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Microsurgical Release of Spinal Cord and Nerve Root in Old Sports Spinal Cord Injury

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Abstract: The spinal cord is an important part of the central nervous system and a carrier of information between the brain and external nerves. Old sports spinal cord injury is a serious neurological disease that is difficult to cure and can cause serious sequelae, and even cause patients with general paralysis and high paraplegia. It has become the number one public enemy in the medical world. Spinal cord and nerve root microsurgery are an effective way to treat old motor spinal cord injury. The purpose of this article is to solve some problems in the implementation of spinal cord and nerve root microsurgery, and analyze the specific effect of microsurgery on the treatment of old sports spinal cord injury. Microsurgery is used to loosen the spinal cord and nerve roots of the patient, follow-up and follow-up of the patient is carried out, and the treatment effect is studied. The results of the study show that, compared with traditional surgical treatment, microsurgery can relieve the spinal cord and nerve roots of patients by 22%, 86.3% of patients have significant spinal function recovery, and 78.6% of patients have significantly improved motor function. In 90% of patients, the nerve roots of the spinal cord segment felt significantly improved, which proved the correctness and feasibility of spinal cord and nerve root microsurgery for the treatment of old motor spinal cord injury.

1. Introduction

Spinal cord tissue injury (SCI) is a serious neurological chronic disease with a poor prognosis. Spinal cord injury has three major characteristics: high disease incidence, high surgical disability rate, and high consumption of medical resources. It has now developed into a global. Major medical technology problems. The spinal cord is the main information carrier for information communication between the human brain and the peripheral nervous system. After the spinal cord is injured, it often directly leads to brain damage below the horizontal level and makes sensory, motor, and other autonomic nervous system functions impaired or loss of intelligence. Old sports spinal

cord tissue injury is common in accidents caused by various sports. There are more than 3 million clinical patients with severe sports spinal cord injury each year in our country, and 150,000 to 200,000 new patients are added every year, mainly for young female patients, Bringing a heavy financial burden to their families and society.

Spinal cord injury Spinal cord injury, especially after the old sports spinal cord injury, how to promote the functional recovery of the spinal cord and nerve roots has been the subject of discussion in the medical field [1]. At present, most of the basic research and clinical practice reports on sports spinal cord injury focus on the acute stage of spinal cord injury, and there are few related studies on the surgical treatment of old sports spinal cord injury [2]. Although patients with old sports spinal cord injury have undergone early surgical treatment, the normal recovery of the root and joint function of the spinal cord and other neurons after operation is still not ideal. The team of medical experts in orthopedic surgery has conducted systematic anatomy clinical research and surgical medical exploration. It was found that spinal cord adhesion, fibrosis in the sclerotic meninges, and sclerosis, softening, and cyclization of the scars after spinal cord nerve trauma are the main reasons that seriously hinder the normal recovery of the function of the root and joints of the spinal cord and other neurons. And on this basis, pioneered the treatment of spinal cord and nerve root lysis and reduction surgery under the microscope to treat patients with old motor spinal cord injury, and achieved satisfactory clinical results [3].

In order to study the specific therapeutic effect of spinal cord and nerve root microsurgery of old motor spinal cord injury, this article consulted a lot of relevant data. Among them, Pereg gave a detailed introduction to the pathogenesis of old sports spinal cord injury, analyzed the current problems in the medical system for the treatment of old sports spinal cord injury, and elaborated the medical research methods and techniques for old sports spinal cord injury [4]. In his article, Attri proposed that in the case of today's medical technology has great limitations, the old sports spinal cord injury is still a kind of neurological disease that is difficult to cure. China has carried out many medical studies for this purpose, but the results have been minimal [5]. In the article, Villares elaborated the application principle and specific implementation process of spinal cord and nerve root microsurgery, and pointed out some defects and specific improvement methods of microsurgery [6]. Levine emphasized in the article that there is no mature medical technology to restore the function of a completely broken spinal cord. The treatment of spinal cord injury will be the key research direction of China's medical community [7]. Hill pointed out that the microsurgical release of spinal cord and nerve roots is currently the most effective way to treat old sports spinal cord injury, and it is worthy of promotion and application. This is of great significance for improving the quality of life of patients with spinal cord injury [8].

