

## · 临床研究 ·

## 寰枢椎脱位外科治疗与疏通督脉瘀阻相关性研究

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**【摘要】** 目的:探讨寰枢椎脱位外科治疗与疏通督脉的相关性。方法:2004年6月至2010年6月,对113例(男65例,女48例;年龄8~64岁,平均42.6岁)寰枢椎脱位患者按TOI分型分为T1、T2、O、I4组,并给予外科治疗,主要包括牵引、手术复位融合固定。分别对比各组治疗前后寰椎平面SAC(脊髓有效空间)、督脉经络瘀阻症候积分、JOA评分、NDI评分(颈椎功能障碍指数)。结果:T1、T2、O、I组患者寰椎平面SAC术前分别为(13.34±3.21)、(10.43±2.42)、(7.89±3.14)、(10.50±0.71)mm,末次随访分别为(16.02±1.42)、(15.34±1.87)、(14.49±1.58)、(12.50±0.71)mm;督脉经络瘀阻症候积分术前分别为(8.37±1.87)、(6.87±1.35)、(5.17±1.13)、(7.50±0.71),末次随访分别为(10.59±0.94)、(10.25±1.01)、(8.41±1.31)、(9.0±0);JOA、NDI评分较术前明显改善。结论:采用TOI外科分型治疗寰枢椎脱位,在明显改善神经功能的同时,也有效地缓解督脉经络瘀阻的症状,表明外科治疗与疏通督脉有密切相关性。

**【关键词】** 寰枢关节; 脱位; 分类法; 督脉

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**Research on the correlation between surgical treatment for atlantoaxial dislocation and dredging Governor vessel**

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**ABSTRACT Objective:** To research the correlation between surgical treatment for atlantoaxial dislocation and dredging Governor vessel. **Methods:** From June 2004 to June 2010, 113 patients were reviewed, including 65 males and 48 females, with the mean age of 42.6 years (ranged, 8 to 64 years). All the patients were classified and treated by TOI clinical classification which included traction and decompression and reduction, and inter fixation fusion by surgery. The SAC (space available for the cord), Governor vessel Yuzu score, JOA score, NDI score (cervical spine dysfunction index) before treatment were compared with those of after treatment. **Results:** The SAC in each group before treatment were (13.34±3.21), (10.43±2.42), (7.89±3.14), (10.50±0.71) mm respectively, the last follow-up of (16.02±1.42), (15.34±1.87), (14.49±1.58), (12.50±0.71) mm; Governor vessel Yuzu score before treatment were (8.37±1.87), (6.87±1.35), (5.17±1.13), (7.50±0.71) respectively, the last follow-up of (10.59±0.94), (10.25±1.01), (8.41±1.31), (9.0±0); JOA, NDI score significantly improved compared with that of before treatment. **Conclusion:** Atlantoaxial dislocation confirmed and treated by TOI clinical classification can effectively relieve the nerve function and Governor vessel Yuzu syndrome, and show that surgical treatment is closely related with dredging the Governor vessel.

**KEYWORDS** Atlanto-axial joint; Dislocations; Classification; Governor vessel

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近年来,关于寰枢椎脱位造成的脊髓损伤的外科治疗得到了长足的发展,手术治疗的安全性、内固定的稳定性等都有很大的进步。中医对于脊髓损伤的治疗多从督脉的瘀阻展开,给予针灸、牵引、中药汤剂等治疗,达到疏通督脉的目的。本文对2004年6月至2010年6月,手术治疗的113例寰枢椎脱位患者进行回顾性分析,重在讨论TOI临床分型<sup>[1]</sup>治疗寰枢椎脱位与疏通督脉的关系。

**1 资料与方法****1.1 一般资料** 本组113例,男65例,女48例;

年龄8~64岁,平均42.6岁。均伴有不同程度的颈部及上肢疼痛、四肢功能障碍、呼吸困难、大小便异常等临床表现。采用笔者等<sup>[1]</sup>提出的TOI分型:T1型48例,其中新鲜创伤36例,慢性咽部炎症所致12例;T2型44例,其中枕颈畸形15例,齿状突不连11例,创伤7例,肿瘤7例,结核4例;O型19例,其中枕颈畸形7例,创伤9例,医源性不稳2例,齿状突不连1例;I型2例,均为强直性脊柱炎患者。

