

• 临床研究 •

浮椎损伤的诊断及早期治疗探讨

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【摘要】 目的: 探讨浮椎损伤的临床特点及早期治疗原则。方法: 椎间结构严重损伤、椎体附件骨折伴椎体严重的前侧方脱位患者 6例, 男 4例, 女 2例; 年龄 24~58岁, 平均 36岁。6例均有不同程度的脊髓损伤, 按 Frankel 分级, A 级 2例, B 级 3例, C 级 1例。早期手术探查及选择不同的内固定和植骨方式, 5例采用长节段经椎弓根后路固定, 1例采用短节段经椎弓根后路固定; 2例采用单纯椎体间植骨, 3例采用椎间融合器植骨, 1例采用关节突及椎板后外侧植骨。结果: 6例均获随访, 随访时间 12~18个月, 平均 15个月。无术中血管、神经损伤; 未见内固定松脱、断裂等并发症。6例均获骨性融合, 术后未发生椎体再滑脱。脊髓功能 Frankel 分级: 2例 A 级者术后无改善, 3例由 B 级恢复至 D 级, 1例由 C 级恢复至 E 级。结论: 脊柱极度不稳, 脊髓损伤可能相对较轻, 由于脊髓、神经根可能因逃逸而避免严重损伤, 长节段经椎弓根后路固定及植骨融合有利于维持伤椎间的稳定, 浮椎损伤早期手术复位容易, 椎间植骨能获得较高骨性融合率。

【关键词】 脊髓损伤; 骨折固定术, 内; 植骨

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ABSTRACT Objective To investigate the clinical characteristics and primary treatment of the floating vertebra trauma. **Methods** Six patients (4 male and 2 female, the average age of 36 years ranging from 24 to 58 years) with major injury of intervertebral structure, appendix fracture of vertebra and severe anterolateral dislocation of vertebra were treated. According to Frankel classify, the level of spinal cord injury in 6 patients were graded into grade A in 2 cases, grade B in 3 cases, grade C in 1 case. Six patients were managed with early operative probing and different internal fixation or bone graft. Five patients were operated with long segmental internal fixation of the pedicle screw and the other one did with short segmental internal fixation of the pedicle screw through posterior approach. Two patients were treated by bone implantation between two vertebra, three patients by bone implantation of intervertebral cage and the other one by bone implantation of articular process and posterolateral vertebral plate. **Results** Six patients were followed-up for an average of 15 months (range 12 to 18 months). No complication of the injury of the vessels or nerve endings were found. There was no loosening and breakage of the plate and screw. Bone fusion was obtained in all 6 cases. No any case took place redislocation. The spinal cord functions of all patients had improved except 2 cases of grade A of Frankel, 3 cases recovered from B to D and 1 case from C to E. **Conclusion** If spine is utmost instable, spinal cord injury is probably slight. Early surgical reduction is easy to perform in treatment of the floating vertebra trauma. The long segmental internal fixation of the pedicle screw through posterior approach combined with bone graft can retain stable between vertebrae. Intervertebral grafting can gain a solid bone fusion rate.

Key words Spinal cord injuries; Fracture fixation, internal; Bone transplantation

浮椎损伤 (floating vertebra) 在临床上并不多见, 多系高能损伤所致。到目前为止, 仍没有一种脊柱损伤的分类包括浮椎损伤这一特例^[1]。浮椎损伤^[2]的诊断与治疗 and 单纯椎体压缩或爆裂骨折伴有脊髓损伤有很大特殊性, 本文就浮椎损伤的定义、诊

断及治疗进行讨论。

1 临床资料

本组 6例, 男 4例, 女 2例; 年龄 24~58岁, 平均 36岁。伤后就诊时间 2~24 h。损伤原因: 交通伤 2例, 高处坠落伤 2例, 重物砸伤 2例。损伤部位: C₄-C₅ 1例, T₁₂-L₁ 3例, L₁-L₂ 2例。椎体脱位情况: 完全前纵向脱位 2例, 完全前侧方旋转脱位 4例。

