Can the degeneration adjacent to herniated disc in patients with lumbar disc herniation cause low pack pain?☆

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Abstract

BACKGROUND: It is often difficult to determine the cause of low back pain (LBP) in the patients with lumbar disc herniation. The herniated disc has long been thought to be an important cause of the patient's complaint about LBP and sciatica. Whether the adjacent degenerative disc results in LBP needs further confirmations.

OBJECTIVE: This study sought to determine whether the degenerative disc adjacent to the herniated disc in patients with LBP and radicular pain can result in discogenic LBP, as assessed by provocative discography, and to report the outcomes of the residual LBP when adjacent symptomatic disc were treated with methylene blue after microendoscopic discectomy.

METHODS: Twenty lumbar disc herniation patients complaint about LBP and radicular pain underwent provocative discography. There was one degenerative herniated disc with one or more adjacent degenerative discs in their MRI. Provocative discography was performed on all degenerative discs and at least one normal disc for control. The severity of LBP and leg pain of all patients was assessed using visual analog scale before discography. All patients underwent microendoscopic discectomy at herniated level, and intradiscal injection of methylene blue was given at painful adjacent level in five patients after microendoscopic discectomy.

RESULTS AND CONCLUSION: Discographies were performed on 64 discs of 20 patients, from L_{2-3} to L_5–S_1. There were 11 discs satisfying the positive response criteria, including 6 in degenerative segment adjacent to the herniated disc and 5 in the herniated disc that induced corresponding radiculopathy. The leg pains were evidently improved in all patients, while LBP was partially improved after microendoscopic discectomy. Six patients with symptomatic adjacent degenerative disc still had evident LBP, influencing their daily living. Five of them received intradiscal injection of methylene blue treatment and the LBP was relived. One patient refusing to the treatment still complained the LBP. Results evidenced that accompanying LBP for many LDH patients may come from the degenerative levels adjacent to the herniated disc.

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Received: 2011-02-25
Accepted: 2011-04-03
(20110225012/YJ)

Wang G, Liu SL, Chen ZW, Guan HG, Han DF, Shi YZ. Can the degeneration adjacent to herniated disc in patients with lumbar disc herniation cause low pack pain?. Zhongguo Zuzhi Gongcheng Yanjiu yu Linchuang Kangfu. 2011;15(22): 4171-4175.

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INTRODUCTION

Lumbar discectomy successfully relieves radicular pain in most patients[1-3]. Many recent clinical analyses have shown a significant improvement in back pain after discectomy[4-5]. Improvement of leg pain and LBP simultaneously after discectomy and moderate correlation of them suggested that lumbar disc herniation (LDH) might be one of the possible cause of LBP[5].

Recent cross-sectional and follow-up studies have reported a moderate association between degenerative disc and LBP[6-7]. Imaging methods, such as plain radiographs, magnetic resonance imaging (MRI) and computerized tomography, are quite sensitive in detecting disc degeneration, but cannot confirm whether a symptomatic disc contributes to the patient's pain syndrome. Discography is still the useful means of evaluating pain character and the precise levels of pain production, in spite of its invasiveness[8]. Residual LBP was found in 74.6% of the patients after standard discectomy and 12.7% of them had severe LBP, the majority of these severe LBP patients had preoperative advanced disc degeneration[9].

The objective of the present study was to determine whether the degenerative disc adjacent to the herniated disc in patients with LBP and radicular pain can result in discogenic LBP as assessed by provocative discography, and to report the outcomes of the residual LBP when adjacent symptomatic disc were treated after discectomy.

SUBJECTS AND METHODS

Design

A prospective clinical study pertaining to the imaging.

Time and setting

This study was performed at the Department of Orthopedic Surgery, the Second Affiliated Hospital of Sun Yat-sen University, China from June 2007 to April 2008.

Subjects

Twenty consecutive patients with LBP and radicular leg pain were included in this study.

