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·临床研究·

颈椎体前移与颈后路全椎板切除减压术治疗颈脊髓损伤的疗效对比

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[摘 要] **目的** 比较颈椎体前移与颈后路全椎板切除减压术治疗颈脊髓损伤的临床疗效。**方法** 纳入颈椎外伤伴颈脊髓损伤的患者62例,按手术方式分为颈椎体前移减压术(ACAF)组(30例)和颈后路全椎板切除减压术(PCLD)组(32例)。比较2组患者术中出血量、手术时间、术后引流量、住院时间减压节段数及并发症差异。采用美国脊椎损伤学会(ASIA)评分评价2组患者术前及术后2周、2年的脊髓神经功能情况。**结果** ACAF组术后出现椎管内血肿1例,PCLD组出现术后感染2例和脑脊液漏2例,经对症处理后均顺利出院。PCLD组患者术中出血量、术后引流量和住院时间均大/长于ACAF组($P<0.05$);2组患者减压节段数、手术时间比较,差异无统计学意义($P>0.05$)。2组患者术前ASIA评分比较差异无统计学意义($P>0.05$),2组患者术后2年脊髓神经功能较术前及术后2周均明显恢复($P<0.05$),但组间比较差异无统计学意义($P>0.05$)。**结论** ACAF和PCLD均可有效治疗颈脊髓损伤,但在控制术中出血量、术后引流量、住院时间方面,ACAF更优。

[关键词] 颈椎;脊髓损伤;手术;神经功能

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Comparison of the outcomes of anterior controllable antedisplacement and fusion and posterior cervical laminectomy decompression and fusion in the treatment of cervical spinal cord injury

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Abstract: Objective To compare the clinical outcomes of anterior controllable antedisplacement and fusion and posterior cervical laminectomy decompression and fusion for cervical spinal cord injury. **Methods** A total of 62 patients with cervical spine trauma and cervical spinal cord injury were included and divided into the anterior controllable antedisplacement and fusion (ACAF) group (30 cases) and posterior cervical laminectomy decompression and fusion(PCLD) group (32 cases) according to their surgical methods. The intraoperative blood loss, operation time, postoperative drainage volume, hospital stay, number of vertebral decompression segments and complications between the two groups were compared. The American Spinal Injury Association (ASIA) score was used to evaluate the spinal nerve function before surgery, 2 weeks and 2 years after surgery. **Results** There was 1 case of intraspinal hematoma after surgery in the ACAF group, 2 cases of infection and 2 cases of cerebrospinal fluid leakage after surgery in the PCLD group, and all of them were discharged smoothly after symptomatic treatment. The intraoperative blood loss, postoperative drainage volume and hospital stay in the PCLD group were larger/longer than those in the ACAF group ($P<0.05$), and there was no statistically significant difference in the number of vertebral decompression segments or operation time between the two groups ($P>0.05$). There was no statistically significant difference in the ASIA score before surgery between the two groups ($P>0.05$), the spinal nerve functions 2 years after surgery of the two groups were recovered obviously compared with those before surgery and 2 weeks after surgery ($P<0.05$), but there was no statistically significant difference between the two groups ($P>0.05$). **Conclusion** Both ACAF and PCLD can effectively treat cervical spinal cord injury, but ACAF is better in controlling intraoperative blood loss, postoperative drainage volume and hospital stay.

Keywords: cervical spine; spinal cord injury; surgery; neurological function

颈椎外伤可致颈脊髓缺血或严重受压,临床表现主要为脊髓功能障碍,治疗方式主要为颈前路、颈后路或前后路联合手术,早期手术解除脊髓受压,重建颈椎稳定性及早期进行康复治疗[1-2]。其中颈后路手术是通过扩大椎管容积,使脊髓向后漂移,避开前方致压物,达到间接减压的目的。颈椎体前移减压术可从脊髓前方直接进行减压,同时恢复颈椎生理曲度并维持颈椎机械稳定性。这两种手术方案治疗颈椎外伤伴颈脊髓损伤均取得了良好的减压效果[3],但在术后脊髓神经功能恢复及并发症方面尚缺乏横向比较研究。本

