

Three-level cervical disc herniation

Case report and review of the literature

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Abstract: Multilevel cervical degenerative disc disease is well known in the cervical spine pathology, with radicular syndromes or cervical myelopathy. One or two level cervical herniated disc is common in adult and multilevel cervical degenerative disc herniation is common in the elderly, with spinal stenosis, and have the same cause: the gradual degeneration of the disc. We report the case of a patient with two level cervical disc herniation (C4 – C5 and C5 – C6) treated by anterior cervical microdiscectomy both levels and fusion at C5 – C6; after five years the patient returned with left C7 radiculopathy and MRI provided the image of a left C6 – C7 disc herniation, he underwent an anterior microsurgical discectomy with rapid relief of symptoms. Three-level cervical herniated disc are rare in adults, and the anterior microdiscectomy with or without fusion solve this pathology.

Key words: anterior cervical microdiscectomy, cervical radiculopathy, surgery in different time points, three-level cervical disc herniation.

Introduction

The most common cause of a cervical disc herniation is the degeneration of the cervical intervertebral disc, sometimes a cervical herniated disc can occur after a cervical trauma. Usually the patients present isolated neck pain or arm pain or typically cervical radiculopathy, in rare cases a large cervical disc herniation can cause paraplegia, bladder incontinence and it is a surgical emergency. The multilevel cervical degenerative disc disease is accompanied by formation of bone spurs and osteophytes of the facet joints and hypertrophy of the ligamentum flavum with cervical stenosis or cervical myelopathy. Medical exploring using cervical MRI defines the diagnose of herniated disc or of spinal stenosis and neurologic compression.

Concerning the cervical herniated disc, the annual incidence is of 5.5/100,000 people, the

most frequent level involved is C5-C6, followed by C4-C5 and C6-C7 and most patients are in the fifth decade of age. Surgery remove the compression of the cervical nerve root with the relief of symptoms. Surgical treatment can be anterior cervical microdiscectomy and/ without fusion or microscopic posterior cervical foraminotomy. The outcome is generally very good with rapid relief of symptoms and return to normal activities. We report the case of a patient with two level cervical herniated disc , C4 – C5 and C5 – C6, treated by anterior cervical microdiscectomy both levels and fusion at C5 – C6 and after five years he returned with left C7 radiculopathy and MRI provided the image of a left C6 – C7 herniated disc and the surgical approach was an anterior microsurgical discectomy.

Case report

A 43-year-old man presented for neck pain radiating to his right arm and forearm, also numbness and tingling along with pain radiate to the thumb side of the right hand and weakness of his right hand. These symptoms occurred after a physical effort performed two months ago and he reported the pain and the weakness increase last three weeks. Physical exam found a diminished right brachioradialis reflex.

A magnetic resonance imaging (MRI) scan showed two level cervical herniated disc herniation: right C4 – C5 herniated disc and median C5 – C6 disc herniation (Figures 1, 2, 3).

An anterior cervical approach was performed: microdiscectomy both levels and fusion at

C5 – C6 with rapid relief of symptoms and the patient returned to work in a month.

Five years later, at age 48 years, the patient returns with neck pain, left arm pain and numbness in left middle finger appeared a week ago, and physical exam find a diminished left triceps reflex. A new magnetic resonance imaging (MRI) scan showed a left C6 – C7 disc herniation (Figures 4, 5). He underwent a new anterior cervical approach with microsurgical discectomy of left C6 – C7 disc herniation without fusion, without complications and with relief of symptoms.



Figure 1 - MRI scan: Right C4 – C5 herniated disc



Figure 2 - MRI scan: Right C4 – C5 herniated disc and median C5 – C6 disc herniation

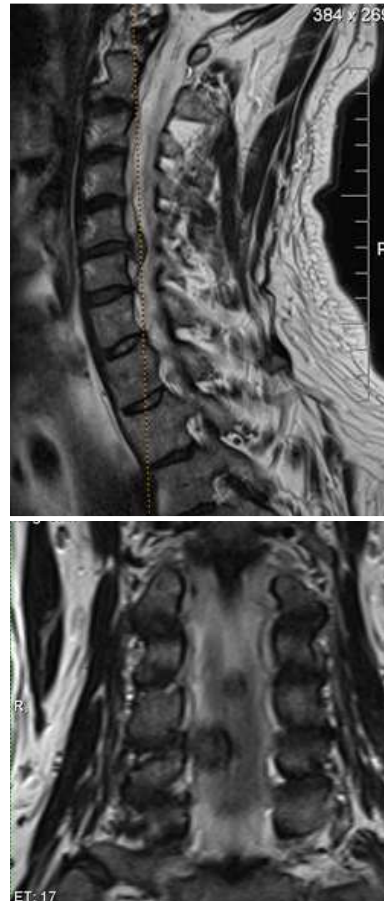


Figure 3 - MRI scan: Right C4 – C5 herniated disc and median C5 – C6 disc herniation



