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Neoplasias extramedulares como factor de riesgo en la compresión medular

Extramedullary neoplasms as a risk factor in spinal cord compression

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Palabras claves:
Comprensión medular, impacto, Neoplasias extramedulares, riesgo, salud.

Resumen

Introducción. La neoplasia extramedular en la compresión medular se relaciona con la presencia de tumores cerca de la médula espinal y que causan compresión en la misma. **Objetivo.** Investigar la incidencia y prevalencia de neoplasias que causan compresión medular, identificando los tipos de tumores más comúnmente asociados con esta condición, así como evaluar los síntomas, diagnóstico y tratamientos disponibles para estas neoplasias. **Metodología.** Diseño documental-bibliográfico, de tipo exploratorio, explicativo y modalidad cualitativa. **Resultados.** Resulto que las neoplasias estramedular que causan la comprensión medular incluyen las meningionama que son tumores beningnos de crecimiento lento que se desarrollan en el canal espinal; las neurofibromas desarrollados por las células que rodean los nervios; los Schwannomas que son tumores histológicos en la medula espinal. Entre los síntomas predominantes se tiene le dolor, delibilidad en los brazos, los cambios de cisión, dolor de cabeza, pérdida de memoria, pérdida del olfato, convulsiones y dificultad del lenguaje. **Conclusión.** Las neoplasias extramedulares afectan significativamente en el impacto de la salud del paciente, dado que la gravedad de los síntomas y el pronóstico dependen del tipo de neoplasia, su ubicación y el grado de compresión medular que cause, teniendo así repercusión en la comprensión de la medula espinal, dolor intenso en la zona, parálisis de las extremidades superiores e inferiores, y finalmente alteraciones neurológicas. **Área de estudio general:** Medicina. **Área de estudio específica:** Neurología. **Tipo de estudio:** Artículos originales.

Keywords:
Spinal cord understanding, impact, Extramedullary neoplasms, risk, health.

Abstract

Introduction. Extramedullary neoplasia in spinal cord compression refers to the presence of tumors or lesions that are located outside the spinal cord and that cause compression in it. objective. Investigate the incidence and prevalence of neoplasms that cause spinal cord compression, identifying the types of tumors most associated with this condition, as well as evaluate the symptoms, diagnosis, and treatments available for these neoplasms. Methodology. Documentary-bibliographic design, exploratory, explanatory, and qualitative modality.

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Results.It turned out that stramedullary neoplasms that cause spinal compression include meningionama, which are slow-growing benign tumors that develop in the spinal canal; neurofibromas that develop from the cells surrounding the nerves; Schwannomas are histological tumors in the spinal cord. Among the predominant symptoms are pain, weakness in the arms, changes in vision, headache, memory loss, loss of smell, seizures, and language difficulty. Conclusion. Extramedullary neoplasia can have a significant impact on the patient's health. The severity of the symptoms and the prognosis depend on the type of neoplasm, its location, and the degree of spinal compression it causes, thus having the impact of compression of the spinal cord, intense pain in the area, paralysis of the upper and lower extremities, and finally neurological alterations.

Introduction

The spine plays a crucial role in providing structural support to the body and protection to the nerve roots and spinal cord. The stability of this structure depends on the proper functioning of the spinal cord, which is surrounded by a protective capsule. However, at the same time, the spinal cord is exposed to various compression phenomena.(1). Spinal cord compression (SC) is an emergency medical condition that requires early diagnosis and treatment to prevent neurological problems.

This medical condition is characterized by the pressure or narrowing of the spinal cord, which is responsible for transmitting nerve impulses from the brain to other parts of the body, mainly due to extramedullary injuries, in such a way that they can cause sensory and motor deficits and sphincter dysfunction. Its causesThe most common are metastases, vertebral fractures and herniated discs..As well as neoplasms that can increase the risk of spinal cord compression. These tumors develop either in the membrane around the spinal cord or in nerve roots that break off from it. Although these tumors do not originate within the spinal cord, they can affect its function by exerting pressure and causing other problems (2). In turn, there are other risk factors and causes of spinal cord compression, such as herniated disc, ligamentum flavum hypertrophy, and arteriovenous malformations. In addition, age can also affect the risk of developing plasma cell tumors (3).

