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经后路伤椎椎弓根钉固定治疗胸腰椎爆裂骨折的疗效观察 *

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摘要 目的：探讨经后路伤椎椎弓根钉固定治疗胸腰椎爆裂骨折的临床疗效及安全性。**方法：**择取 2014 年 1 月至 2016 年 12 月我院收治的 64 例胸腰椎爆裂骨折患者，将其均分为研究组（n=32）与对照组（n=32）。研究组采用经后路伤椎椎弓根钉固定治疗，对照组采用经后路非伤椎置钉短节段椎弓根钉固定治疗，治疗后随访 6 个月。比较两组临床指标、并发症发生情况以及术前、术后 1 个月、6 个月伤椎前缘高度比、Cobb 角、疼痛数字评分量表（NRS）评分。**结果：**两组患者手术切口均实现 I 期愈合，术后无感染。与对照组相比，研究组手术时间较长（P<0.05），术中出血量、住院时间比较无统计学差异（P>0.05）。两组术前伤椎前缘高度比、Cobb 角、NRS 评分比较无统计学意义（P>0.05）；术后 1 个月、术后 6 个月两组伤椎前缘高度比较术前显著升高，Cobb 角、NRS 评分较术前显著降低，差异有统计学意义（P<0.05）。术后 6 个月研究组 Cobb 角、NRS 评分低于对照组（P<0.05），两组伤椎前缘高度比比较无统计学意义（P>0.05）。与对照组相比，研究组术后腰背痛、内固定失败发生率均较低（P<0.05）。**结论：**对于胸腰椎爆裂骨折患者，经后路伤椎椎弓根钉固定可以有效改善临床指标，有利于术后身体恢复，减轻疼痛，安全性较高，值得临床推广。

关键词：胸腰椎爆裂骨折；伤椎椎弓根钉固定；伤椎前缘；疼痛；疗效

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Curative Effect of Thoracolumbar Burst Fracture Treatment with Posterior Vertebral Pedicle Screw Fixation*

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ABSTRACT Objective: To explore the clinical efficacy and safety of posterior vertebral pedicle screw fixation in the treatment of thoracolumbar burst fracture. **Methods:** 64 cases of thoracolumbar burst fracture treated in our hospital from January 2014 to December 2016 were selected,which were divided into study group (n=32) and control group (n=32). The study group was treated by posterior vertebral pedicle screw fixation, the control group was treated by posterior vertebral pedicle screw pedicle screw fixation. The patients were followed up for 6 months. The clinical indicators, complications were compared between the two groups. The height ratio of anterior margin of injured vertebra, Cobb angle and Numeric Pain Rating Scale (NRS) scores of the two groups before operation,1 month after operation, 6 months after operation were compared. **Results:** All the patients were all healed in I stage and no infection after operation. Compared with the control group, the operation time of the study group was longer (P<0.05), and there was no significant difference between the amount of bleeding and the time of hospitalization (P>0.05). There was no significant difference between the height ratio of anterior margin of injured vertebra, Cobb angle and NRS scores of the two groups (P>0.05). 1 month after operation, 6 months after operation, the height ratio of anterior margin of injured vertebra in the two groups were higher than before operation, Cobb angle and NRS scores were lower than before operation, the differences were statistically significant (P<0.05). 6 months after operation, the Cobb angle, NRS scores in the study group were lower than that in the control group (P<0.05), and there was no significant difference in the height ratio of anterior margin of injured vertebra of the two groups (P>0.05). Compared with the control group, the incidence rate of lumbago and back pain and internal fixation failure in the study group were lower than that in the control group (P<0.05). **Conclusion:** For thoracolumbar burst fractures,posterior vertebral pedicle screw fixation can effectively improve clinical indicators, is conducive to postoperative physical recovery,pain relief and safety, and is worthy of clinical promotion.

