

志, 2020, 26(5): 955-958.

YANG H J, CHEN X D, ZHAO H B, et al. Study on the quantity effect of traditional Chinese medicine for invigorating qi and promoting blood circulation on the recovery of cauda equina syndrome after lumbar disc herniation[J]. Chin J Surg Integr Tradit West Med, 2020, 26(5): 955-958. Chinese.

[13] 徐昕, 唐丽玮, 金丹, 等. 氯胺酮对腰椎间盘突出根性痛大鼠脊髓炎症因子的影响及机制[J]. 中国临床药理学杂志, 2019, 35(18): 2119-2121.

XU X, TANG L W, JIN D, et al. Effect of ketamine in spinal cord of rats with lumbar disc herniation and root pain and its mechanism [J]. Chin J Clin Pharmacol, 2019, 35(18): 2119-2121. Chinese.

[14] 赵千文, 吴海华, 谢玉萍. 舒芬太尼联合咪达唑仑对机械通气脓毒症患者镇静效果及炎症因子的影响[J]. 临床肺科杂志, 2019, 24(8): 1446-1449, 1469.

ZHAO Q W, WU H H, XIE Y P. Effect of sufentanil and midazolam on sedation and inflammatory factors in patients with me-

chanical sepsis[J]. J Clin Pulm Med, 2019, 24(8): 1446-1449, 1469. Chinese.

[15] 张蓝予, 左玲, 朱庆, 等. 外源性消褪素 D2 对大鼠非压迫性腰椎间盘突出症根性神经痛的影响[J]. 中华麻醉学杂志, 2018, 38(6): 687-690.

ZHANG L Y, ZUO L, ZHU Q, et al. Effect of exogenous resolvin D2 on radicular pain in a rat model of non-compressive lumbar intervertebral disc herniation[J]. Clin J Anesthesiol, 2018, 38(6): 687-690. Chinese.

[16] 陈峰, 邹懿, 胡波, 等. 鼠神经生长因子对坐骨神经痛大鼠背根神经节磷酸化 p38MAPK 表达的影响[J]. 中国临床药理学与治疗学, 2019, 24(4): 411-417.

CHEN F, ZOU Y, HU B, et al. Effects of rat nerve growth factor on the expression of phosphorylated p38MAPK in dorsal root Ganglia of rats with sciatica[J]. Chin J Clin Pharmacol Ther, 2019, 24(4): 411-417. Chinese.

(收稿日期: 2022-03-11 本文编辑: 王宏)

• 病例报告 •

脊柱内镜联合胸腔镜手术切除 Eden IV 型胸椎哑铃型肿瘤 1 例

纪昌宾, 刘玉铎, 杨克石, 李昆朋, 徐辉, 罗大伟

(聊城市人民医院骨科, 山东 聊城 252000)

关键词 脊柱内镜; 胸腔镜; 外科手术; 胸椎哑铃型肿瘤

中图分类号: R739.43

DOI: 10.12200/j.issn.1003-0034.2023.01.011

开放科学(资源服务)标识码(OSID):



Spinal endoscopic and thoracoscopic resection of Eden type IV thoracic dumbbell tumor: a case report

Ji Chang-bin, Liu Yu-duo, Yang Ke-shi, Li Kun-peng, Xu Hui, Luo Da-wei (Department of Orthopaedics, Liaocheng People's Hospital, Liaocheng 252000, Shandong, China)

KEYWORDS Spinal endoscopy; Thoracoscopy; Surgery; Thoracic spine dumbbell tumor

患者,女,52岁,胸背部及左侧肋弓处疼痛不适1年,对症止痛治疗,效果不佳,胸部CT检查发现胸椎哑铃型肿瘤,Eden IV型(肿瘤位于椎间孔及椎旁)。于2020年11月9日入院,患者既往体健。查体:左侧肋弓平面处皮肤感觉减退,余胸、腹部皮肤感觉正常,无大小便障碍,无下肢感觉异常及活动障碍。胸椎CT、MRI检查示胸椎椎间孔(T_{8,9}左侧)及椎旁占位性病变(考虑神经源性),肿瘤经椎间孔向椎旁生长并突入胸腔(图1a-1c)。完善术前评估,无手术禁忌,于2020年11月12日气管插管全身麻醉下