本组6例均有不同程度的脊髓损伤,按Frankel分级:A级2例,B级3例,C级1例。合并症:肝破裂1例,股骨骨折1例,肋骨骨折1例。手术时间:伤后8h内1例,24h内2例,1周内3例。后路固定节段:固定2个节段的1例,固定5个节段的3例,固定7个节段的2例。

2 手术方法

本组患者均行气管插管全麻。术中可见:椎旁肌及其筋膜、棘上、棘间韧带断裂,椎板、棘突、关节突、椎弓根、横突骨折4例;椎旁肌及其筋膜、棘上、棘间韧带断裂,关节突关节交锁,伴椎板、棘突、一侧椎弓根骨折2例。4例椎间盘纤维环完全破裂,髓核突入椎管内2例。脊髓完全挫断2例,硬膜囊破裂2例,脊髓受压变形4例。减压及止血:后路充分减压,去除骨折的椎板、棘突、关节突关节、椎弓根及影

响椎体复位的中柱结构,清除破裂的纤维环及突出的髓核组织,椎旁明胶海绵充分填塞止血。牵引及椎间撬拨复位,置入经椎弓根后路固定器。5例采用长节段经椎弓根后路固定,1例采用短节段经椎弓根后路固定。3例采用椎间融合器植骨,2例采用单纯椎间植骨,1例采用关节突及椎板后外侧植骨。

3 结果

本组6例均获得随访,随访时间12~18个月,平均15个月。6例均获骨性融合,术后未发生椎体再滑脱。未见内固定松动、断裂等并发症。1例脑脊液漏,经局部换药等处理1个月后恢复。无伤口感染、褥疮、肺及泌尿系统严重感染等并发症。脊髓功能除2例按Frankel分级为A级者术后无改善,余均有不同程度恢复,3例由B级恢复到D级,1例由C级恢复到E级。典型病例见图1。