Inclusion criteria

(1) Patients with LBP and radicular leg pain showed one degenerative herniated disc with one or more adjacent degenerative discs in their MRI. (2) The radicular pain contributes to the degenerative herniated disc according to the clinic presentation and MRI. (3) Patients had been treated conservatively with physical therapy and nonsteroidal nti-inflammatory medication without relief or recurrent occurrence of their symptoms for more than 6 months. (4) All patients have written the informed consents.

Exclusion criteria

Patients with spondylolisthesis, canal stenosis, segmental instability (>10° angular motion or >4 mm translation), a tumors, infections and previous lumbar surgery were excluded. The study group finally included 9 males and 11 females at a mean age of

43.8 years (ranging 29–55 years).

Methods

MRI examination

All patients first underwent MRI investigation. Lumbar intervertebral disc degeneration was assessed by Pfirrmann Grading System[10]. Those discs graded as Pfirrmann Grade 1 or 2 were regarded as normal ones. Grade 3 or onward were considered as degenerative discs. Severity of LBP and leg pain of all patients was assessed using visual analog scale before discography, ranging from 0 (no pain) to 100 mm (maximum, unbearable pain).

Provocative discography

Provocative discography was performed on all degenerative discs and at least one normal disc for a control by two orthopedic surgeons at 2 weeks before operation. The patient was placed prone on an operative, radiolucent table. A sterile preparation and draping was then undertaken. Needles were always introduced from the side opposite of any lateralizing clinical pain under investigation. Discography was performed with a standard posterolateral approach by using 21-gauge or 23-gauge discography needles following local infiltration anesthesia with 1% lidocaine. Iohexol (Omnipaque, 240 g/L; GE Healthcare Co. Ltd, Shanghai, China) was used for disc injections. Pain sensation during discography was defined as positive if the patient had the following performance: the injection of the disc caused significant pain and the pain severity was concordant with or similar to that of the patient's usual pain. Films of each disc were obtained in anteroposterior and lateral projections of each disc before removing needles. Axial discography was obtained with a CT scan at 2 hours after discography. With regard to annular disruption, discs were classified according to the four stages of the Dallas Discogram Description, which based on the extent of the radial tears: stage 0, no contrast extension; stage 1, contrast extension into the inner annulus; stage 2, contrast extension into the outer annulus; stage 3, contrast extension beyond the outer annulus[11].

Treatment

All patients were recommended to carry out microendoscopic discectomy (MED) to decompress the affected nerve root. After six-month follow-ups, leg pain was significant improved in all the patients; LBP was partially relieved, the patients with symptomatic adjacent degenerative disc still have evident back pain, influencing their daily living. Intradiscal injection of methylene blue treatment as described by Peng[12] was recommended in this level for these patients.

Visual analog scale for pain

The intensity of pain was evaluated with visual analog pain scale.

Evaluation of function

Functions were evaluated with 24-point Roland-Morris questionnaire[13].

Main outcome measures

The intensity of pain and function in all patients were determined.

RESULTS

Quantitative analysis of involved subjects

All 20 patients underwent discography. LBP was evident in six patients during discography, and five of them were intradiscally injected with methylene blue. All patients were enrolled in the final analysis.

Results of discography

Discographies were performed on a total of 64 discs, from L_{2-3} to L_5–S_1 in 20 patients. Among these discs, 11 satisfied positive response criteria, including 6 in degenerative segment adjacent to the herniated disc (Table 1) and 5 in the herniated disc that induced corresponding radiculopathy. Only one patient showed concordant LBP in herniated level and adjacent degenerative level.