In the study of spinal cord, nerve root microsurgery of old sports spinal cord injury, this article summarizes and analyzes the research experience and achievements of a large number of predecessors. In addition, this article has made some innovations in the research content and research methods, specific innovations. There are the following points: first, this article uses immunohistochemistry and fluorescence detection for the first time to explore the therapeutic effect of spinal cord and nerve root microsurgery, and improves the accuracy of the detection results. Second, for the first time, based on the relevant neurosurgical physical examination and imaging assisted examination, after the specific diagnosis of spinal cord injury is clearly diagnosed, the spinal cord and nerve root lysis technique is used to treat the spinal cord injury syndrome. Third, this article is the first to use micro neurosurgical techniques to perform decompression and decompression on patients with laminectomy, loosen the cone and cauda equina nerves, and cut the terminal filaments of adhesion to achieve the purpose of clinical treatment.

2. Regenerative Repair Mechanism and Treatment

2.1. Spinal Cord Injury Regeneration and Repair Mechanism

In order to create a microbial environment in the area around the spinal cord injury that is very conducive to cell regeneration, the tissues in the spinal cord injury must possess certain self-healing and repairing capabilities. Unlike other neural tissues, after spinal nerve injury, the injured area will gradually form a highly persistent inflammatory neural microenvironment. Although there is a prolife able endogenous central nervous system stem cell that persists, due to inflammation The temperature limit of the sexual neurotic cannot differentiate into other functional central neurons, but may differentiate into a star-shaped reticular glial axon cell, which may form a high density that hinders the regeneration of axon cells. Astrocyte scars make the regeneration of other central nervous systems very difficult [9]. At present, the clinical research on the repair mechanism of acute spinal nerve injury cell regeneration function repair mainly focuses on the following two main aspects.

Analysis of the microenvironment cells of the brain after spinal cord injury: clinical researchers have found that after spinal nerve injury, there are multiple macromolecular proteins in the microenvironment cells after injury. Such as myelin-stromal-associated hormone-inhibitory regenerative protein, calcium sulfate, and chondroitin inhibition protein aggregation and axon-directed regeneration molecules can directly inhibit the axon-directed regeneration of spinal neurons through different neural signal transmission pathways. Further related studies have also found that in addition to directly inhibiting axon growth, myelin glial proteins in nerve microenvironmental cells of spinal cord injury can also function by promoting stellate neural stem protein cells to an astrocyte. Nerve differentiation directly inhibits its differentiation into astrocytes, which is also a correct explanation for the stellate neural stem protein cells in inhibiting the main neural differentiation of spinal nerve injury microcirculation area to become an astrocyte. The differentiation of fewer neurons into astrocytes provides an important theoretical basis. Recently, through the analysis of the signal expression profiles of different tissues of the rat spinal cord cell injury at different expression time periods after acute spinal cord injury, it was found that there are different time windows of genes with different differential signal expression changes in acute and old rat spinal cord injury obviously different, and there are obvious time differences between the different signal expression pathways whose main expression changes. Further comparison and analysis of tissue microenvironment and different tissue cytology at different expression time periods of spinal cord injury will be considered to be more systematic. To accurately reveal the changes of the microenvironment of rat spinal cord injury tissue [10].

Construction of spinal cord injury nerve regeneration microcell environment. It is to use biochemical materials, growth factors and neural stem cells to reconstruct a microcell environment conducive to nerve regeneration, and promote the recovery of the whole-body cross section and spinal vascular injury nerve function. This is an effective rehabilitation treatment strategy to treat spinal nerve injury. Early clinical studies have shown that the use of new embryonic spinal cord nerve joint tissue cell transplantation technology to repair embryonic spinal cord nerve injury can have good clinical results, suggesting that the microenvironment in the embryonic spinal cord nerve injury is directly transformed into the microenvironment in the embryonic development stage. It can help the regeneration and regeneration of embryonic nerve and joint tissues [11]. Related scientific research staff further research confirmed that multi-energy neuron and progenitor cell transplants that induce differentiation into spinal neuron vascular bundles and caudal cells may be better integrated with the host spinal cord cortex tissue, especially with the non-regenerating spinal cord cortex and spinal cord tissue establish effective synaptic connections. China has also made some