行脊柱内镜联合胸腔镜胸椎肿物切除术,术后恢复良好,术后病理为神经鞘瘤,术后随访1年,恢复良好,神经鞘瘤无复发。

手术方法:气管插管全身麻醉后,患者取俯卧位,腹部及前胸悬空。C形臂X线引导下穿刺针置于T₈椎板外下方,后正中线左侧旁开约2cm(正中旁开距离需根据透视结果确定,穿刺靶点位于椎板外上缘),取出穿刺针内芯,置入导丝。取长约7mm的皮肤切口,沿导丝依次置入逐级扩张导杆和工作套管(图1d-1e)。射频清理椎板外缘表面软组织(图1f),全可视化内镜下环锯切除椎板外上缘骨质后进入椎间孔(图1g),显露神经根及椎间孔区肿瘤(图1h),于肿瘤组织近脊髓端切断神经根(图1i),

通讯作者:罗大伟 E-mail:309776870@qq.com

Corresponding author: LUO Da-wei E-mail: 309776870@qq.com

游离椎间孔区肿瘤并将其推向椎间孔外，双极射频止血，椎间孔放置明胶海绵填塞(图 1j)，退出脊柱内镜，缝合手术切口。将患者体位由俯卧位更改为右侧卧位，然后由胸外科医师行胸腔镜手术，胸腔镜下用电钩及超声刀打开纵膈胸膜分离肿瘤(图 1k-1l)，将肿瘤组织完整切除(图 1m)。用电钩仔细行创面止血。冲洗胸腔，放置胸腔引流管，关闭切口。

结果：胸椎哑铃型肿瘤(T_{8,9})经胸腔镜及脊柱内镜 I 期完整切除，手术时间 2 h，出血 30 ml，术后第 2 天拔除胸腔闭式引流后开始下床活动。术后组织

病理学检查显示神经鞘瘤。术后患者胸背部及左侧肋弓处疼痛明显缓解，但因为左侧 T₈ 神经根的切断导致左侧肋骨平面处皮肤感觉消失。患者术后随访 1 年(图 1n-1s，因手术导致的骨性缺损范围明显缩小，肿瘤无复发)，恢复良好，左侧肋骨平面处皮肤感觉恢复，无双侧下肢感觉、运动障碍，无脊柱失稳及畸形等并发症。