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文旨在比较颈椎体前移减压术和颈后路全椎板切除减压术治疗颈脊髓损伤的临床疗效,现报告如下。

1 资料与方法

1.1 临床资料

回顾性分析2015年1月至2020年4月上海市虹口区江湾医院和上海长征医院收治的62例颈椎外伤伴颈脊髓损伤患者的临床资料。其中,男45例,女17例;患者年龄37~71岁,平均(48.5±11.1)岁;致伤原因:31例意外摔伤,17例交通事故伤,5例高空坠落,5例重物砸伤,4例颈椎过伸性损伤。按照手术方案分为颈椎体前移减压术(anterior controllable antedisplacement and fusion,ACAF)组(30例)和颈后路全椎板切除减压术(posterior cervical laminectomy decompression and fusion,PCLD)组(32例)。2组患者性别、年龄等临床资料比较,差异无统计学意义($P>0.05$)。本研究获上海市虹口区江湾医院医学伦理委员会(2021-101-001)和上海长征医院医学伦理委员会(2021-323-098)批准。

纳入标准:①明确的颈椎外伤致颈脊髓损伤症状,如肢体无力瘫痪、呼吸困难等;②颈椎X射线提示颈椎不稳定,颈椎CT和MRI见椎管狭窄伴脊髓受压,MRI T2加权相脊髓出现高信号等。排除标准:①合并颅脑损伤、多发伤;②严重颈椎骨折、脱位关节突绞锁需行前后路联合手术治疗;③C_1~C_3高位或C_7以下损伤;④颈椎畸形;⑤身体状况差不能耐受全身麻醉。

1.2 手术方法

术前准备:患者入院后常规给予激素、脱水、保护胃黏膜等对症处理,均行颈椎X射线、CT三维重建、MRI检查,完善各项术前检查,排除手术禁忌证。

ACAF组:患者取仰卧位,颈椎略过伸,采取颈前横切口常规入路。将责任节段椎间盘切除,同时将突破后纵韧带的髓核组织摘除。选择大小合适的椎间融合器填塞人工骨混合自体骨后置入椎间隙。术前根据患者颈椎CT三维重建椎体后缘椎弓根间距确定开槽最佳宽度,最宽不能超越两侧横突孔间距。根据患者正常颈椎管矢状径-狭窄节段椎管矢状径确定椎体前移距离,保证提拉螺钉在提拉过程中完全拧入椎体。将钛板置入椎体前缘,使用超声骨刀开槽至椎体后缘骨皮质时,使用1 mm枪钳咬除剩余骨皮质,同时扩大相应节段神经根管。探查神经根管通畅后,同步拧紧螺钉使椎体整体前移,在椎体两侧骨槽中置入骨纤维,逐层缝合切口。

PCLD组:患者取俯卧位,用石膏床固定头颈部,颈椎轻微屈曲,取颈后正中入路,用电刀沿白色的薄层中缝(项韧带)切开深层组织,避免切开有血管的肌肉组织,显露至所需的椎板直至侧块中部,予以侧块螺钉固定后连接钛棒。磨钻两侧开槽后,切断相应的韧带,予以整块切除,仔细分离硬脊膜粘连部分、止血,于关节突关节间植骨,逐层缝合切口。

1.3 观察指标

记录2组患者术中出血量、手术时间、术后引流量、住院时间、减压节段数及并发症发生情况。分别于术前及术后2周、2年进行美国脊椎损伤学会(American Spinal Injury Association,ASIA)评分,按ASIA标准分为A级(完全性瘫痪)、B级(不完全性瘫痪),损伤程度的评定根据最低骶椎节段(S_4~S_5)有无残留功能为准,残留感觉功能时,刺激肛门皮肤与黏膜交界处有反应或刺激肛门深部时有反应,残留运动功能时,肛门指诊外括约肌有随意收缩。运动功能评定,分值按徒手肌力评定结果记录,1级肌力为1分,5级肌力为5分,共10组肌肉,最高50分。感觉功能评定:共28个关键感觉点,每个点4分,痛觉与轻触觉左右各56分,最高224分。球海绵体反射消失为休克期,再现为脊髓休克的终止。ASIA评分越高,功能越好。

