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Research Article

Clinical Diagnosis and Tactics of Surgical Treatment of Combined Anomalies of Neural Tube Development

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• Spina bifida; Lipomyelocele; Tetring

Abstract

To study the clinical features of the complicated forms of spinal hernias in combination with other malformations of the central nervous system Research. The research work was carried out in the clinic of the Children's National Medical Center. The work is based on the data of 25 patients with various forms of abnormalities of the central nervous system. Based on comprehensive studies, 55% of cases revealed various concomitant pathologies of the development of the neural tube. Full-fledged correction of the entire oral tube allows you to achieve the desired results.

INTRODUCTION

The frequency of cases in the population, the polymorphism of clinical manifestations and the complexity of surgical treatment of spina bifida commplicata (lipomas), attracts the attention of many scientists from around the world. Gradually, persistent progressive neurological symptoms observed in lipomatous processes in conditions of fixed spinal cord syndrome alarm neurosurgeons in choosing the time, nature and tactics of surgical admission. According to E.V. Syrchin (2005), the progression of focal neurological symptoms is usually not observed during neonatal and early childhood. By the end of the first year of life, a delay in the physical development of children is visibly noticed with the gradual progression of spastic paresis of the lower extremities, curvature and reduction of the foot, tension of the Achilles tendon, restriction of active movements. At the time of the school and preschool period in 5-7 years, the above-mentioned complaints are joined by a violation of the function of the pelvic organs by the type of true urinary incontinence. In not

Of all lumbosacral malformations, spina bifida commplicata accounts for 35% (La Macra et al., 1997), and a fifth of them belong to lipomyelomeningocele. According to other authors (V.G. Voronov 2002; E.V.Syrchina 2005), lipomas occur in 11.5% to 16.2% of cases of all spina bifida. Very often, the concomitant pathology of spina bifida commplicata is an orthopedic anomaly, such as scoliotic deformities of the spine (%), double-sided or unilateral clubfoot (%), as well as congenital dislocation of the hip (%). In addition, in parallel with orthopedic diseases, patients often suffer from urological pathology – hemorrhagic cystitis (%), chronic pyelonephritis (%), urinary tract infection (%).

Many aspects of surgical treatment of spinal defects in the development of the neural tube are well developed. The standard situation, examination algorithm and surgical treatment of spina bifida commplicata is usually performed at the average age of 6-7 years, and in some cases patients are operated at the age of 20-30 years. Such a late treatment of patients is associated with a slow and gradual manifestation of the neurological picture of the disease.

Operations performed for this pathology, as a rule, do not completely eliminate the initial gross neurological deficit. As is known, in the case of membranous spinal hernias, surgical correction is performed as early as possible at an early age. In case of threats and ruptures of the hernial sac, the operation is performed as an emergency, according to vital indications. As for the tactics of surgical treatment of the lipomatous process, there are different opinions. Some authors believe that surgical intervention should be carried out as the focal neurological symptoms progress, while other researchers hold the opinion of earlier surgical intervention, before the progression of neurological symptoms [1-6]. In addition, the scope of surgical intervention is often limited to the removal of only

the extravertebral and extradural part of the lipoma, while only the cosmetic appearance of the patient changes. In such cases, the fixed spinal cord syndrome persists.

MATERIALS AND METHODS

The aim of our work was to improve the results of surgical treatment of lipomyelocele by improving the diagnostic process and pathogenetically sound surgical tactics. Materials and methods of research. Our clinical observations are represented by 25 patients (14.1%), of all patients with spina bifida complicated by various lipomas who underwent examination and treatment in the period from 2015-2023 at the clinic of the National Children's Medical Center (Table 1).

The patients were mostly under the age of one year and children 6-7 years old. Lipomas were most often found in females. In 13 cases, lipomas were located in the lumbosacral region, in 10 - on the lumbar, in 2 – on the thoracolumbar level. According to the localization of lipomyelocele, in 18 cases there were along the middle line and 7 lateralized more often to the left side (Table 2).

