JCSMICR
ISSN 2837-7567

Journal of Clinical Studies and Medical Images, Case Reports

Case Report

Volume 1, Issue 5

Received: Sep 28, 2023
Published: Oct 26, 2023

DOI: 10.55920/2837-7567/1023

A controlled study of two discography methods for the diagnosis of discogenic low back pain

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Abstract

To observe the long-term effect of ozone nucleation in treating disogenic low back pain and to study the value of classical discography and ozone discography. Methods: A prospective study was conducted on 207 patients with low back pain requiring ozone lysis, and the pain induced reaction and the pathological classification were observed respectively. Visual analog pain scores (VAS) were followed at 1,2, and 3 years after surgery. The preoperative and postoperative VAS were weighted and the efficacy was evaluated, and the positive rate of the two disogram induced pain tests was controlled with SPSS 10.0 statistical software. Results: Actual follow-up occurred to 181 cases, accounting for 87.4% of the enrolled follow-up cases. The total response rate at 1,2 and 3 years were 88%, 72% and 78%, and the excellent rates were 67%, 63% and 57%. The incidence of ozone-induced pain in 243 discs and 62 disc discs was 89.7% and 45.2%, respectively. The positive rate of O-induced pain test was significantly higher than classical disgraphy (57%: 25%). Conclusion: The long-term effect of ozone-induced pain was positively correlated with the effect, and the positive rate of induced pain test was significantly higher than that of classical discgraphy.

Keywords: Discography, Diagnosis, Discogenic low back pain, Controlled study.

Introduction

For a long time, due to the pathogenesis of low back pain is unclear, the diagnosis and treatment are very difficult. Previously, the role of mechanical compression of the herniated disc in the production of lumbar and leg pain was mainly emphasized clinically, but mechanical compression does not explain many clinical phenomena. Although numerous prospective and retrospective clinical studies have shown clear effects of various fusion techniques for improving low back pain[1], But it also brings some new problems, such as the degeneration acceleration of adjacent segments, fusion failure, etc. In view of the disadvantages of fusion surgery, more and more clinical studies are looking for the pathogenesis and accurate diagnosis methods of low back pain. Especially for the diagnostic method of discogenic low back pain, the classic discography has been used as the gold standard for diagnosis, but after clinical observation, the diagnostic specificity and sensitivity of this method is not very ideal, so it is necessary to find a more accurate diagnostic method.

Data and methods

General information

There were 181 enrolled patients, 47 males and 134 females, with a mean age of 55 years (31 to 79 years). All the patients were treated with ozone nucleolysis. A total of 307 discs were treated by ozone lysis, and 168 discs were tested by classical and ozone discography.

Inclusion criteria

(1) recurrent low back pain over 6 months, with or without hip, thigh and other involved pain, prolonged standing, sitting or bending; (2) no lumbar abnormalities on X-ray, no lumbar disc herniation on CT or MRI, but T2 weighted MRI; (3) conservative treatment for 2 months, and the patient was not considered for discectomy and intervertebral fusion.

Exclusion criteria

Psychological disorders; severe neurological deficit; coagulation disorders; severe spinal deformity and spondylolisthesis; spinal stenosis and lateral recess stenosis; patients unwilling to do ozone lysis and mental illness; intervertebral disc herniation with calcification, large protrusion, compression of dural sac more than 50%; patients with serious diseases of important organs and risk of operation.

Surgical method

The patient was in the prone position under the G arm X-ray machine. Routine disinfection shop. Generally, lumbar intervertebral disc puncture adopts the posterolateral path, namely the puncture needle through the "safe triangle area" (entering the diseased disc, the puncture point positioning is generally parallel to the diseased intervertebral space, and the lateral open midline is 8cm~12cm. CT axial scan can also be used to directly measure the distance and puncture depth of the lateral open midline. After the puncture, the G-type arm X-ray machine confirmed that the needle tip should be located in the center of the intervertebral disc or in the middle and rear one-third of the junction. Eurpike contrast was injected at 2ml / disc, and the patient was asked for induced pain or duplication pain, and reagain to determine the type of disc lesion. After contrast injection, the patient was slowly injected into the disc at a concentration of 50 u g/ml. After ozone disc ablation treatment, the amount of gas injection in the disc can be adjusted according to the patient's tolerance degree, generally each disc is 10~20 ml. She was absolutely absolute bed for 24 hours in the supine position. A small number of patients will have symptoms "rebound" 1 to 2 weeks after surgery, which can be treated with analgesics and dehydragents.

Statistical treatment

The incidence of contrast-induced pain or duplication pain in both groups was counted and controlled between the two groups. And the positive rate of pain induced by ozone disc angiography was com-

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Citation: Liu Yanqing. A controlled study of two discography methods for the diagnosis of discogenic low back pain. Jourl of Clin Stud and Med Imag, Cas Rep. 2023; 1(5): 1023.

