

Clinical analysis of posterior approach total laminectomy in the treatment of intravertebral schwannoma

Huacong Wang¹, Dexun Wang¹, Xiaoxuan Gu², Yong Liu^{1*}

¹Department of Spine Surgery, the Affiliated Hospital of Qingdao University, Qingdao 266100, China

²Rheumatology and Immunology Department, Yuhuangding Hospital Affiliated of Qingdao University, Yantai 264000, China

Abstract: To investigate the effect of posterior approach total laminectomy in the treatment of intravertebral schwannoma. From January 2016 to January 2018, 50 patients with spinal schwannoma hospitalized in our hospital all underwent posterior total vertebral laminectomy in 21 males and 29 females, aged 12-78 years, with an average age of (53.12±15.01) years. All patients with intramedullary line into the road after the lamina decompression, pedicle screw fixation, re-movement of epidural tumor directly, intradural tumor line cut epidural tumor remove the epidural capsulorrhaphy all patients with incision after negative pressure drainage. Postoperative intravenous drip of antibiotics for three days were followed up for 6 to 12 months postoperatively, observe the clinical curative effect. All patients' bleeding time before surgery and JOA score 6 months and 12 months after surgery were recorded, and VAS score 6 months and 12 months after surgery were recorded. Rreview the MRI to observe whether the tumor recurrence, with the evaluation of patients with nerve functional recovery degree, review of X-ray observation of patients with spinal stability. Operation time 1-6h, an average of 2.63h±1.14, intraoperative blood loss, 100-1000ml, an average of 289.00ml±260.16. Postoperative pathological biopsy in 50 patients with tumor, proved schwannoma in 18 cases without postoperative spinal cord injury patients have different degree of cerebrospinal fluid leakage, give symptomatic treatment after rehabilitation. The posterior approach of total laminectomy and decompression can fully expose the tumors in the spinal canal, so as to facilitate the complete removal of the lesion site. The effect of this method in the treatment of intravertebral schwannoma is satisfactory. In addition, JOA score was increased after surgery, VAS score was decreased, and symptoms improved significantly.

Keywords: Posterior approach surgery; Laminectomy; Neurilemmoma; Curative effect

Received 25 July 2018, Revised 2 September 2018, Accepted 10 September 2018

*Corresponding Author: Yong Liu, qdfly@163.com

1. Introduction

Neurogenic tumors are the most common intraspinal tumors, and Schwann cell tumor is a common benign tumor in the spinal canal, Mainly single hair, a few more[1], 0.25 times more than the primary tumor in the spinal canal[2]. Its oppression spinal nerve root a symptom, serious can appear paralyzed. Therefore, regardless of tumor size, as long as find intra-spinal canal tumors, should be treated as soon as possible. In order to achieve good effect, surgical removal of the tumor is the most commonly used treatment method[3]. The purpose of this study was to investigate the effect of posterior approach total laminectomy in the treatment of intravertebral schwannoma.

2. Materials and Methods

2.1. General information

Selection from January 2016 to January 2018 schwannoma intra-spinal canal of 50 cases of patients, all patients were performed after total laminectomy into the road. The cases were confirmed by pathologically method as schwannoma (21 male, 29 female, age 12-78, the average age of 53.12±15.01, course of 5-17 months, 10 cases of cervical segment, 19 cases thoracic segments, waist section 21 cases, 13 cases in epidural. In 10 patients,

limb muscle strength decreased and other symptoms appeared, including 4 patients with grade 4, 4 patients with grade 4, 2 patients with grade 3. Horsetail nerve compression symptoms in 4 patients (Bowel and bladder dysfunction or perineum numb), 20 cases of patients with different degree of tendon have hyperfunction of muscle tone. 16 cases of pathological character had positive preoperative patients with spine X-ray CT, MRI scan: spinal canal oppressive nerve root spinal space-occupying lesions, part of the performance have been strengthening the lesion site.

