

C1~C2椎弓根钉内固定治疗C2~C7阻滞椎伴寰枢椎不稳1例报告及文献复习

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摘要

目的: 寰枢椎不稳是一种罕见的颈部病变。这种情况有时与寰枢椎半脱位有关, 这可能导致脊髓高度受压。由于颈椎阻滞导致的寰枢椎不稳定极为罕见。病例介绍: 我们报告了一位64岁男性患者诊断为C2~C7阻滞椎伴寰枢椎不稳并有进行性脊髓病变。根据患者情况, 术者予行后路C1~C2椎弓根螺钉 + 自体髂骨移植关节融合术。在一年的随访中, 患者临床症状得到了显著的改善, 术后X线片显示了坚强的骨融合, 没有矫正损失或植入失败。讨论: 与颈椎阻滞相关的慢性寰枢椎不稳定是罕见的。阻滞椎伴寰枢椎不稳会导致患者枕颈疼痛、脊髓病、瘫痪或死亡。手术减压和稳定是治疗的选择。治疗原则是防止神经系统损害导致的突然瘫痪, 改善神经系统状况, 稳定颈椎, 提高生活质量。手术选择后路C1~C2椎弓根螺钉 + 自体髂骨移植关节融合术。固定的位置取决于脊髓压迫的位置、关节融合的区域和骨质量。

关键词

阻滞椎, 寰枢椎不稳定, 手术固定

Surgical Treatment of C2~C7 Cervical Block Vertebrae with Atlantoaxial Instability by C1~C2 Fixation: A Case Report and Literature Review

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Abstract

Introduction: Atlantoaxial instability is a rare cervical lesion. This unusual condition is sometimes associated with atlantoaxial subluxation, which may cause high spinal cord compression. Atlantoaxial instability due to cervical block vertebrae is extremely rare. **Case presentation:** We report an unusual case of a 64-year-old male, who was diagnosed as having chronic posterior atlantoaxial instability associated with C2~C7 cervical block vertebrae with progressive myelopathy. The patient underwent posterior C1~C2 pedicle screws and autologous iliac crest strut bone graft arthrodesis. During one year of follow-up, he was clinically significantly improved and postoperative radiographs showed a solid osseous fusion without loss of correction or implant failure. **Discussion:** Chronic posterior atlantoaxial instability associated with cervical block vertebrae is rare. This condition can cause occipital cervical pain, myelopathy, paralysis, or death. Surgical decompression and stabilization is the treatment of choice. Principles of treatment are to prevent sudden paralysis from neurological compromise, improve neurological status, stabilize the cervical spine, and improve quality of life. Surgical options include posterior C1~C2 pedicle screws and autologous iliac crest strut bone graft arthrodesis. Decision making depends on the location of spinal cord compression, area for arthrodesis, and bone quality.

Keywords

Block Vertebrae, Atlantoaxial Instability, Surgical Fixation

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1. 引言

阻滞椎是脊柱畸形，是脊柱的一种骨融合。两个或多个椎体节段经常受累，受累部位的两个椎体通常表现为完全融合为一体[1]。按性别划分的发病率没有显著差异。阻滞椎主要发生在颈椎和腰椎，但在胸椎很少发生。先天性颈椎阻滞椎的发生率很低，后天性颈椎阻滞椎更是少之又少。马新龙等人报告了2006年至2011年中国北方地区33,762名患者中的218例颈椎阻滞椎病例，发病率为0.65%[2]。主要临床表现为颈部和肩部背部僵硬和疼痛，以及上肢放射痛和麻木。颈部运动的限制非常明显，甚至关节强直。阻滞椎体的高度大于正常椎骨的高度，相当于两个正常椎体及其椎间隙的总高度[3]。由于颈椎阻滞导致的慢性寰枢椎不稳定是罕见的。这种情况会导致枕颈疼痛、脊髓病、瘫痪或死亡。Jian Liang Lin等人报道了两例分别从C2到C5和C2到C4的颈椎阻滞椎。他们提出融合的颈椎在寰枢关节处产生了“支点效应”，并使这些患者容易发生创伤性寰枢半脱位[4]。

现我们文章中报告了一例64岁男性患者诊断为C2~C7阻滞椎伴寰枢椎不稳并有进行性脊髓病变。患者接受后路C1~C2椎弓根螺钉和自体髂骨移植关节融合术。在一年的随访中，患者临床症状得到了显著的改善，术后X线片显示了坚强的骨融合，没有矫正损失或植入失败。