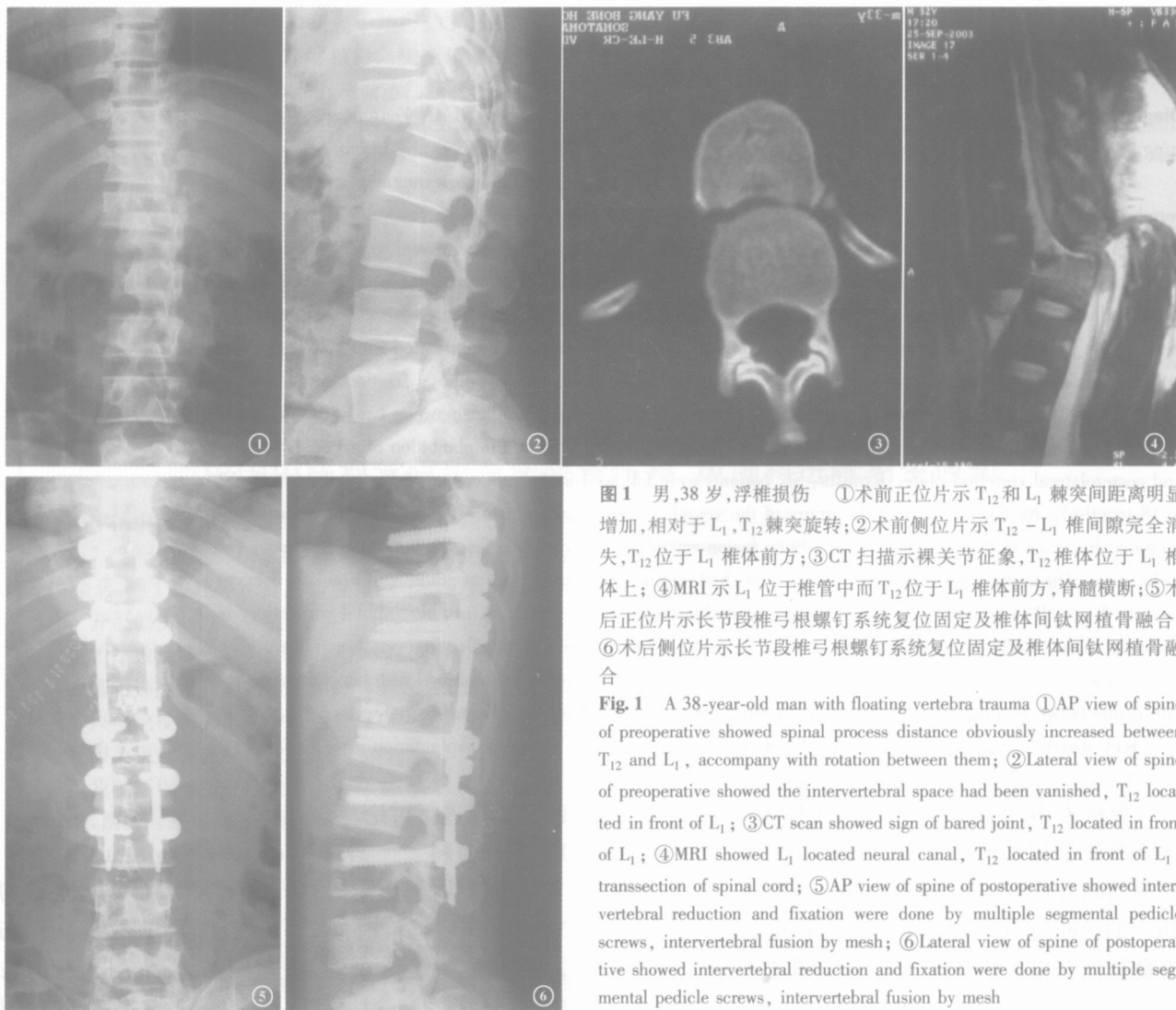


图1 男,38岁,浮椎损伤 ①术前正位片示T₁₂和L₁棘突间距离明显增加,相对于L₁,T₁₂棘突旋转;②术前侧位片示T₁₂-L₁椎间隙完全消失,T₁₂位于L₁椎体前方;③CT扫描示裸关节征象,T₁₂椎体位于L₁椎体上;④MRI示L₁位于椎管中而T₁₂位于L₁椎体前方,脊髓横断;⑤术后正位片示长节段椎弓根螺钉系统复位固定及椎体间钛网植骨融合;⑥术后侧位片示长节段椎弓根螺钉系统复位固定及椎体间钛网植骨融合

Fig. 1 A 38-year-old man with floating vertebra trauma ①AP view of spine of preoperative showed spinal process distance obviously increased between T₁₂ and L₁, accompany with rotation between them; ②Lateral view of spine of preoperative showed the intervertebral space had been vanished, T₁₂ located in front of L₁; ③CT scan showed sign of bared joint, T₁₂ located in front of L₁; ④MRI showed L₁ located neural canal, T₁₂ located in front of L₁, transection of spinal cord; ⑤AP view of spine of postoperative showed intervertebral reduction and fixation were done by multiple segmental pedicle screws, intervertebral fusion by mesh; ⑥Lateral view of spine of postoperative showed intervertebral reduction and fixation were done by multiple segmental pedicle screws, intervertebral fusion by mesh

4 讨论

4.1 浮椎损伤概念及诊断 浮椎损伤理论上是指单一或数个相邻椎体的远近侧椎间盘及椎间韧带损伤或断裂, 致使其间单一或数个椎体发生浮动现象。实际上常伴有单一或相邻数个椎体的远近两端同时移位。如果脊柱损伤 X线表现为单一或相邻的几个椎体旋转脱位则诊断比较容易, 但 X线无征象则很难诊断, 此时仅表现为脊柱失稳所致的神经损伤表现症状。Bedat等^[3]发现 1例双侧骶骨翼骨折但影像学征象阴性, 损伤当时无任何神经系统表现, 而 2周后出现神经损伤症状, 认为神经损伤症状是由骶椎浮动所致, 并称此现象为漂浮骶椎骨折 (floating sacrum fracture)。Levine等^[4]描述一种“漂浮骨盆” (floating pelvis) 损伤, 是指 L₄-L₅ 韧带损伤的同时伴有双侧髌部骨折。由此可见, 不论是骶骨还是骨盆的浮动损伤都有椎间韧带损伤的存在, 易漏诊。脊椎浮动失稳是导致神经系统损伤的首发症状, CT及 MRI检查有助于诊断。椎体骨质损伤相对较轻, 脊髓和神经根可能因后柱骨折、韧带断裂等椎管自动减压逃逸而避免严重的损伤, 也有可能因损伤椎前大血管而失去救治机会。