Key words: Thoracolumbar burst fracture; Vertebral pedicle screw fixation; Anterior margin of injured vertebra; Pain; Curative effect

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前言

胸腰椎爆裂性骨折是临床上常见的脊柱骨折,也是一种严重的脊柱损伤,由于该类损伤累及前、中柱,脊柱稳定型遭到破坏,需要进行手术治疗[1-3]。目前,临床上对于治疗胸腰椎爆裂性骨折的手术方式仍不统一,经后路非伤椎置钉短节段椎弓根钉固定是目前应用最广泛的手术方式,该方法复位良好,可以对伤椎起到很好的固定效果[4]。但由于后路非伤椎置钉短节段椎弓根钉固定在骨折椎体上下节段各置入一对椎弓根螺钉,缺乏对伤椎的固定,致使部分病例后期出现断钉和矫正丢失的情况,影响治疗效果[5,6]。经后路伤椎椎弓根钉固定不仅增强了伤椎节段的稳定性,同时减少了后期椎体丢失的发生[7-9]。为进一步探讨经后路伤椎椎弓根钉固定治疗胸腰椎爆裂骨折的临床疗效,本文选取我院 64 例患者进行对照研究,现作如下报道。

1 资料与方法

1.1 一般资料

将 2014 年 1 月至 2016 年 12 月我院收治的 64 例胸腰椎爆裂骨折患者纳入本次研究。纳入标准:(1)所有患者均经 CT 或磁共振检查证实为胸腰椎爆裂骨折;(2)受伤节段为 T11~L2 节段;(3)伤椎前缘压缩高度低于椎体的 1/2;(4)患者及家属对研究知情同意。排除标准:(1)联合损伤患者;(2)合并肝、肾、心脏等脏器的功能障碍者;(3)患有精神疾病的患者。将其均分为研究组(n=32)与对照组(n=32)。两组患者在性别构成、年龄构成、骨折节段、Cobb 角、住院时间和 Frankel 脊髓神经功能障碍分级比较上无统计学差异(P>0.05),均衡可比,见表 1。本研究经医院伦理委员会审批同意。

表 1 两组患者一般资料比较

Table 1 Comparison of general data in two groups of patients

Groups	n	Male/female	Age (years)	Fracture segment (n)				Cobbangle(°)	Frankel classification of spinal nerve dysfunction (n)				
				T11	T12	L1	L2		A	B	C	D	E
Study group	32	20/12	38.45±8.82	4	14	12	2	20.17±5.24	11	9	8	2	2
Control group	32	21/11	39.13±8.48	5	13	11	3	19.42±5.36	12	8	7	3	2
x^2/t/Z	-	0.068	0.534	0.142				0.375			0.674		
P	-	0.794	0.678	0.155				0.825			0.500		

1.2 方法

对照组采用经后路非伤椎置钉短节段椎弓根钉固定治疗。患者在气管插管全身麻醉下进行手术,患者仰卧位,平躺于脊柱外科支架床上,以受伤脊椎棘突为中心做长度为 10 cm 的后正中切口,充分显露伤椎及上下邻近一节椎板、横突和关节突。在 X 线 C 臂透视下进行定位,了解骨折移位情况。以伤椎上关节突外缘和横突中线交点为入点,在 C 臂透视下从伤椎上下椎体置入长度、直径适合的 4 枚螺钉,取长度适合的连接棒,预弯后置于螺钉上,在 C 臂透视下确认复位满意后固定。合并神经功能障碍的患者应于入院后常规进行甲泼尼龙琥珀酸冲击疗法,术中进行椎管探查减压术后再进行复位,所有患者均不进行植骨融合,术后常规负压引流,常规进行抗生素治疗,内固定 1 年后拆除。研究组采用经后路伤椎椎弓根钉固定治疗,麻醉方法和切口位置同对照组,在 X 线 C 臂透视下进行定位,了解骨折移位情况。以伤椎上关节突外缘和横突中线交点为入点,在 C 臂透视下从伤椎上下椎体置入长度、直径适合的 4 枚螺钉,同时在伤椎部位置入 2 枚椎弓根钉。其余处置同对照组。