1.4 统计学处理

数据采用SPSS 20.0软件处理,计量资料以均数±标准差($\bar{x}\pm s$)表示,组间比较采用独立样本t检验,各组内ASIA评分中运动和感觉评分均采用配对样本t检验对比分析。$P<0.05$为差异有统计学意义。

2 结果

2.1 2组患者手术情况比较

PCLD组患者术中出血量、术后引流量和住院时间均大/长于ACAF组($P<0.05$),2组减压节段数、手术时间比较,差异无统计学意义($P>0.05$),见表1。

表1 2组患者手术情况比较

组别	减压节段数	术中出血量(mL)	术后引流量(mL)	手术时间(min)	住院时间(d)
ACAF组	3.8±1.1	212.5±30.6	88.3±10.2	110.3±14.2	6.5±2.3
PCLD组	4.2±0.9	290.4±26.5*	161.5±23.5*	118.6±13.4	8.8±3.1*

*:与ACAF组比较,$P<0.05$

2.2 2组术后并发症情况

ACAF组术后出现1例椎管内血肿,及时清除血肿后,顺利出院。PCLD组出现2例术后感染,清创手术后治愈;2例脑脊液漏,对症处理后均顺利出院。

2.3 2组患者手术前后脊髓神经功能情况比较

2组患者术前ASIA评分中运动和感觉评分无显著差异($P>0.05$);术后2年,2组患者ASIA评分较

术前及术后2周均显著改善($P<0.05$),但PCLD组和ACAF组运动和感觉评分比较,差异均无统计学意义($P>0.05$),见表2。

表2 2组患者手术前后神经功能ASIA评分比较($\bar{x}\pm s$,分)

组别	术前		术后2周		术后2年	
	运动	感觉	运动	感觉	运动	感觉
ACAF组	34.3±6.6	74.5±7.7	42.8±8.1*#	85.6±8.8*#	59.4±9.8*#	118.3±10.3*#
PCLD组	35.4±7.2	76.8±6.3	44.7±7.5*#	84.3±6.9*#	60.3±9.5*#	115.6±11.6*#

*:与术前比较,$P<0.05$;#:与术后2周比较,$P<0.05$

3 讨论

颈椎外伤伴脊髓损伤致死率、致残率非常高,给患者家庭及社会带来巨大负担[4]。既往报道显示,受伤12 h内进行减压手术、术后再进行高压氧舱治疗能获得更佳的神经功能恢复效果[5]。近年来,虽然干细胞移植已成为治疗脊髓损伤的研究热点[6],但尽早通过手术解除颈脊髓机械压迫、恢复颈椎序列稳定性并早期进行运动神经功能康复锻炼仍然是临床首选处理方式[7-9]。对颈椎外伤伴脊髓损伤进行手术的目的在于解除颈脊髓压迫,恢复颈椎管容积,重建颈椎序列机械稳定性[10-11]。故临床实践中,颈脊髓损伤患者应尽早手术治疗。

对于手术治疗颈椎外伤伴脊髓损伤,传统颈前路、颈后路和前后路联合手术是常规采用的方法和策略[12-13]。颈后路手术是治疗颈椎脊髓损伤的经典术式,其通过切除脊髓后方椎板,扩大脊髓后方空间,使脊髓向后漂移,达到间接减压的目的,疗效显著,应用广泛[14]。但颈后路手术会破坏患者颈后方韧带复合体及颈后肌群,其愈合会产生瘢痕,限制颈椎活动;且手术会破坏颈后肌肉起始点,术后轴性疼痛发生率高;同时切口创伤大易增加切口感染率,延长卧床时间容易形成下肢静脉血栓,而过早抗凝治疗容易导致椎管内血肿形成等,进而增加肺部感染及深静脉血栓发生率;此外,颈后路手术因减压过程中枪钳直接作用于硬膜囊,可能损伤硬膜囊或因减压产生的骨刺刺破硬膜导致脑脊液漏;[15-16]。本研究中,术后ACAF组出现1例椎管内血肿,PCLD组出现2例脑脊液漏和2例术后切口感染,但经过对症处理后临床效果满意,均顺利出院。

