REVIEW

Degenerative Cervical Myelopathy (DCM), Guidelines, Treatment, and Future Directions: A Narrative Review

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Abstract

Background data: **Degenerative cervical myelopathy (DCM) is a prevalent degenerative neurological condition that leads to spinal cord compression and functional impairment. Understanding DCM is crucial due to its high prevalence, potential disability, and burden on the aging population.**

Purpose: **This manuscript aims to provide a comprehensive overview of DCM, including its pathophysiology, clinical presentation, diagnostic modalities, treatment options, and future directions for research and management.**

Study design: **This manuscript is a narrative review article that synthesizes existing literature on DCM.**

Patients and methods: **The author reviews the pathophysiological mechanisms underlying DCM, including mechanical compression and compromised blood supply. The work also discusses anatomical changes within the cervical spine. Clinical features and symptomatology associated with DCM are explored to aid clinicians in accurate diagnosis and differentiation from other spinal cord disorders. Imaging techniques, such as MRI and CT, are highlighted for assessing the extent and severity of spinal cord compression. Treatment options, both surgical and nonsurgical, are discussed, with an emphasis on evidence-based medicine using data from randomized controlled trials, systematic reviews, and meta-analyses. The potential use of pharmacological agents and stem cell therapy in treating DCM is also explored. The economic impact of DCM, including healthcare costs and long-term care expenses, is discussed.**

Results: **The manuscript provides an extensive overview of DCM, covering its prevalence, pathophysiology, clinical presentation, diagnostic modalities, treatment options, and economic impact. It evaluates the efficacy, safety, and potential complications of different treatment modalities, emphasizing evidence-based medicine.**

Conclusion: **Further research and collaboration are needed to enhance our understanding of DCM and improve patient outcomes. The comprehensive overview provided in this manuscript is a valuable resource for clinicians and researchers working in the field of DCM.**

Keywords: Degenerative cervical myelopathy, Future directions, Guidelines, Treatment

Introduction

Degenerative cervical myelopathy (DCM) is a common, degenerative neurological condition [1]. This condition encompasses various structural changes in the cervical vertebrae and intervertebral discs, leading to spinal cord compression and subsequent functional impairment [2]. DCM is typically characterized by pain, gait disturbances, sensory deficits, and weakness in the upper extremities [3].

The importance of understanding DCM lies in its high prevalence and potential for significant disability [4]. It represents the most common cause

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of spinal cord dysfunction in adults worldwide, with an estimated prevalence ranging from 2.8% to 4% [5,6]. As the aging population continues to grow, the burden of DCM is expected to increase, emphasizing the need for comprehensive research and review of available treatment options [7]. In assessing the pathophysiological aspects of DCM, we explore the anatomical changes within the cervical spine that contribute to spinal cord compression [2].

The clinical presentation of DCM manifests differently in affected individuals, making accurate diagnosis challenging [3]. This narrative review will outline the various clinical features and symptomatology associated with DCM, aiding clinicians in recognizing the condition and distinguishing it from other spinal cord disorders [3,8].

Diagnostic modalities for DCM have evolved significantly in recent years, with advances in imaging techniques providing valuable insights into the extent and severity of spinal cord compression [1].

This narrative review aims to provide an overview of DCM, including its pathophysiology, clinical presentation, diagnostic methods, and various management strategies [8]. By examining the current literature, this review will present a comprehensive assessment of the available evidence on DCM, allowing healthcare professionals to make informed decisions in diagnosing and treating this condition. A comprehensive overview of imaging methods, such as magnetic resonance imaging (MRI) and computed tomography (CT), will be presented, along with their respective benefits and limitations [1]. Treatment options for DCM will be reviewed, including surgical and nonsurgical approaches [8]. We will explore the efficacy, safety, and potential complications of different treatment modalities, considering patients' diverse needs and preferences [9]. Emphasis will be given to evidence-based medicine, utilizing data from randomized controlled trials, systematic reviews, and meta-analyses to evaluate the effectiveness of various interventions [6,8].

Methods

A systematic search was conducted in electronic databases, including PubMed, MEDLINE, and Google Scholar, up until 2023. The search terms used included 'degenerative cervical myelopathy', 'cervical spondylotic myelopathy', 'pathophysiology', 'diagnosis', 'treatment', and 'outcomes'.

Studies published in the English language and peer-reviewed journals were included. Additionally, relevant articles from the reference lists of the identified papers were also screened for potential inclusion. The inclusion criteria comprised articles that provided valuable insights into the epidemiology, etiology, pathophysiology, clinical presentation, diagnostic modalities, treatment options, and outcomes of DCM.

Exclusion criteria consisted of studies not directly related to DCM, case reports, review articles, and studies lacking critical information.

