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# 椎间孔镜下髓核摘除术对腰椎间盘突出患者 CK、CRP 及腰椎功能恢复的影响\*

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**摘要** 目的:探讨椎间孔镜下髓核摘除术对椎间盘突出患者肌酸激酶(CK)、C反应蛋白(CRP)及腰椎功能恢复的影响。方法:选择2016年10月-2018年8月在我院接受治疗的90例腰椎间盘突出患者,采用抽签法分为椎间孔镜组(n=45)和后路切开组(n=45)。对照组给予后路切开髓核摘除手术治疗,观察组给予椎间孔镜下髓核摘除治疗。比较两组患者的手术情况、CK、CRP、腰椎功能、视觉模拟(VAS)评分、Oswestry功能障碍指数(ODI)评分变化情况及并发症发生情况。结果:椎间孔镜组手术时间较后路切开组更长,术中出血量、术后下床时间及住院时间较后路切开组更低( $P<0.05$ );手术前,两组CK、CRP检测结果无差异;手术后,两组CK、CRP均随着时间的延长均呈上升趋势,且椎间孔镜组上升较后路切开组低( $P<0.05$ );手术前,两组腰椎功能检测结果无差异;手术后,两组腰椎曲度、直腿抬高试验均随着时间的延长均呈上升趋势,且椎间孔镜组上升更为明显( $P<0.05$ );手术前,两组VAS、ODI评分评定结果无差异;手术后,两组VAS、ODI评分均随着时间的推移均呈下降趋势,且椎间孔镜组下降更为明显( $P<0.05$ );手术后,与后路切开组24.44%(11/45)进行比较,椎间孔镜组4.44%(2/45)显著降低( $P<0.05$ )。结论:在腰椎间盘突出患者中应用椎间孔镜下髓核摘除效果显著,可有效改善CK、CRP及腰椎功能水平。

**关键词:**椎间孔镜下髓核摘除术;腰椎间盘突出;肌酸激酶;C反应蛋白;腰椎功能

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## Effect of Nucleus Pulposus Excision Under Foramina Lens on CK, CRP and Lumbar Functional Recovery in Patients with Lumbar Disc Herniation\*

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**ABSTRACT Objective:** To study Effect of nucleus pulposus excision under foramina lens on Creatine kinase (CK), C-reactive protein (CRP) and lumbar functional recovery in patients with lumbar disc herniation. **Methods:** 90 patients with lumbar disc herniation who were treated in our hospital from October 2016 to August 2018 were selected and divided into intervertebral foramina group (n=45) and posterior incision group (n=45) by lottery. The control group was treated with posterior incision and nucleus pulposus resection, while the observation group was treated with intervertebral foramen. The changes of surgical conditions, CK, CRP, lumbar function, visual analogue scale (VAS) score, Oswestry disability index (ODI) score and complications were compared between the two groups. **Results:** The operative time of the foramina group was longer than that of the posterior incision group, and the amount of intraoperative blood loss, postoperative time to the ground and hospital stay were lower than that of the posterior incision group ( $P<0.05$ ). Before surgery, there was no difference in CK and CRP detection results between the two groups. After surgery, CK and CRP in both groups showed an upward trend with time, and the increase in the intervertebral foramina group was lower than that in the posterior incision group ( $P<0.05$ ). Before operation, there was no difference between the two groups. After surgery, the lumbar curvature and straight leg elevation tests in both groups showed an increasing trend over time, and the increase was more obvious in the foraminal lens group ( $P<0.05$ ). There was no difference in VAS and ODI scores between the two groups before surgery. After surgery, VAS and ODI scores in both groups showed a downward trend with the passage of time, and the decline was more obvious in the foraminal lens group ( $P<0.05$ ). After surgery, compared with the posterior incision group (24.44%(11/45)), the intervertebral foramina group (4.44%(2/45)) was significantly reduced ( $P<0.05$ ). **Conclusion:** In patients with lumbar disc herniation, the effect of nucleus pulposus removal under intervertebral foramen microscopy is significant, which can effectively improve CK, CRP and lumbar function level.

