

ANALYSIS OF THE RESULTS OF SURGICAL TREATMENT OF HERNIATED DISCS OF THE CERVICAL SPINE USING ANTERIOR DECOMPRESSION AND INTERBODY CAGE STABILIZATION

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ABSTRACT

The aim of the study was to study the results of surgical treatment of the cervical spine with anterior decompression and interbody cage stabilization.

Material and methods. An analysis of the immediate and remote (from 12 months to 5 years) results of surgical treatment using the anterior intercorporeal method was performed. spinal fusion (anterior cervical discectomy and fusion - ACDF) 57 patients with diseases of the cervical spine.

Results The treatment outcome was assessed based on clinical examination data in accordance with the Odom criteria, and the neurological status was assessed in accordance with the criteria proposed by the Japan Orthopedic Association (JOA).

Conclusions. A study of the long-term results of surgical treatment of patients with degenerative-dystrophic diseases of the cervical spine using the ACDF technique showed high efficiency, reliability and safety of anterior decompression and stabilization with titanium cages.

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Osteochondrosis of the cervical spine ranks second after the lumbar spine and is often found among able-bodied patients aged 25–60 years. The danger of osteochondrosis of the cervical spine is associated with a high risk of developing myelopathies with severe neurological disorders, which leads to a deterioration in the quality of life and high disability [5]. Today, there are many methods of surgical treatment of herniated discs of the cervical spine, including anterior cervical discectomy with interbody spinal fusion (anterior cervical discectomy and fusion — ACDF) is the "gold standard" for treating patients with cervical osteochondrosis. The ACDF technique was first described in 1955 by Robinson and Smith [2, 4, 10], then in 1956 Coward [9] modified it. According to vertebrologist surgeons, the ACDF technique is technically simple and its correct use is not accompanied by the development of postoperative complications. At the same time, with the introduction of new implants in vertebral surgery and the development of an evidence base, an active search is underway for the optimal technique and the best implant for the treatment of cervical osteochondrosis.

Over the past ten years, in vertebral surgery for interbody spondylodesis, so-called cage structures made of metal alloys have found wide application [2, 3, 8]. Obtaining primary reliable, optimal stabilization of the operated spinal -motor segment, allowing the patient to be activated in the shortest possible time without cumbersome external immobilization, is the main goal of stabilizing surgical treatment of the spine. The problem of reliable fixation is most



closely related to the choice of surgical access and material for the interbody spondylodesis [1, 6]. Cage structures meet these requirements. Over the past ten years, vertebral surgery for interbody spondylodesis, so-called cage structures made of metal alloys have found wide application [7]. The use of cages has dramatically increased the effectiveness of the ACDF interbody technique spondylodesis. Thus, the effectiveness of spondylodesis increased from 56% when using bone implants to 93% when using cages [4].

According to a number of authors, decompressive and stabilizing operations on the cervical spine should pursue the following goals:

- 1) adequate and safe decompression of intracanal vascular-nerve formations;
- 2) stabilization of the affected vertebral segment in a functionally advantageous position [6];
- 3) installation of an interbody implant to restore the height of the interbody space [1, 3, 4].

In order to improve the methods of interbody stabilization of the cervical spine, we have developed an original titanium cage, for which we have received a patent from the PV RUZ (No. FAP 00297 dated 06/25/2007).

The aim of the study was to investigate the results of surgical treatment of the cervical spine with anterior decompression and interbody cage stabilization of our own design.

Material and methods

The object of the study were 57 patients with degenerative instability of the cervical spine, treated in the vertebrology department of the Research Institute of Traumatology and Orthopedics of the Ministry of Health of the Republic of Uzbekistan in the period from 2012 to 2018. Of these, 41 were men and 16 were women. The average age of patients was 39 years. Most patients were of working age - from 30 to 55 years.

The distribution of patients by anatomical levels of the pathological process is as follows: at the level of C3 - C4 – 5 patients (11%), C4 - C5 — 6 patients (10.7%), C5 - C6 — 26 patients (45.6%), C6 - C7 — 20 patients (35%). Discogenic compression at one level was detected in 49 patients, at two levels — in 8. Myelopathy was detected in 33 patients and radiculopathy — in 14.

All patients underwent clinical examination (including neurological status), radiological and tomographic (CT, MRI, MSCT) methods and electroneuromyographic studies (Neurosoft - MVP Russia).

In order to decompress the spinal cord and nerve elements, all patients underwent surgical intervention in the amount of anterior interbody decompression of the spinal canal with a crown burr and interbody stabilization with a titanium cage of the cervical spine.

Results

Remote treatment results for periods from 1 year to 5 years were studied in 57 patients after surgical treatment. The results of surgical treatment of cervical spine stenosis were assessed in accordance with the Odom criteria, VAS and the Japanese Orthopedic Association (for the leading syndrome of cervical myelopathy, the Japanese scale was used). Orthopedic Association (JOA).