Table 1: *To compare of percentage of evoked pain between effect and inefficiency groups by ozone.*

	Case (%)	Disc	Positive Rate	Negative Rate
Ineffective	36 (20)	62	45.2% (28 / 62)	54.8% (34 / 62)
Effective	145 (80 *)	243	89.7%*(218 /243)	10.3% (25/243)

** Compared with ineffective group, P<0.01.*

Table 2: *To compare of percentage of evoked pain between ozone discgraphy and classics discgraphy.*

Classics	Discgraphy		Ozone Discgraphy	
The number of disc	Positive(%)	Negative(%)	Positive(%)	Negative(%)
168	25	75	57*	43

** Ozone discgraphy compared with classics discgraphy, p <0.01.*

pared between the effective and ineffective treatment groups. The data of the statistics were processed using SPSS 10.0 statistical software. Counting indicators were treated with chi-square test and p <0.05 was considered significant.

Result

This group included 181 patients. The incidence of ozone-induced pain in 243 effective patients was 89.7%, and the incidence of induced pain in 62 ineffective patients was 45.2% (see Table 1). According to Table 2, in the 168 discs with simultaneous classical contrast and ozone contrast, the incidence of induced pain in classical contrast and ozone contrast was 25% and 57%, which was significantly higher in ozone contrast group.

Discussion

This paper compares the clinical utility of classical discography and ozone discography for the diagnosis of discogenic low back pain. Previous discography is considered the gold standard for diagnostic discogenic low back pain and is currently the only reliable diagnostic method[2,3]. However discography has some controversy, such as contrast induced pain test is subjective feeling, influenced by psychological factors, the lack of objective judgment subjective standard, etc., and discography is still a invasive examination method, has great difficulties in outpatient implementation, in addition to the patient is not easy to accept, CT examination also often use inconvenience. Exploring new minimally invasive, non-invasive, and sensitive examination methods is a future research focus, but also in line with the trend of medical development. By comparing the incidence of induced pain (including duplication pain) induced by intraoperative classical intervertebral disc angiography and ozone angiography, the results showed that the incidence and efficacy of induced pain induced by ozone angiography were positively correlated, and the incidence of induced pain caused by classical angiography was increased. It suggests that ozone discography is more sensitive than classical discography for the diagnosis of discogenic low back pain and has some clinical application value[4]. Moreover, patients are more likely to receive intraoperative ozone angiography, which can reduce medical costs and speed up hospital turnover. This requires more accurate diagnosis of the outpatient department and reduce the occurrence of misdiagnosis and missed diagnosis. Therefore, it is particularly important for clinicians to understand the diagnosis and treatment of this disease, and we need to explore precise diagnostic criteria and standardized treatment methods.

Discogenic low back pain (D iscogenic low back pain) refers to the low back pain caused by the stimulation of various lesions in the pain receptors in the intervertebral disc, without radicular symptoms, no radiological evidence of nerve compression or excessive segment activity, which can cause loss of function. In the past, the unclear pathogenesis has brought great difficulties in diagnosis and treatment, especially in patients with disc-derived low back pain without disc herniation after imaging examination. In recent years, domestic and foreign scholars have conducted a lot of deep research on the pathogenesis of disc-derived low back pain. Studies believe that the pathogenesis of discogenic low back pain is: disc degeneration produces inflammatory mediators, the formation of secondary inflammatory granulation zone, which stimulates hypersensitivity in the sinus vertebral nerve endings distributed in the outer layer of the annulus fibrosus, causing discogenic low back pain. Have studied its characteristic pathological change is formed from the annulus behind the outer layer to the nucleus pulposus with extensive nerve distribution of granulation tissue strip area, its corresponds to the lumbar disc angiography shows fissure, in normal disc only annulus fibrosus surface vascular distribution, asymptomatic normal aging disc, its vascularity is only seen in the outer annulus, never in the inner annulus fibrosus and nucleus pulposus[5]. Lower pressure in the disc and less proteoglycan content can promote neurovascular growth[6-8], Nerve growth factor (Nerve Growth Factor, NGF) can promote the growth of nociceptive sensory nerve fibers, inflammation upregulates the expression of NGF, and promote the axonal regeneration of NGF-sensitive neurons, causing inflammatory pain[8,9], Inflammatory response is an important pathogenesis of discogenic low back pain. Pain-causing chemicals such as TNF- α, IL-1, IL-6, NO, and phospholipase A2 have been found in degenerative discs, and these pro-inflammatory mediators of the annulus is an important cause of low back pain[10], The most common inflammatory cells are macrophages; only few macrophages in normal discs.

The sample of this study is small, so it is necessary to further explore the objective diagnostic indicators and treatment norms of discogenic low back pain, improve the treatment effect, promote the development of this technology, and benefit more patients.

Conflict of interest: All authors declare no conflicts of interest.

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