This compression has multiple etiologies and is characterized by alterations in the anatomy of the spine accompanied by great pain and dysfunction due to mechanical and neurological alterations.Thus, common extramedullary tumors that can cause spinal cord compression include the following types of tumors: Meningiomas; Neurofibromas; Schwannomas; Other nerve sheath tumors that mainly include metastatic primary tumors. Bone metastases are the most frequent neoplasms that cause this type of compression, with a slightly higher predominance in men and an age ranging from 50 to 70 years (4). Metastases can come from various sources, such as lung, prostate, myelomas and lymphomas. They usually settle in the dorsal region and the presentation can be acute, subacute or chronic. On the other hand, tumors or cancer from other parts of the body can spread to the vertebrae, the support network surrounding the spinal cord or, in rare cases, to the spinal cord itself, which can also cause spinal cord compression and related consequences (5).

Meningiomas, on the other hand, occur as tumors in the meninges, or in the layers of tissue that cover the brain and spinal cord. These tumors can compress adjacent brain or spinal cord tissue, which can cause symptoms and neurological deterioration. The symptoms of a meningioma depend on its location and may include progressive headaches, epileptic seizures, and neurological changes.In the specific case of spinal cord compression, spinal meningiomas can affect the spinal cord and produce signs of spinal cord compression, such as weakness, sensory disturbances, and sphincter dysfunction.(6)The compression pathology caused by this tumor may require surgical treatment to relieve pressure on the spinal cord and prevent neurological deterioration.

Spinal cord tumors or tumors of any type can cause pain, nerve problems, and sometimes paralysis.Spinal cord neoplasms can be fatal and cause permanent disability. Therefore, neoplasms can be a risk factor for spinal cord compression, affecting spinal cord function, causing compression and other problems. Medical attention is important if you have symptoms of pain, nerve problems, or paralysis. It should be remembered that spinal cord compression is a medical condition in which the spinal cord is pressed or narrowed, which can cause sensory and motor deficits and sphincter dysfunction (7). In addition, it is characterized by alterations in the anatomy of the spine, accompanied by pain and functional disability due to mechanical and neurological alterations (8). For this reason, this document addresses the issue of risk factors for spinal cord compression due to its prevalence and the significant clinical implications it has on the patient's life.

It is important to address the issue of risk factors for extramedullary tumors, due to the prevalence and significant clinical implications of this condition, as well as knowing how to diagnose them and the timely treatment, since early recognition and multidisciplinary intervention will improve the patient's functional prognosis (9). By conducting a literature review on the subject of spinal cord compression, the main causes and predisposing

factors can be identified, which will allow health professionals to have a more precise approach in the diagnosis of patients at risk of developing this health problem.

It is crucial to understand how to diagnose this condition to ensure timely treatment. Early recognition and multidisciplinary intervention can significantly improve the patient's functional prognosis. The present investigation offers a useful methodology that allows future research with compatible methodologies, facilitating temporal comparisons, joint analyses, interventions and assessments of extramedullary neoplasia as a risk in spinal cord understanding. Considering that, early recognition of extramedullary neoplasia is crucial for effective treatment. Evaluating the usefulness of different surgical approaches, such as hemilaminectomy, in patients with intradural-extramedullary tumors is an important aspect to consider (10).

This study seeks to contribute to national and international research on the importance of neoplasia as a risk factor for spinal cord compression. For this reason, it is relevant, since there is a wide availability of sources of information that allow these risk factors to be identified. In addition, there are the necessary economic and human resources to carry out solid research, backed by the appropriate theoretical bases.

By conducting a comprehensive literature review on the topic of spinal cord compression, the main causes and predisposing factors can be identified. This will allow health professionals to have a more precise approach to diagnose and treat patients at risk of developing spinal cord compression. Thus, the article aims to investigate the incidence and prevalence of neoplasms that cause spinal cord compression, identifying the types of tumors most commonly associated with this condition, as well as assessing the symptoms, diagnosis, and treatments available for these neoplasms.

Methodology

This research used a documentary-bibliographic design, exploratory, explanatory and qualitative in nature. A deeper and more detailed understanding of the experiences, perceptions and emotions of people affected by extramedullary tumors was obtained, based on already documented facts.

