

Herniated Nucleus Pulposus

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Sciatic and back pain are by far the most common presenting complaints to seek treatment worldwide. Most frequently this pain is a result of a herniated nucleus pulposus; commonly referred to as a herniated disc. Herniated nucleus pulposus is defined as a prolapse of an intervertebral disc through a tear in a compromised annulus fibrosus. The tear causes pain and inflammation due to irritation of sensory nerves surrounding the vertebrae. Depending on the nerves affected, symptoms and treatment outcomes will differ in each case. In many instances, patients may present asymptomatic, however, more serious cases involving nerve or spinal cord compression will cause nerve root trauma and damage. Treatment options used are indicative of the location of the injured disc, the severity of pain, and nerve involvement. Most cases involving a herniated nucleus pulposus heal with managed conservative treatment, but if unrelieved, may require interventional procedures or surgical repair (De Cicco & Camino Willhuber, 2020; Dydyk et al., 2021). Therefore, effective communication from an interprofessional healthcare team to prevent, diagnose, and treat the injured disc while avoiding further complications is fundamental to providing the best possible care. This paper will encompass the overall etiology, risk reductions, and treatment options of a nucleus pulposus herniation including the role of the nurse implementing best care.

STATEMENT OF THE PROBLEM

The anatomy of intervertebral discs includes two primary structures, the nucleus pulposus, and the annulus fibrosus. The nucleus pulposus is a “jelly-like” structure composed mainly of water and collagen fibers allowing the shapes structure flexibility and absorption of compression within the spinal cord. Dense collagen and fibrous connective tissues make up the composition of the annulus fibrosus with Sharpey fibers attaching the structure to the vertebral body (Al Qaraghli & De Jesus, 2021; De Cicco & Camino Willhuber, 2020). The annulus fibrosus encircles the nucleus pulposus located between each spinal vertebra. Disc herniations

occur as the nucleus pulposus begins protruding through the annulus fibrosus causing inflammation and nerve irritation. The time during injury is often asymptomatic or may result in immediate back pain, radiating leg pain, or compression causing numbness and tingling in the upper and lower extremities. As previously discussed, this compression of the disc may lead to radiculopathy or myelopathy due to severe nerve irritation. Left untreated "balance" problems, weakness, numbness, and tingling in the upper and/or lower extremities may result (Dydyk et al., 2021; Epstein & Hollingsworth, 2017).

Disc herniations occur due to degenerative changes in the integrity of the annulus. Age-related degenerative changes or general "wear and tear", trauma, and genetic predispositions change the disc structure leaving it weakened. The weakness allows disc material to migrate outside the annulus margins. Lumbar regions of the spine account for approximately 95% of disc herniation cases every year (Al Qaraghli & De Jesus, 2021). Irritated nerve roots of the lumbar spine run through the spinal canal and connect to the sciatic nerve at the pelvis, often causing chronic radiating pain with movement. If the disc injury occurs in the neck area referred to as the cervical region of the spine, pain may radiate into the arms or down the spine. Nucleus pulposus herniations are reported at about 5-20 cases per 1,000 adults annually commonly affecting patients 30-50 years of age (Dydyk et al., 2021). Over 85% of cases involving patients with this problem will experience relief of symptoms within 6 to 12 weeks without treatment (Qaraghli & Jesus, 2021). Providing care to patients that do not heal without treatment will require all healthcare team members to collaborate, diagnose and treat the problem. Nursing care will aid the patient in recovering whether it be through conservative or surgical treatment options by providing education for cases less severe cases to prevent a recurrence. Patients will often require imaging studies depending on the severity of their injury. Commonly X-rays, MRI, and CT scans are used to look for any structural defects, localization of the damaged site, and

nerve involvement related to herniation (Harding et al., 2020, p.1487). Disc herniation injuries may affect the nursing community in general, with more patients requiring surgical interventions. Higher incidences of this type of intervention may put a strain on the number of available nurses specialized in orthopedic and neurological fields. Effective communication by the nurse on treatment plans to be followed including activity restrictions and education of their diagnosis is extremely important to ensure the best possible outcome and avoid an increased number of cases.