**1.2 治疗方法** T1型48例,牵引复位后稳定性良好[ADI(寰齿间隙)≤5mm或SAC(脊髓有效空间,齿突后缘至寰椎后弓距离)≥13mm],给予持续牵

引(牵引重量为 8~10 kg)4 周后,改用颈围严格制动 3 个月。T2 型 44 例,经牵引复位后仍有再脱位倾向,不能用外固定维持复位,经牵引复位后行后路手术固定融合。O 型 19 例,入院后经影像学(三维 CT)检查显示寰枢关节突关节无破坏或无骨性融合,但经严格牵引 1~2 周不能获得满意复位(ADI≥5 mm 或 SAC≤13 mm),采用经口腔前路松解,一期后路 C<sub>1</sub>-C<sub>2</sub> 椎弓根钉系统提拉复位固定融合或颈枕融合术。I 型 2 例,影像学(三维 CT)检查显示寰枢关节突关节已骨性融合,预期经前路松解后行后路手术亦难以获得满意复位。实施后路枕肌下减压,原位枢椎椎弓根钉枕骨钢板螺钉系统固定融合。对于寰枕关节未破坏病例,采用寰枢椎椎弓根钉内固定植骨融合术<sup>[2]</sup>;颈枕畸形、寰枕关节破坏病例行颈枕融合术。术后围手术期严密观察患者生命体征,对症给予消肿、促进骨愈合、预防感染、激素等药物治疗。卧床 3~5 d,颈旁置沙袋制动,轴位翻身、四肢锻炼,术后 3 d 后可戴颈围下床锻炼,3 个月去除颈围进行颈部功能锻炼。

**1.3 观察项目与方法** 分别比较不同分型治疗前后寰椎平面 SAC、督脉经络瘀阻证候积分、JOA 评分(17 分法)<sup>[3]</sup>、NDI 评分(颈椎功能障碍指数)<sup>[4]</sup>。JOA、NDI 评分以最后随访获得。督脉经络瘀阻积分标准根据 JOA 评分与《颈椎病临床评价量表》<sup>[5]</sup>,结合我

科对寰枢椎脱位患者证候的研究制定。总分 12 分(见表 1)。

**1.4 统计学处理** 应用 SPSS 16.0 统计软件进行分析,数据均以均数±标准差表示,采用配对 *t* 检验对治疗前后 SAC、JOA、NDI、督脉经络瘀阻证候积分进行统计学分析,以 *P*<0.05 为差异有统计学意义。

**2 结果**

手术过程顺利,术中未发生脊髓、神经根、椎动脉等损伤。术中出血 200~750 ml,平均 350 ml;手术时间 120~210 min,平均 160 min。113 例均获随访,时间 6~48 个月,平均 20.6 个月。113 例患者在术后 3~6 个月时均获得骨性融合,未发现螺钉松动、断钉及寰枢椎再移位现象。治疗前后寰椎平面 SAC、JOA 评分(17 分法)、NDI 评分见表 2。治疗前后督脉瘀阻证候积分见表 3。寰椎平面 SAC、JOA 评分、NDI 评分、督脉经络瘀阻证候积分在 T1、T2、O 型患者治疗前后的差异有统计学意义,在 I 型患者治疗前后差异无统计学意义。典型病例影像学资料见图 1~4。

**3 讨论**

**3.1 外科治疗的复位效果** 寰枢椎弓根螺钉技术具有直视下置钉、可操作性强、固定节段短、可术中复位、融合率高等特点,是治疗寰枢椎脱位的一种有效手术,可以有效解除脊髓压迫,恢复导致督脉受阻的机械性压迫原因。研究认为<sup>[6]</sup>侧块钉棒系统的生

表 1 督脉经络瘀阻积分的评定方法

Tab.1 Calculation method of Governor vessel Yuzu score

| 症状    | 3 分   | 2 分                                      | 1 分                                 | 0 分                   |
|-------|-------|--|-------------------------------------|-----------------------|
| 颈部僵痛  | 无明显疼痛 | 仅夜间疼痛,偶然,轻度                              | 经常,轻度或偶重度                           | 持续剧痛                  |
| 上下肢功能 | 无明显症状 | 下肢或(和)上肢轻度麻木不仁和乏力;行走不稳,不能快走,手不灵活,但能用筷子进食 | 下肢或(和)上肢无力;用拐可在平地行走少许,不能用筷子,但能用勺子进食 | 下肢或(和)上肢痿废不用,不能使用勺子进食 |
| 膀胱功能  | 正常    | 小便不畅                                     | 小便淋漓不尽                              | 尿潴留或失禁                |
| 呼吸功能  | 正常    | 时作憋闷                                     | 喘憋                                  | 喘憋难以维持,需吸氧            |