A documentary review article is carried out with an exhaustive search for information about extramedullary neoplasias as a risk factor in spinal cord compression, through databases such as Redalyc, scielo, Elsevier Pubmed, Scopus, Google Scholar, in which keywords such as "extramedullary neoplasias", "risk factors", "spinal tumors", "spinal cord compression", "meningiomas", "benign neurofibromas" are used. The articles were selected according to the title, authors and abstract. The methodological validity of the article was subsequently reviewed with its results.

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For the study, a total of approximately 35 scientific articles were obtained in the search, which were distributed as follows: 8 in Scielo, 8 in Redalyc, 5 in Elsevier, 5 in PubMed/Medline and 4 in Scopus, in addition to 7 articles found in Google Scholar (Figure 1).

During the selection of articles, exclusions were made as follows: 6 articles were discarded for being duplicates, 4 articles for not meeting the title criteria, 2 articles for not having an adequate abstract, and another 2 articles were excluded at the full reading stage because their methodology and results did not exactly align with the research objectives. Finally, a total of 23 articles were included in the study.

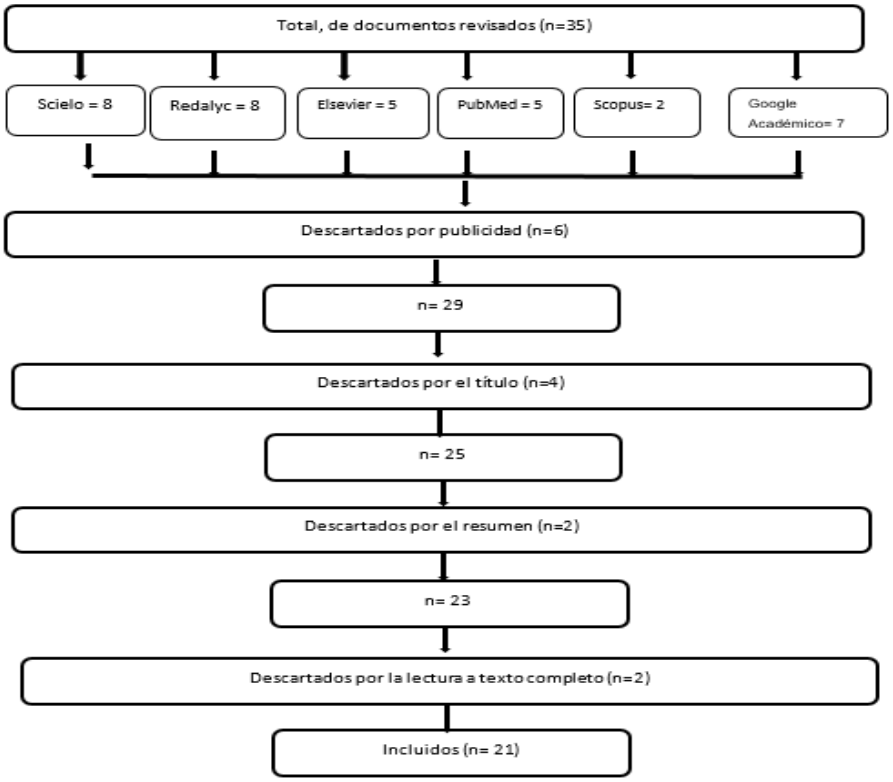

Figure 1. Strategy for searching and selecting scientific documents

Results

The results were obtained from the analysis of 23 articles found in journals indexed in databases such as Scielo, Redalyc, Elsevier, PubMed/Medline, Scopus and Google Scholar. These articles address the characteristics of extramedullary neoplasias from different points of view, as well as the risk factors and importance in the investigation of spinal cord compression.