Results and discussion

Pathophysiology

The term 'degenerative cervical myelopathy' was officially introduced and defined in a research article published in 2015 [10]. This designation encompasses both cervical spondylotic myelopathy (CSM) and ossification of the posterior longitudinal ligament (OPLL) and better acknowledges the degenerative characteristics of the condition, as well as its connection to older age.

The shift from using CSM to DCM nomenclature is an ongoing process. However, its increasing adoption, including its inclusion in treatment guidelines by AO Spine and its integration into an ongoing research efficiency initiative [11], signifies the recognition and acceptance of this terminology.

DCM is a complex condition with multifactorial pathophysiology. The primary underlying cause is the age-related degeneration of the cervical spine, which includes various degenerative changes such as cervical spondylosis, herniated discs, and spinal canal stenosis [10]. These degenerative changes lead to the spinal canal's narrowing, resulting in compression and mechanical injury to the spinal cord within the cervical spine [10]. The compression can result from osteophyte formation, disc protrusion, ligamentum flavum hypertrophy, or a combination of these factors [10].

The spinal cord compression disrupts the normal flow of signals between the brain and the rest of the body, leading to progressive dysfunction. The exact mechanisms through which compression causes damage to the spinal cord are still not fully understood but are likely multifactorial. The primary injury is believed to occur due to a combination of mechanical compression and compromised blood supply [12].

The mechanical compression directly damages the spinal cord tissue, causing neuronal injury, demyelination, and disruption of axonal pathways [12]. The compression also raises intramedullary pressure, impeding adequate blood flow and oxygen supply to the spinal cord [12]. Decreased blood flow to the spinal cord, particularly in chronic compression, can result in ischemia, tissue hypoxia, and subsequent neuronal loss [12].

The pathophysiological changes in DCM are not limited to the site of compression but also extend to adjacent spinal cord segments. This phenomenon, known as 'rostral and caudal degeneration', occurs due to Wallerian degeneration, where axons degenerate proximally and distally to the injury site [10].

The spinal cord undergoes reparative and adaptive processes in response to ongoing damage. These processes include reactive gliosis, proliferation of astrocytes and fibroblasts, and scar tissue formation [12]. While these mechanisms initially serve a protective role by isolating the injured area, prolonged gliosis and scarring can also contribute to further compression and impaired axonal regeneration [12]. Histologically, there is the presence of interstitial and mitochondrial edema, as well as signs of vacuolar degeneration [13,14]. In a preclinical experiment with canines affected by DCM, an increase in proinflammatory cytokines and macrophages has been observed, leading to the consideration that the innate immune system could be significant in the development of DCM [13]. Additionally, both Wallerian and retrograde axonal degeneration are detected, along with harm to the grey and white matter pathways of the spinal cord [15].

Clinical presentation

The clinical picture of DCM can vary widely depending on the severity of spinal cord compression and the level of the affected vertebrae [16]. Common symptoms include neck pain, stiffness, and range of motion limitations. However, the hallmark feature of DCM is the development of neurological deficits [17]. These deficits can manifest as a wide range of symptoms, such as numbness, tingling, and weakness in the upper and lower extremities. Patients may also experience impairments in fine motor skills, including agility, coordination, and balance. Patients may sometimes present with gait disturbances, including a spastic, shuffling gait.

As the disease progresses, patients may develop more severe neurological symptoms. This can include a loss of limb sensation, muscle wasting, and decreased reflexes. Patients may also experience bladder and bowel dysfunction, such as urinary incontinence and difficulty with bowel movements. In severe cases, patients may even develop paralysis or quadriplegia.

Imaging modalities

Imaging plays a fundamental role in evaluating and diagnosing DCM. Various imaging modalities are utilized to assess the severity of spinal cord compression, identify the underlying pathology, and guide treatment decisions.

Magnetic resonance imaging (MRI) is considered the gold standard for Imaging in DCM [18]. It provides detailed visualization of the spinal cord, intervertebral discs, and surrounding structures. MRI allows for assessing spinal cord compression, foraminal stenosis, disc herniation, ligamentous hypertrophy, and other degenerative changes [12]. Additionally, MRI can be used to evaluate signal changes within the spinal cord (Fig. 1), which may aid in predicting functional outcomes and prognosis [12]. Advanced MRI techniques, such as diffusion-weighted imaging (DWI) and diffusion tensor imaging (DTI), provide quantitative information on microstructural changes within the spinal cord and may assist in predicting neurological recovery [10].

Computed tomography (CT) is another imaging modality used to evaluate DCM, particularly to assess for bony pathology and spinal canal stenosis [11]. CT scans can provide detailed visualization of bony structures, osteophyte formation, and foraminal narrowing. Most importantly, a CT scan can provide clear visualization of the OPLL (Fig. 2), which can aid the decision of the surgical approach in such cases [19]. In cases where MRI is contraindicated, CT myelography may be used to visualize the spinal cord, nerve roots, and CSF space [20]. However, CT lacks the soft tissue resolution of MRI and is limited in assessing the spinal cord itself.