1.3 评价指标

对两组临床指标(手术时间、术中出血量、住院时间)以及术后并发症发生情况进行统计并比较。所有患者术后随访 6 个月,比较两组患者术前、术后 1 个月、术后 6 个月伤椎前缘高度比(伤椎前缘高度与其上下邻近椎体前缘高度之和的比值×100%)、Cobb 角、疼痛数字评分量表(Numeric Pain Rating Scale,NRS)评分变化。NRS 评分 0~10 分,评分越高表明疼痛越剧烈,1~3 分为轻度疼痛,4~6 分为中度疼痛,7~10 分为重度疼痛[10]。

1.4 统计学方法

应用 SPSS 23.0 统计学软件进行统计处理,性别比例、并发症发生率等计数资料以率表示,组间比较实施 x^2 检验;椎体高度比、Cobb 角、NRS 评分等计量资料以($\bar{x}\pm s$)表示,组间比较实施 t 检验;等级资料实施秩和检验,检验标准为α=0.05。

2 结果

2.1 两组临床指标比较

两组患者经过手术后,其切口均达到 I 期愈合,术后无感染。与对照组相比,研究组手术时间较长(P<0.05),术中出血量、住院时间比较无统计学差异(P>0.05)。见表 2。

2.2 两组患者伤椎前缘高度比、Cobb 及 NRS 评分比较

两组术前伤椎前缘高度比、Cobb 角、NRS 评分比较无统计学意义(P>0.05);术后 1 个月、术后 6 个月两组伤椎前缘高度比较术前显著升高,Cobb 角、NRS 评分较术前显著降低,差异有统计学意义(P<0.05)。术后 6 个月研究组 Cobb 角、NRS 评分低于对照组(P<0.05),两组伤椎前缘高度比比较无统计学意义(P>0.05)。见表 3。

2.3 两组术后并发症发生情况比较

与对照组相比,研究组术后腰背痛、内固定失败发生率均较低(P<0.05),见表 4。

表 2 两组手术时间、术中出血量、住院时间比较($\bar{x}\pm s$)

Table 2 Comparison of operation time, intraoperative bleeding,time of hospitalization between the two groups ($\bar{x}\pm s$)

Groups	n	Operation time(min)	Intraoperative bleeding(mL)	Time of hospitalization(d)
Study group	32	112.46± 9.22	143.86± 15.24	27.89± 7.44
Control group	32	89.74± 8.85	138.72± 12.95	28.26± 7.17
t	-	3.021	1.124	0.823
P	-	0.000	0.089	0.154

表 3 两组患者伤椎前缘高度比、Cobb 角及 NRS 评分比较($\bar{x}\pm s$)

Table 3 Comparison of height ratio of anterior margin of injured vertebra,Cobb angle and NRS scores between the two groups ($\bar{x}\pm s$)

Groups	n	Height ratio of anterior margin of injured vertebra(%)			Cobb angle(°)			NRS scores (scores)		
		Before operation	1 month after operation	6 months after operation	Before operation	1 month after operation	6 months after operation	Before operation	1 month after operation	6 months after operation
Study group	32	48.25± 12.62	93.25± 2.87*	92.78± 2.65*	20.17± 4.23	10.64± 3.38*	11.33± 2.89*	8.34± 0.65	2.33± 0.76*	2.27± 0.75*
Control group	32	49.37± 12.84	93.44± 2.77*	91.24± 2.88*	19.45± 4.38	10.55± 3.48*	13.84± 2.57*	8.52± 0.76	2.43± 0.64*	2.87± 0.57*
t	-	0.125	0.183	0.576	0.176	0.145	2.687	0.109	0.187	2.704
P	-	0.921	0.876	0.342	0.894	0.912	0.046	0.938	0.886	0.042

Note:compared with before operation,*P<0.05.