2. 病例介绍

患者64岁男性，收入我院时主诉为进行性四肢麻痹4个月。4个月前，患者开始出现颈后轴向疼痛和双上肢麻木。症状逐渐加重，双手乏力，手指无法完成精细动作。在之前的医院，最初接受了口服药

物和物理治疗，临床症状未得到缓解。体查提示颈部活动范围明显减少，伴有颈部轴向疼痛。VAS 评分为 5，颈椎功能障碍指数(Neck Disability Index, NDI)为 44% [5]，为重度功能障碍。逐渐出现双上肢张力亢进，双上肢肌力测试如表 1，双侧 C4 皮肤节分布感觉减退，双上肢反射亢进，霍夫曼反射、奥本海姆征、巴宾斯基反射、Rossolimo 反射和踝阵挛均为阳性，大小便功能正常。

Table 1. Comparison of exercise muscle strength grading between preoperative and postoperative one-year follow-up
表 1. 术前和术后一年随访运动肌力分级的比较

Motor	Right	Left
Preoperative		
C5: Shoulder abduction	4	4
C6: Elbow flexion	4	4
C7: Wrist extension	4	4
C8: Finger flexion	3	4
T1: Finger abduction	3	4
L2: Hip flexion	5	5
L3: Knee extension	5	5
L4: Ankle dorsiflexion	5	5
L5: Big toe dorsiflexion	5	5
S1: Ankle plantar flexion	5	5
S2: Anal sphincter	Normal tone	
Postoperative		
C5: Shoulder abduction	5	5
C6: Elbow flexion	5	5
C7: Wrist extension	5	5
C8: Finger flexion	5	5
T1: Finger abduction	4	5
L2: Hip flexion	5	5
L3: Knee extension	5	5
L4: Ankle dorsiflexion	5	5
L5: Big toe dorsiflexion	5	5
S1: Ankle plantar flexion	5	5
S2: Anal sphincter	Normal tone	

颈椎的屈伸动力位平片提示了寰枢椎不稳定和 C2 至 C7 段的颈椎阻滞椎(图 1)。CT 提示颈椎阻滞椎，椎间盘间隙变窄，C2 至 C7 水平的后部骨赘形成(图 2)。MRI 在 T2WI 上显示脊髓内 C1 至 C2 和 C7 至 T1 水平的高信号，脊髓受压明显，椎间盘高度变窄(图 3)。查血碱性磷酸酶为 70 u/L，血尿酸为 350 μmol/L，HLA-B*5801 基因检测为阴性，男性肿瘤标志物 12 项检查提示各项均未见异常。



Figure 1. Atlantoaxial instability and C2~C7 cervical block

图 1. 寰枢椎不稳定和 C2 至 C7 段的颈椎阻滞椎

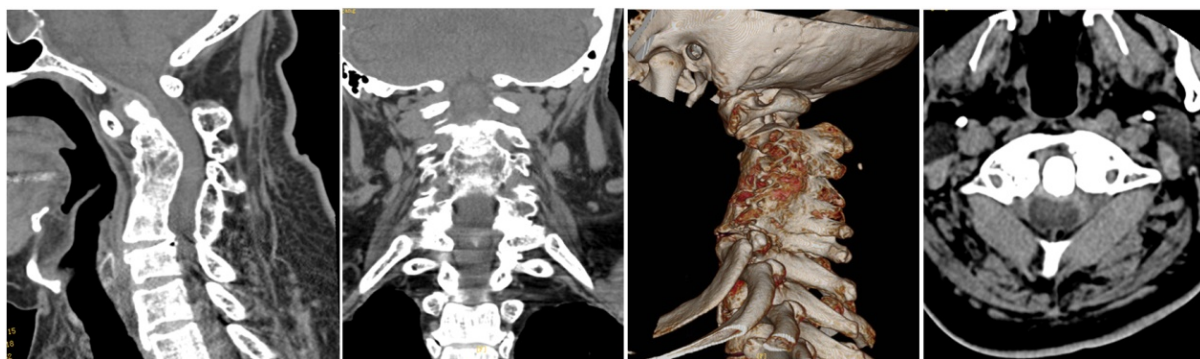


Figure 2. The sagittal and coronal CT images showed that the cervical vertebra was reversed, the C2~C7 vertebral body and its attachments were fused, the horizontal bony spinal canal of C3 vertebral body was narrowed, the anterior space of atlantoaxial joint was widened, and the corresponding segmental bony spinal canal was narrowed. Horizontal position suggests subluxation of atlantoaxial joint