Dynamic imaging, such as flexion-extension radiographs and dynamic MRI, is often utilized to evaluate for spinal instability and assess the dynamic changes during neck movements [21]. These imaging techniques are beneficial in cases where pathology is suspected of worsening with neck motion, such as cervical spondylolisthesis or ligamentous instability.

Additionally, electrophysiological studies and neurophysiological testing, such as somatosensory evoked potentials (SSEPs) and electromyography (EMG), may be utilized in conjunction with imaging studies to assess the severity of neural compromise and aid in surgical decision-making [22]. These studies provide valuable information about the integrity and function of the spinal cord and peripheral nerves, helping to correlate imaging findings with clinical symptoms and objective measures of neurological dysfunction.

Assessing the severity of DCM

The Modified Japanese Orthopedic Association (mJOA) scale is commonly used to assess the severity of DCM and monitor disease progression.

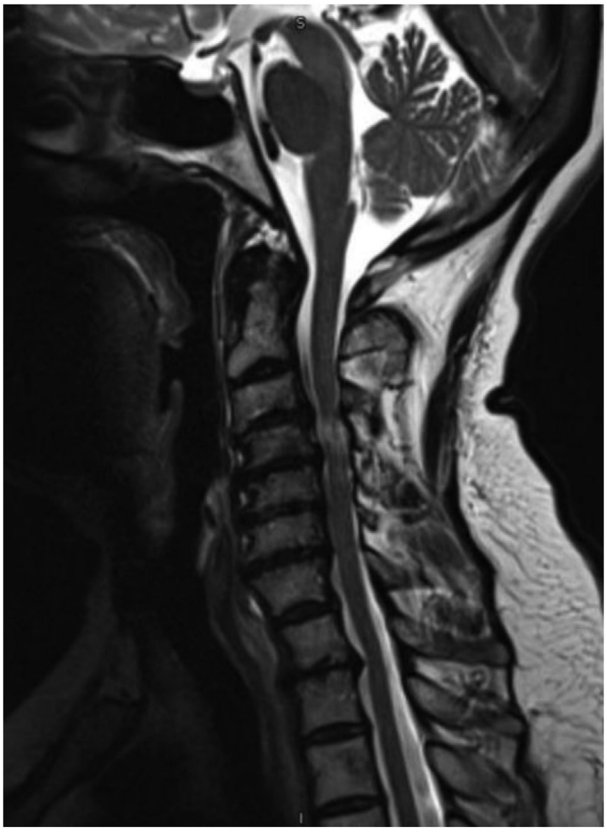

Fig. 1. MRI of the cervical spine, T2 sequence, sagittal cut, showing spinal cord compression with signal hyperintensity.

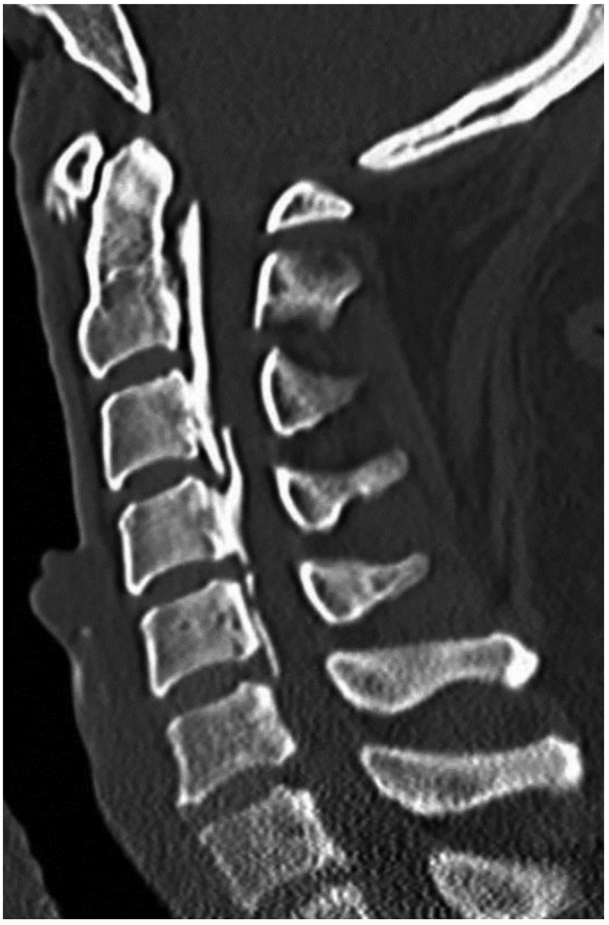

Fig. 2. CT scan of the cervical spine, sagittal cut, showing ossification of the posterior longitudinal ligament (OPLL).

The major scale is a validated scoring system that evaluates various aspects of neurological function, including motor function, sensory function, and sphincter dysfunction [23]. It assesses the severity of symptoms and quantifies the functional impairment caused by DCM. The scale ranges from 0 to 18. Higher scores represent less severe impairment.