Table 1 Summary of positive provocative discography in degenerative segment adjacent to the herniated disc

Case	Gender	Age (yr)	LBP/Leg pain (VAS)	Clinic representation	Levels	MRI finding (Pfirrmann classification andother features)	DDD	Discography response
1	M	45	75/52	LBP and left leg pain, L_5 radiculopathy	$L_{3/4}$	Ⅳ/HIZ/modic Ⅱ	3	Concordant pain
					$L_{4/5}$	Ⅳ/extrusion	3	No pain
					L_5/S_1	Ⅱ	0	No pain
2	M	44	80/40	LBP and right leg pain, S_1 radiculopathy	$L_{3/4}$	Ⅱ	0	No pain
					$L_{4/5}$	Ⅲ/HIZ	3	Concordant pain
					L_5/S_1	Ⅳ/extrusion	3	No pain
3	F	50	60/40	LBP and left leg pain, L_5 radiculopathy	$L_{3/4}$	Ⅱ	0	No pain
					$L_{4/5}$	Ⅳ/extrusion	3	Concordant pain
					L_5/S_1	Ⅳ	3	Concordant pain
4	F	29	60/70	LBP and left leg pain, L_5 radiculopathy	$L_{2/3}$	Ⅱ	0	No pain
					$L_{3/4}$	Ⅲ	2	No pain
					$L_{4/5}$	Ⅲ/protrusion	3	No pain
					L_5/S_1	Ⅳ	3	Concordant pain
5	F	44	85/61	LBP and right leg pain, L_{4-5} radiculopathy	$L_{3/4}$	Ⅱ	0	No pain
					$L_{4/5}$	Ⅳ/lateral protrusion	3	No pain
					L_5/S_1	Ⅲ	3	Concordant pain
6	M	35	60/40	LBP and left leg pain, L_5 radiculopathy	$L_{3/4}$	Ⅱ	0	No pain
					$L_{4/5}$	Ⅲ/protrusion	3	No pain
					L_5/S_1	Ⅳ	3	Concordant pain

M: Male; F: female; L: lumbar; S: sacral; LBP: low back pain; HIZ: high intensity zone; DDD: Dallas Discogram Description; VAS: visual analog scale

Results of methylene blue treatment

The mean follow-up period was 14.9 months (10–21 months) after this treatment. No side effects or complications occurred in these patients. One patient that refused intradiscal injection of methylene blue treatment on the painful adjacent level showed no evident improvement and still complained evident LBP, and the remainder declared marked improvement in LBP, the living was significantly improved (Table 2).

Table 2 Treatment effects of six patients with painful adjacent degenerative disc

Case	Gender/Age (yr)	LBP/Leg pain (VAS)	LBP/Leg pain after MED at six months (VAS)	R-M score after MED at six months	LBP/Leg pain after IMBI (VAS)	R-M score after IMBI	Duration of follow-up after IMBI (mon)
1	M/45	75/52	60/20	14	20/11	5	15
2	M/44	80/40	58/12	11	4/13	3	15
3	F/50	60/40	43/8	9	20/4	4	10
4[a]	F/29	60/70	55/14	10	60/16	11	21
5	F/44	85/61	42/0	9	10/0	1	12
6	M/35	60/40	60/6	13	8/6	2	16

[a]The patient refused IMBI; M: Male; F: female; LBP: low back pain; VAS: visual analog scale; MED: microendoscopic discectomy; IMBI: Intradiscal methylene blue injection; R-M score: Roland-Morris score

A typical case

A 45-year-old patient with LBP and left leg pain was observed, the clinical and MRI findings indicated L_5 radiculopathy (Figure 1).