great progress in the use of bio-composite scaffold support materials combined with new regenerative nerve factor repair and construction of the microenvironment technology for the treatment of spinal vascular injury repair, such as promoting the use of new chitosan bio-scaffold materials equipped with nt5 bio composite new organisms. The support material scaffold promotes the use of endogenous spinal nerve repair and generation factors in adult patients to repair spinal vascular injury, avoiding medical ethics service disputes, immune system rejection adverse reactions and the huge risk of spinal cord tumors, and can use the data to transcribe the analysis results of this article. Reveals an important molecular mechanism for promoting nerve repair of spinal vascular injury: for example, the chitosan bio scaffold equipped with nt5-1 has the function of activating and promoting the endogenous spinal nerve repair in adult patients and it also promotes the cells of spinal blood vessels. It produces and effectively inhibits the growth and infiltration of spinal cord inflammation macrophages, which can play an important role in promoting the repair of spinal nerve injury repair regeneration factor.

2.2. Treatment of Old Spinal Cord Injury

Surgical treatment: Surgical treatment of sports spinal cord injury is the mainstream treatment method and has also been proven to be the best treatment method. For patients with intractable pain, frequent attacks, and old spinal cord injuries that affect the quality of life, there are currently three surgical methods.

(1). Decompression: Myelography shows that the nerve roots are squeezed by ruptured discs or fracture fragments. Laminectomy decompression or discectomy combined with fusion can solve this problem, and sometimes can selectively remove a few nerve roots that cause pain.

(2). Posterior amputation of the spinal cord: it aims to partially cut off the sensory conductive fibers to reduce pain. Some people advocate complete amputation of the spinal cord. Due to the large rupture of the operation, it must be carefully studied before the operation and the patient's consent must be obtained.

(3). Nerve root adhesion loosening surgery: the surgical method is to cut the injured dura from the beginning, loosen the arachnoid and pia mater fibrous scar zone, cut the mesh scar fiber between the dentate ligaments, and loosen the nerve root and spinal cord to the hard Meninges [12].

Cell transplantation therapy: CNS brain cell transplantation is a human progenitor stem cell that can mainly separate stem cells that produce central neurons and CNS glial cells, and can be isolated from human embryos and other adult mammalian central nervous motor tissue cells. After transplantation, it can diffuse and increase in cell culture in vitro, and can directly assemble and express a variety of exogenous cell genes. Its long-term existence in the central nervous motor system can help the early repair of brain injury of the central nervous motor system. Active nerve interfering somatic cells have the potential for self-functional replication, diversity and differentiation, and the ability to secrete a variety of active neuronal nutrient metabolic factors and other biological evolution characteristics, so they are considered to be ideal for repair. Synthetic materials for nerve cells from chronic spinal cord injury. In addition to brain nerve interfering with somatic cells, a large number of clinical experiments have been confirmed that transplanting. Schwann cells in some parts of the spinal cord after nerve injury can not only effectively support the regeneration of axon sheath, but also the stem cells of Schwann have been found to help damage nerves. The posterior myelin sheath structure is continuous but the axons that have undergone demyelination structural changes have remyelination or sheathing, thereby quickly restoring the ability to use electrical nerve transducers. Since the differentiation of nerve cell nuclei and axon guidance are equally important in these spinal cord tissue injuries and nerve repairs, it has been proposed many times that these nerves interfering somatic cells and olfactory unsheathing cells are

directly transplanted to these nerve tissue lesions through spinal cord scaffolds. In this way, they can complement each other and complement each other's deficiencies.

Drug therapy: researchers have found that 15% -35% of patients with spinal cord injury and acute paraplegia have permanent local spinal cord disability and central neuropathic chronic pain after spinal cord trauma. Pain can sometimes occur suddenly and repeatedly, and the paroxysmal episodes become more severe, and at the same time, it may be long-term and persistent. The pain point may only be located at the painful part of the spinal cord nerve injury, which may be caused by the root of the spinal cord neuron touching the injury site, or it may sometimes occur directly below the level of spinal cord injury. At present, the anti-inflammatory and analgesic drugs that people take mainly use inactive steroid hormone anti-inflammatory drugs, and the main side effect mechanism is mainly through inhibiting the normal synthesis of human prostaglandins. The current commonly used drugs for the treatment of acute spinal cord injury pain can be roughly divided into 3 categories. The first category is represented by pregabalin and gabapentin, and its curative effect on neuropathic pain has been confirmed. These two types of medicine can be used as first-line medicine for pain relief. Class 2 drugs are represented by tricyclic antidepressants, which are especially suitable for neuropathic pain associated with depression. Category 3 mainly refers to papaverines and lamotrigine. These drugs are mainly used for intractable pain and allodynia that are ineffective in categories 1 and 2. All in all, drug therapy is only an adjuvant therapy, which cannot eradicate the spinal cord injury disease, but can effectively reduce the pain of patients with old sports spinal cord injury.