Multiple studies have shown the utility of the major scale in evaluating DCM and monitoring treatment outcomes. In a study by Tetreault et al., the mJOA scale was a reliable and valid tool for assessing neurological function in patients with DCM [23]. Another study by Machino et al. demonstrated that the mJOA scale effectively detected improved neurological function after surgical decompression in patients with DCM [24].

The major scale is widely used in clinical practice and research to guide treatment decisions and evaluate treatment outcomes in DCM. It allows for standardized assessment and comparing patients' neurological function over time or between different treatment modalities. It has also been used to stratify patients into different severity categories, which helps predict prognosis and select appropriate treatment options.

Treatment guidelines

Fehlings et al. [9] published in 2017 the treatment guidelines for DCM. This clinical practice guideline provides comprehensive recommendations for managing patients with DCM, considering the severity of the disease and associated neurological deficits. It is an essential resource for healthcare providers in making informed treatment decisions and providing optimal care for patients with DCM.

Nonoperative management is recommended for patients with mild DCM without significant neurological deficits (mJOA 15–17). This includes patient education, activity modification, physiotherapy, and analgesics or nonsteroidal anti-inflammatory drugs (NSAIDs) for symptomatic relief. Regular follow-up is advised to monitor disease progression and assess the need for further interventions.

Surgical intervention is recommended for patients with moderate DCM (mJOA 12–14) and severe DCM (<12).

They also recommended against offering preventive surgery to nonmyelopathic patients who show

signs of cervical cord compression but do not exhibit symptoms of radiculopathy. It is advisable to provide these patients with counseling regarding potential risks of progression, educate them about relevant indicators and symptoms of myelopathy, and closely monitor their condition. As for nonmyelopathic patients who have cord compression and demonstrate clinical evidence of radiculopathy, with or without confirmation through electrophysiological tests, they face a higher likelihood of developing myelopathy. They should be informed about this risk and given a choice between surgical intervention or nonsurgical options, such as frequent check-ups or a supervised trial of structured rehabilitation [9].

Treatment of DCM

Various factors, including the severity of symptoms, clinical presentation, imaging findings, and patient-specific characteristics, guide the treatment of DCM. The management of DCM aims to relieve compression on the spinal cord, preserve neurological function, alleviate pain, and improve the overall quality of life.

Conservative treatment options for DCM include physical therapy, medication, and lifestyle modifications. Physical therapy focuses on strengthening the neck and upper extremity muscles, improving posture, and enhancing flexibility [10]. Medications such as nonsteroidal anti-inflammatory drugs (NSAIDs), muscle relaxants, and neuropathic pain medications may be utilized to manage pain and inflammation [10]. Lifestyle modifications, such as maintaining a healthy weight, avoiding smoking, and practicing good ergonomics, are also recommended to reduce stress on the cervical spine [10].

Surgical treatment options for DCM aim to alleviate spinal cord compression, restore neurological function, and improve patients' quality of life. The selection of surgical procedures depends on various factors that have been proven to impact patient outcomes following surgery for (DCM). These factors include age, comorbidities, cervical deformity, and bone density [25]. Among these factors, the restoration of sagittal alignment after surgery emerges as a crucial element linked to postoperative outcomes [26]. It is imperative to apply the concept of the modified K-line and the minimum interval distance (at least 4 mm between the K-line and the anterior compression elements) to every case, as the failure to address cervical kyphosis adequately increases the risk of residual compression postoperatively [26–28].

One standard surgical procedure for DCM is decompressive laminectomy and instrumented fusion, which helps create space for the compressed spinal cord and alleviates pressure on neural structures [29,30].

Fusion procedures (Fig. 3) stabilize the spine, prevent abnormal movement, and promote long-term symptom relief [31]. Advances in surgical techniques and instrumentation have enhanced the success rates of spinal fusion procedures, improving patient outcomes regarding neurological recovery and functional improvement [31]. However, fusion procedures restrict motion at the fused segments, which may lead to stress and increased load on adjacent levels, potentially causing adjacent segment disease or degeneration over time [32].

In patients with a limited number of levels affected by pathology, the absence of retrovertebral disease, predominantly anterior compression or cervical kyphosis, anterior cervical discectomy, and fusion (ACDF) is considered the primary treatment approach (Fig. 4). ACDF is an effective technique that provides excellent access to the anterior spine, allowing for efficient ventral decompression of the spinal cord [33].

Moreover, ACDF enables the restoration of cervical alignment, indirect decompression of the neural foramina, and stabilization of the spine through the utilization of intervertebral grafts and cervical plate fixation methods. In cases of significant retrovertebral compression, an anterior cervical corpectomy followed by graft reconstruction and fusion may be necessary to achieve adequate decompression of the spinal cord.

