

DEVELOPMENT OF CICATRICIAL ADHESIVE EPIDURITIS AND EPIDURAL FIBROSIS

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Abstract.

Herniated intervertebral discs are considered one of the most common pathologies. Despite the improvement of modern surgical methods for their treatment, the problem of postoperative complications remains relevant.

In this article, we set ourselves the goal of studying and highlighting the causes of recurrence of radicular pain syndrome after discectomy. As you know, a correct diagnosis is the key to successful treatment. Considering the polyetiological nature of the recurrence of radicular pain syndrome after discectomy, in our opinion, the study will be useful not only for vertebrologists, but also for neurologists, neurosurgeons and traumatologists.

Keywords: discectomy, failed back surgery syndrome, radicular pain syndrome, etiopathogenesis, epidural fibrosis, relapse

ЧАНДИҚ-ПАЙВАНДЛИ ЭПИДУРИТ ВА ЭПИДУРАЛ ФИБРОЗ РИВОЖЛАНИШИ

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Аннотация.

Умуртқалар аро диск чурраси кенг тарқалган патологиялар қаторига киради. Уни даволашда кўлланилаётган замонавий жаррохлик усуллари бора-бора такомиллашишига қарамай, халигача ташрихдан кейинги асоратлар муаммоси долзарблигини йўқотмаяпти.

Ушбу мақолада биз дискэктомиядан кейин илдизчали оғриқ синдромини қайталаниши сабабаларини ўраганиш ва ёритишни олдимизга мақсад қилиб қўйдик. Маълумки, тўғри қўйилган ташхис самарали даволашга замин бўлади. Оғриқ синдроми қайталаниши полиетиологик ҳолатлигини инобатга олиб ушбу ўтказилган тадқиқот нафақат вертебрологлар, балки невропатолог, нейрохирург ва травматолог-ортопедлар учун фойдали бўлади деб хисоблаймиз.

Калит сўзлар: дискэктомия, failed back surgery syndrome, илдизча оғриқли синдроми, этиопатогенез, эпидурал фиброз, рецидив.

РАЗВИТИЕ РУБЦОВО-СПАЕЧНОГО ЭПИДУРИТА И ЭПИДУРАЛЬНОГО ФИБРОЗА

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Аннотация.

Грыжи межпозвонковых дисков считаются одной из распространенных патологий. Несмотря на совершенствование современных хирургических методов их лечения, проблема послеоперационных осложнений сохраняет свою актуальность.

В данной статье мы поставили перед собой цель изучить и осветить причины рецидива корешкового болевого синдрома после дискэктомии. Как известно, правильный диагноз – залог успешного лечения. Учитывая полиэтиологичность рецидива корешкового болевого синдрома после дискэктомии, по нашему мнению проведенное исследование будет полезно не только вертебрологам, но и невропатологам, нейрохирургам и травматологам-ортопедам.

Ключевые слова: дискэктомия, failed back surgery syndrome, корешковый болевой синдром, этиопатогенез, эпидуральный фиброз, рецидив

The number of operations on the spine is increasing, and the removal of intervertebral hernia is becoming a common operation performed in all neurosurgery hospitals [12, 16]. In the middle of the last century, the number of operations in the world was in the tens of thousands, but in 1970, 128 thousand people were operated on in the United States alone. For the period from 1979 to 2000. the number of operations increased by 65%. A similar situation is observed in other developed countries. However, the increase in surgical activity led to the emergence of a number of complications, which later became known as "failed back surgery syndrome "(FBSS). The large number of degenerative diseases of the spine, the active surgical position, the development of postoperative complications, the duration of disability and the development of the disease among the working population certainly cause serious complications [3, 7, 20]. One of the most common causes of FBSS is postoperative scar-graft adhesive epiduritis (SGAE), which is the reason for reoperations in 52.3% of cases.

Postoperative SGAE is a polyetiological and multifactorial pathological process, resulting in the formation of epidural fibrosis around the dural sac and neurovascular formations of the spinal canal in the postoperative period [21]. SGAE is a common condition in people who have had spinal surgery. Epidural

fibrosis is an unpleasant complication that is difficult to treat with conservative and surgical methods [17, 19].

It is characterized by varying degrees of neuropathic pain. In the postoperative period, its frequency is from 10 to 40%. Repeat surgery for scar tissue usually leads to unsuccessful surgical outcomes, unlike primary disc herniation [4, 13]. In 100% of cases during repeated operations, a graft process is detected in the epidural space. According to the literature, there is a correlation between epidural SGAE and radicular pain. A controlled, randomized, blinded, multicenter study by some authors showed that patients with severe epidural fibrosis had 3.2 times more recurrent radicular pain compared to patients with less scarring [6, 10, 18]. A correlation between the severity of scar - graft changes and the duration and severity of the disease was also noted. B.V. Drivotinov analyzed the results of surgical treatment of 200 patients and found that 19.8% of patients with a disease lasting up to 6 years, 86.5% of patients with a disease lasting more than 6 years, and SGAE were observed [1]. 18.8% of patients had exacerbations lasting up to 3 months and 80.9% lasting more than 3 months. In the literature, there are studies describing the asymptomatic course of epidural fibrosis, but it is not clear why epidural fibrosis does not manifest itself clinically [5, 11]. This may be due to the lack of high specificity and sensitivity of existing imaging and diagnostic methods for this process. There was a very low percentage of detection of scar changes using common instrumental research methods: MRI (4.8%), CT (3.1%), ENMG (1.3%) [11, 15].