3. Spinal Cord Injury Related Research

3.1. Research Object Selection

General information of the research subjects: this clinical study mainly selected 50 patients with old sports spinal cord injury who were diagnosed and treated in our hospital from August 2016 to August 2019, aged 37 to 65 years, including 33 males and 17 females' example. All patients have undergone early post-exercise posterior catheter decompression and nail-rod internal fixation, and found that there are old and serious sports legs with spinal cord injury to the spine of varying severity, and each patient was classified according to the IFRNK classification criteria. The severity of motor spinal cord injury is graded in order, of which 7 cases may belong to class A or a, 17 cases may belong to class A or b, and 10 cases may belong to class b or c. 16 cases may belong to class c or d, and 0 cases may belong to class d ore. Fifty patients with cervical spine were examined by abdominal x-rays or chest radiographs, and they all showed that the upper edge of the posterior wall of the vertebral body or the posterior wall of the vertebral body moved backward, and there was a certain degree of tissue inside the spinal cord oppressed and deformed. The duration of surgery from injury to micro valvular release is generally up to 24 months, the shortest is 6 months, and the average is 16 months.

3.2. Inclusion and Exclusion Criteria

Inclusion criteria: (1) Patients with definite diagnosis of obsolete motor spinal cord injury. (2) clinical manifestations of spinal sacral pain with/without intermittent weakness of both lower extremities$\leqslant$ 6 months, invalid after multiple treatments, resolutely requiring surgery patient. (3) Spine MR showed: low conic of spinal cord (lower than L1-L2) and/or thickened terminal silk (>2mm), spinal cord injury with lumbosacral dermal sinus; enlargement of the dura mater sac. There is a crack in the spine. (4) The patient agreed to undergo endoscopic and/or microscopic surgical treatment with informed consent.

Exclusion criteria: (1) Patients with dismembered or paralyzed limbs for many years due to old or non-motor or spinal nerve injury surgery, and who have severe ankylosis and atrophy. (2) The patient's urinary and motor functions are severely impaired and it is difficult to recover motor nerve function is completely restored. (3) There is no obvious symptom during the operation, and it is strongly supported by surgical patients who require non-surgical treatment and a specific type of surgical treatment with endoscopic or surgical microscope. (4) Surgical patients who are comorbid or have severe other organic joint diseases that cannot tolerate long-term treatment by other surgical methods. (5) Due to the complexity of the intraoperative lesions, they can be converted to other internal treatments that require surgical microscope or combined double-mirror surgery patients in the endoscopic group. (6) Patients with spinal canal inversion or space-occupying joint lesions larger than d>3 cm during the operation.

3.3. Preoperative Preparation

All patients with old sports spinal cord injury received general anesthesia with tracheal intubation and routine catheterization after anesthesia. A number of sponge pads are placed under the patient's body, especially the local bone protruding parts. It is recommended to use a pressure-proof sponge patch at the rib arch to reduce local pressure sores during surgery. The head is properly biased to one side to prevent twisting of the endotracheal tube. It is recommended that after the gauze is covered at the anal opening, the surgical adhesive towel is partially isolated to prevent local contamination. The use of intraoperative nerve electrophysiology detection is helpful to distinguish nerve tissue and tethered terminal filaments, which can assist in the identification of the two during surgery, and can achieve better surgical release effect.

3.4. Surgery Equipment

The main equipment used in this experimental research institute: Y1008 electronic balance, loosening surgical instrument, medical grounded surgical lamp, spinal cord injury device, SLM microscope observer, BX230 transmission electron optical microscope, 725B spectrophotometer, 786S ultraviolet spectrophotometer (Jiangsu Zhongdu Analytical Instrument), fluorescent display, PSCX imaging instrument, spinal cord injury analyzer, etc. Other auxiliary equipment and reagents are shown in Table 1.