Surgical strategies that can be considered for pathologies involving multiple levels include multilevel discectomies, multilevel corpectomies, or a hybrid approach that combines both discectomy and corpectomy. A recent study utilizing the National Surgical Quality Improvement Program database (NSQIP) indicated that, in terms of complication rates, length of hospital stay, and discharge disposition, multilevel discectomies and hybrid approaches were superior to multilevel corpectomies [18].

Alternatively, motion preservation techniques such as laminoplasty can be considered to maintain segment mobility (Fig. 5). A recent systematic review and meta-analysis of 75 studies demonstrated substantial heterogeneity in the way clinical and radiographic outcomes were reported for patients undergoing posterior surgery for DCM, making it difficult to determine which surgical approach is superior [34]. Notably, the CSM-S randomized controlled trial compared ventral and dorsal surgery for DCM and published important findings [35]. In this trial, patients with multilevel DCM and no cervical kyphosis were randomly assigned to undergo

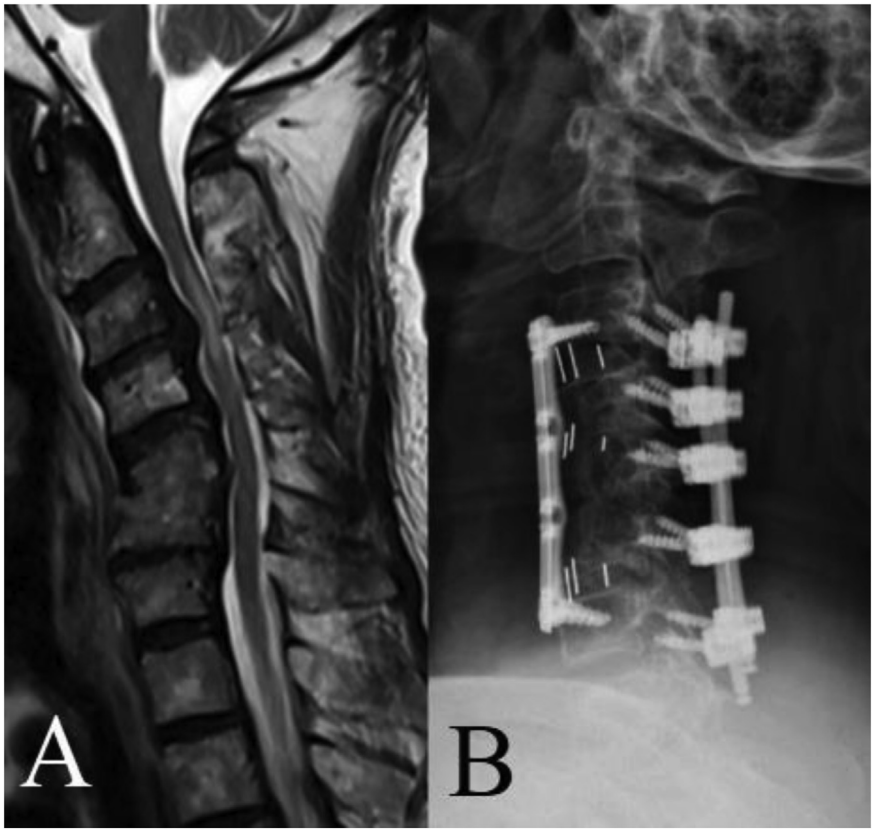

Fig. 3. (A) MRI of the cervical spine showing C4-5, C5-6 degenerative disc disease with spinal canal stenosis and spinal cord signal hyperintensity. (B) The patient was operated with C4-6 ACDF Surgery.

either an anterior or posterior surgical approach, depending on the surgeon's judgment. The decision to perform laminoplasty ($n = 28$) or laminectomy and fusion ($n = 69$) was at the discretion of the surgeon. A predetermined subgroup analysis comparing laminoplasty to laminectomy and fusion showed significantly higher rates of adverse events (fusion: 29.0% [95% CI, 18.7–41.2%]; laminoplasty: 10.7% [95% CI, 2.3–28.2%]), increased use of opioids (fusion: 65.2% [95% CI, 52.8–76.3%]; laminoplasty: 39.3% [95% CI, 21.5%–59.4%]), and poorer physical functioning at the 2-year mark after surgery in patients who underwent laminectomy and fusion [35]. These recent high-quality findings were preceded by numerous studies that failed to establish the superiority of laminoplasty over laminectomy and fusion in terms of neurological recovery [36–38].

Artificial Disc Replacement (ADR) is another option that aims to preserve motion in the operated segments. However, at present, the application of ADR in the treatment of DCM is severely constrained due to its limitations when used in more than two levels [25]. Furthermore, there exists a prevalent belief among many surgeons that preserving motion across a diseased or spondylitic segment is imperative for the success of surgery, which contradicts the principles underlying ADR. However, a recent development involves the emergence of 'hybrid' constructs where ADR is utilized in conjunction with anterior cervical discectomy and fusion (ACDF) or as a supplementary measure following a prior ACDF [39].