2.2. Operation method

Patients after general anesthesia intubation prone position, C arm fluoroscopy location to determine the operation phase, after the midline incision, skin incision subcutaneous tissue and muscle layer in turn, reveals the spines, vertebral plate joints pedicle fixation in tumor stage. C arm fluoroscopy to confirm good position of internal fixation after installation of connecting rod with pressurized fixed in epidural tumors, will be fully exposed, tumor resection of the mass directly. Tumors locate in intradural, longitudinal incision hard membrane. The suspension shows the tumor, protect the spinal cord. Tumor removed, rinsed repeatedly surgical field with physiological saline, with fine line suture dural sac, hard film around a brain cotton to protect spinal cord

in giving 100 ml saline + 80 mg patients methylprednisolone. To prevent spinal cord edema, spinal cord injury, intravenous drip antibiotic placed negative pressure drainage, postoperative intravenous drip of antibiotics for three days, according to traffic, pull out the tube.

2.3. Postoperative management

Postoperative closely monitoring all patients vital signs with limb can feel and activity. Adopt intravenous drip of antibiotics to prevent infection, all patients can be appropriately oral nsaid with anti-inflammatory analgesic pull out according to the amount of drainage tube. The tube at the same time to suture of the drainage pipe, strengthen nutrition can reduce the risk of infection in patients who have cerebrospinal fluid leakage absolute bed rest, continuous clip drainage tube to relieve symptoms. After surgery, the patient wore a neck brace or a waist circumference brace for 3 months. Limiting the patient's activity, and the outpatient review was conducted after 3 months.

2.4. Post-operation follow-up

Telephone follow-up of patients with postoperative regularly at least six months, records the changes of preoperative and postoperative clinical symptoms in patients with muscle strength as well as the limbs change basis on X-ray and MRI, which can help to judge whether the stability of the spine and tumor recurrence.

2.5. Statistical method

The measurement data were represented by mean standard deviation using SPSS23.0 statistical software. The data were analyzed by variance analysis and t test.

3. Results

The tumor was completely removed in 50 patients. All of them were given pathological examination after surgery. The results showed that all of them were schwannomas. The operation time is 1-6 hours, average(2.63±1.14)h. Intraoperative blood loss was 100-1000ml, and average (289.00±260.16)ml. 18 patients had different degrees of cerebrospinal fluid leakage. Given a flat pillow to sleep on, adequate rehydration. The symptoms improved after intermittent clamping of drainage tube, pull out the drainage tube and suture the incision at the same time. No tumor recurrence was observed after 6-12 months of follow-up. The JOA score increased significantly and VAS score decreased 6 months, 12 months after surgery (P<0.05) (Table1). During the follow-up, all the patients' symptoms were relieved. The preoperative muscle strength of 35 patients was 4 grade, all of them reached grade 5 after surgery. 10 patients had preoperative muscle strength of grade 3 and postoperative recovery of grade 4+. After surgery 12 months, 40 patients returned to normal sensation. The pathological signs disappeared. The postoperative symptoms of 3 patients with dysuria greatly improved.

Table 1. JOA and VAS scores of the follow-up

Name	preoperative	six months after operation	12 months after surgery
Cervical VertebraJOA (n=10)	8.00±1.89	11.30±2.06	13.00±2.31
Thoracic VertebraJOA (n=19)	5.84±0.96	9.00±1.29	9.58±1.17
Lumbar VertebraJOA (n=21)	14.48±3.28	21.86±3.37	22.81±2.93
Improvement Rate (%)			
VAS Grade		0.41±0.18	0.52±0.23
P	4.48±2.52	2.00±1.70	1.73±1.55
		<0.05	<0.05