Table 1. Other auxiliary equipment and reagents

Group	Usage amount	Source
Medical operating table	1	Nanjing First Hospital
Potentiometer	1	Xin He Hospital
Absolute ethanol	300ml	Shanghai Analytical Instruments
N-butanol	600ml	Caused by Jiangsu Feng Hua
Hydrochloric acid	1000ml	Gaohu Chemical Enterprise
Sulfuric acid	500mg	Japan Sanwa Kimono
Electrophoresis tank	1	Bosch, Germany

3.5. Surgical Procedure

The posterior spine of patients with old sports is incised, and the internal fixation surgery is the posterior approach. The spinal cord and the dura mater are completely broken. If the spinal cord and the dura mater are completely ruptured, use scissors to cut the hard cyst or scar meninges; those with continuous dura mater were cut longitudinally along the dura mater axis with a scalpel, revealing the proximal root of the spinal cord and the nerve roots in the positioning plane before

surgery, and the nerves with continuity of anatomy. One by one under the operating microscope from the beginning to the intervertebral foramen, complete sharp line release, thickened scarred dura without suture, covered with artificial dura mater or muscle flap. The wound is sutured conventionally, the drainage tube does not need negative pressure, and the drainage tube is promptly removed when there is a large proportion of bloodless drainage or content of cerebrospinal fluid.

3.6. Works after Surgery

After the operation, two anesthesia surgeons, surgical nurses, and itinerant surgery nurses are also required to jointly mobilize the two patients to steadily lift them back to the operating bed. One person should hold the head of one patient's torso in one hand. The patient's torso and the patient's torso are turned left and right at the same time, in order to keep the patient's neck fixed, and the head is turned axially. The out-patient clinic nurses follow up and check each patient's facial skin and other limb organ function abnormalities in detail, to ensure that all types of infusion pipelines are in place at any time, and record all the precautions that need to be handed over by the patients in the "Patient Surgical Handover Checklist". Work with the general nurses in all wards to do a good job of handing over information. After the operation is completed, statistical analysis software such as ASIA can also be used to perform quantitative statistical data analysis on the progress of complete recovery of the human spinal cord and spinal nerve function before and after decompression surgery, the time relationship between complete decompression and complete recovery of spinal nerve function, etc.

4. Analysis and Discussion of Microsurgical Release of Spinal Cord and Nerve Root

4.1. Spinal Cord and Nerve Root Microsurgery for the Treatment of Old Sports Spinal Cord Injury

The results of the study showed that 1 out of 7 patients with grade A died of systemic failure 1 year after surgery due to lung infection, 3 cases had multiple lower limb ganglion and root segment muscle function development improvement, and 2 cases had partial limb muscles. The development of joint function has been significantly improved. Among the 17 patients with grade b operation, all the functions of the upper limbs of the postoperative limbs have been significantly improved, and the functions of the lower limbs of the 6 patients have been partially improved. One patient had systemic failure due to complicated anemia 2 years later. Cause death. In group C, 10 second-class clinical patients showed significant improvement in motor function of upper and lower limbs. The 16 patients with graded showed significant improvement in the nerve function of the extremities after surgery. Among them, 14 patients were completely normal, and the remaining 10 patients had a large part of the remaining muscles with sensory abnormalities or local muscle weakness. One case had fungal infection at the bone incision taken from the inner side of the iliac bone of the neck after operation, and was effectively cured by antifungal infection treatment after local infusion drainage. Two cases of supragingival tongue appeared after the operation of the cervical vertebrae due to high cervical spine injury. The pain symptom of the nerve joint paralysis on both sides failed to be treated with special treatment, and all healed by follow-up. The relevant data of ASIA classification of patients after spinal cord and nerve root lysis surgery are shown in Table 2.