表 2 治疗前后寰椎平面 SAC、JOA、NDI 评分结果( $\bar{x}\pm s$ )

Tab.2 The SAC, JOA, NDI scores at atlas plane before and after treatment( $\bar{x}\pm s$ )

| 分型   | 例数(例) | SAC (mm)   |            |            |            | JOA(分)     |            |            |            | NDI(分)      |             |            |            |
|------|-------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|------------|------------|
|      |       | 治疗前        | 末次随访       | <i>t</i> 值 | <i>P</i> 值 | 治疗前        | 末次随访       | <i>t</i> 值 | <i>P</i> 值 | 治疗前         | 末次随访        | <i>t</i> 值 | <i>P</i> 值 |
| T1 型 | 48    | 13.34±3.21 | 16.02±1.42 | -16.467    | <0.01      | 13.54±1.54 | 15.34±1.33 | -8.828     | <0.01      | 25.14±8.86  | 9.87±8.24   | 7.477      | <0.01      |
| T2 型 | 44    | 10.43±2.42 | 15.34±1.87 | -18.969    | <0.01      | 10.16±1.85 | 13.45±1.21 | -10.720    | <0.01      | 33.76±13.53 | 14.21±10.13 | 6.451      | <0.01      |
| O 型  | 19    | 7.89±3.14  | 14.49±1.58 | -12.677    | <0.01      | 7.47±2.01  | 11.45±1.53 | -4.371     | <0.01      | 45.56±12.18 | 27.67±9.46  | 6.430      | <0.01      |
| I 型  | 2     | 10.50±0.71 | 12.50±0.71 | -4.333     | 0.144      | 8.50±0.71  | 10.00±0.00 | -3.000     | 0.205      | 51.50±7.78  | 40.50±2.12  | 1.500      | 0.374      |

表 3 治疗前后督脉经络瘀阻证候积分( $\bar{x}\pm s$ )

Tab.3 Governor vessel Yuzu score before and after treatment( $\bar{x}\pm s$ )

| 分型   | 例数(例) | 治疗前(分)    | 末次随访(分)    | <i>t</i> 值 | <i>P</i> 值 | 督脉经络瘀阻证候积分改善率(%) |
|------|-------|-----------|------------|------------|------------|------------------|
| T1 型 | 48    | 8.37±1.87 | 10.59±0.94 | -8.315     | <0.01      | 60.94±16.83      |
| T2 型 | 44    | 6.87±1.35 | 10.25±1.01 | -6.674     | <0.01      | 40.21±21.10      |
| O 型  | 19    | 5.17±1.13 | 8.41±1.31  | -6.627     | <0.01      | 41.04±20.63      |
| I 型  | 2     | 7.50±0.71 | 9.0±0      | -3.000     | 0.205      | 32.50±10.61      |

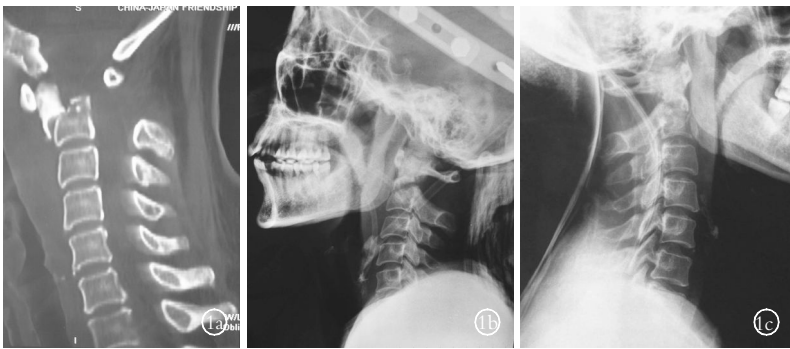


图1 患者,女,33岁,新鲜齿突基底部骨折脱位属T1型寰枢椎脱位 1a. 术前CT 1b. 颅骨牵引复位后,颈椎侧位X线片 1c. 骨牵引复位后,颈托外固定12周,颈椎侧位X线片

Fig.1 Female, 33-year-old, T1-type, fresh odontoid fracture and dislocation of the base 1a. Preoperative CT 1b. Lateral X-ray of cervical spine after skull traction 1c. Lateral X-ray of cervical spine after skull traction using neck collar for 12 weeks

