

Spinal Endoscopic Surgery for Tophi in Lumbar Spinal Canal: A Case Report

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1. Abstract

Objective: To summarize the clinical efficacy of spinal endoscopic surgery in a patient with tophi in the lumbar spinal canal admitted to our hospital. **Methods:** This patient complained of low back and leg pain for 2 years, which was aggravated for 10 days. After admission, a routine examination was made to formulate a diagnosis and treatment plan, and endoscopic spinal canal debridement was performed. **Results:** The tophi with a size of about 1cm×1.5cm×1.5cm was completely removed during the operation. The patient's low back and leg pain symptoms were relieved, and there were no adverse complications. **Conclusion:** Spinal endoscopic surgery for the treatment of tophi in the lumbar spinal canal has an ideal effect, with less trauma and clear visibility.

2. Background

Gout is mainly a series of syndromes caused by disorder of purine metabolism or elevated blood uric acid [1-2], with clinical features such as acute and chronic inflammation of joints, gouty nephropathy, and urinary tract interpretation. According to relevant data statistics, in recent years, the incidence of hyperuricemia in my country has been increasing, and it has gradually become a common clinical metabolic disease [2-3]. Tophi is a characteristic manifestation of chronic gout, which is usually found in the first metatarsophalangeal joint, Achilles tendon, and finger pulp. In this case, tophi in the lumbar spinal canal is relatively rare [4-5]. At

present, there is no accurate clinical diagnostic criteria for tophi in this location, and its clinical imaging manifestations and symptoms are easily confused with lumbar disc herniation and spinal tumors, which increases the difficulty of diagnosis and treatment [6-7]. This case report summarizes the clinical efficacy of endoscopic spinal surgery for a patient with tophi in the lumbar spinal canal admitted to our hospital.

3. Medical Records

Male, 72 years old. The chief complaint was low back pain and leg pain for 2 years, aggravated for 10 days. The patient had low back pain with radiating pain in the right lower extremity two years ago, and no limb numbness and fatigue. 10 days ago, the above symptoms of the patient were aggravated, accompanied by shortness of breath, cough and sputum discomfort. After conservative treatment at the local hospital, the symptoms did not significantly relieve. After checking the negative nucleic acid of new coronavirus pneumonia, except for the new coronavirus pneumonia, it will be admitted to our department.

Past history: Gouty arthritis, chronic bronchitis and asthma for many years. **No history of drug or food allergies.** **Physical examination:** the formation of turgout was observed at the metacarpophalangeal and hallux joints of the left foot, and there was no local redness, swelling, heat and pain. Right Lasegue sign positive (40°), left Lasegue sign negative.

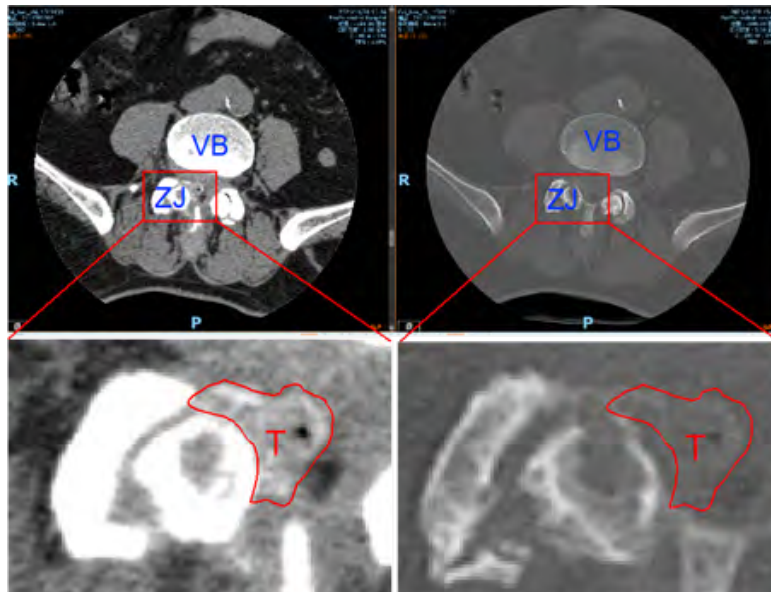


Figure 1: Minor arthritis of the right vertebra of L4/5 with peripheral chronic granuloma, intraspinal stenosis at the same level. VB: vertebral body, ZJ: zygapophysial joint, T: tophi