50 patients were followed up for 1-5 years (average 3 years) after operation. Among the 50 patients with old motor spinal cord injury, 42 patients had nerve root segments, and 35 patients had 1-6 nerve root segments. Motor function recovery (muscles dominated by the nerve roots in this segment recovered from grade 0 to grade III preoperatively in 22 cases; grade I recovered to grade

III preoperatively in 18 cases; grade II recovered to grade IV preoperatively in 15 cases). Twenty-five patients with sensory recovery of the nerve root innervation area of this segment reached S4, and the rest were S2. There was a significant improvement in the lumbar spine SPSM score before and 6 months after surgery. There was a significant correlation between the lumbar spine SPSM score before and 6 months after surgery. The surgery was effective in improving the normality of lumbar spine patients for more than 6 months after surgery. The score of SPSM at lumbar vertebrae time has microscopic statistical significance ($p<0.05$). There was a significant improvement in the overall score of lumbar intervertebral SPSM between patients who were followed up continuously before surgery and 12 months after two operations. The non-interrelated relationship of the surgery has a certain statistical significance for the initial improvement of the overall SPSM score of the lumbar vertebrae during the follow-up of the lumbar vertebrae 12 months after surgery ($p<0.05$). During the 6 months after the operation and during the first month after the first operation, the two patients were followed up for the score of SPSM in the lumbar vertebral space, and some patients in the clinical follow-up may have a certain significant improvement. The results of the study show that microsurgery of the spinal cord and nerve roots can improve the therapeutic effect of old sports spinal cord injury and promote the recovery of patients' exercise capacity. The relevant data is shown in Figure 1.

Table 2. Relevant data of ASIA classification of patients after spinal cord and nerve root lysis

Patient classification	Number of patients	Preoperative	Postoperative	Sports score
Class A	7	86±0.817	114±0.918	257±1.756
Class B	17	57±0.785	94±0.932	304±2.247
Class C	10	83±0.648	153±0.596	226±2.065
Class D	16	75±0.529	99±0.278	292±4.618

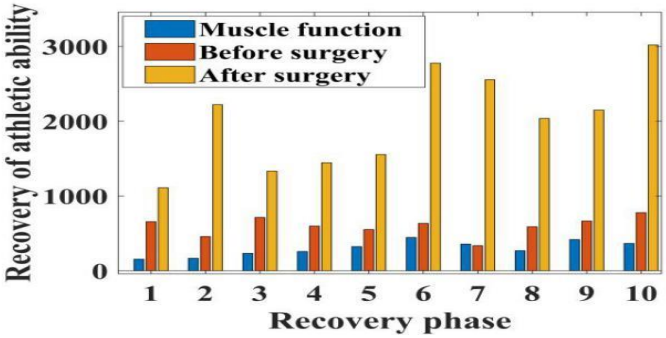

Figure 1. Spinal cord and nerve root microsurgery can improve the treatment effect of old sports spinal cord injury and promote the recovery of patients' exercise capacity

From the data in Figure 1, it can be seen that the spinal cord, compared with traditional surgery, nerve root microsurgery can improve the treatment effect of old sports spinal cord injury, can increase the treatment effect by 22%, and 78.6% of patients have motor function.

The results of this article show that after 50 patients with old motor spinal cord injury underwent microsurgery operation, the improvement rate of urination and defecation function reached 82%, and the improvement rate of lower limb sensory and dyskinesia reached 78%. The factors causing this gap, but the specific factors need to be further explored. In order to improve the therapeutic effect of spinal cord and nerve root lysis, the end of the dura mater should be gradually separated downwards to make it fully exposed; after cutting the dura mater, the adhesion tissue must be carefully separated and the terminal filament or abnormality should be found cut the fiber tape completely. In view of the patient’s loss of normal anatomical tissue during the operation, the

normal dura mater should be found and recognized during the deep separation, and the detachment should be gradually guided by this; the normal dura sac and the dorsal protruding site should be fully exposed. In order to achieve the desired decompression effect, when performing microsurgery surgery, the defect bone tissue should be removed by biting, and the spinal canal bone defect should be appropriately enlarged. After discovering the concomitant spinal disease tissue, the diseased tissue should be completely removed, and the pathologically thickened, beaded and fan-shaped end wire should be cut off to deal with the adhesion of the thick end wire and the bulging sac wall. Spinal cord and nerve root microsurgery can improve the stool function of patients with old motor spinal cord injury, as shown in Figure 2.