Firstly, specific guidelines related to these topics were followed for the selection of the articles. The following results of the research phase were obtained:

- Types of neoplasms as a factor for spinal cord understanding
- Predominant symptoms
- Extramedullary plasmacytoma as a related neoplasm
- Risk factors for spinal cord compression.
- Treatment of plasma cell neoplasms.
- Importance of rehabilitation in spinal cord compression.
- Self-catheterization in patients with spinal cord compression.
- Bowel regimen in cases of spinal cord compression.
- Spinal cord metastasis as a complication of neoplasia.
- Impact on health

1) Types of neoplasms

Extramedullary tumors causing spinal cord compression include:

- Meningiomas
- Neurofibromas
- Schwannomas
- Other tumors.

Meningiomas

Spinal meningiomas (SM) are slow-growing benign tumors that account for 25% to 46% of intradural extramedullary lesions. Most affected female patients are between 60 and 80 years old and present with symptoms such as altered sensitivity and gait or sphincter dysfunction. Despite tumor size and spinal cord compression, most patients experience excellent neurological recovery after surgery, even in advanced age (11).

Meningioma is a common type of tumor that develops in the spinal canal, accounting for about 25-30% of primary tumors affecting the spine and approximately 8% of all meningiomas. Its manifestation can vary from being asymptomatic to causing severe mobility problems, such as paraplegia or quadriplegia. These spinal tumors have a higher incidence in women and are most common in the thoracic spine, followed by the cervical spinal canal.

Previous studies show that anterior or anterolateral locations are less functionally affected and may present with sphincter dysfunction at the first physical examination. However, this will vary depending on the degree of meningioma in the spinal canal. It is suggested that a meningioma occupying 64% or more of the spinal canal will have motor involvement (11). As a primary treatment, surgery is crucial, but before performing it it is important to delimit the area occupied by the tumor. A useful imaging technique is magnetic resonance imaging with contrast.

Spinal meningiomas are benign tumors that, despite their slow growth, can cause a variety of symptoms, from mild to severe, depending on their location and size. Surgery is the main treatment and can result in excellent neurological recovery, even in elderly patients.

Predominant symptoms

They may present a variety of symptoms, which may be subtle at first due to their slow growth. Some of the predominant symptoms include:

- Pain: Pain is a predominant symptom of spinal meningiomas.
- Weakness in the arms or legs: Weakness in the extremities can also be a symptom of these tumors.
- Other symptoms: In addition to pain and weakness, spinal meningiomas may cause other symptoms such as vision changes, headaches, hearing loss, memory loss, loss of smell, seizures, and language difficulties.

Neurofibromas

They can be a risk factor for spinal cord compression. These tumors, which develop from the cells surrounding the nerves, can put pressure on the spinal cord, which can cause symptoms such as pain, weakness, tingling and loss of sensitivity in the extremities (12). The presence of these tumors in the spinal cord region can increase the risk of spinal cord compression and require specialized medical attention for its management.

Neurofibroma tumors originate in nerve cells. They may occur in association with a genetic disease called neurofibromatosis type 1 (NF1) or as sporadic cases in people without NF. Neurofibromas are classified as localized, diffuse, and plexiform, depending on their location and depth. Symptoms vary by the location, type, and size of the tumor. They may cause pain or affect neurological function, especially when located in the spinal cord. However, it is important to note that neurofibromas cause serious problems, such as paralysis and acute pain.

Predominant symptoms

Neurofibroma tumors, which originate in the cells and tissues surrounding nerves, can present with a range of symptoms and associated risks. Some of the symptoms and risks include:

- Soft lumps. Symptom of a tumor or lump on or under the skin. These are benign tumors that can grow on or under the skin. Sometimes, pain or itching may occur that involves some nerves (plexiform neurofibroma).
- Spinal cord compression: One of the possible effects of neurofibromas is compression of the spinal cord. When neurofibromas put pressure on the spinal

cord, they can cause symptoms such as pain, weakness, tingling, and loss of sensation in the extremities (12).

- Risk or presence of cancer: Between 3 and 5% of people with neurofibromatosis type 1 develop cancer. Neurofibromas occur under the skin or in plexiform tumors.
- In addition, there is a risk of other types of cancer (leukemia, breast, colorectal, brain and some soft tissue cancers).

Schwannomas

Meningiomas and schwannomas are the two most common types of histologic tumors, accounting for 55% to 90% of all intradural extramedullary spinal cord tumors. Despite their mostly benign nature, there are significant differences in the surgical techniques used to remove each. Because spinal meningiomas tend to recur, complete tumor resection along with dural excision is recommended to minimize the recurrence rate. Therefore, it is crucial to perform radiologic differentiation between these two types of spinal tumors when planning surgery.