讨论

哑铃型肿瘤是通过椎间孔连接椎管内及椎旁的占位性病变，其病理类型大部分为神经源性，包括神

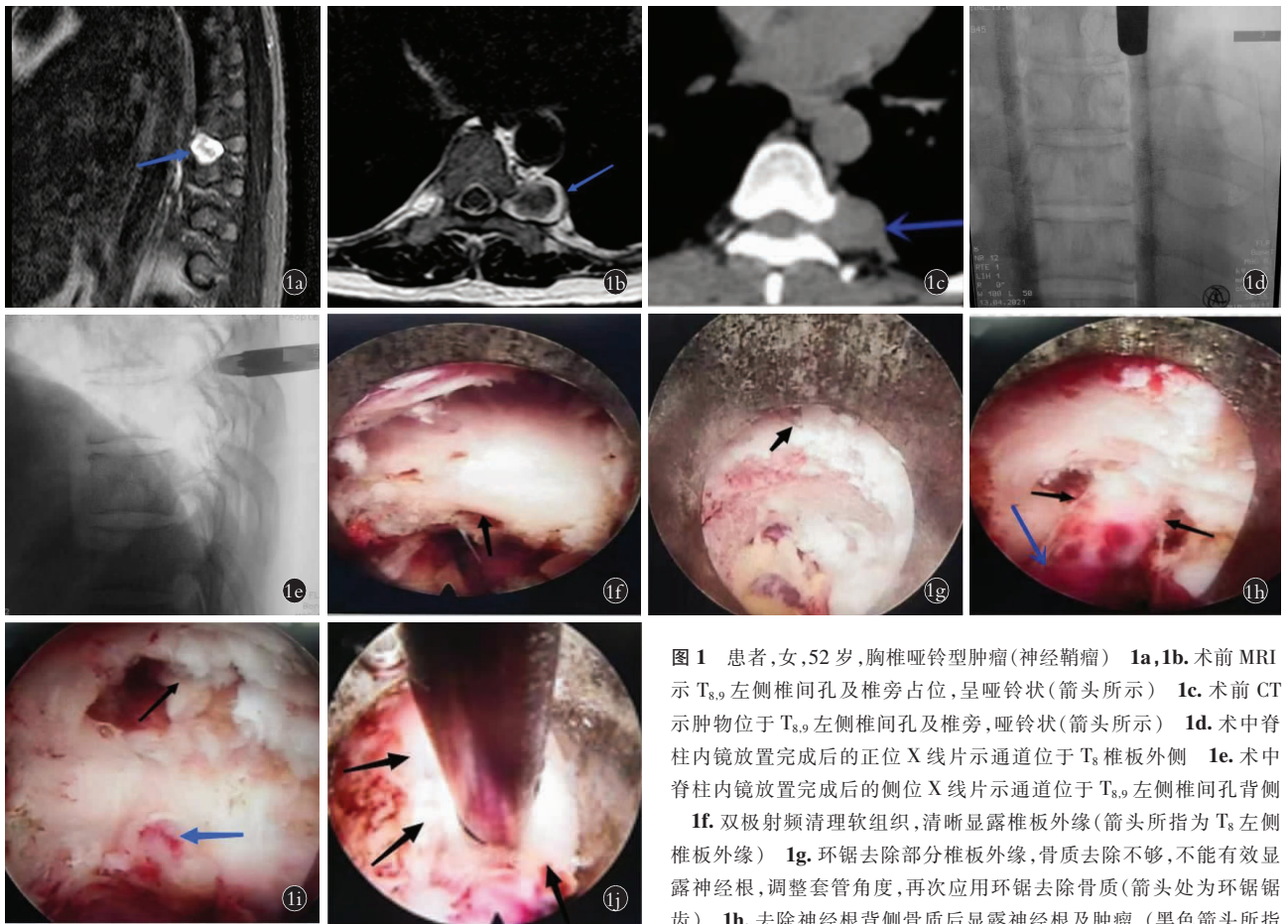


图 1 患者,女,52 岁,胸椎哑铃型肿瘤(神经鞘瘤) 1a,1b. 术前 MRI 示 T_{8,9} 左侧椎间孔及椎旁占位,呈哑铃状(箭头所示) 1c. 术前 CT 示肿物位于 T_{8,9} 左侧椎间孔及椎旁,哑铃状(箭头所示) 1d. 术中脊柱内镜放置完成后的正位 X 线片示通道位于 T₈ 椎板外侧 1e. 术中脊柱内镜放置完成后的侧位 X 线片示通道位于 T_{8,9} 左侧椎间孔背侧 1f. 双极射频清理软组织,清晰显露椎板外缘(箭头所指为 T₈ 左侧椎板外缘) 1g. 环锯去除部分椎板外缘,骨质去除不够,不能有效显露神经根,调整套管角度,再次应用环锯去除骨质(箭头处为环锯锯齿) 1h. 去除神经根背侧骨质后显露神经根及肿瘤(黑色箭头所指为神经根,蓝色箭头所指为神经根远端的肿瘤组织) 1i. 切断神经根(黑色箭头所指为神经根近侧断端,蓝色箭头所指为神经根远侧断端) 1j. 切断神经根后予神经断端处填塞可吸收明胶海绵(箭头所示白色部分为可吸收明胶海绵)

根(黑色箭头所指为神经根近侧断端,蓝色箭头所指为神经根远侧断端)