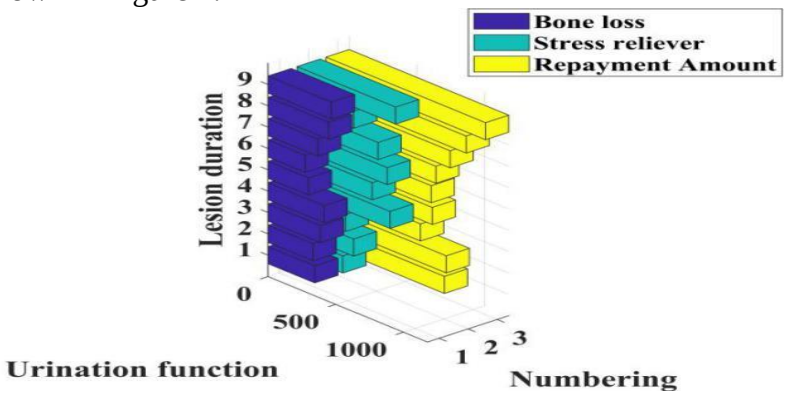

Figure 2. Can improve the stool function of patients with old sports spinal cord injury

From the data in Figure 2, it can be seen that spinal cord and nerve root microsurgery can improve the stool function of patients with old motor spinal cord injury. The improvement rate of stool function is 82%, thereby improving the patient's quality of life.

4.2. Discussion on Spinal Cord and Nerve Root Microsurgery for Old Sports Spinal Cord Injury

The results of the study showed that the residual bilateral kyphotic vertebral body deformity found after microsurgery of the spinal cord and nerve root may adversely affect the supine and supine postures of high patients and cause pain at the same time. Malformations of the posterior superior wall can cause severe compression on the patient's spinal cord and other spinal nerve tissues. The posterior spinal vertebral body loosening wedge-shaped spinal osteotomy is an ideal treatment method for the treatment of bilateral residual kyphotic spine deformity after partial osteotomy trauma. In this paper, the characteristics of the posterior vertebral posterior vertebral spine arch sacral root joint vertebra cone pyramid wedge combined osteotomy were studied in depth. The kyphotic cuneiform deformity is 30℃, and the anterior edge of the vertebral cuneiform is only moderately increased by 5-8mm. In each case, the average temperature of the kyphosis height deformity was corrected by 20℃, 5 cases showed an increase in the height of the anterior edge of the vertebral spine by 15mm, and the remaining cases showed no significant increase in the height of the anterior edge of the vertebral body. In order to effectively prevent the root of the anterior neural tube from being damaged, patients should pay special attention to the operation in the anterior vertebral body during osteotomy, and use a knife to reserve a thin layer on the posterior edge of the anterior vertebral body. Effectively protect the anterior spinal cord, osteotomy and nerve root injury, and then use a knife to remove the remaining thin anterior wall of the anterior edge of the vertebral body. This operation can greatly improve the safety of the operation of the microscope and loosening osteotomy. The results of the study show that the treatment of spinal cord and nerve root microsurgery in patients with old sports spinal cord injury can effectively reduce the amount of

bleeding and reduce the patient's pain during surgery. Compared with traditional surgery, it has a high safety and related the data is shown in Figure 3.

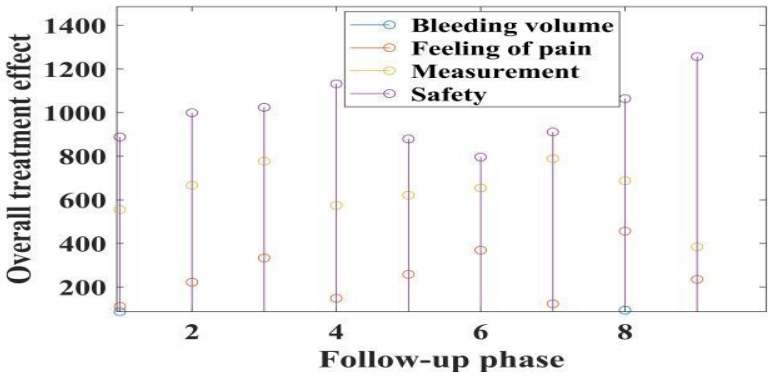

Figure 3. Can effectively reduce the amount of bleeding in patients during surgery, reduce patients' pain, and has a high safety compared with traditional surgery

As can be seen from the data in Figure 3, patients with old motor spinal cord injury can be treated with microdissection methods such as motor spinal cord, neural canal and root canal, etc. The amount of bleeding is greatly reduced by 15%, and the pain of injured patients is reduced by 35%. Compared with other traditional surgical methods, its safety is increased by 42%.