Values are mean ±SD, VAS JOA score of 50 patients with schwannoma

4. Discussion

4.1. Diagnosis of intravertebral schwannoma

Intravertebral schwannoma has hidden onset and slow growth, and generally has no specific symptoms and signs. Early diagnosis is difficult, so it is easy to cause misdiagnosis. Most of them occur in the thoracic spine of the lumbar spine, followed by the cervical spine. The most common initial symptoms were root pain, followed by dyskinesia and sensory

abnormalities. The pain of tumors in the upper cervical vertebral canal was mainly in the neck, and occasionally radiated to the upper arm and shoulder. The tumor pain at the junction of neck and chest is often located in the upper back and radiates to the chest the upper limb shoulder. The tumors in the upper thoracic segment are mostly backache and often radiate to the chest or shoulder. The pain of thoracic tumors is mostly located in the thoracic waist and

radiated to the lower limbs of the abdominal groin, which is often confused with diseases such as appendicitis. Lumbosacral period of cancer pain in lumbar ministry perineum area hip lower limbs of intra-spinal canal tumor early special symptoms of pain at night, most of the patients of this research is the pain at night. However, in some cases, the location of the tumor is closely related to the major nerves. Even if the tumor is located in the lumbosacral region and the tumor volume is small, it will be found because of obvious clinical symptoms[4]. It was due to lay down at night, the lumbar spine physiological lordosis angle decreases, and retraction of the spinal cord to tighten, adding to the tumors of nerve root compression seat after walking or stretching, near the trailing edge vertebral bodies, the spinal cord and spinal canal wall after relative increase of distance, so as to relieve symptoms[5]. Intra-spinal canal symptoms such as numbness weakness is common in patients with space-occupying lesions, often confused the cervical spondylosis and lumbar intervertebral disc protrusion, due to the lesion site is located in the spinal canal, compression of spinal cord, resulting in a series of symptoms, so early diagnosis is very important to this study during follow-up. Patients symptoms abated with preoperative muscle strength level 4, postoperative achieves level 5, 10 patients with preoperative muscle level 3, postoperative recovery to 4 +. 12 months postoperatively in patients with 40 patients feel back to normal, pathological character disappear 3 patients with sphincter disturbances, postoperative symptoms have greatly improved. Therefore, early diagnosis of early treatment, has significant meaning on patients prognosis. The first choice for the intra-spinal canal tumors in MRI can accurately judge the tumor size and the shape of the position[6].

4.2. Operative selection

Schwannoma is not sensitive to radiotherapy and chemotherapy. The preferred treatment for intravertebral schwannoma is surgical resection to remove the tumor. Spinal cord compression, restore spinal cord function to the greatest extent[7]. For different types of spinal canal nerve sheath tumor patients, should fully consider the tumor resection operation difficulty and spinal stability and making operation plan. The ideal operation method is the tumor and nearby tissue structures exposed to a great extent[8,9], reduce the peripheral vascular damage. The tumor locating in the ventral and dorsal surgical option is one of the important problems. Clinicians first consider mainly according to the size of the tumor location and the relationship of the spinal cord. The posterior total laminectomy used in this study can completely expose the internal structure of the vertebral canal, and can complete the tumor resection.

4.3. Treatment of cerebrospinal fluid leakage and

removal of tuberculous nerve roots

Schwannoma with epidural intra-spinal canal was cut. Cerebrospinal fluid leakage appeared in this study. There were 18 cases with cerebrospinal fluid leakage. Intraoperative needed close stitches epidura. Closing the wound, skin and subcutaneous tissue should be tight suture drainage of liquid in patients with postoperative close observation, if the liquid color was a clear liquid. The hint of cerebrospinal fluid leakage should go to pillow recumbent[10].

Sometimes, in order to completely remove the tumors in the spinal canal, the tumor bearing nerve root can be excised together, and postoperative dysfunction is also rare. Celli P[11] et al. reported that the removal of 2-3 nerve roots did not result in permanent dysfunction or serious complications. Schuhhiess[12] et al. reported to have no permanent or serious functional deficiency after nerve root amputation. There are possible reasons for this : 1) The nerve root that governs the limb is not a single nerve root, but a nerve stem formed by multiple nerve roots. 2) The tumor-carrying nerve root, which has been chronically compressed, has lost its normal function, or its function has been replaced by the adjacent nerve root.

5. Conclusion

Posterior total laminectomy has a good clinical effect in the treatment of intravertebral schwannoma, which can fully expose the tumor and completely remove the tumor.

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