AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences
Volume 3, Issue 11, 2025 ISSN (E): 2993-2149

Results of Discectomy and Implantation of Peek Intervertebral Keys for Cervical Disk Herniation

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Abstract: Cervical osteochondrosis is the second most common disease after lumbar osteochondrosis and most often occurs in patients of working age 25–60 years [1]. The risk of herniated discs in the cervical spine is associated with a high probability of developing myelopathy, which leads to serious neurological disorders, decreased quality of life, and disability. The cervical segment of the spinal column is a complex anatomical and biomechanical structure. It exhibits the highest degree of mobility among all spinal segments, making it a pivotal component in the preservation of overall sagittal balance and functional integrity [2]. The curvature of the cervical segment is shaped by a range of factors, such as muscle tone distribution in the neck and shoulder girdle or the shape of the thoracic and lumbosacral segments. The curvatures of individual spinal segments influence each other. Regrettably, similar to other spine regions, the cervical segment is susceptible to degenerative alterations that may necessitate surgical intervention. The primary aim of the treatment for degenerative disc disease of the cervical spine is to decompress neural structures and pre serve the former height of the disc space and foramina. Anterior cervical discectomy without the simultaneous insertion of a graft or cage is not recommended because there is a possibility of future instability and kyphotic malalignment of the cervical spine [3]. Anterior cervical discectomy and fusion (ACDF) is currently the gold stan dard for surgical treatment of degenerative disc disease of the cervical spine. An interbody implant should have a size that produces a tight interference fit and maximizes the dimensions of the graft–vertebral body interface. Popular methods include an ACDF using a standalone cage or a cage with a cervical plate. However, it is still debatable whether a plate is necessary for enhanced treatment ment outcomes [4]. Both methods have their advantages and disadvantages. Most surgeons believe that plating is not necessary for single-level surgery, but operations on multiple levels require additional strengthening of the fixation obtained using a cervical plate. This paper reviews current literature reports, with insight added from the au thors' experience. Anterior cervical plates may increase interbody fusion rates and stability, maintain or improve cervical sagittal alignment, and prevent subsidence, particularly in multiple-level ACDFs [5]. However, anterior plating may also be associated with potential disadvantages and complications. The complications associated with plate fixation consist of esophageal soft tissue damage, neurovascular injuries and dysphagia. The success of surgery for cervical disc disease depends fundamentally on the appropriate decompression of neural structures.This is the main determinant of postoperative clinical improvement measured using scales which show changes in pain intensity and quality of life [6].

Target: Analysis of the results of surgical treatment of the cervical spine using anterior decompression and the intercorporeal cage stabilization developed by us.

Materials and methods. The object of the study were 57 patients with degenerative cervical spinal stenosis, treated in the neurosurgical department of the multidisciplinary clinic of

Samarkand State Medical University in the period from 2023 to 2025. Of these, 41 were men and 16 were women. The average age of the patients was 39 years. Most patients were of working age, that is, from 30 to 55 years old. The distribution of the pathological process by anatomical levels was as follows: at the C3-C4 level - 5 patients (11%), at the C4-C5 level - 6 patients (10.7%), at the C5-C6 level - 26 patients (45.6%), at the C6-C7 level - 20 patients (35%). Discogenic compression was detected in 49 patients at one level, myelopathy at two levels in 8 patients, radiculopathy in 33 patients, and radiculopathy in 14 patients. All patients underwent a clinical examination (including neurological assessment) and neuroradiological examinations (MRI, MSCT). To ensure decompression of the spinal cord and neural elements, all patients underwent surgical intervention involving anterior intercorporeal decompression with a crown burr and intercorporeal stabilization of the cervical spine with a PEEK cage manufactured on our 3D printer.

Results. Long-term treatment outcomes were studied in 57 patients, ranging from one to five years after surgery. The results of surgical treatment for cervical spinal stenosis were assessed using the Odom criteria, the VAS (visual analogue scale), and the Japan Orthopaedic Association criteria (the JOA scale was used in the presence of an underlying syndrome, cervical myelopathy). The initial neurological status, musculoskeletal function of the cervical spine, and the anatomical and biomechanical axis of the operated spinal segment were assessed. At long-term follow-up, radiographic examination revealed signs of interbody fusion formation in all patients. According to Odom criteria, an excellent outcome was considered complete resolution of all preoperative symptoms and pathological signs. Postoperatively, this outcome was observed in 18 patients (38%). A good outcome was defined as minimal persistence of preoperative symptoms and improvement or absence of changes in pathological signs. A good outcome was observed in 21 patients (44%).

A satisfactory outcome was observed in 7 patients (15%). This was characterized by some improvement in preoperative symptoms, but no change or only minor improvement in other pathological signs. An unsatisfactory outcome was observed in 1 patient (4%). In this patient, symptoms and pathological signs associated with cervical spinal stenosis remained unchanged.

Conclusion. Remote results of surgical interventions using the ACDF method in patients with degenerative-dystrophic diseases have demonstrated high efficiency, reliability and safety. An ideal replacement for natural components of the human body does not exist, even though increasingly more refined solutions appear every year. A comparison of the outcomes of standalone cage and cage + plate procedures should separately analyze radiological and clinical outcomes. Both methods have their advantages and disadvantages. Overall, radiological outcomes are slightly better following cage + plate procedures, while clinical outcomes are comparable.

Literature review

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