图 2. CT 矢状面和冠状面提示颈椎反弓，C2~C7 椎体及其附件骨质融合，C3 椎体水平骨性椎管扫描变窄，寰枢关节前间隙增宽，相应节段骨性椎管扫描变窄。水平位提示寰枢关节半脱位



Figure 3. On T2WI of MRI sagittal plane, there were high signals in the spinal cord at C1~C2 and C7~T1 levels. At the same level, the spinal cord was severely compressed and the height of intervertebral disc narrowed

图 3. MRI 矢状面 T2WI 上，C1 至 C2 和 C7 至 T1 水平的脊髓内有高信号，在相同水平上脊髓受压严重，椎间盘高度变窄

保守治疗 1 周后, 患者入院症状仍未见明显改善。排除手术禁忌症行详细术前计划。患者在全麻后俯卧位, 在牵引架上进行复位, 并通过透视检查确认位置。尝试复位后, 寰枢椎半脱位轻微减轻。定位于 C1~C2 体表投影, 取约 8 cm 切口, 切开皮肤, 皮下及浅、深筋膜, 用电凝由正中斜方肌、项筋膜、竖脊肌从棘突上剥离, 逐步显露椎板, 自动拉钩牵开。定位于 C1、C2 椎弓根投影, 钻孔开路后安装定位针, C 臂透视下位置满意, 拧入椎弓根螺钉, 安装连接棒, C 臂透视下位置满意, 切开左髂后上棘 2.5 cm 创口, 剥离骨膜分离骨膜, 骨凿凿取适量松质骨。在取骨处用明胶海绵止血, 清理 C1 后弓、C2 椎板软组织, 准备植骨床, 将自体骨植于 C1 后弓、C2 椎板。冲洗切口, 止血, 明确无活动性出血, 逐层缝合伤口, 左髂后术口留置半胶管 1 条, 颈部手术内置负压引流管, 无菌敷料包扎术口。

术后治疗予结合理疗、伤口换药等。术后患者颈部疼痛明显改善, 术后 6 周使用颈托固定。术后第 3 天, 可以引导患者下床, 进行主动和被动训练。术后颈部疼痛 VAS 评分 2 分, NDI 为 22%, 为中度功能障碍。术后 1 周颈部疼痛 VAS 评分为 1 分, 颈椎功能障碍指数 NDI 评分为 14%, 为轻度功能障碍。1 年后患者可以在没有支撑的情况下行走, NDI 为 6%。VAS 评分为 0。整体运动能力显著提高, SCI AIS 国际神经分类量表为 D (表 1) [6]。颈椎 X 线片显示内固定无松动、骨折, 位置良好 (图 4)。

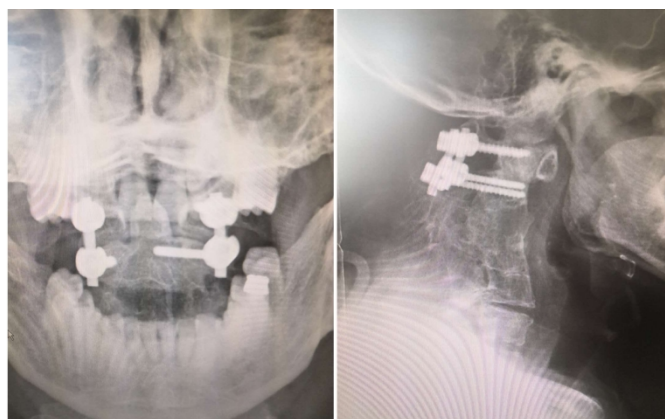


Figure 4. One year after operation, the lateral X-ray showed that C1-C2 internal fixation was not loose or broken, and the position was good. The space of odontoid process of atlantoaxial vertebra is asymmetrical, with the width on the left and the width on the right narrow, the upper and lower spaces of lateral mass are normal, no abnormality is found in bone, and the internal fixation is not loose or broken

图 4. 术后 1 年复查 X 线侧位提示 C1-C2 内固定无松动, 断裂, 位置良好。环枢椎齿状突间隙欠对称, 左宽右窄, 侧块上下间隙正常, 骨质未见异常, 所见内固定无松脱、断裂