**Key words:** Excision of nucleus pulposus under foramina lens; Lumbar disc herniation; Creatine kinase; C-reactive protein; Lumbar function

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## 前言

椎间盘突出症是引起腰腿疼痛的常见病因之一,是因为椎间盘经过不同程度的退行性改变后,在外力作用下,椎间盘纤维环被破坏,髓核组织从破裂点向后方或椎管突出,造成脊髓神经根受压,腰椎疼痛,严重影响患者的生活质量<sup>[1,2]</sup>。临床通常使用手术治疗该病,既往通常使用后路切开髓核摘除术,但治疗效果不佳,近年来随着微创技术的发展,椎间孔镜下髓核摘除术的治疗也得到改变,椎间孔镜下髓核摘除术是近年来发展的新技术,在手术中具有较好的视野,能准确辨认和保护好硬脊膜囊、椎管内血管,减少手术出血量,降低术后并发症的发生<sup>[3,4]</sup>。目前炎症因子 CRP、CK 是外科手术术后效果评价的常用指标,因此改善患者炎症反应对疾病具有重要意义<sup>[5]</sup>。CRP 是炎症因子常用指标,当机体受到损伤时其水平上升,可能参与了椎间盘突出症的发生;CK 主要存在于骨骼肌细胞浆中,具有调节造血细胞功能,还能修复受损组织<sup>[6-8]</sup>。但关于椎间盘突出症微创术后对患者血清 CK、CRP 的变化影响报道较少,因此,本研究旨在探讨椎间孔镜下髓核摘除术对椎间盘突出患者 CK、CRP 及腰椎功能恢复的影响。

## 1 资料与方法

### 1.1 一般资料

选择 2016 年 10 月 -2018 年 8 月在我院接受治疗的 90 例腰椎间盘突出患者。采用抽签法分为 2 组,椎间孔镜组 45 例,其中男 27 例,女 18 例,年龄 38~74 岁,平均(58.72± 3.06)岁,病程 8~38 月,平均(25.36± 4.12)月,椎间盘突出位置:椎间孔内型 8 例、旁中央型 27 例、中央型 10 例;后路切开组 45 例,男 25 例,女 20 例,年龄 42~76 岁,平均(58.73± 3.51)岁,病程 9~40 月,平均(25.46± 4.23)月,椎间盘突出位置:椎间孔内型 6 例、旁中央型 26 例、中央型 13 例。两组基线资料无明显差异,可比较。

参照《腰椎间盘突出症诊断和治疗现状》<sup>[9]</sup>,(1)伴反复发作性腰痛;(2)下肢放射性疼痛,站立、行走、时症状加重;(3)腰椎侧凸,跛行;(4)影像检测确诊。

纳入标准:(1)符合上述诊断标准;(2)临床资料完整;(3)血流动力学稳定;(4)病情稳定,无生命危险;(5)签署知情同意书。排除标准:(1)重症有生命危险患者;(2)患有意识障碍、精神障碍者;(3)合并感染者;(4)合并凝血功能异常患者;(5)心脑血管病变者;(6)合并病理性骨折患者;(7) 依从性较差者;(8)腰椎不稳者。

### 1.2 方法

后路切开组给予传统开窗手术:全麻后,后路正中切口,逐层切开,显露出硬膜囊和神经根,切除脱落的髓核组织。冲洗止血后,引流关闭伤口。椎间孔镜组给予椎间孔镜下髓核摘除:患者麻醉后,根据透视穿刺进入椎间盘,置入扩张管,置入椎间孔镜,取出髓核组织,进行神经根管减压,观察无残留后,冲洗切口,取出手术器械并缝合。

### 1.3 观察指标

采集空腹静脉血 5 mL,采用荧光分光光度法检测 CK、CRP 水平;采用 X 线片测定腰椎曲度;VAS:0 分表示无痛;分值越高,疼痛感越强;ODI 评分:分值越高,功能障碍越严重;记录手术情况及并发症发生情况。

### 1.4 统计学分析

以 spss18.0 软件包处理,符合正态分布计量资料用均数±标准差( $\bar{x} \pm s$ )表示,组间比较使用独立样本 t 检验,计数资料以率表示, $\chi^2$  检验, $P < 0.05$  表示差异具有统计学意义。

## 2 结果

### 2.1 不同手术方式围手术期情况比较

椎间孔镜组手术时间高于后路切开组,术中出血量、术后下地时间及住院时间低于后路切开组( $P < 0.05$ ),见表 1。

表 1 不同手术方式围手术期情况比较( $\bar{x} \pm s$ )

Table 1 Comparison of perioperative conditions of different surgical methods( $\bar{x} \pm s$ )

Groups	n	The operation time (min)	Intraoperative blood loss (mL)	Postoperative time to the ground (d)	The length of time (d)
Intervertebral foramen lens group	45	81.53± 14.65	33.56± 9.45	2.21± 1.02	7.15± 2.31
Posterior incision group	45	70.24± 18.04	80.84± 9.57	4.98± 2.03	8.96± 2.68
t value		3.259	23.582	8.179	3.432
P value		0.002	0.000	0.000	0.001

### 2.2 不同手术方式 CK、CRP 检测结果对比

手术前,两组 CK、CRP 检测结果无差异;手术后,两组 CK、CRP 均随着时间的均呈上升趋势,且椎间孔镜组上升较后路切开组低( $P < 0.05$ ),见表 2。