Postoperative care typically involves a structured rehabilitation program. Physical therapy, exercises, and rehabilitation interventions are essential to optimize functional recovery, restore range of motion, and strengthen the cervical musculature [36].

Riluzole and DCM

Riluzole, a glutamate modulator, has emerged as a potential treatment option for patients with (DCM). As an FDA-approved medication for the treatment of Amyotrophic Lateral Sclerosis (ALS), riluzole has shown promise in modulating glutamate excitotoxicity, which may play a role in the pathophysiology of DCM.

Glutamate is an excitatory neurotransmitter that plays a crucial role in neuronal signaling. However, excessive glutamate release can lead to

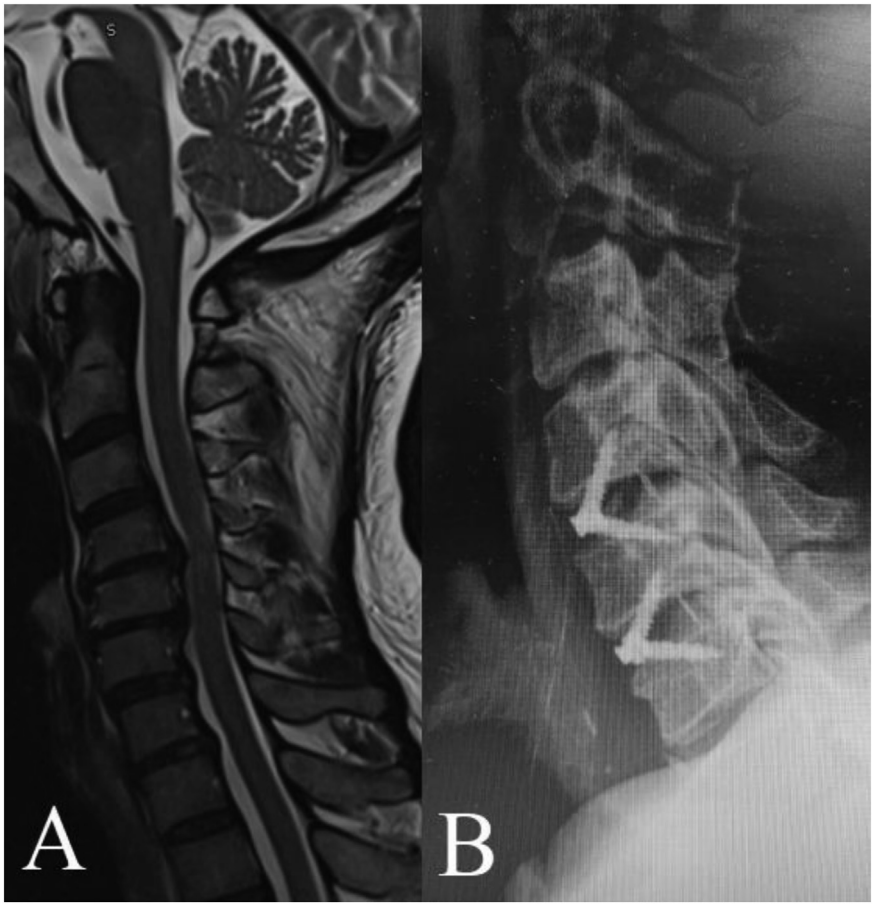

Fig. 4. Pre and postoperative images of a patient who had (A) A kyphotic deformity of the cervical spine with severe spinal canal stenosis and spinal cord signal hyperintensity as shown on his MRI, (B) The patient was operated with a double level ACDF using standalone cages.

excitotoxicity, causing damage to neuronal cells. In DCM, the compression of the spinal cord can result in increased release and impaired clearance of glutamate, leading to excitotoxicity and subsequent neurological deficits.

Preclinical studies have demonstrated that riluzole can attenuate glutamate-induced neuronal damage by inhibiting presynaptic glutamate release and blocking glutamate receptors [40]. These neuroprotective properties have led to the investigation of riluzole as a potential treatment for DCM.

A recent randomized controlled trial evaluated the efficacy of riluzole in patients with mild to moderate DCM. The study compared the effects of riluzole versus placebo in improving functional outcomes and neurological status [41]. The results of this trial showed that riluzole treatment was associated with significant improvements in functional outcome measures, including the modified Japanese Orthopedic Association (mJOA) score and the Nurick scale, compared to placebo [41]. Additionally, riluzole-treated patients exhibited a trend toward improved spinal cord DTI metrics, suggesting a possible neuroprotective effect [41].

While the exact mechanism of action of riluzole in DCM is yet to be fully elucidated, its potential neuroprotective effects and modulation of glutamate excitotoxicity make it an intriguing treatment option. Further research is needed to understand better riluzole's benefits, optimal dosage, and long-term effects in DCM.