They were assessed from the initial state according to the neurological status, the state of the musculoskeletal functions of the cervical spine, the position of the anatomical and biomechanical axis of the operated spinal motor segment.

In X-ray examination at a later date, all patients showed signs of interbody space formation. spondylodesis.

According to the Odom criteria, an excellent result is considered to be the absence of all preoperative symptoms and pathological signs, which were observed in 18 (38%) patients in a separate period after surgery.

A good result was considered to be minimal preservation of preoperative symptoms, improvement or preservation of pathological signs. A good result was obtained in 21 (44%) patients.

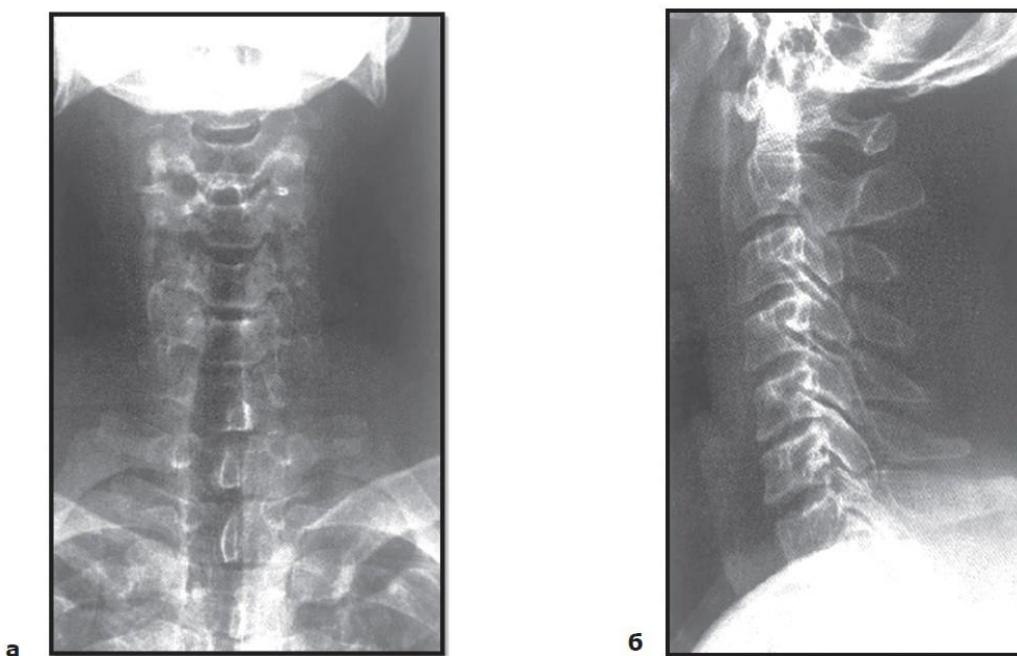
A satisfactory result was found in 7 (15%) patients, which was characterized by a certain improvement in preoperative symptoms, other pathological signs did not change or improved slightly.

An unsatisfactory result was obtained in 1 (4%) patient, in whom the symptoms and pathological signs of cervical spine stenosis did not change.

As a clinical example, we present the following observation. Patient R., 54 years old, diagnosis: herniated disc C5-C6. She has been ill for several years, has repeatedly received conservative treatment. Objectively, the cervical lordosis is smoothed, the paravertebral muscles are tense, active movements in the cervical spine are limited, pain on palpation at the level of C5 - C6, the pain spreads to the left upper limb. Also noted is decreased sensitivity in the innervation zone of C6 and muscle hypotrophy. Tendon reflexes are reduced (Fig. 1).