Magnetic resonance imaging (MRI) allows the detection and characterization of lesions and the evaluation of suspected spinal tumors. An important difference between both types of tumors is that schwannomas tend to show a hyperintense signal, while a significant part of meningiomas show an isointense signal compared to that of the spinal cord (13).

Schwannomas, which are caused by Schwann cells that normally form a protective covering around nerves, may represent a risk factor for spinal cord compression (14). These benign tumors can begin in spinal nerves and, as they grow, they put pressure on the spinal cord, causing loss of sensation, muscle weakness, and bowel and bladder problems.

Early detection and insensitive treatment can help prevent further loss of nerve function and restore damaged nerve function through intensive rehabilitation. The location of the tumor can be a determining factor in the risk of spinal cord compression, as the tumor can compress the spinal cord and be life-threatening (14).

Predominant symptoms

The predominant symptoms of schwannomas are associated with the involvement of cranial nerves, especially the 8th and 7th. In addition, schwannomas may be associated with symptoms arising from the involvement of other cranial nerves. It is also important to note that deep-seated tumors, such as schwannomas, may present with complex and nonspecific symptoms, which may make their diagnosis difficult.

It is crucial to note that the presence of schwannomas may be associated with an increased risk of spinal cord compression, especially in the case of schwannomas affecting the spinal cord. In addition, vestibular schwannomas (acoustic neuromas) associated with neurofibromatosis type 2 can occur on both sides of the head and pose a significant risk to hearing and balance.

Other tumors

Multiple Myeloma, which represents 1% of all cancers and belongs to the 10% of hematological type, could be preferred as the malignant homologue of plasma cells in which there is a cellular replacement with multiple organic affectation, with special affinity for bone and bone marrow up to 80-90%, the spine being the most frequently affected site, which is why they are included in the differential diagnoses during the approach to the patient with vertebral destruction syndrome (15).

There is a higher predominance in males and incidence in African Americans. In the present study, the most affected segment was the thoracic, followed by the lumbar, after the diagnosis of multiple myeloma by percutaneous biopsy guided by fluoroscopy. The weakness resulted in an asymmetric vertebral wedging with a potential compromise of the stability of the spine and neurological function, with regard to the clinical presentation it was paraplegia, which in the majority was preceded by axial pain and sensory deficit (16).

Since these tumors cause extensive pain in patients, kyphoplasty is performed to reduce pain in patients. After surgery, people usually experience less pain and better mobility, allowing them to reduce the need for pain medications and resume their daily activities (16). That is, kyphoplasty is a surgical procedure used to treat painful vertebral compression fractures, especially in cases of osteoporotic vertebral fractures that do not respond to pain relief treatment. During kyphoplasty, a balloon is used to create a space in the collapsed vertebral bone and then bone cement is injected into the created space to stabilize the vertebra. On the other hand, vertebroplasty, involves injecting bone cement into the fractured vertebra. These treatments, combined with radiofrequency ablation, use radio waves to heat and destroy abnormal cells, with the aim of relieving pain, improving mobility and achieving stabilization of the vertebrae affected by multiple myeloma (17).

Diffuse non-Hodgkin lymphoma has been associated with spinal cord compression. They are a common subtype of mature B-cell neoplasms (30-35%), usually present in the seventh decade of life. They are also aggressive and represent 80% of high-grade lymphomas. They begin in the paraspinal soft tissues in the form of paravertebral adenomegaly, later invading the bone marrow through the vertebral foramen as the mass spreads, affecting the epidural space and locally affecting the bone structures causing

spinal cord compression at that level. The dorsal segment is the most affected, followed by the cervical and lumbar areas.

The clinical presentation is pain, sphincter relaxation, flaccid paralysis, distal hypoesthesia in the stocking, and areflexia. Regarding treatment, surgical decompression improves neurological symptoms. A surgical approach is not recommended because in this type of patients the mortality rate is high associated with surgery (17).