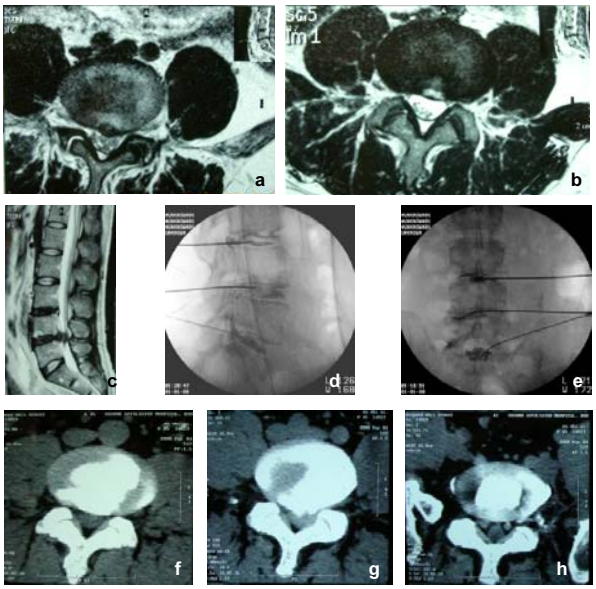

Figure 1 A 45-year-old patient with low back pain and left leg pain, clinical and MRI findings indicate L_5 radiculopathy. MRI demonstrates degenerative disc with high intensity zone in the posterior annulus at L_{3-4} (a–c). Discography film shows annular tears at L_{3-4} and L_{4-5}, contrast medium leaked into left L_5 nerve sleeve (d, e). CT-discography demonstrates a normal L5/S1 segment and a wide tear with posteromedial leak of contrast medium at L_{3-4} and L_{4-5} (f–h). Positive response was showed at L_{3-4} in discography.

DISCUSSION

In 1934, Mixter and Barr was the first to describe the degenerative origin of LDH[14]. Accordingly, the association between LDH and sciatica has been well described. For the patient with sciatica, if his or her symptoms corresponded to the herniated disc found by modern imaging technology, a clear diagnosis can be made. However, it is often difficult to determine the cause of LBP. Kuslich *et al*[15] stimulated various tissues during the surgical treatment of herniated discs using local anesthesia. They found that stimulation of an affected nerve root evoked leg pain but not LBP, and stimulation of the posterior portion of the lumbar intervertebral discs elicited LBP only. Ohtori *et al*[16-17] demonstrated that, dorsal root ganglion neurons innervated the lateral and dorsal portion of the disc through the paravertebral sympathetic trunks and the sinuvertebral nerves, which are thought to be the afferent pathway of discogenic LBP. Sensory innervations of the lumbar posterior longitudinal ligament and the lumbar dura mater have also been reported[18-19]. These findings suggested that, LDH contributes to cause LBP by irritating the nerve in the disc, posterior longitudinal ligament or dura mater.

This study demonstrated that, the discogenic LBP from the adjacent degenerative segment was an important component of accompanying LBP in many LDH patients. Because the herniated disc can cause LBP, discogenic LBP from the adjacent disc may be ignored. For the patients who were resistant to nonoperative treatment, surgical treatment was a better selection. Lumbar discectomy can relieves radicular pain and LBP in most patients, leg pain will be more greatly improved than back pain[5]. A majority of patients experienced no improvement of LBP[9, 20-21]. For these patients, LBP may come from the adjacent level. Effective treatment requires accurate targeting of the intrinsic cause with appropriate application of specific managements, correctly identifying the symptomatic level leads to good therapeutic outcome. To receive a good result, a detailed and conscientious diagnostic process must be made. It may be expected to have better clinical results when adjacent painful disc was also treated during surgical treatment of the disc herniation. Preliminary outcomes of intradiscal methylene blue injection and intradiscal electrothermal annuloplasty for discogenic LBP are encouraging[12, 22-23]. In this study, all these patients that underwent intradiscal methylene blue injection reported that, LBP was distinctly improved.

It is interesting to find that, the painful discs were only seen in patients with a preponderance of LBP or an equivalence of LBP to leg pain, and no patients with a preponderance leg pain had painful discs in discography. The findings may suggest that, sciatica is more evident than LBP in the LDH patients. If a LDH patient presented evident LBP, the exact reason of LBP should

be confirmed. IDD was the most likely cause of LBP, except for potential sources such as facet joints, ligaments and muscles. Discography is strongly recommended for the LDH patients with refractory LBP especially when moderate or severe degenerative disc is found adjacent to the herniated level to determine the exact level which causes the LBP.