It is important to note that riluzole is not without side effects. Common adverse effects of riluzole include gastrointestinal disturbances (nausea, vomiting), dizziness, and liver function abnormalities [42]. Therefore, careful patient selection, monitoring, and shared decision-making with the treating physician are essential when considering riluzole as a therapeutic option for DCM.

DCM and future directions

DCM is rapidly evolving, and several future directions hold promise for improving the treatment

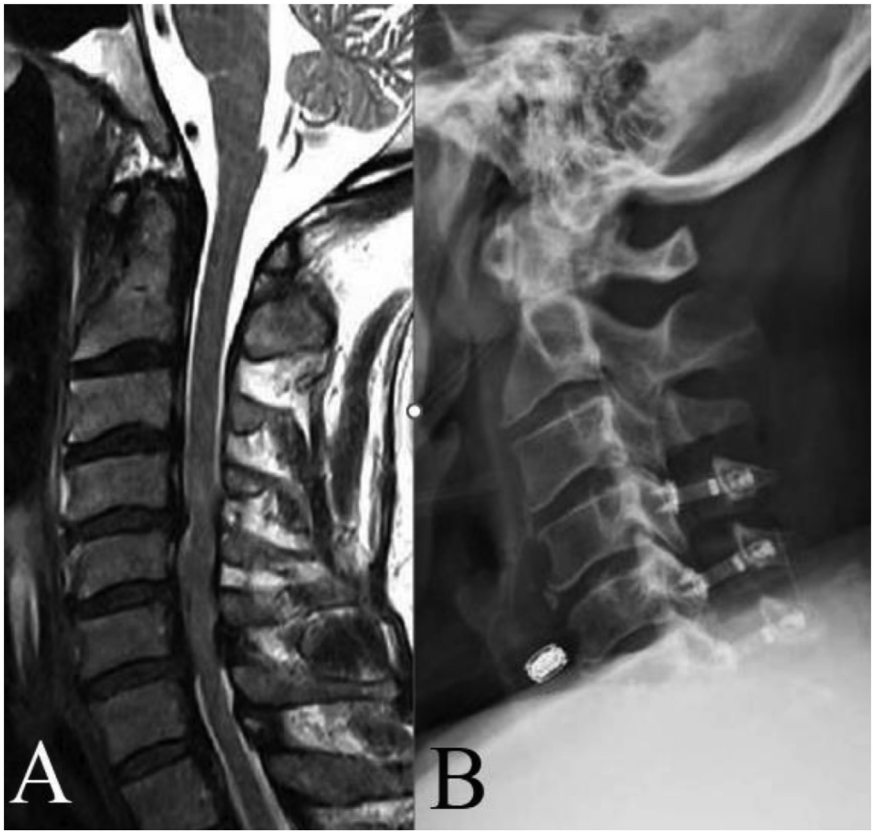

Fig. 5. (A) Preoperative MRI of a patient with severe spinal canal stenosis, (B) The patient was operated on with C4-7 laminoplasty.

outcomes of this condition. One area of ongoing research is the development of novel pharmacological agents targeting specific pathways involved in the pathophysiology of DCM. For example, agents targeting neuroinflammation, oxidative stress, and apoptosis pathways are being explored for their potential neuroprotective effects [43].

Stem cell therapy represents another avenue for potential treatment of DCM. Preclinical studies have shown that stem cells can differentiate into neuronal cells and promote tissue repair and regeneration [44]. Researchers are investigating the use of different types of stem cells, including mesenchymal stem cells and induced pluripotent stem cells, for their therapeutic potential in DCM [45]. Clinical trials evaluating the safety and efficacy of stem cell therapies in DCM are ongoing and show promise for future therapeutic options [45].

Advancements in surgical techniques and technologies are also shaping the future of DCM treatment. Minimally invasive surgical approaches, such as endoscopic-assisted decompression, may reduce surgical trauma, decrease blood loss, and faster recovery times [46]. Developing advanced imaging modalities, such as intraoperative MRI and navigation systems, also enables more precise surgical planning and execution [47]. These innovations may contribute to better surgical outcomes and improved patient satisfaction.

Furthermore, the role of personalized medicine in DCM management is gaining attention. With advancements in genomics and molecular profiling, there is growing interest in identifying specific genetic markers and biomarkers associated with DCM progression and treatment response [48]. Integrating personalized medicine approaches may allow for tailored treatment strategies based on individual patient characteristics, optimizing therapeutic outcomes.

Telemedicine and digital health platforms are also emerging as potential tools to enhance DCM management. Remote monitoring, video consultations, and virtual rehabilitation programs may improve access to care, patient adherence, and overall patient outcomes [49]. These technologies can potentially revolutionize healthcare service delivery for individuals with DCM, especially those in remote or underserved areas.