Chemotherapy treatment will be individualized depending on the patient's severity and associated risk factors, as well as the health status, however, the R-CHOP regimen (Cyclophosphamide, Doxorubicin, Vincristine, Prednisone) remains the Gold standard.

Metastatic spinal cord compression has a prevalence of 2.5 to 5% in cancer patients, and usually presents insidiously, although deterioration can be rapid. The main symptom is back pain in 95%, even 2 months before specific signs of spinal cord compression appear (18).

The pain is usually constant and worsens at night or in the morning, becoming worse when coughing, straining or lying down. Weakness in the limbs affects 85% of patients. There is also the presence of autonomic dysfunction, such as bladder and bowel dysfunction (urinary retention, incontinence and constipation) or impotence.

Metastases to the spine are the third most common site after the lung and liver. CT plays a key role in surgical and radiotherapy treatment, but MRI is the most commonly used method to confirm the diagnosis.

Treatment for spinal cord compression varies by the cause and severity of symptoms. In some cases, conservative approaches such as pain management medications or occupational therapy to reduce pain or symptoms may be used. However, in more severe or progressive cases, surgical intervention may be necessary.

Surgery for spinal cord compression is intended to relieve pressure on the spinal cord and restore its function. Depending on the case, different types of procedures may be performed, such as laminectomy, discectomy, spinal fusion, or tumor removal (18). Surgery may be followed by a period of rehabilitation to help the patient regain strength and mobility.

It is important to note that the treatment of spinal cord compression must be individualized and adapted to the specific needs and characteristics of each patient. A thorough evaluation by specialists in neurology and neurosurgery is required to determine the cause of the compression and the most appropriate therapeutic approach.

2) Extramedullary plasmacytoma as a related neoplasm

Extramedullary plasmacytoma is a type of plasma cell tumor that develops outside the bones, in soft tissues such as the lungs or throat. It is considered a rare form of cancer and is classified as a variant of multiple myeloma (cancer in the bone marrow). Symptoms may include pain, swelling, or pressure in the affected area.

Treatment for this type of tumor may include radiation therapy to the tumor and lymph nodes, surgery followed by radiation therapy, or simply careful observation followed by appropriate measures such as radiation therapy, chemotherapy if the tumor grows or causes signs (19).

It is also noted that extramedullary plasmacytoma is a rare disease and each case may be individual. Therefore, it is recommended to consult a specialist for an accurate diagnosis and treatment.

3) Risk factors for spinal cord compression

Spinal cord compression may be associated with several risk factors. Some of these factors include:

Tumors: Tumors can put pressure on the spinal cord, which can lead to spinal cord compression.

Metastatic lesions of the spine: The presence of metastases in the spine increases the risk of spinal cord injury by 20% (19).

4) Treatment of plasma cell neoplasms

Treatment for plasma cell neoplasms, including multiple myeloma, may vary depending on the type and stage of the disease, as well as individual patient characteristics. Some common treatment options include:

Chemotherapy: Drugs are used to destroy or control cancer cells. Chemotherapy may be given in combination with other treatments.

Targeted therapy: Drugs that attack cancer cells by blocking pathways for abnormal cell growth and division.

Stem cell transplant: Stem cells may be collected from the patient or a matched donor and then high doses of chemotherapy are given to destroy the cancer cells. The stem cells are then infused to help reestablish the bone marrow.(19).

Immunotherapy: Drugs that stimulate the body's immune system are used to fight cancer cells (20).

5) Importance of rehabilitation in core understanding

Rehabilitation is essential for the treatment of spinal cord compression. Spinal cord compression can cause a variety of symptoms and functional limitations, and rehabilitation aims to enable improved quality of life.

Rehabilitation may include different approaches such as occupational therapy, physical therapy, depending on the individual needs of the patient (20). Some important aspects of rehabilitation in spinal cord compression include:

Restoring motor function: Physical therapy is essential to improve muscle strength, coordination, and balance. Specific exercises, mobilization techniques, and assistive devices can be used to help patients regain the ability to move and perform daily activities.

Improving sensory function: Occupational therapy can help improve sensory perception and the ability to perform everyday tasks. Sensory stimulation techniques and specific skills training can be used to help patients adapt to changes in sensory sensitivity and function (21).