RISK REDUCTION/ TREATMENT OF THE PROBLEM

Preventing nucleus pulposus herniation may be challenging depending on the predisposition of the problem and will require ongoing education contingent on the patient's willingness to comply. Reducing the chance of a disc injury requires several simple actions or modifications in one's habits or lifestyle. Maintaining good posture, lifting with mindfulness to engage the core and use legs, avoiding twisting while straining muscles, engaging in exercise routines with proper form, and healthy weight management will reduce the possibility of a herniated disc complication (Dydyk et al., 2021). However, a disc herniation may happen suddenly or unexpectedly and conservative as well as surgical treatment interventions are available.

First-line treatments are primarily non-surgical. Physical therapy, epidural corticosteroid injections, and NSAIDs are examples of conservative treatment modalities commonly used. Initially upon injury physical therapy is not recommended as the tissues and nerves are in a state of distress. Exercising during the onset of injury or even reoccurrence of disc trauma may cause further harm further increasing pain and symptoms. It is recommended to begin physical therapy treatments after a short course of rest and until symptoms have lasted for at least three weeks (De Cicco & Camino Willhuber, 2020; Al Qaraghli & De Jesus, 2021).

This type of therapy will promote healing and strengthen core muscles to support the intervertebral discs within the spine. Prescribing pain medications such as anti-inflammatories before opioids analgesics is the preferred line of pain management due to the risk and side effects of dependency. If prescribed a course of opioids the nurse should educate the patient on risks while taking the medication. Assessing and confirming the patient's understanding of its actions, dosage, and adverse effects to avoid misuse should be conveyed with strict compliance (Herniated intervertebral disk, 2021).

Some patients may not benefit from surgery and as a last resort will require surgery to decompress the herniated disc and involved nerve. A laminotomy with discectomy is a common surgical procedure to treat radiculopathy (pinching of a nerve root) or myelopathy (compression of the spinal cord). Performed as an outpatient procedure, orthopedic surgeons or neurologists will remove part of the lamina to access, remove, and decompress the protruding disc affecting the nerve root. Surgical intervention is often associated with improved long-term outcomes, however, complications associated may include nerve root damage, infection, and recurrent disc herniation (Al Qaraghli & De Jesus, 202; Dydyk et al., 2021; Harding et al., 2020, p.1488).

Prevention and treatments of nucleus pulposus require healthcare team members to provide education and resources to patients under care for this problem. Encourage healthy lifestyle choices such as an exercise routine while emphasizing conscious nutritional intake and weight management. Information provided on these topics would aid in the prevention of injury and support the patient in avoiding medical treatment.

REFLECTION

During the time spent researching this topic, the information available was abundant. Sciatic and back pain associated with a disc herniation is found to be extremely prevalent in the community and requires timely intervention by healthcare professionals. Through my research,

I learned that although there are typically a high number of cases each year the body works in amazing ways to heal itself naturally. There are also many conservative measures of care to aid in the healing process. Researching this problem allowed for a better understanding of the anatomy of the disc and its fragility especially with age. Educating at-risk patients was found to be necessary through recognition of signs and symptoms which, if left untreated may result in serious irreversible damage. Some anticipated challenges implementing what I have learned include the reluctance for a patient to participate in their recommended prevention and treatment plan. Deficient knowledge on the problem is another obstacle I also expect; however, researching this topic has given me sufficient background needed to teach patients what symptoms to report, common treatments, and when surgical interventions are necessary as a last resort.

CONCLUSION

In synopsis, nucleated pulposus herniations are a common complaint within the community, however, there are many resources available to reduce and treat the number of cases prevalent. Healthy lifestyle choices will decrease risks associated with disc herniations and nursing guidance to educate patients should be available. It is important to encourage patients to seek medical advice, especially when neurological symptoms as previously described are evident. Understanding the risk factors to developing a disc herniation will aid the patient in preventing injury. Using evidence-based treatments will provide the best possible care for patients and community members. Collaboration with interprofessional team members and effective communication techniques are crucial elements for a positive outcome in the diagnosis of nucleated pulposus herniations.

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