Fig.1 A 52-year-old female patient with thoracic spine dumbbell tumor (Schwannoma) 1a,1b. Preoperative MRI showed T₈ and T₉ left intervertebral foramina and paravertebral mass with a dumbbell-shaped (arrows) 1c. Preoperative CT showed that the tumor was located in the left intervertebral foramen and paravertebral space of T_{8,9}, and it was dumbbell-shaped (arrow) 1d. Anteroposterior radiograph after intraoperative spinal endoscopic placement showed that the tube was located lateral to the T₈ lamina 1e. Lateral radiograph after intraoperative spinal endoscopic placement showed that the tube was located dorsally to the left intervertebral foramen of T_{8,9} 1f. Bipolar radiofrequency cleaned the soft tissue and clearly exposed the outer edge of the lamina (the arrow points to the outer edge of the left lamina of T₈) 1g. The trephine was used to remove part of the outer edge of the lamina, but the bone removal was not enough to effectively expose the nerve root. The angle of the cannula was adjusted, and the trephine was used again to remove the bone (arrow indicated trephine teeth) 1h. The nerve root and tumor were exposed after removal of the dorsal bone of the nerve root (black arrow indicated nerve root and blue arrow indicated tumor tissue distal to nerve root) 1i. Cut off the nerve root (black arrow indicated to proximal stump of nerve root, and blue arrow indicated to distal stump of nerve root) 1j. After the nerve root was severed, absorbable gelatin sponge was packed at the nerve stump (the white part indicated by the arrow was the absorbable gelatin sponge)