At the same time, we did not find any literature data on age, gender and ethnic standards for visualization of this pathology. However, it is important to assess the condition of the lumbar spine after surgery. The choice of further treatment tactics for the patient depends on the correct interpretation of the detected changes [8]. It is known that the clinical and pathomorphological manifestations of this nosology are very variable. For example, the use of a research method such as epiduroscopy shows that the prevalence of severe epidural fibrosis in FBSS is significantly higher than that usually reported in MRI evaluations [14]. Remember that patients with severe epidural fibrosis cause problems for the attending physician in the diagnosis and choice of treatment tactics, and the diagnosis of clinical arachnoiditis is mainly a "diagnosis of despair". In their report, the authors noted that adhesive arachnoiditis remains a largely unknown, underreported, and underrecognized disease [2, 9]. Intraneural fibrosis cannot be detected by modern imaging

methods and can only be confirmed pathomorphologically, and therefore it is important to correctly assess the clinical and neurological picture. A functional diagnostic method was proposed in the form of the ENMG index, which describes different levels of motor and sensory innervation in patients with SGAE [10].

The term "arachnoiditis" refers to chronic inflammation that occurs within the MCP, while epidural fibrosis is scarring on the outer side of the dural sac [1, 5, 19, 21].

K. Miaki et al. in 1999, in an experiment, by disrupting the supply of nutrients to the nerve roots through the subarachnoid space, they showed the harmful effects of the obliteration process on the roots of the cauda equina [7]. By completely eliminating this space at the level of the cauda, the transfer of glucose from the cerebrospinal fluid to the roots of the tail of the horse is reduced by 72% compared to normal. The authors concluded that pathological changes occurred at the level of the cauda equina secondary, associated with malnutrition and possible neurodegeneration, and if the spinal cord is affected, the areas that show such changes are areas of ischemic damage, myelomalacia (softening of tissues) and cyst formation [9].

The arachnoid membrane occurring with lumbar-sacral arachnoiditis - were described in 1978 [5]. The first stage is inflammation of the soft and arachnoid membranes with hyperemia and swelling of the roots. The second stage - arachnoiditis, is characterized by the proliferation of fibroblasts and collagen deposition [18]. At this stage, the nerve roots attach to each other and to the dural sac. The third stage is adhesive arachnoiditis, including complete encapsulation of the nerve roots, followed by crushing leading to atrophy. Scarring prevents contact with cerebrospinal fluid in this area [12, 17]. Severe adhesive arachnoiditis can be obliterative, completely preventing the flow of cerebrospinal fluid in the affected area (and therefore the loss of dural impulse). Complete encapsulation of nerve roots, their hypoxia and progressive atrophy occurs [20]. The overlap or adhesion of the roots occurs mainly in the dorsal segments. The exact timing of these three stages is not clear. Some authors noted that scars can limit the mobility of roots, which increases their sensitivity to tension, as well as a decrease in blood flow in roots - (ischemia) and causes additional damage [7, 9].

Many researchers believe that epidural fibrosis is less clinically significant than arachnoiditis, but nerve root compression caused by epidural fibrosis can cause similar clinical problems, such as back and leg pain, sensory

disturbances, and paresis. Epidural fibrosis differs from arachnoiditis in that it is a localized problem affecting only one or two nerve roots and is usually a postoperative phenomenon, although it can also occur as a result of invasive processes such as hemonucleolysis [3, 15]. Epidural fibrosis is common in arachnoiditis, but the inverse relationship is not usually recognized, so patients may be diagnosed with epidural fibrosis but -may not be diagnosed when arachnoiditis is clinically apparent [12].

of epidural fibrosis, scar tissue formation is a normal part of wound healing in response to trauma, even if induced by surgery. The wound process is an example of the relationship between cellular elements operating in a limited area and is associated with many reactions of the body in the form of dysfunction of the nervous and endocrine systems, the development of shock states, etc. [11]. The wound healing process is always cyclical and is characterized by phases (three periods: recovery, reproduction, scarring) in accordance with the functional, metabolic and structural changes at the site of damage and surrounding tissues. Wound healing proceeds according to general laws, but morphogenesis varies depending on the nature of the damage, the size of the defect, the presence of infection, and the type of damaged structure [13]. Although this process is defined and overdetermined, it is individual for each person and depends on many related factors, including genetic factors [8, 10].

They use and discuss different approaches to decompression of less traumatic formations for vascular-nerve formations of the spine, as well as algorithms of surgical techniques, and propose to complete the operation with plastic surgery [2].

A number of factors that may affect the formation of epidural fibrosis have been considered. Preoperative blood fibrinolytic activity was evaluated and it was concluded that the outcome of postoperative wound healing depends on the size of the surgical intervention and some fibrinolytic factors associated with poor clinical outcomes and, more specifically, epidural fibrosis according to MRI data [6]. This became the basis for the development of a method for predicting the development of epidural fibrosis before surgery. The use of this method takes into account a group of factors, and therefore there is no possibility to determine the high and low risk of developing epidural fibrosis in the postoperative period [4].

If we consider the history of the issue, some aspects of the anatomy, etiology, pathogenesis and pathophysiology of SGAE, we can note the high interest of researchers in defining the criteria [10, 17].

Currently, there are no clear clinical recommendations for examining patients and predicting complications after spinal surgery. Current imaging and diagnostic methods do not have high specificity and sensitivity for this process. However, epidural fibrosis is a dynamic process with periods of development, and it is important to understand which part of this process can be affected by timely methods of diagnosis, treatment and prevention, as well as how to predict the severity of the disease [3, 9].

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