесе мойын мен қол аймағында ауырсынуға алып келеді. Клиникалық көріністе грыжаның жағындағы белгілер басым болады.

Науқас, 36 жаста, функционалдық белсенділігінің тез нашарлауына шағымданып келді. Науқастың жағдайын бағалау үшін анамнез деректері, неврологиялық тексеру нәтижелері және диагностикалық бейнелеу әдістері пайдаланылды. 2021 жылдың шілдесінде ол кенеттен мойын және бел аймақтарында күйдіріп, тітіркендіріп, жарылып тұрғандай ауырсыну сезінген. Бұл жағдайды ол үш жыл бұрын болған мойын жарақаты мен гипотермиямен байланыстырған. Кейін ауырсыну жоғарғы және төменгі аяқ-қол саусақтарына таралып, біртіндеп бәсеңдеген. Бірнеше дәрігерге жүгінгенімен, әрқайсысы әртүрлі ауырсынуды басатын дәрілер жазып берген. Біраз уақыттан кейін ол саусақ қимылдарының шектелуін және жүруде қиындықты сезіне бастады. Желтоқсан айында ауруханаға түскен кезде жүргізілген неврологиялық тексеру төменгі аяқ-қолда перифериялық парез, ал жоғарғы аяқ-қолда спастикалық парез бар екенін көрсетті, бұл оның жүрісінің спастикалық түрге ауысуына себеп болды.

Бұл клиникалық жағдай екіжақты атипиялық белгілермен және үдемелі қозғалыс бұзылыстарымен көрінетін жас ересектерде мойын омыртқа жарығын дифференциалды диагнозда ескерудің маңыздылығын көрсетеді. Уақытылы жүргізілген визуализация және хирургиялық араласу тұрақты неврологиялық жетіспеушілікті болдырмау және функционалдық қалпына келуді қамтамасыз ету үшін шешуші мәнге ие.

Түйін сөздер: мойын, омыртқа жарығы, тетрапарез.

Атипичное течение грыжи шейного межпозвонкового диска у молодого взрослого с развитием тетрапареза: Клинический случай и хирургическое лечение

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Резюме

Прямое сдавления корешков спинномозговых нервов и сопутствующие воспалительные процессы при грыже шейного межпозвонкового диска часто сопровождаются болью в шее и верхних конечностях. Клиническая симптоматика, как правило, имеет односторонний характер и соответствует стороне локализации грыжи.

Пациент, мужчина 36 лет, обратился с жалобами на быстрое ухудшение функциональной активности. Для оценки состояния пациента были использованы данные анамнеза, результаты неврологического обследования и методы диагностической визуализации. В июле 2021 года внезапно появились распирающие, жгучие и пульсирующие боли в шейном и поясничном отделах позвоночника, которые пациент связывал с переохлаждением и травмой шеи, полученной три года ранее. Позже боль распространилась на пальцы верхних и нижних конечностей, затем постепенно ослабевала. В течение нескольких месяцев пациент наблюдался у различных специалистов, каждый из которых назначал разные обезболивающие препараты. С прогрессированием симптомов появились затруднения при ходьбе и ограничение движений пальцев. При поступлении в стационар в декабре было выявлено неврологическое поражение: периферический парез нижних конечностей и спастический парез верхних конечностей, что обусловило формирование спастической походки.

Данный клинический случай подчеркивает необходимость включения грыжи шейного диска в дифференциальную диагностику у молодых пациентов с атипичной двухсторонней симптоматикой и прогрессирующим двигательным дефицитом. Своевременная визуализация и хирургическое вмешательство критически важны для предотвращения необратимых неврологических нарушений и достижения оптимального функционального восстановления.

Ключевые слова: шейный отдел, грыжа межпозвоночного диска, тетрапарез.

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