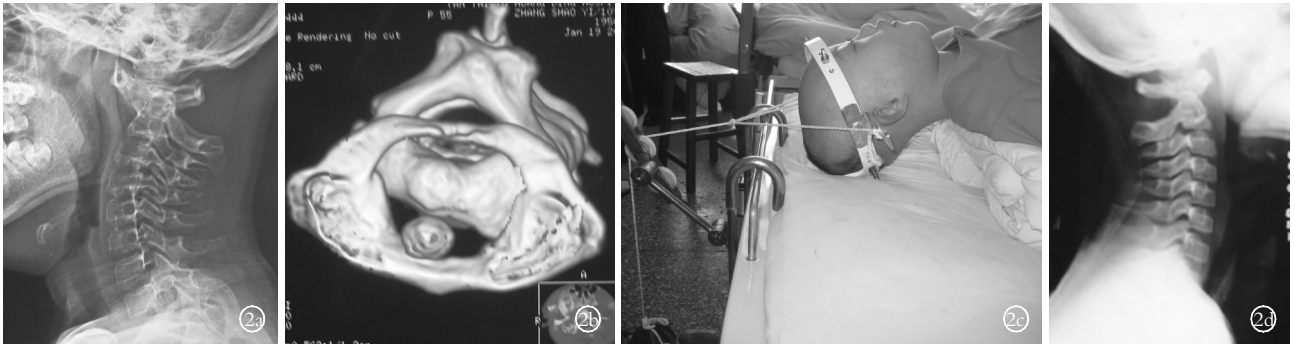


图2 患者,女,10岁,T2型,儿童齿突不连C<sub>1-2</sub>脱位伴鹅颈畸形 2a. 术前侧位X线片 2b. 术前CT片 2c. 术前牵引2周 2d. 术前牵引2周后侧位X线片示C<sub>1-2</sub>脱位基本复位 2e. 术中用椎弓根钉技术使C<sub>1-2</sub>脱位解剖复位,并固定融合 2f. 术后侧位X线片

Fig.2 Female, 10-year-old, T2-type, children odontoid not connected C<sub>1-2</sub> dislocation with goose neck deformity 2a. Preoperative lateral X-ray 2b. Preoperative CT film 2c. Traction for 2 weeks before surgery 2d. Preoperative lateral X-ray after traction for 2 weeks showed C<sub>1-2</sub> dislocation reducing 2e. Using pedicle screw technology enables the C<sub>1-2</sub> dislocation of the anatomical reduction and fixation and fusion 2f. Postoperative lateral X-ray

物力学强度就相当于 Margerl 螺钉系统,而椎弓根的单皮质固定的强度相当于侧块双皮质固定的强度,即使在个别情况下由于后弓高度过小( $<3.5\text{ mm}$ )造成后弓下缘部分骨皮质穿破,但是椎弓根与侧块移行处高度的增加,使大部分螺钉仍在椎弓根内,其生物力学强度仍优于侧块螺钉。在同时可使用椎弓根钉与侧块钉时,应首选寰枢椎弓根钉固定方式<sup>[7]</sup>。

颈枕融合术既可重建枕颈部的正常曲度,又可防止头枕部下沉和颅底凹陷<sup>[8]</sup>。Singh 等<sup>[9]</sup>认为以侧块螺钉、椎弓根钉为基础的钉棒固定融合技术,同时握持颈椎和枕骨,力学稳定,既能减少尾侧颈椎的固定节段,又能避免因椎板下留置内固定物引起的脊髓压迫等并发症,是一种较为理想的枕颈融合技术。