The patients underwent a comprehensive examination in addition to clinical and neurological examination, which included: spondylography and craniography, MRI of the brain and spinal cord, neuro-ophthalmological examination and neuropsychological testing, medical genetic screening, EEG, electrocerebellography, electro-neuromyography, somatosensory evoked potentials. Of the invasive examinations, the following were used: MSCT-perfusion of the brain and spinal cord, MSCT-hernio, myelo and cisternography. In almost all patients, spina bifida complicate was combined with other defects. Arnold-Chiari malformation was most often observed in 14 cases (55.5%). It is noteworthy to note that hypertensive hydrocephalus was not observed in patients with spina bifida complicate.

Table 1: Characteristics of patients by age and gender

floor	age periods				in total
	up to a year	from 1 to 3 years old	from 4 to 10 years old	over 10 years old	
boys	-	-	7	1	8
girls	6	2	6	3	17
in total	6	2	13	4	25

Table 2: The combination of spina bifida complicate with other anomalies

Anold-Chiari Malformation	10	55,5 %
Syringomyelia	1	5,5 %
Normotensive hydrocephalus	1	5,5 %
clubfoot	1	5,5 %
Intradural cysts	2	11 %

Surgical treatment was performed in all patients, and the combination with other anomalies required 2 or multi-stage surgical correction. When lipoma was combined with Arnold-Chiari malformation, the first stage was bone-dural decompression of the cervical occipital region, and the second stage was lipoma excision. Due to the absence of clinical manifestations of hydrocephalus and syringomyelia, surgery was not undertaken in relation to these anomalies

The principles of surgery of spina bifida of complicated forms included the following key stages: 1) mobilization of the extravertebral part of the lipoma and isolation of the hernial gate; 2) adequate access to ensure surgical reception and direct visualization at all stages of the intervention; 3) plastic surgery of the dura mater from the position of reconstruction of the subdural space 4) meningoradiculomyelolysis; 5); if possible, radical resection of the lipoma; 6) external drainage of the formed subdural cavity; 7) musculoskeletal fascia repair of a bone defect. The main stages of surgical intervention were performed using magnifying optics and microsurgical instruments.

Additional resection of the uninfected arches was performed in 9 children, laminectomy of 1-2 vertebrae was performed in 7. Radical resection of the adipose veins was successful in 2 patients. Subtotal lipoma resection was performed in 10 patients. Meningoradiculolysis is observed in 11 patients. The plastic of the hard shell with artificial material is made for 4 children

RESULTS AND DISCUSSION

After bone-dural decompression, as the first stage of surgical correction of the combined defect, the following changes were found: 1) improved sensitivity in the extremities and anogenital region was noted in 2 patients. 2) 3 children had urge to urinate and feces. 3) in 2 observations, a decrease in the feeling of heaviness in the legs was recorded. 4) in 1 case, the pain in the leg went away. In addition, in 2 patients, the consistency of the hernial sac became orthostatically dependent (in the horizontal position, the protrusion became pliable and soft, and in the vertical position it acquired a puffy shape). In two cases, short-term dizziness and rare vomiting were noted. After the reconstruction of the vertebro-medullary anomaly, the following changes were noted: 1) an improvement in sensitivity was observed in 2 cases; 2) an increase in the amplitude of movements - in 3; 3) improved control of pelvic organ function – in 4; 4) the spastic tone of the flexors of the toes was normalized - in 1; 5) improved trophic function

Thus, relatively little clinical material confirms the position that the diagnosis and treatment of spina bifida commplicata with lipoma is a complex, multi-stage and ambiguous process. Only following the principles of scrupulous detail and meticulous surgical strategy, complemented by physiological permissibility and technical capability, can to a certain extent provide an acceptable result.

CONCLUSIONS

1. Surgical correction of complex developmental abnormalities requires a complex of diagnostic studies, invasive and non-invasive methods. The use of available imaging methods makes it possible to plan the tactics of surgical treatment of congenital spinal hernias on a large scale

2. Treatment of combined developmental abnormalities requires sequential multi-stage surgical correction of complex abnormalities of the nervous system in conjunction with other malformations of the central nervous system.

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