Derincek *et al* [24] reported that the provocative pain in a disc may be due to the referred pain from an adjacent abnormal disc during discography. In present study, among 20 herniated discs on MRI, 25% (5 discs) showed a positive response and 75% showed a negative pain response. In contrast, six degenerative discs adjacent to the herniated disc showed positive response. However, only one patient had provocative pain in the herniated disc and adjacent degenetive disc. Therefore, it seemed impossible that the pain in adjacent degenerative level come from the referred pain of herniated disc.

This study contains two limitations, one is there is no gold standard for diagnosing disc pain and there are some controversies in whether a disc is truly a clinically significant pain generator in a chronic LBP patient identified by discography. Carragee *et al* [25-27] have shown an unacceptable high rate of false-positives. However, serial Carragee's researches have been extensively criticized. Multiple drawbacks described include no mention of the side of needle insertion, interpretation, presence of negative discs, small number of patients, inability to compare pain provocation with clinical or typical pain, post-test and pretest probability, and accuracy of psychological evaluation[28]. It is an interesting fact that, none of the patients in the Carragee's subgroup of truly asymptomatic patients had a low pressure positive discogram. The second limitation is that a small number of patients investigated in this study. There were only 6 adjacent levels in 6 patients resulting in LBP, therefore the incidence of adjacent painful disc is relatively low. But the significance of our study is if LDH patients had severe LBP, the exact diagnosis may be given very cautiously, LBP may be come from the adjacent degenerative disc. Whether the preoperative status of the adjacent discs as determined by provocative discography, has an impact on the clinical outcome of lumbar fusion in chronic LBP patients, still remains unclear[29-30]. However, this study demonstrated that, LBP was distinctly improved when adjacent painful disc being treated, even though authors admitted that the patients were small. Considering that minimally invasive therapy, including automated percutaneous discectomy, laser discectomy, and percutaneous endoscopic discectomy have been widely practiced, and discography was done to assess the integrity of annulus fibrosus before minimally invasive therapy, assessment and treatment of adjacent level were convenient and may obtain a good result.