3. 讨论

脊椎阻滞椎是一种脊柱畸形, 先天性脊椎阻滞椎多由显性遗传或胎儿酒精综合征引起。颈椎 X 线表现为: ① 受累椎体之间前后径变短且前后凹陷, 融合椎体前缘多平滑呈弧度凹陷, 没有骨增生或破坏。② 在骨性融合的两个椎体间相当于椎体间隙部位变细, 外形如“蜂窝腰状”。③ 在相对应椎间孔、椎板和椎管矢状径均变小, 椎间孔常有圆形变成椭圆形[6]。后天性颈椎阻滞椎主要受创伤、颈椎间盘退变、类风湿和其他感染的影响[2] [7] [8]。而后天颈椎阻滞椎多因外伤、颈椎间盘退行性变及结合、类风湿和其他感染等因素影响, 在 X 线方面表现为: ① 骨性融合在受累处非常明显, 邻近椎间孔常变性, 为肾型和哑铃型。② 椎体可见骨性增生或破坏。本例患者具有以下特征: (1) 颈椎阻滞椎后天形成; (2) 颈椎累积节段较长; (3) 寰枢椎呈不稳状态, 高位颈髓受压; (4) 神经症状非常明显, 已经严重影响患者生活质量; (5) 患者年龄偏高。

目前所报道的颈椎阻滞椎病例多为先天性, 而因后天性因素形成的颈椎阻滞椎极为少见, 这值得我

们进一步重视后天性阻滞椎的特点和诊治方式。颈椎阻滞椎的存在,引起颈椎较早发生退行性变,会导致相邻椎体侧向弯曲和旋转,椎间关节紊乱和不稳定,进而导致局部运动功能和生物力学特性的变化。椎体承受着不均匀的强度和韧带过载,因此进一步加剧了颈椎骨骼肌系统退化[9]。颈椎病常发生在阻滞椎体的相邻节段。原因是融合椎体的运动受到严重阻碍,相邻椎骨关节的代偿运动增加,破坏了颈椎的正常稳定性以及颈椎与周围神经和血管之间的平衡,导致颈椎的排列结构异常,继而发生脱位、不稳定,退变、脊髓压迫和骨赘形成[10][11]。患者阻滞椎受累节段多且已经形成畸形改变,严重的神经症状严重影响了患者的生活质量,而患者神经症状并非主要源于受累节段,主要是由于C2~C7长节段椎体阻滞导致颈椎畸形、活动减少和C1~C2不稳定[12]。相邻节段代偿运动范围的增加导致C1~C2应力集中和寰枢关节过度磨损,最终导致C1~C2半脱位和寰枢关节不稳定。同时,C7~T1节段活性的过度增加也导致C1~C2和C7~T1脊髓受压。脊髓损伤的症状定位为C4。当C1~C2和C7~T1脊髓压迫同时存在时,应首先治疗C1~C2脊髓压迫和C1~C2关节不稳定。术后应观察患者4个月,然后根据患者情况对C7~T1进行治疗。因此,根据综合情况,为减少手术对患者健康的代价,椎体阻滞本身并没有引起症状,可以暂时不予行手术治疗。颈椎阻滞椎引起的C1-C2不稳定导致高位颈脊髓受压和神经症状。寰枢椎关节不稳定应通过手术行内固定手术,从而降低对患者生活能力质量的影响[13]-[15]。单纯阻滞椎体亦有研究保守治疗有效,曲有位[16]等认为该类病患者系气血凝滞,脉络不通,筋骨失濡。而脑为髓之海,依赖于肝肾精血和脾胃精微物质的充养,患者久病体虚致脑髓失养。并应用补阳还五汤配合颈部理疗治疗先天性颈椎阻滞椎合并寰齿脱位畸形1例,具有一定改善疗效作用。谭涛[17]等利用针刺推拿治疗神经根型颈椎病并阻滞椎28例,在改善颈部疼痛方面,观察组较对照组疗效更加显著。

总之,治疗寰枢椎不稳颈椎阻滞的目的是缓解颈部疼痛,解除脊髓和神经根的压迫,保持颈椎的稳定性,防止神经功能损伤和其他并发症的进一步加重。大多数临床工作者和学者认为,有明显椎管狭窄、脊髓压迫或神经系统症状的患者应尽快进行手术治疗,这对改善患者的临床症状和预后具有重要意义。本篇文章研究为个案报道,随访时间相对有限,长期疗效尚待观察及大量数据研究。

伦理声明

该病例报道已获得患者的知情同意。

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