The economic impact of DCM

DCM poses significant burdens on individuals affected by the condition and has substantial economic implications for the community. The economic impact of DCM stems from various factors, including healthcare costs, lost productivity, and the need for long-term care.

First, healthcare costs associated with DCM diagnosis, treatment, and management contribute to the economic burden. Studies have shown that surgical intervention, such as decompression and fusion surgeries, is a common treatment pathway for DCM, with costs varying depending on the specific procedures performed and the healthcare system in place [18,50]. Additionally, recurrent hospital visits, consultations with healthcare professionals, imaging studies, and the use of assistive devices further add to the overall healthcare costs associated with DCM management.

Second, DCM has a considerable impact on productivity in terms of missed workdays and reduced work capacity. Chronic pain, motor dysfunction, and other debilitating symptoms of DCM can significantly limit an individual's ability to engage in work-related activities. A study by Kotter et al. estimated that individuals with DCM experience, on average, a 36% reduction in work productivity compared to their healthy counterparts [50]. This reduction in productivity can result in significant economic losses for the affected individuals and the community.

Furthermore, the long-term care needs of individuals with severe DCM can impose a substantial financial burden. In the advanced stages of the condition, individuals may require assistance with activities of daily living, caregiving support, and ongoing rehabilitation services. These care services, including professional caregivers, equipment, and home modifications, often incur high costs. The financial strain associated with long-term care can have ripple effects on families and communities, impacting their ability to meet other financial obligations and invest in economic growth.

The economic impact of DCM is not limited to direct healthcare costs, lost productivity, and long-term care expenses. Indirect costs, such as transportation expenses related to medical appointments and modifications to living environments, can also contribute to the overall economic burden.

Efforts to quantify and understand the economic impact of DCM are essential for policymakers, healthcare providers, and community stakeholders to allocate resources effectively and implement appropriate interventions. By recognizing the economic implications of DCM, policymakers can invest in research, healthcare infrastructure, and support programs to address the specific needs of individuals with DCM and mitigate the economic burden on the community.

Conclusion

This narrative review has underscored the importance of understanding and addressing the complexities surrounding DCM. This review sought to consolidate current knowledge on the pathophysiology, clinical presentation, diagnostic modalities, and treatment options for DCM by analyzing a comprehensive range of literature.

Findings have revealed a multifaceted condition characterized by progressive neurologic impairment. DCM manifests many symptoms, ranging from neck pain and stiffness to motor weakness, sensory deficits, and gait disturbances. Additionally, it has become evident that early detection and accurate diagnosis are crucial in optimizing patient outcomes, as timely intervention can help alleviate neurological deterioration and mitigate long-term disabilities.

Diagnostic advancements, such as magnetic resonance imaging (MRI) and clinical assessment tools tailored for DCM, have greatly improved our ability to identify the condition, aiding in stratifying patients based on severity and guiding appropriate interventions. Surgical decompression remains the gold standard in cases with significant cord compression, while conservative management can benefit those with mild to moderate presentations or contraindications for surgery.

Given the potential impact of DCM on patients' quality of life, the long-term consequences, and the burden placed on healthcare systems, it is essential to employ a multidisciplinary approach. Ongoing research and collaboration between neurologists, neurosurgeons, physiotherapists, and other allied healthcare professionals are necessary to refine treatment protocols, enhance surgical techniques, and develop optimized rehabilitation plans.

Furthermore, patient education and dissemination of accurate information are vital to promote early recognition of symptoms, encourage timely seeking of medical attention, and reinforce the importance of adherence to prescribed treatments. Additionally, future research endeavors should focus on elucidating the underlying mechanisms contributing to the development and progression of DCM, which may pave the way for novel therapeutic avenues, including pharmacological interventions and regenerative medicine approaches.

In conclusion, while degenerative cervical myelopathy poses significant challenges, this

narrative review emphasizes that a comprehensive understanding of the condition, prompt diagnosis, and appropriate management strategies can significantly improve patient outcomes. Policymakers, clinicians, and researchers must collaborate to enhance awareness, refine diagnostic techniques, optimize treatments, and extend the advancements in tackling this debilitating condition. By doing so, we nurture the potential for a brighter future for patients affected by DCM.

Conflicts of interest

The authors report no conflict of interest.

Author declaration of funding statement

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Ethics Information

The article does not contain information about medical device(s)/drug(s).

Abbreviations

ACDF	Anterior cervical decompression and fusion
ADR	Artificial disc replacement
ALS	Amyotrophic lateral sclerosis
CSM	Cervical spondylotic mylopathy
CT	Computed tomography
DCM	Degenerative cervical myelopathy
DTI	Diffusion tensor imaging
DWI	Diffusion-weighted imaging
EMG	Electromyography
mJOA	Modified Japanese Orthopaedic Association
MRI	Magnetic resonance imaging
OPLL	Ossified posterior longitudinal ligament
SSEPs	Somatosensory evoked potentials

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