### 2.3 不同手术方式腰椎功能对比

手术前,两组腰椎功能检测结果无差异;手术后,两组腰椎曲度、直腿抬高试验均随着时间的均呈上升趋势,且椎间孔镜组上升更为明显( $P < 0.05$ ),见表 3。

### 2.4 不同手术方式 VAS、ODI 评分变化情况

手术前,两组 VAS、ODI 评分评定结果无差异;手术后,两组 VAS、ODI 评分均随着时间的推移均呈下降趋势,且椎间孔镜组下降更为明显( $P < 0.05$ ),见表 4。

### 2.5 不同手术方式并发症情况对比

手术后,与后路切开组 24.44%(11/45)进行比较,椎间孔镜组 4.44%(2/45)显著降低( $P < 0.05$ ),见表 5。

## 3 讨论

椎间盘突出是临床常见的骨科疾病,多发生于中老年人,

发病率较高,随着我国人口老龄化的进展加快速,其发病率呈上升趋势,据调查显示,20%~30%腰腿痛患者其病因源自腰椎间盘突出,是腰腿痛的常见原因之一,严重者甚至会导致大小便障碍及下肢瘫痪等,严重影响患者的日常生活<sup>[10]</sup>。较多研究认为,对于LDH疼痛发生机制,临床认为是由脱出髓核组织对神经根造成压迫及刺激引起的,因此手术治疗以早期摘除病变

髓核组织,减轻神经根压迫为主<sup>[11-13]</sup>。后路切开髓核摘除术是既往治疗椎间盘突出的常用方法,具有一定的疗效,但该手术会导致脊柱肌肉系统受损,增加了术后脊椎破坏风险,且创伤较大,同时可对机体其他部位造成不必要的损伤致使患者遭受更大的痛苦<sup>[14,15]</sup>。

表 2 不同手术方式 CK、CRP 检测结果对比( $\bar{x} \pm s$ )

Table 2 Comparison of CK and CRP detection results of different surgical methods( $\bar{x} \pm s$ )

Groups	n	CK(U/L)		CRP(mg/L)	
		Before the operation	After the operation	Before the operation	After the operation
Intervertebral foramen lens group	45	91.56± 27.41	181.27± 64.82	5.21± 0.49	10.67± 1.75
Posterior incision group	45	92.35± 29.83	237.59± 75.71	5.28± 0.61	28.64± 1.53
t value		0.131	3.791	0.600	51.859
P value		0.896	0.000	0.549	0.000

表 3 不同手术方式腰椎功能对比( $\bar{x} \pm s$ )

Table 3 Comparison of lumbar spine functions by different surgical methods( $\bar{x} \pm s$ )

Groups	n	Lumbar curvature(cm)		Straight leg raising test(points)	
		Before the operation	After the operation	Before the operation	After the operation
Intervertebral foramen lens group	45	1.31± 0.18	1.78± 0.27	56.95± 6.71	88.34± 6.58
Posterior incision group	45	1.29± 0.19	1.57± 0.21	57.16± 6.82	78.59± 9.02
t value		0.513	4.118	0.147	5.858
P value		0.609	0.000	0.883	0.000

表 4 不同手术方式 VAS、ODI 评分变化情况( $\bar{x} \pm s$ ,分)

Table 4 Changes of VAS and ODI scores in different surgical methods( $\bar{x} \pm s$ , points)

Groups	n	VAS		ODI	
		Before the operation	After the operation	Before the operation	After the operation
Intervertebral foramen lens group	45	8.57± 1.04	2.13± 0.34	69.58± 8.27	28.14± 3.21
Posterior incision group	45	8.60± 1.05	4.38± 0.56	69.87± 8.31	40.49± 4.37
t value		0.136	23.039	0.166	15.279
P value		0.892	0.000	0.869	0.000

表 5 不同手术方式并发症情况对比[n(%)]

Table 5 Comparison of complications of different surgical methods[n(%)]

Groups	n	Nerve damage	Intervertebral space infection	Infection of incision	Spinal instability	The total incidence of
Intervertebral foramen lens group	45	0	1	0	1	2(4.44)
Posterior incision group	45	2	3	4	2	11(24.44)
$\chi^2$ value						7.283
P value						0.007

近年来随着医疗技术的发展,微创技术逐渐应用到临床中,减少了常规手术带来的风险,微创手术主要通过内窥镜等设备进行,具有创伤小、效果好的优点<sup>[16,17]</sup>。椎间孔镜下髓核摘除术是脊柱微创手术时代标志,主要是通过微小工作通道,在

不破坏重要骨质结构的基础上,直接到达髓核突出位置,保证了解剖位置的安全性,同时内镜具有清晰手术视野,可避免对血管等重要组织的损伤<sup>[18-20]</sup>。有研究显示,椎间孔镜下髓核摘除术操作更为复杂,对手术技术要求较高,因此可导致手术时间