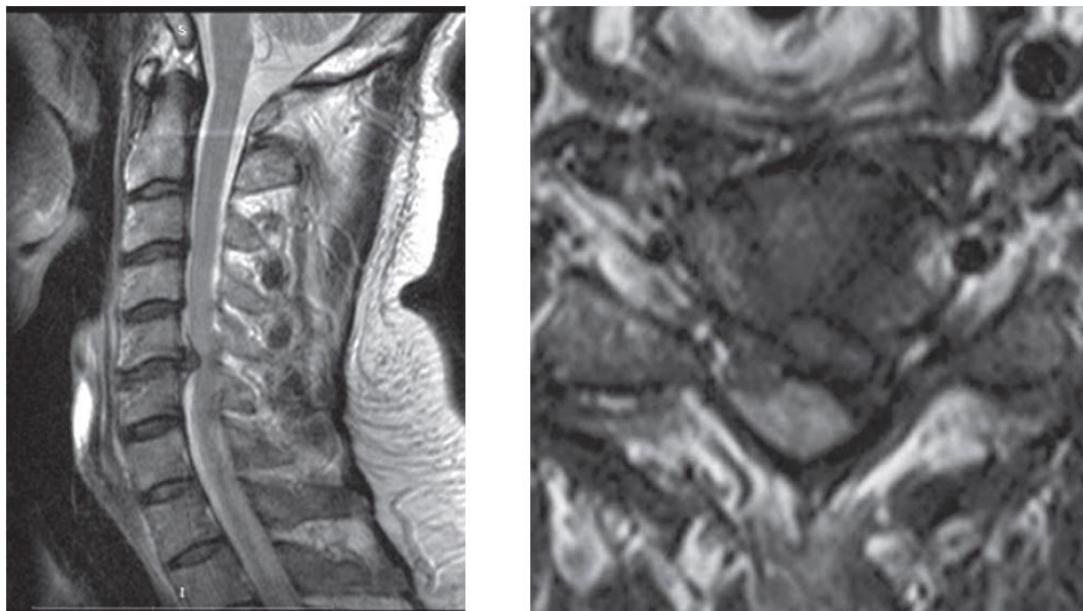
Figure 1. Spondylogram of the cervical spine before surgery: a - direct projection; b - lateral projection

Figure 1. Spondylogram of cervical spine before the operation: a — frontal projection; b - lateral projection



MRI and X-ray show signs of cervical osteochondrosis. Cervical lordosis is smoothed. Narrowing of the intervertebral space C5 - C6. Herniated intervertebral disc C5 - C6. Spinal canal stenosis at the level of C5 - C6 (Fig. 4).

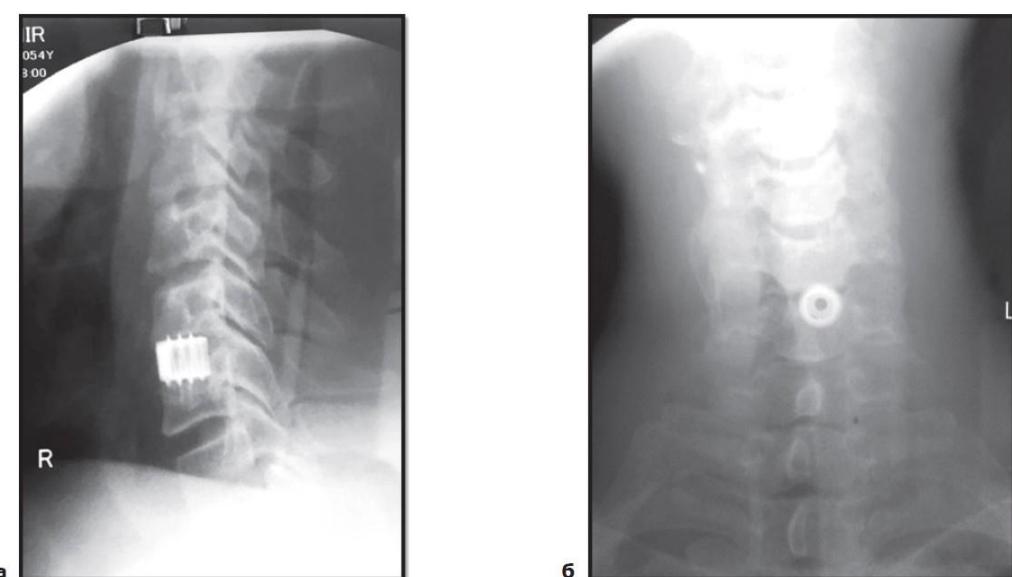
Figure 2. MRI tomograms of the cervical spine **Figure 2. MO tomograms of cervical spine**



discectomy operation of C5 - C6 was performed, with stabilization of the spinal motor segment with a titanium cage . In the postoperative period, the wound heals by primary intention. External immobilization of the neck with a rigid corset for a period of 1 month.

After 3 months, there are no complaints. Formation of a bone-metal block at the level of C5-C6 is noted. Complete regression of neurological symptoms, the spinal axis is normal (Fig. 3).

Figure 3. Spondylogram of the cervical spine after surgery. Segments C5 - C6 are fixed with a titanium cage of our own design by anterior interbody spondylodesis: a - direct projection; b - lateral projection



Conclusions



The study of remote results of surgical treatment of patients with degenerative-dystrophic disease of the cervical spine by the ACDF method showed high efficiency, reliability and safety of anterior decompression and stabilization with titanium cages. As a result of the operation, decompression of the neurovascular structures of the spinal canal was eliminated, stable fixation was achieved, positive dynamics in neurological symptoms were noted. The technique of anterior spondylodesis of the cervical spine is simple and effective and with minimal complications if performed correctly.

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