4.2 手术时机及围手术期处理 一旦确诊若无手术禁忌证, 应急诊或早期手术, 尽量在 8~24 h 内手术。手术宜早不宜迟, 伤后超过 3周手术很难复位。本组 8 h 内手术 1例, 24 h 内手术 2例, 余 3例因复合伤均 1周内手术。4例急诊入院者伤后 8 h 内给予大剂量甲基强的松龙, 第 1小时内给予 30 mg·kg⁻¹·h⁻¹ 的冲击量, 15 min 内输完, 随后 23 h 给予 5.4 mg·kg⁻¹·h⁻¹ 持续滴入。术后按脊柱脊髓损伤常规处理, 包括脱水、预防感染、改善脊髓神经微循环、营养及代谢、腰围支具及卧床 3个月、功能康复训练等。

4.3 浮椎损伤的手术治疗及体会 手术应采用后路减压复位多节段经椎弓根内固定系统加椎间植骨融合, 早期手术浮椎复位较容易, 但复位时动作一定要轻柔避免粗暴引起神经血管的副损伤或导致大出血。由于浮椎损伤椎间极度不稳, 在上近侧及伤椎的椎弓根螺钉时保持椎节的复位及稳定尤为重要, 并且应先复位后上椎弓根固定系统, 靠内固定系统撑开及提升很难达到复位目的, 同时也能避免副损伤的发生。术中用巾钳把持棘突及椎间撬拨维持复位及稳定有助于内固定的实施。小关节脱位交锁经牵引复位失败的病例应采用后路关节突切除、撬拨

复位, 并重建其稳定性^[5]。视伤椎的损伤程度上椎弓根螺钉是必要的, 这有利于复位及维持椎节的稳定。对有明显旋转脱位的浮椎损伤, 可采用复位加融合的方法, 经后路手术切开, 椎弓根内固定系统复位固定。复位时要先在旋转的伤椎椎弓根内打入 2枚椎弓根螺钉, 伤椎远近侧椎体也各打入 1对椎弓根螺钉。在伤椎远近侧椎体椎弓根螺钉撑开的同时, 配合提拉扭转及伤椎上加 2枚椎弓根螺钉使其复位。复位后应分别做伤椎远近侧椎间隙的骨性融合。本组 3例在伤椎远近侧椎间隙各放 2枚椎间融合器, 达到稳定脊柱的目的。对于浮椎脱壳骨折块的复位是困难的, 也没有必要强求复位, 复位与否不影响脊柱的稳定。术中止血非常重要, 浮椎损伤的软组织损伤严重术中出血量大, 尤其是椎前静脉丛的出血不易结扎或电凝止血, 凝血酶明胶海绵充分填塞止血效果很好。本组 5例术中采用自体血回输。若无椎体脱位, 只有伤椎远近侧椎间盘及椎间韧带损伤所致脊柱失稳, 可采用伤椎融合的方法, 采用后侧椎板外植骨, 椎间融合及前路植骨融合手术均可。伴有神经症状的浮椎损伤应根据 CT及 MRI所示情况, 弄清神经症状为椎间盘压迫还是骨性压迫而按常规方法予以摘除或减压。短节段椎弓根固定系统稳定性差, 不利于术后维持浮椎的复位及稳定, 本组 5例采用长节段固定术后拍 X线片未出现浮椎复位丢失和滑脱。对于高度脊柱滑脱患者应采用长节段固定加椎间植骨融合或前后路同时内固定可防止早期畸形复发、减少内固定失败率、提高植骨融合率。综上所述, 脊柱极度不稳, 脊髓损伤可能相对较轻, 由于椎体、附件和椎旁组织骨折损伤严重, 脊髓、神经根可能逃逸而避免严重损伤。长节段经椎弓根后路固定及植骨融合有利于维持伤椎间的稳定, 浮椎损伤早期手术复位容易, 椎间植骨能获得较高骨性融合率。

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(收稿日期: 2005-11-01 本文编辑: 连智华)