Figure 2: MR Examination suggested abnormal signals in the spinal canal at the L4/5 intervertebral disc level, abnormal enhancement foci around the spinous process and intervertebral facet joints, and considered microarthritis of the vertebra with chronic inflammatory exudation around it.

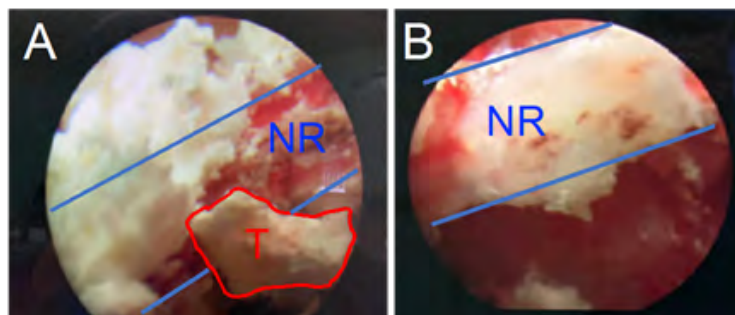


Figure 3: 1) The tophore was clearly seen during the operation 2) Relief of nerve compression after removing the tophore. T: tophi, NR: nerve root

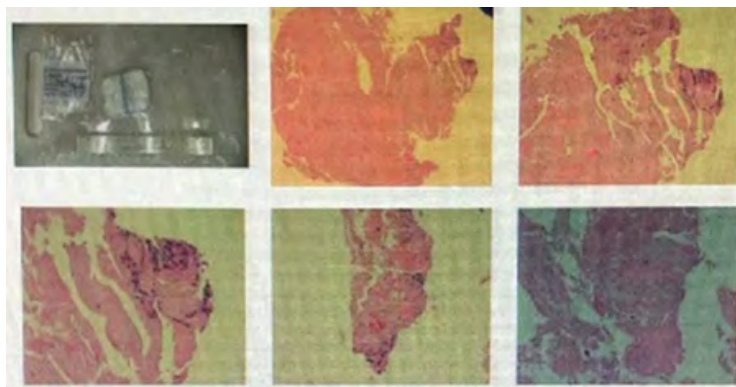


Figure 4: Postoperative pathological results suggest gout stone

4. Clinical Examinations

CRP 197.17mg/L↑ (0.00-10.00mg/L); WBC 16.49 $10^9/L$ ↑, uric acid 694 $\mu\text{mol/L}$ ↑ Pulmonary function examination suggested severe ventilation dysfunction. lumbar spine MR scan showed that: L4 vertebral body I degree forward slippage. Abnormal signals in the spinal canal at the level of the L4/5 intervertebral disc. lumbar spiral CT plain scan showed that bilateral minor arthritis of the L2/3, L4/5, and L5/S1 vertebrae with peripheral chronic granuloma along with intraspinal stenosis at the L4/5 level. Enhanced MR Examination of the lumbar spine showed abnormal signals in the spinal canal at the L4/5 intervertebral disc level and abnormal enhancement foci around the spinous process of L1-L5 and around the intervertebral facet joints. The possibility of microarthritis of the vertebra and peripheral chronic inflammatory exudation was considered.

5. Treatment

Preoperative imaging examination considered the lumbar canal mass lesion and the possibility of chronic granuloma. The patient had a uric acid of 694 $\mu\text{mol/L}$ and had a history of gout for many years. After discussion in the department, the possibility of intraspinal gout stone was considered, and endoscope intraspinal debridement of spinal lesions was proposed.