Indications and value of decompression surgery: the paraplegic planes of patients with old motor spinal cord injury described in this article are the nerve root innervation area rather than the spinal cord segment. The plane referred to is the last nerve root ganglion with pain and muscle contraction Segment, not a fractured vertebral body or spinal cord segment. The selected cases were all C5, C6, C7 and T12~L2 spinal segment old spinal cord injury paraplegia, clinically ASUS or FRA grade. Any recovery of motor function is more valuable. For example, if the plane is C5 before surgery, the patient has only shoulder abduction but no elbow flexion function. After descending to C6 after operation, elbow flexion function can be restored, which is of great significance to those with quadriplegia. Those with C6 before operation can recover wrist joint function after operation, and later spinal cord transposition can restore partial grasping ability, which has greater clinical value. For example, if the paraplegic plane is L1 before operation, the hip flexion function of the iliopsoas muscle can be restored after operation, and some patients can still restore the muscle strength of the quadriceps muscles of grade II to III. After rehabilitation training, they can walk with abduction or stent . At present, only surgery is performed on patients younger than 50 years old. One neurological recovery ability is related to age, and two older people have limited perseverance to adhere to functional rehabilitation training. Patients with old motor spinal cord injury treated with spinal cord and nerve root microsurgery can effectively improve nerve root sensory function, as shown in Figure 4.

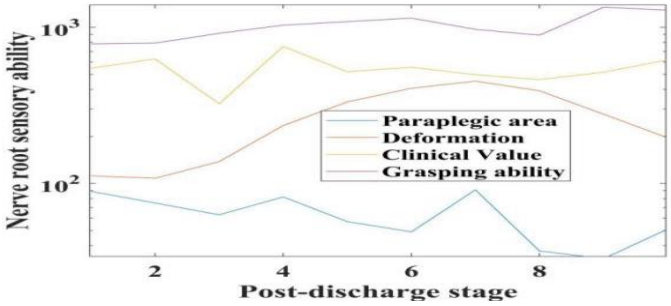

Figure 4. Can effectively improve nerve root sensory function

It can be seen from Figure 4 that patients with old motor spinal cord injury treated with spinal cord and nerve root microsurgery can effectively improve the nerve root sensory function of patients, and 90% of patients have significantly improved nerve root sensory.

Discussion on the timing of surgery: Complete paraplegia caused by old sports spinal cord injury is a huge blow to patients. Both physical and psychological needs an adaptation process. To avoid premature disappointment for patients and relatives, even doctors. It is clear that the spinal cord injury is complete, and it is currently incurable, and in most cases, it is not clear and affirmative to inform the judgment about the prognosis. Therefore, 70% of the patients in this article were treated with microsurgery of spinal nerve roots 1 year after injury. Because at this time, they have tried a variety of ineffective treatments, and many doctors in many hospitals have told the truth that they have accepted the harsh reality of paralysis psychologically, and never treated the paraplegia with unrealistic requirements and turned to face the reality. To improve or rebuild some functions. It is believed that with the education level of patients and the popularization of popular science knowledge, more patients will understand and undergo spinal cord and nerve root lysis surgery.

5. Conclusion

(1) The spinal cord is an important part of the central nervous system and a carrier of information between the brain and external nerves. Old motor spinal cord injury is a very serious neurological disease that is difficult to cure and can cause serious sequelae, and can even cause paralysis and high paraplegia in patients. Spinal cord and nerve root microsurgery treatment for old motor spinal cord injury can promote the recovery of motor function and nerve root sensory function.

(2) The results of the study show that, compared with traditional surgical treatment, microsurgery can relieve the spinal cord and nerve roots of patients by 22%, 86.3% of patients have significant spinal function recovery, and 78.6% of patients have significantly improved motor function. In 90% of patients, the nerve roots of the spinal cord segment felt significantly improved, which proved the correctness and feasibility of spinal cord and nerve root microsurgery for the treatment of old motor spinal cord injury.

(3) Studies have shown that spinal cord and nerve root microsurgery can improve the stool function of patients with old motor spinal cord injury. The improvement rate of stool function is 82%, thereby improving the quality of life of patients. Patients with old sports spinal cord injury can use microsurgery methods such as motor spinal cord, neural canal and root canal for minimally invasive treatment, which can effectively reduce the total bleeding of each injured patient by 15% and reduce injuries. Compared with other traditional surgical methods, the patient's pain is 35%, and its safety is improved by 42%.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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