对于寰枢椎脱位的治疗多数学者<sup>[10-14]</sup>认为术前应给予颅骨牵引,复位后采用后路寰枢或颈枕融合术,不能复位者则采用经口咽入路的切骨减压术。

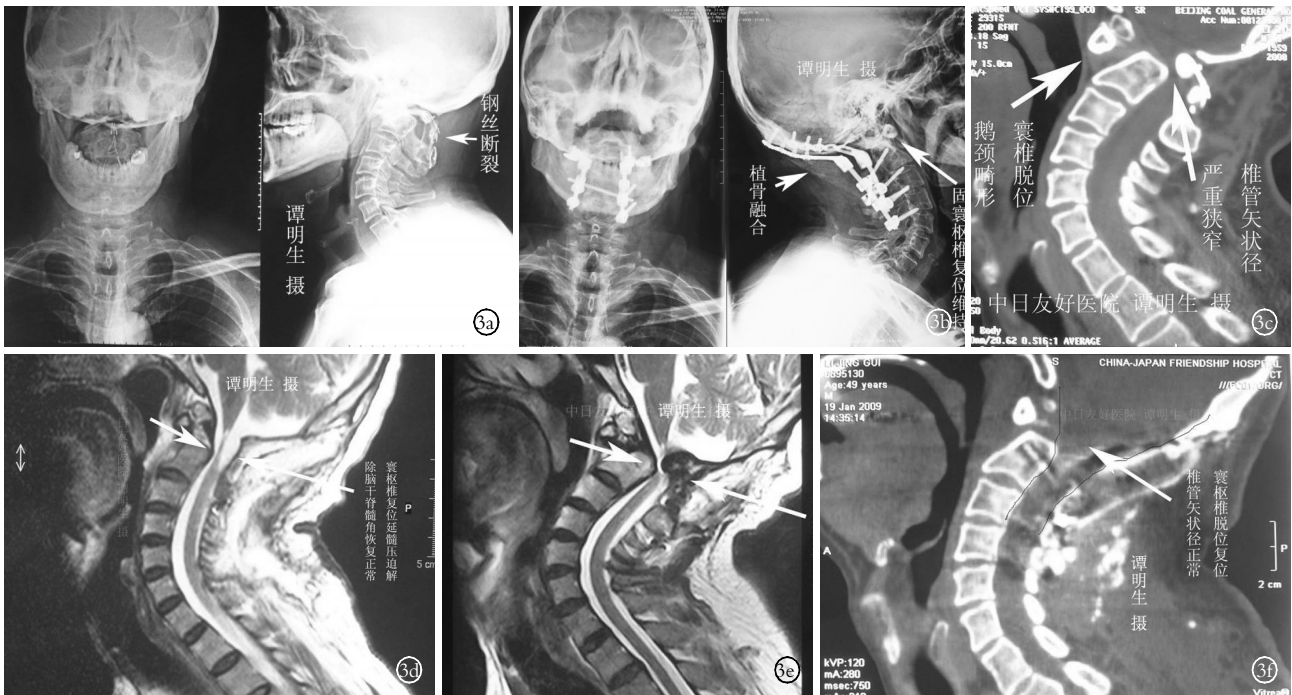
寰枢椎脱位诊断标准为影像学测量  $\text{ADI} \geq 5\text{ mm}$  或  $\text{SAC} \leq 13\text{ mm}$ <sup>[15-19]</sup>。而有学者认为有些病例  $\text{SAC} \geq 11\text{ mm}$ ,即可解除脊髓压迫<sup>[20]</sup>。

本组患者除齿突不连者外,寰齿间隙术后均小

于  $3\text{ mm}$ 。除 I 型患者外,术后寰椎平面脊髓有效空间(SAC)均大于  $13\text{ mm}$ 。寰椎水平脊髓压迫均已充分松解。2 例 I 型患者脊髓得到一定程度减压。

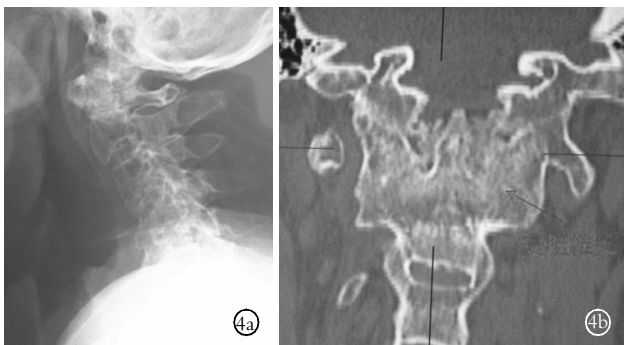
**3.2 寰枢椎脱位脊髓损伤的中医认识与治疗** 寰枢椎脱位造成脊髓损伤的主要临床表现有颈枕部疼痛,斜颈及颈部活动受限,全身肌肉紧张,手握物不稳或无力、行走无力,容易跌倒,大小便无力,四肢肌肉萎缩,严重可出现全身瘫痪,甚至危及生命;同时可能伴有眩晕、耳鸣、视物模糊、胸闷、心悸和血压升高,椎动脉供血不全的症状<sup>[15]</sup>。督脉主要循行于头部、背部,督脉具有督领全身阳气、统率诸阳经之功能;又因督脉与任脉相衔接,而任主一身之阴,为“阴脉之海”,因此督脉与十二经脉联系密切;另一方面,督脉循行于头部、脊柱内和脊柱两侧,与足太阳膀胱经相邻,督脉之别“别走太阳”,并与足太阳经多处重叠,经气交通,共主一身之阳气,而五脏六腑之气皆通过背俞穴与足太阳经相联系,故督脉与脏腑经脉气血的功能活动密切相关<sup>[21]</sup>。