Pain management: Rehabilitation may include strategies to manage pain associated with spinal cord compression, such as physical therapies, relaxation techniques, and medications.

Adaptation and psychological support: Rehabilitation may include psychological support and adaptation strategies for patients to cope with the psychosocial and emotional challenges associated with the condition.

That is, rehabilitation may include different therapeutic approaches, such as physical therapy, occupational therapy, and speech therapy, depending on the patient's individual needs. These treatments can help improve mobility, strengthen muscles, improve coordination and balance, and address any difficulties with speech or swallowing.

6) Self-catheterization in patients with spinal cord compression

The use of intermittent self-catheterization, whereby a catheter is inserted into the bladder, allowing it to be emptied on a regular basis, thus allows treatment in patients with spinal cord compression (21).

It can help prevent urinary retention, minimize the risk of urinary tract infection, and maintain proper bladder function. It is important that self-catheterization is performed under the supervision and guidance of a health care professional, such as a nurse practitioner or doctor.

In addition to self-catheterization, other medications may be used to treat bladder dysfunction in patients with spinal cord compression. These medications may include:

Anticholinergic medications: These medications help relax bladder muscles and reduce overactive bladder, which may help control urinary incontinence (22).

It is important to note that the use of specific medications and the therapeutic approach may vary depending on the individual needs of the patient and the recommendation of the treating physician. It is essential to follow the instructions and recommendations of the health care professional at the time of discharge and to carry out appropriate follow-up to ensure optimal management of spinal cord compression and bladder dysfunction.

7) Bowel regimen in cases of spinal cord compression

In cases of spinal cord compression, bowel management may be necessary to help manage bowel function problems that may arise due to the injury. Some strategies and medications that may be used include:

Manual removal of stool: In certain cases, it may be necessary to manually remove stool from the rectum to facilitate bowel movements (22).

Enemas: An enema may be used to stimulate the passage of stool. Various devices may be used, such as enema catheters or enema cone systems. In cases where simple enemas are not effective, more advanced devices such as Peristin enemas and PID pulse irrigation systems may be used.

Each person is different and bowel regimen should be individualized according to each patient's needs and response. It is essential to follow the recommendations and guidance of a health professional, such as a specialized nurse or doctor.

8) Impact on health

Extramedullary neoplasia can have a significant impact on a patient's health. The severity of symptoms and prognosis depend on the type of neoplasia, its location, and the degree of spinal cord compression it causes.

Some of the potential health impacts on patients with neoplasia include:

- Spinal cord compression: Extramedullary neoplasia can put pressure on the spinal cord, which can cause symptoms such as pain, muscle weakness, sensory disturbances, difficulty walking, and bowel and bladder problems.
- Pain: Spinal cord compression can cause severe pain in the affected area and may radiate to other areas of the body. The pain may be constant or intermittent and may worsen over time.
- Paralysis: In severe cases, spinal cord compression can lead to paralysis of the lower or upper limbs, depending on the location and extent of the neoplasm.

- Neurological disorders: Spinal cord compression can affect neurological functions such as sensitivity, balance, coordination and the ability to move normally (23).

The impact on patient health may vary depending on the type of extramedullary neoplasia and each patient's individual response to treatment. Treatment for extramedullary neoplasia may include observation, chemotherapy, radiotherapy, targeted therapy, immunotherapy, and supportive therapies, depending on the type and stage of the disease.