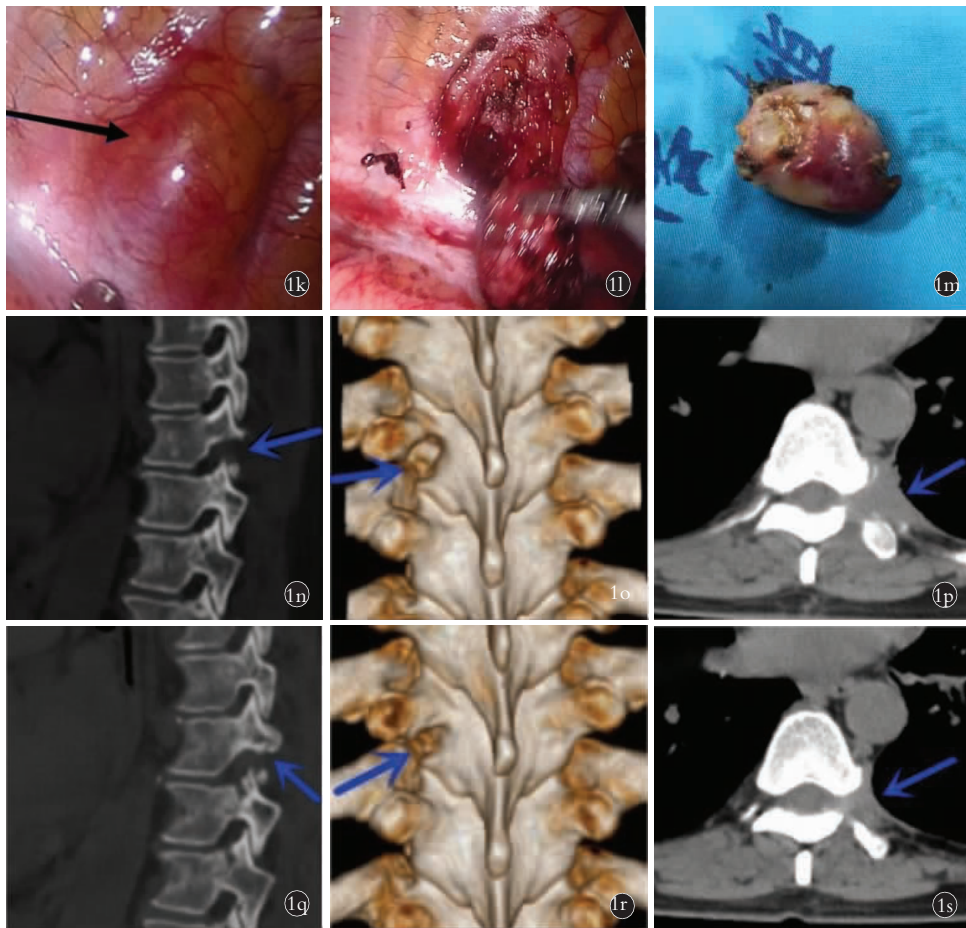


图 1 患者,女,52 岁,胸椎哑铃型肿瘤(神经鞘瘤) **1k.** 胸腔镜下显露肿瘤 **1l.** 胸腔镜下分离并完整切除肿瘤 **1m.** 完整切除的肿瘤大小为 2.7 cm×1.7 cm×1.5 cm **1n.** 术后第 2 天手术部位 CT 矢状位影像,箭头所指为术中去除骨质造成的骨性缺损 **1o.** 术后第 2 天三维 CT 重建(箭头所指为术中去除骨质造成的骨性缺损) **1p.** 术后第 2 天胸部 CT(箭头所指处为手术创腔) **1q.** 术后 1 年手术部位 CT 矢状位影像,骨质缺损部位可见明显的骨质生长 **1r.** 术后 1 年三维 CT 重建,骨性缺损范围较前明显缩小 **1s.** 术后 1 年胸部 CT 显示手术创腔明显变小,胸膜光滑,神经鞘瘤无复发

Fig.1 A 52-year-old female patient with thoracic spine dumbbell tumor(Schwannoma) **1k.** The tumor was revealed under thoracoscopy **1l.** The tumor was separated and completely resected under thoracoscopy **1m.** The size of completely resected tumor was 2.7 cm×1.7 cm×1.5 cm **1n.** CT sagittal image of the surgical site on the 2nd day after surgery, the arrow indicated to the bony defect caused by the removal of bone during operation **1o.** Three-dimensional CT reconstruction on the 2nd day after surgery, the arrow indicated to the bony defect caused by the removal of bone during the operation **1p.** Chest CT on the 2nd day after operation (the point indicated by the arrow was the surgical wound) **1q.** One year after operation, the CT sagittal image of the surgical site showed obvious bone growth at the bone defect site **1r.** Three-dimensional CT reconstruction was performed 1 year after surgery, and the extent of the bony defect was significantly reduced **1s.** Chest CT 1 year after surgery showed significantly smaller surgical wound cavity, pleural smoothness, and no recurrence of schwannoma

经鞘瘤,神经纤维瘤,神经节神经瘤和神经母细胞瘤等^[1-3]。Eden 将脊柱哑铃型肿瘤分为 4 型: I 型为椎管内肿瘤累及硬脊膜内外,肿瘤主体在椎管内; II 型为椎管内肿瘤累及硬脊膜内外,肿瘤通过椎间孔到达椎旁; III 型为椎管内肿瘤均位于硬脊膜外,肿瘤通过椎间孔到达椎旁; IV 型为肿瘤位于椎间孔及椎旁。胸段哑铃型累及椎管、椎旁结构、后纵隔、胸腔等部位,往往形成较大椎旁占位,可压迫椎旁组织如主动脉、腔静脉、奇静脉等,且常与上述结构紧密相连,手术切除具有一定挑战性。以往文献报道,Eden IV 型胸椎哑铃型肿瘤手术多选择开放手术,采用全椎板

或半椎板切除联合开胸或胸腔镜手术^[4-5],也有学者使用单纯后路切除哑铃型肿瘤,常需要切除关节突,甚至切除患侧的椎弓根、肋横关节及部分肋骨以达到良好的暴露,创伤大,出血多,术中需要剥离肌肉、切除椎板和关节突关节,影响脊柱稳定,多数需要行脊柱内固定^[6]。

近年来,脊柱内镜及胸腔镜技术的迅速发展使胸椎哑铃型肿瘤手术的微创化成为可能,电视胸腔镜手术(video-assisted thoracic surgery, VATS)是切除后纵隔肿瘤的一种安全有效的方法^[5,7-8]。单纯在胸腔镜下手术处理 Eden IV 型哑铃型神经源性肿瘤比

较棘手,切除肿瘤时易造成椎管内不可控的出血,牵拉肿瘤时可能造成脊髓间接牵拉损伤造成灾难性后果。大多数学者认为,处理胸腔内肿瘤之前应先处理椎管内或椎间孔内肿瘤,以避免神经损伤^[9]。