The patient was considered to have lung infection and acute attacks of chronic bronchitis and emphysema before surgery. After anti-infection, low-flow oxygen inhalation, phlegm reduction, asthma relief and symptomatic treatment, the lung function was improved and shortness of breath was relieved, oxygen inhalation could be stopped. Before surgery, the patient was trained in prone position to exercise lung function and adapt to the surgical position. Preoperative preparation was made. Lumbar tophore removal + disc-protrusion removal (lateral approach) was performed in the operating room on December 13. During the operation, a large piece of tophore was found at the medial edge of the articular process and around the L5 nerve roots on the L4/5 intervertebral space plane, with the size of about 1cm×1.5cm×1.5cm. The formation of tophite in the lumbar spine was considered in postoperative pathology.

6. Discussion

The clinical symptoms of lumbar gout are mainly low back pain, or accompanied by symptoms of nerve root or spinal cord compression, with acute onset or slow progression [8]. There is usually a history of hyperuricemia or gout. This patient has a history of gout for many years, and the blood uric acid content is significantly increased. It can be seen that spinal tophi may be the primary manifestation of gout, and clinical imaging examination can effectively indicate the lumbar spine. Tophi formation. Some scholars have found that [9-10], high-purine diet, alcoholism, use of diuretics, renal insufficiency, etc. are all risk factors for tophi. With the development of minimally invasive techniques and the

accumulation of surgical experience in recent years, minimally invasive spine surgery has begun to gradually replace traditional spine surgery. Minimally invasive surgery has involved the entire spine from the cervical spine to the lumbar spine, and the types of surgery are becoming more and more diverse, from simple disc surgery to complex spine surgery. The traditional surgery is the use of open surgery, which requires layer-by-layer incision and separation to reach the lesion, and sometimes even the incision has to be enlarged for better visibility during the operation. However, spinal endoscopic surgery is different from it. It uses the endoscope to accurately reach the target lesion through minimally invasive surgical wound puncture, and magnifies the field of view under the water medium. The lesion can be clearly seen, and the diseased tissue can be accurately removed without destroying other normal tissues. [11-12]. The reported case complained of a 2-year history of low back and leg pain, and was admitted to the hospital due to recent aggravation of pain. Personal medical history and family medical history were investigated. After routine physical examination, a suspected diagnosis of lumbar intervertebral disc herniation was performed. CT, lumbar spine CT, MRI and other examinations. Due to the support of CT and MR to consider the lumbar space-occupying lesions in the lumbar spinal canal, the serum uric acid was significantly increased, and there was a history of ventilation for many years. Considering the possibility of intraspinal tophi, it was planned to perform spinal endoscopic debridement of the spinal canal lesions, followed by pathological examination. It was confirmed that tophi formed around the L5 nerve root, which resulted in nerve compression. After adequate preoperative preparation and examination, the patient underwent spinal endoscopic debridement of the spinal canal. The tophi was completely removed, with a size of about 1cm×1.5cm×1.5cm, the incision is small during the operation, and the pain is small. The postoperative curative effect of the patient is ideal. After the operation, the patient should be urged to take low-purine decoction and standardized uric acid-lowering treatment. At present, imaging examination methods such as clinical MRI and CT have low specificity in the diagnosis of lumbar tophi, and are easily confused by other lumbar inflammation and abscesses. Therefore, histopathological examination is always the gold standard for the diagnosis of tophi. A doctor's awareness of the diagnosis of lumbar tophi. In addition, for patients with severe symptoms of spinal nerve compression, surgery should be taken in time to effectively reduce the inflammatory reaction in the lumbar spinal canal, restore the volume of the spinal canal, rebuild the stability of the lumbar spine, relieve pain, and achieve ideal surgical results.

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