中医学者多将脊髓损伤辨证为督脉经络瘀阻,致使气乱血逆,瘀阻经络,气血不能温煦濡养肢体所



**图 3** 患者,男,55岁,O型寰枢椎脱位 3a. 术前正侧位 X 线片显示颈椎呈鹅颈畸形,寰枢椎之间固定的钢丝断裂,假关节形成,C<sub>1-2</sub>严重脱位 3b. 翻修术后3个月颈椎 X 线片显示内固定无松动,寰枢椎脱位复位维持,植骨块融合 3c. 术前三维 CT 显示 C<sub>1-2</sub> 椎管矢状径严重狭窄,寰枢椎脱位,鹅颈畸形 3d. 翻修术后颈椎 MRI 显示寰枢椎脱位已复位,鹅颈畸形矫正,脑干脊髓角恢复正常,延髓压迫已解除 3e. 术前 MRI 显示寰枢椎脱位延髓前后方严重受压,鹅颈畸形,脑干脊髓角变小 3f. 术后枕颈部矢状位 CT 显示寰枢椎脱位复位,椎管矢状径恢复正常,鹅颈畸形矫正

**Fig.3** Male ,55-year-old,O-type 3a. Preoperative AP and lateral X-ray films of cervical spine showed a goose neck deformity, the fixed wire fracture, pseudarthrosis formation, serious dislocation 3b. Three months after the renovation of cervical X-ray showed no loosening of internal fixation, atlantoaxial dislocation maintain bone block fusion 3c. Preoperative three-dimensional CT showed C<sub>1-2</sub> spinal canal sagittal diameter severe stenosis, atlantoaxial dislocation, goose neck deformity 3d. After renovation cervical spine MRI showed atlantoaxial dislocation has been reset, goose neck deformity has been correction, spinal cord angle normal brainstem, the medulla oblongata oppression had been lifted 3e. Preoperative MRI showed atlantoaxial dislocation of the medulla oblongata and rear serious pressure, goose neck deformity, brain stem spinal cord angle becomes smaller 3f. Postoperative sagittal CT showed atlantoaxial dislocation has been reset , sagittal diameter has returned to normal, goose neck deformity has been corrected



**图 4** 患者,女,60岁,I型,强直性脊柱炎导致寰枢椎脱位强直 4a. 颈椎侧位 X 线片 4b. 颈椎三维 CT 显示寰枢椎关节突关节已融合强直

**Fig.4** Female,60-year-old, I-Type, ankylosing spondylitis caused atlantoaxial dislocation 4a. Lateral X-ray of cervical spine 4b. Three-dimensional CT of cervical spine showed atlantoaxial facet joint has been fused

致<sup>[22-23]</sup>。寰枢椎脱位后出现的肢体乏力、肌肉枯萎、运动功能障碍性,亦属于中医痿证范畴,何兴伟等<sup>[21]</sup>认为对于外伤脊髓造成的痿证也可从督脉论治。其基本用药原则为“活血化瘀,益气补肾通络”<sup>[23]</sup>。有学

者<sup>[24]</sup>使用中药汤剂,如补阳还五汤加减治疗脊髓损伤。亦有学者<sup>[25]</sup>针刺督脉腧穴为主给予治疗。

笔者通过对寰枢椎脱位患者进行 TOI 分型,并给予牵引、手术复位融合固定治疗,患者 SAC、督脉经络瘀阻证候积分、JOA、DNI 评分均不同程度改善,督脉经络瘀阻的症状明显缓解,手术治疗亦达到疏通督脉阻滞的目的。故采用 TOI 外科分型手术治疗寰枢椎脱位,在明显改善神经功能的同时,也有效地缓解督脉经络淤阻的症状,表明外科治疗与疏通督脉淤阻有密切相关性。

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