Figure 4 - MRI scan: Left C6 – C7 herniated disc

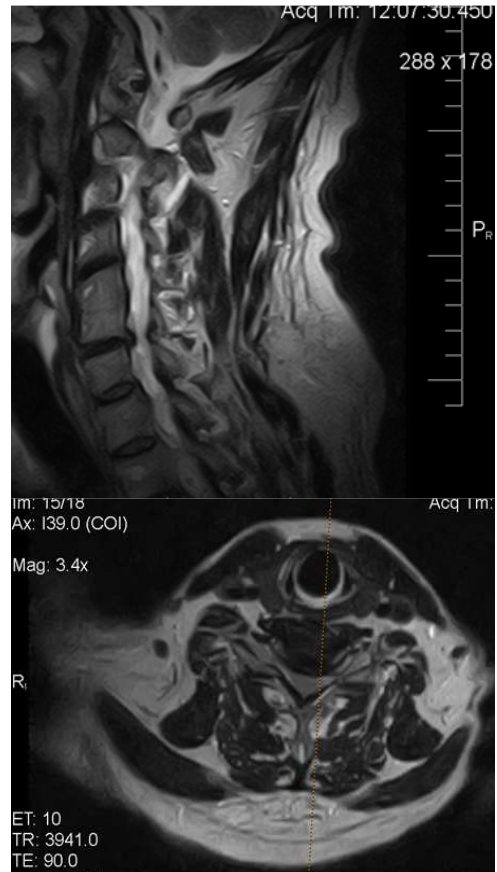


Figure 5 - MRI scan: Left C6 – C7 herniated disc

The patient had complete resolution of all the symptoms after 6 weeks and he was able to return to his work.

Discussion

Cervical disc herniation occurs when the nucleus pulposus herniates through the annulus fibrosus caused by overstress on the normal intervertebral disc or repeated excessive stress on the degenerate intervertebral disc. Symptoms of cervical herniated disc may include neck pain, unilateral arm pain that radiates down to the hand or fingers, numbness or tingling in the arm or hand, unilateral weakness etc. Magnetic resonance imaging

(MRI) examination of the cervical spine is performed and shows the disc herniation, the possible neural foraminal stenosis or central canal stenosis, also the cervical cord. Treatment can be nonoperative (medications and rehabilitation) and surgery: anterior cervical discectomy with or without fusion, posterior foraminotomy or cervical total disc replacement, whose indications are controversial.

Our case presented symptomatic simultaneous three-level disc herniation in the cervical, which were operated on at two different timepoints: first two level cervical disc herniation (C4 – C5 and C5 – C6) treated by anterior cervical microdiscectomy both levels and fusion at C5 – C6 and after five years the patient underwent the second anterior microdiscectomy for a left C6 – C7 herniated disc.

Surgical attitude varies in literature from anterior cervical discectomy with or without fusion to posterior foraminotomy, laminoplasty or cervical total disc replacement.

Kawakami et al. presented one hundred thirty-six patients with two cervical surgical approaches: anterior decompression and fusion to treat patients with one- or two-level lesions without spinal canal stenosis and laminoplasty for patients with more than three-level lesions or spinal canal stenosis. The authors found no differences in recovery rate for patients between two groups.

Fraser and Härtl presented a metaanalysis of twenty-one papers including 2682 patients who underwent an anterior approach of the cervical spine: anterior cervical discectomy (ACD), ACD with interbody fusion (ACDF), ACDF with placement of an anterior plate system (ACDFP) and corpectomy with plate. The study evaluates the fusion rates, but it can note that there are a large number of anterior cervical discectomy without fusion in this series of 2682 patients.

Klaiber, von Ammon and Sarioglu studied

the anterior microsurgical approach for degenerative cervical disc disease on a series of one hundred-ninety-six patient operated by anterior microsurgical discectomy without graft. There were explored two-hundred-eighty-eight levels: 124 one level, 54 two level, 17 three level and 2 four level. They did not find significant differences between their patients and other published series with intervertebral autologous bone graft after disc removal, therefore they recommend “the anterior microsurgical discectomy without fusion as the treatment of choice”. They had only 17 patients with three-level disc herniation in a group of approximately two hundred patients.

We also usually used the anterior microdiscectomy for cervical herniated disc and anterior discectomy with fusion only in the cases with spinal instability.

Barbagallo et al. presented their series of twenty-four patients and they had seven patients with three-level anterior cervical discectomy for cervical degenerative disc disease.

Most cases of the literature are patients over 50 years and the cervical herniated discs occurred in the context of the cervical degenerative disc disease. The presented patient was of 43-year old at his first cervical approach for two level herniated disc and then he was of 48 years old at the second anterior cervical discectomy; the first was right herniated disc and a median herniated disc and the second approach was for a left cervical herniated disc on the lower level.

Cervical MRI did not show other cervical degenerative images and we can consider the cause of these disc herniation can be the over stresses of a quasi-normal intervertebral discs or of an incipient degenerate disc. For the C6 – C7 disc herniation we can consider also the block of the

C5 – C6 level and the mobility reduction at this level can lead to the degeneration of adjacent level.

Conclusion

Three-level cervical herniated disc are not common in adult without cervical degenerative disc disease and the overstresses of the intervertebral discs contributes to disc herniation. The diminution of the normal mobility on the adjacent level caused by the fusion can contribute to the degeneration of the intervertebral discs and then the third disc herniation at this patient.

The anterior cervical microdiscectomy with or without fusion for multilevel cervical herniated disc can solve this pathology.

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