REFERENCES

[1] Gibson JN, Waddell G. Surgical interventions for lumbar disc prolapse: updated Cochrane Review. Spine (Phila Pa 1976). 2007;32(16):1735-1747.
[2] Atlas SJ, Deyo RA, Keller RB, et al. The Maine Lumbar Spine Study, Part II. 1-year outcomes of surgical and nonsurgical management of sciatica. Spine (Phila Pa 1976). 1996;21(15): 1777-1786.
[3] Weinstein JN, Tosteson TD, Lurie JD, et al. Surgical vs nonoperative treatment for lumbar disk herniation: the Spine Patient Outcomes Research Trial (SPORT): a randomized trial. JAMA. 2006;296(20):2441-2450.
[4] Asch HL, Lewis PJ, Moreland DB, et al. Prospective multiple outcomes study of outpatient lumbar microdiscectomy: should 75 to 80% success rates be the norm? J Neurosurg. 2002;96(1 Suppl):34-44.
[5] Pearson AM, Blood EA, Frymoyer JW, et al. SPORT lumbar intervertebral disk herniation and back pain: does treatment, location, or morphology matter? Spine (Phila Pa 1976). 2008; 33(4):428-435.
[6] Kjaer P, Leboeuf-Yde C, Korsholm L, et al. Magnetic resonance imaging and low back pain in adults: a diagnostic imaging study of 40-year-old men and women. Spine (Phila Pa 1976). 2005;30 (10):1173-1180.
[7] Luoma K, Riihimäki H, Luukkonen R, et al. Low back pain in relation to lumbar disc degeneration. Spine (Phila Pa 1976). 2000;25(4):487-492.
[8] Lindblom K. Technique and results of diagnostic disc puncture and injection (discography) in the lumbar region. Acta Orthop Scand. 1951;20(4):315-326.
[9] Yorimitsu E, Chiba K, Toyama Y, et al. Long-term outcomes of standard discectomy for lumbar disc herniation: a follow-up study of more than 10 years. Spine (Phila Pa 1976). 2001;26(6): 652-657.
[10] Pfirrmann CW, Metzdorf A, Zanetti M, et al. Magnetic resonance classification of lumbar intervertebral disc degeneration. Spine (Phila Pa 1976). 2001;26(17):1873-1878.
[11] Sachs BL, Vanharanta H, Spivey MA, et al. Dallas discogram description. A new classification of CT/discography in low-back disorders. Spine (Phila Pa 1976). 1987;12(3):287-294.
[12] Peng B, Zhang Y, Hou S, et al. Intradiscal methylene blue injection for the treatment of chronic discogenic low back pain. Eur Spine J. 2007;16(1):33-38.
[13] Roland M, Morris R. A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain. Spine (Phila Pa 1976). 1983;8(2): 141-144.
[14] Mixter W, Barr JS. Rupture of the intervertebral disc with involvement of the spinal canal. N Engl J Med. 1934;211: 210-215.
[15] Kuslich SD, Ulstrom CL, Michael CJ. The tissue origin of low back pain and sciatica: a report of pain response to tissue stimulation during operations on the lumbar spine using local anesthesia. Orthop Clin North Am. 1991;22(2):181-187.
[16] Ohtori S, Takahashi K, Yamagata M, et al. Neurones in the dorsal root ganglia of T13, L1 and L2 innervate the dorsal portion of lower lumbar discs in rats. A study using dil, an anterograde neurotracer. J Bone Joint Surg Br. 2001;83(8): 1191-1194.
[17] Ohtori S, Takahashi Y, Takahashi K, et al. Sensory innervation of the dorsal portion of the lumbar intervertebral disc in rats. Spine (Phila Pa 1976). 1999;24(22):2295-2299.
[18] Konnai Y, Honda T, Sekiguchi Y, et al. Sensory innervation of the lumbar dura mater passing through the sympathetic trunk in rats. Spine (Phila Pa 1976). 2000;25(7):776-782.
[19] Sekine M, Yamashita T, Takebayashi T, et al. Mechanosensitive afferent units in the lumbar posterior longitudinal ligament. Spine (Phila Pa 1976). 2001;26(14):1516-1521.
[20] Astrand P, Määttänen H, Vucetic N, et al. Pain and orthopaedic and neurologic signs after lumbar discectomy: a 2-year followup. Clin Orthop Relat Res. 2000;(379):154-160.
[21] Atlas SJ, Keller RB, Wu YA, et al. Long-term outcomes of surgical and nonsurgical management of sciatica secondary to a lumbar disc herniation: 10 year results from the maine lumbar spine study. Spine (Phila Pa 1976). 2005;30(8):927-935.
[22] Saal JA, Saal JS. Intradiscal electrothermal treatment for chronic discogenic low back pain: a prospective outcome study with minimum 1-year follow-up. Spine (Phila Pa 1976). 2000; 25(20):2622-2627.
[23] Saal JA, Saal JS. Intradiscal electrothermal treatment for chronic discogenic low back pain: prospective outcome study with a minimum 2-year follow-up. Spine (Phila Pa 1976). 2002;27(9):966-974.
[24] Derincek A, Mehbod A, Schellhas K, et al. Discography: can pain in a morphologically normal disc be due to an adjacent abnormal disc? Arch Orthop Trauma Surg. 2007;127(8): 699-703.
[25] Carragee EJ, Alamin TF, Carragee JM. Low-pressure positive Discography in subjects asymptomatic of significant low back pain illness. Spine (Phila Pa 1976). 2006;31(5):505-509.
[26] Carragee EJ, Alamin TF, Miller J, et al. Provocative discography in volunteer subjects with mild persistent low back pain. Spine J. 2002;2(1):25-34.
[27] Carragee EJ, Tanner CM, Khurana S, et al. The rates of false-positive lumbar discography in select patients without low back symptoms. Spine (Phila Pa 1976). 2000;25(11):1373-1381.