延长<sup>[21]</sup>。本研究结果与上述文献报道有相似之处,说明,椎间孔镜下髓核摘除术对患者机体创伤较小,能减少术中出血量,Deng R<sup>[22]</sup>等研究也显示,椎间孔镜下髓核摘除术具有高倍视野,有利于清除对神经根有压迫的物质,手术效果更好。分析其原因可能是因为经皮椎间孔镜下髓核摘除术是经侧方安全三角穿刺进入椎间盘,手术切口小,同时冲洗液形成的压迫能够起到止血作用,减少了术中出血量,未破坏脊柱后方稳定性,避免过多处理血管、硬脊膜等,故降低了术后卧床时间等。疼痛是腰椎间盘突出症患者最主要的症状,是由多种原因引起的,为进一步证实椎间孔镜下髓核摘除术在椎间盘突出中的疗效,本研究观察了患者术后VAS、ODI评分变化,结果显示,术后,两组VAS、ODI评分均随着时间的推移均呈下降趋势,且椎间孔镜组下降更为明显,提示,椎间孔镜下髓核摘除术可缓解患者疼痛感,减轻其痛苦,有利于促进患者恢复。分析其原因可能是因为椎间孔镜下髓核摘除术主要是通过创面清洗而消除炎症致痛物质,从而减小患者软组织疼痛。有研究显示,椎间孔镜下髓核摘除术是从脊柱侧后方穿刺,不影响脊柱的稳定性,同时还能保护大部分未突出的间盘组织,复发率较小<sup>[23-26]</sup>。本研究结果显示,椎间孔镜下髓核摘除术后并发症发生率为4.44%,明显低于使用后路切开髓核摘除手术的患者,充分证实了椎间孔镜下髓核摘除术对患者机体创伤小,可降低并发症的发生率。

炎症因子是椎间盘突出症的主要原因,在多种刺激因子的作用下分泌大量的炎症介质,加大患者疼痛感<sup>[27,28]</sup>。CK是人体参与能量代谢的一种酶,广泛存在于骨骼肌、脑组织中,能使细胞具有充足能量以完成各类生理功能,当肌肉损伤时机体分泌大量的CK,从而修复损伤的肌肉,其水平与肌肉牵拉程度及剥离程度相关,通过观察其水平变化,被作为肌肉损伤程度的评价指标<sup>[29-31]</sup>。Sansoni V<sup>[32]</sup>等研究显示,在椎间盘突出症术后可对患者肌肉组织造成损伤,导致CK水平升高。CRP是判断组织损伤的敏感指标,其水平越高则代表部位损失程度越严重,相关研究表明,在多种手术后患者能出现不同程度的免疫功能损失,CRP水平随之升高,可作为免疫功能损伤及炎症症状临床评价指标<sup>[33-35]</sup>。为进一步证实椎间孔镜下髓核摘除术对腰椎间盘突出症的疗效,本研究将CK、CRP作为椎间盘突出症的重要指标进行观察,结果显示,手术后,两组CK、CRP均随着时间的推移均呈上升趋势,且椎间孔镜组上升较后路切开组低,说明,术后对患者机体刺激较大,可导致CK、CRP水平升高,但椎间孔镜下髓核摘除术作为微创手术,对患者机体损伤较小,故CK、CRP升高程度较传统后路切开髓核摘除手术低。本研究结果还显示,术后患者腰椎曲度、直腿抬高试验均随着时间的推移均呈上升趋势,且椎间孔镜组上升更为明显,进一步证实了椎间孔镜下髓核摘除术对椎间盘突出症具有确切的临床疗效。

综上所述,在腰椎间盘突出症患者中应用椎间孔镜下髓核摘除效果显著,可有效改善CK、CRP及腰椎功能水平。

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## · 重要信息 ·

### 《现代生物医学进展》2021 年封面设计说明

2019 年底爆发的新冠肺炎疫情肆虐全球,对全球政治、经济、贸易和社会各层次造成了巨大冲击,到目前为止,全球新冠病毒感染人数累计达 81715247 人,死亡人数达 1778294 人。因此,本年度封面形象的以新冠病毒肆虐地球,人类重拳出击抵抗新冠疫情为主题设计了封面,旨在倡导生物医学工作者思考和研究更有效的预防和治疗措施以应对新冠病毒。当前,隔离仍然是遏制新冠病毒快速传播的有效手段,新冠疫苗研发与接种是克制新冠疫情的内生动力,而环境消杀是彻底消灭新冠病毒的有力保障。相信通过人类共同努力,各国携手合作,众志成城,一定能够消灭新冠疫情,开创人类命运共同体的美好明天。

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