表 4 两组术后并发症发生情况比较 [n(%)]

Table 4 Comparison of postoperative complications between the two groups [n(%)]

Groups	n	Lumbago and back pain	Internal fixation failure
Study group	32	3(9.38)	0(0.00)
Control group	32	10(31.25)	4(12.50)
x^2	-	4.730	4.267
P	-	0.030	0.039

3 讨论

胸腰椎爆裂骨折属严重的脊柱损伤,患者多为严重的胸腰段骨折脱位,甚至部分患者合并脊髓损伤,应尽早实施手术治疗,重建脊柱生理弯曲和稳定性,减轻神经损伤[11-13]。经后路非伤椎置钉短节段椎弓根钉固定是目前临床上治疗胸腰椎爆裂骨折最为广泛的手术方法,该术式在 C 臂透视下从伤椎上下椎体置入 4 枚螺钉,可以对伤椎起到很好的固定效果,同时具备创伤小、操作简单的优点[14]。但近年来,临床发现经后路非伤椎置钉短节段椎弓根钉固定远期可能出现内固定失效的并发症[15,16]。Cheng X 等[17]报道,43%的单纯经后路非伤椎置钉短节段椎弓根钉固定患者在骨折愈合期内发生椎体矢状面塌陷。而 Gonschorek O 等[18]研究发现该项术式术后 3 年固定失败率高达 50%。

近年来学者们发现经伤椎置钉可以为胸腰椎提供解剖学的支持,除对伤椎进行复位外还可以通过牵张前纵韧带、腰大肌纤维起到固定软组织的作用，从而降低固定失败的发生率[19,20]。本研究对我院收治的 64 例胸腰椎爆裂骨折患者进行了对照研究,结果两组患者手术切口均实现 I 期愈合,术后无感染。而研究组手术时间比对照组更长(P<0.05),术中出血量、住院时间无明显差异(P>0.05)。其可能原因与研究组患者除常规固定外,需要在伤椎部位置入 2 枚椎弓根钉有关,但这种操作并未增加术后感染的发生。本研究结果还显示,术后 1 个月、术后 6 个月两组伤椎前缘高度比较术前显著升高,Cobb 角、NRS 评分较术前显著降低(P<0.05),证实两种术式均能重建脊柱生理弯曲和稳定性，降低患者损伤部位疼痛。术后 6 个月研究组 Cobb 角、NRS 评分低于对照组(P<0.05),两组伤椎前缘高度比比较无统计学意义(P>0.05)。表明经后路伤椎椎弓根钉固定治疗效果更好。这主要与经后路伤椎椎弓根钉固定更为稳定,术后固定失败率较低有关[21,22]。而两组伤椎前缘高度比比较无统计学差异,可能与病例数较低以及观察时间较短有关,后续仍需进一步研究证实。与传统术式相比,本次研究的经后路伤椎椎弓根钉固定的优势可以体现在以下几个方面:(1) 采用伤椎椎弓根钉固定手术方式具有更加直接，复位后更加稳定的特点,伤椎高度恢复更为可靠[23,24]。(2)将伤椎与其相邻的椎体、椎间盘固定,与传统方法相比避免了伤椎“漂浮”问题[25]。(3)通过

伤椎椎弓根钉固定将应力分散，将两点固定变为三点固定，减轻各螺钉负荷，降低远期并发症[26,27]。通过以上优势有效的避免了术后并发症的发生。从本研究结果来看，与对照组相比，研究组术后腰背痛、内固定失败发生率均较低（P<0.05）。证实了经后路伤椎椎弓根钉固定治疗胸腰椎爆裂骨折术后并发症较低。胸腰椎爆裂骨折治疗的目的是恢复椎体的高度和脊柱的生理弯曲，解除骨折对神经和激素的压迫，恢复脊柱生理弯曲，因此仅仅从伤椎上下椎体置入 4 枚螺钉是不够的，由于不能形成整体的应力，势必引起伤椎椎体间隙形成，导致远期并发症升高[28-30]。而经伤椎置钉可以为胸腰椎提供解剖学的支持，使椎体前缘更加充实，因此治疗效果更好。

综上所述，经后路伤椎椎弓根钉固定可以有效预防后凸矫正丢失，降低术后并发症，是治疗胸腰椎爆裂骨折的有效方法。

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