Discussion

A series of articles were reviewed in different databases available in indexed journals in databases where relevant information was collected on the topic "Extramedullary neoplasms as a risk factor for spinal cord compression". Neoplasms are tumors that develop in the space between the dura mater and the spinal cord, also known as intradural tumors. These tumors can be benign or malignant and can cause serious problems such as pain and paralysis. As they grow, they can put pressure on the spinal cord or nerve roots, causing permanent damage over time. Some types of tumors are meningiomas, schwannomas, neurofibromas, and other nerve sheath tumors. It is important to note that cancer that arises in the spinal cord is different from cancer that occurs in other parts of the body and spreads to the spinal cord. Primary spinal cord tumors are rare and their exact cause is unknown. Some primary spinal cord tumors are the result of inherited genetic mutations. Spinal cord compression can cause a variety of neurological symptoms and signs, which may include muscle weakness, loss of sensation, changes in organ function, difficulty walking, bladder and bowel problems, among others. Symptoms of extramedullary spinal cord tumors can vary depending on the location and size of the tumor. Some common symptoms may include back or neck pain, muscle weakness, difficulty walking, changes in sensation, problems with bladder or bowel control, and difficulty moving the arms or legs. These symptoms may appear gradually or suddenly. Diagnosis is usually made through imaging tests such as MRI (magnetic resonance imaging), myelography, and computed tomography (CT). These tests can visualize the spinal cord and determine the cause and extent of the compression. Ultimately, treatment for spinal cord compression depends on the underlying cause and severity of symptoms. Management and treatment of spinal cord tumors depends on the type and location of the tumor, as well as the patient's overall health. Treatment may include surgery to remove the tumor, radiation therapy to destroy cancer cells, surgery to decompress the spinal cord and remove the cause of the compression, radiation therapy or chemotherapy in cases of malignant tumors to stop the tumor from growing, and rehabilitation after surgery to improve function and mobility.

Furthermore, it is important to consider that this research includes information distributed by specific guidelines related to Neoplasias as a risk factor in spinal cord compression,

whose scope allows to present subtopics such as types of tumors, general symptoms, extramedullary plasmacytoma as a related neoplasia; chronic spinal cord compression as a result of bone exuberance or slow-growing neoplasias; risk factors in spinal cord compression; treatment of plasma cell neoplasias; importance of rehabilitation in spinal cord compression; self-catheterization in patients with spinal cord compression; bowel regimen in cases of spinal cord compression. Likewise, it is necessary to highlight that this article is strictly limited to a specific group of analyzed journals, allowing the reader to have prior knowledge, in order to then present the chronological evolution of a patient with neoplasias with a risk factor in spinal cord compression.

Conclusions

- It was identified that the incidence and prevalence of a patient with extramedullary neoplasms as a risk factor for spinal cord compression can vary significantly. Patients are at risk for bone marrow failure, leukemia, and squamous cell carcinoma, which can influence disease progression. In addition, myeloid sarcoma, a tumor, commonly occurs in patients with preexisting hematologic malignancies, which can influence the course of the disease. The patient's rapid and tragic course may require rapid decisions, such as transfer to specialized facilities. It should be remembered that the development of patients with extramedullary neoplasms as risk factors for spinal cord compression can be complex and varied and depends on many factors, including the type of tumor, the treatment received, and the individual patient's response.
- Common extramedullary tumors that cause spinal cord compression include meningiomas, neurofibromas, schwannomas, and other nerve sheath tumors. Although they do not originate in the spinal cord, these tumors can affect its function by putting pressure on it and causing other problems. Spinal cord compression can be aggravated by a herniated disk and hypertrophy of the ligamentum flavum, and in less common cases by arteriovenous malformations and slow-growing tumors. This condition can cause pain, nerve problems, and even paralysis, and in some cases it can be life-threatening and cause permanent disability.
- Finally, it is concluded that neoplasms that cause spinal cord compression can present a variety of symptoms, and their diagnosis and treatment are essential to address this condition. First, symptoms may include weakness, numbness, difficulty walking, bladder and bowel control problems, back or neck pain, and in more severe cases, paralysis. It is based on clinical diagnosis, physical examination, and confirmation through imaging tests, such as MRI. Finally, treatment of neoplasms that cause spinal cord compression may include radiotherapy, surgery, and pharmacological therapies. Radiotherapy is intended to reduce pain and the need for analgesics, prevent pathological fractures, and

improve the patient's activity and mobility. However, the patient may require surgery to decompress the spinal cord and stabilize the spine. Finally, pharmacological treatment can be used to control symptoms.

Conflict of interest

The authors declare that there is no conflict of interest.

Authors' contribution statement

Soraya Lisseth Tenorio Mogro. Conducted the bibliographic search taking into account selection and exclusion criteria. Structured, wrote and corrected the bibliographic review.

Verónica Cristina Jurado Melo. Review of the first drafts through critical comments in order to contribute to the development of the writing.

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