脊柱内镜与胸腔镜联合处理胸椎哑铃型肿瘤,尤其适用于 Eden IV 型肿瘤,目前还没有脊柱内镜及胸腔镜联合切除胸椎哑铃型肿瘤的报道。笔者首先在脊柱内镜下切断受累及的神经根,切断其与脊髓的连接,充分游离椎间孔内肿瘤,然后胸腔镜下剥离肿瘤。这样可以避免在胸腔镜操作时对脊髓的牵拉刺激,避免脊髓损伤,保证手术的安全。术中骨性结构切除少,仅用环锯切除少量椎板及下关节突骨质,不影响胸椎稳定性,因此无须脊柱内固定,进而减少了患者的手术创伤及手术花费。

本病例在脊柱内镜操作时穿刺点选择后中线旁开 2 cm 的位置,透视下旁正中后侧入路直接将工作套管置于相应椎板外侧、下关节突与横突交界处,环锯切除部分骨质进入椎间孔,可直接显露相应节段神经根及椎间孔内肿瘤,这与李顺等^[10]报道经皮脊柱内镜下脊神经根切断术治疗癌痛病例所采用的入路相似。这种入路旁开距离短,透视次数少,简便安全。

综上所述,在 Eden IV 型胸椎哑铃型肿瘤治疗中,脊柱内镜联合胸腔镜肿瘤切除是一种新的安全有效且微创的手术方式,不仅可以 I 期切除胸椎椎间孔内、外的肿瘤,而且术中出血少,最大限度地减少对关节突关节、椎板、椎旁肌肉和韧带等正常结构的破坏,有助于患者早期康复。但是脊柱内镜联合胸腔镜手术切除 Eden IV 型胸椎哑铃型肿瘤也存在一定的局限性,对于术前影像学资料怀疑恶性肿瘤、瘤

体基底部较宽或累及 2 个以上椎间孔的患者仍以开放手术切除为主。

参考文献

- [1] OZAWA H, KOKUBUN S, AIZAWA T, et al. Spinal dumbbell tumors: an analysis of a series of 118 cases[J]. J Neurosurg Spine, 2007, 7(6): 587-593.
- [2] BARRENECHEA I J, FUKUMOTO R, LESSER J B, et al. Endoscopic resection of thoracic paravertebral and dumbbell tumors[J]. Neurosurgery, 2006, 59(6): 1195-1201.
- [3] CHEN X F, MA Q Y, WANG S H, et al. Surgical treatment of thoracic dumbbell tumors[J]. Eur J Surg Oncol, 2019, 45(5): 851-856.
- [4] SHADMEHR M B, GAISSERT H A, WAIN J C, et al. The surgical approach to "dumbbell tumors" of the mediastinum[J]. Ann Thorac Surg, 2003, 76(5): 1650-1654.
- [5] KONNO S, YABUKI S, KINOSHITA T, et al. Combined laminectomy and thoracoscopic resection of dumbbell-type thoracic cord tumor[J]. Spine(Phila Pa 1976), 2001, 26(6): E130-E134.
- [6] AKWARI O E, PAYNE W S, ONOFRIO B M, et al. Dumbbell neurogenic tumors of the mediastinum. diagnosis and management[J]. Mayo Clin Proc, 1978, 53(6): 353-358.
- [7] LIU H P, YIM A P, WAN J, et al. Thoracoscopic removal of intrathoracic neurogenic tumors: a combined Chinese experience[J]. Ann Surg, 2000, 232(2): 187-190.
- [8] MCKENNA R J Jr, MALINE D, PRATT G. VATS resection of a mediastinal neurogenic dumbbell tumor[J]. Surg Laparosc Endosc, 1995, 5(6): 480-482.
- [9] CITOW J S, MACDONALD R L, FERGUSON M K. Combined laminectomy and thoracoscopic resection of a dumbbell neurofibroma: technical case report[J]. Neurosurgery, 1999, 45(5): 1263-1265.
- [10] 李顺, 计忠伟, 刘文龙, 等. 经皮脊柱内镜下脊神经根切断术治疗癌痛 1 例[J]. 中国疼痛医学杂志, 2019, 25(5): 396-398.
LI S, JI Z W, LIU W L, et al. Percutaneous endoscopic spinal rhizotomy for cancer pain: a case report[J]. Chin J Pain Med, 2019, 25(5): 396-398. Chinese.

(收稿日期: 2022-08-19 本文编辑: 王宏)