[28] Buenaventura RM, Shah RV, Patel V, et al. Systematic review of discography as a diagnostic test for spinal pain: an update. Pain Physician. 2007;10(1):147-164.
[29] Willems PC, Elmans L, Anderson PG, et al. Provocative discography and lumbar fusion: is preoperative assessment of adjacent discs useful? Spine (Phila Pa 1976). 2007;32(10): 1094-1100.
[30] Buttermann GR, Heithoff KB, Ogilvie JW, et al. Vertebral body MRI related to lumbar fusion results. Eur Spine J. 1997;6(2): 115-120.

椎间盘突出临近退变节段是否导致腰痛☆

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摘要

背景：椎间盘突出症患者腰痛原因很难判断，一直以来，认为突出的椎间盘是椎间盘突出症患者腰痛及腿痛重要原因，椎间盘突出临近退变节段是否导致腰痛需进一步研究证实。

目的：通过椎间盘造影判断突出临近退变节段是否是椎间盘突出症患者腰痛原因，并报告经椎间盘镜摘除椎间盘后残留腰痛在临近退变疼痛椎间盘经亚甲蓝注射治疗的效果。

方法：20 例同时具有腰痛和腿痛椎间盘突出症患者行椎间盘造影检查，这些患者腰椎 MRI 表现为有 1 个突出椎间盘外至少合并 1 个或 1 个以上的临近退变的椎间盘，全部患者均经椎间盘镜摘除椎间盘切除突出的椎间盘，5 例临近退变椎间盘造影阳性患者在椎间盘镜切除后经椎间盘内注射亚甲蓝治疗。腰痛、腿痛采用目测类比评分评定。

结果与结论：20 例患者总共 64 个椎间盘行椎间盘造影，共 11 个椎间盘造影阳性，其中 6 个位于椎间盘突出临近退变节段，5 个位于引起神经根性痛的椎间盘突出节段。全部病例腿痛行椎间盘镜切除突出椎间盘后明显缓解，腰痛有部分缓解，6 例临近椎间盘造影阳性患者经椎间盘镜摘除椎间盘后腰痛明显，影响日常生活，其中 5 例行临近疼痛椎间盘亚甲蓝注射后腰痛缓解，1 例患者拒绝亚甲蓝注射治疗仍有明显腰痛。结果显示椎间盘突出症患者腰痛可能来源于突出临近退变节段。

关键词：椎间盘退变；椎间盘突出；腰痛；椎间盘造影；盘源性腰痛

doi:10.3969/j.issn.1673-8225.2011.22.043
中图分类号: R318　文献标识码: B
文章编号: 1673-8225(2011)22-04171-05
王刚，刘尚礼，陈志维，关宏刚，韩敦富，施彦璋. 椎间盘突出临近退变节段是否导致腰痛[J].中国组织工程研究与临床康复，2011，15(22):4171-4175.
[http://www.crter.org　http://cn.zglckf.com]
(Edited by Fei Q/Yang Y/Wang L)

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伦理批准：所有患者行椎间盘造影检查及经椎间盘镜椎间盘切除均签署了“知情同意书”，实验经过中山大学第二附属医院伦理学委员会批准。

本文创新性：临床上椎间盘突出症患者 MRI 表现常显示除椎间盘退变突出外，常合并相邻节段椎间盘退变，既往研究显示椎间盘退变与腰痛相关，椎间盘突出症患者除神经根性痛外常合并腰痛，椎间盘突出临近退变椎间盘是否导致腰痛，据作者所知目前国内外尚无相关研究。本研究通过椎间盘造影判断突出临近退变节段是否是椎间盘突出症患者腰痛原因，并报告经椎间盘镜摘除椎间盘后残留腰痛在临近退变疼痛椎间盘经亚甲蓝注射治疗的效果，提示部分椎间盘突出临近退变节段可导致盘源性腰痛。