颈椎外伤患者椎体后缘与硬膜囊很少发生粘连,在颈后路椎管扩大进行椎体向前提拉时,无法形成"帐篷"效应,亦无法预防椎管内血肿发生[17-18]。而ACAF通过切除前柱部分椎体,使中后柱部分椎体及骨化韧带整体前移,扩大椎管容积,达到直接减压的目的;术中不直接碰触硬膜囊及脊髓,避免了颈前路椎间盘切除及椎体次全切除手术减压造成的脊髓刺激等二次损伤,降低了脑脊液漏发生风险。ACAF的难点为术中开槽,因开槽宽度决定了脊髓减压的横向宽度。临床通常沿钩椎关节内侧开槽,减压区域宽度大于其他前路手术的减压宽度,对脊髓功能恢复起到重要的作用[19-20]。ACAF为新的颈前路手术方式,与传统颈前路手术入路一样,均是通过内脏鞘与血管鞘间隙进入,对肌肉损伤小,术后愈合快。本研究结果表明,与PCLD相比,ACAF在减少术中出血量、术后引流量、住院时间方面优势更加显著。

综上,我们认为ACAF和PCLD均可有效治疗颈椎外伤伴颈脊髓损伤,与PCLD相比,在控制术中出血量、术后引流量、住院时间方面,ACAF更优。

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·临床研究·

钛丝环扎固定外侧壁联合股骨近端防旋髓内钉治疗 AO/OTA 31-A3 型股骨转子间骨折的临床疗效

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[摘 要] **目的** 探讨钛丝环扎固定外侧壁联合股骨近端防旋髓内钉治疗 AO/OTA 31-A3 型股骨转子间骨折的临床疗效。**方法** 选取我院收治的 AO/OTA31-A3 型股骨转子间骨折患者 20 例,所有患者均行钛丝环扎固定外侧壁联合股骨近端防旋髓内钉治疗。记录患者手术时间、术中失血量及围术期并发症发生情况。术后 X 射线观察骨折愈合情况,术前及术后 12 个月采用视觉模拟量表(VAS)评估骨折部位疼痛情况,采用 Harris 评分评估髋关节功能。**结果** 所有患者手术均顺利完成,手术时间平均(2.25±0.90)h;术中失血量平均(403.28±204.56)mL。术后 12 个月 VAS 评分为(1.03±0.54)分,低于术前的(7.35±1.32)分,差异有统计学意义($t=9.335$,$P<0.001$)。术后 12 个月 Harris 评分为(88.65±5.89)分,高于术前的(38.20±7.42)分,差异有统计学意义($t=-24.320$,$P<0.001$)。所有患者均未发生伤口感染及不愈合、关节周围神经血管损伤、内固定失败等并发症。**结论** 使用钛丝环扎固定外侧壁联合股骨近端防旋髓内钉治疗 AO/OTA 31-A3 型股骨转子间骨折并发症较少,骨折断端对位良好,复位稳定,能促进骨折早期愈合,临床疗效满意。

[关键词] 转子间骨折;钛丝;股骨近端防旋髓内钉;外侧壁

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Clinical outcome of fixing lateral wall with titanium-wire cerclage combined with proximal femoral nail antirotation in the treatment of AO/OTA 31-A3 femoral intertrochanteric fracture

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Abstract: Objective To explore the clinical outcome of fixing lateral wall with titanium-wire cerclage combined with proximal femoral nail antirotation in the treatment of AO/OTA 31-A3 femoral intertrochanteric fracture. **Methods** A total of 20 patients with AO/OTA 31-A3

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