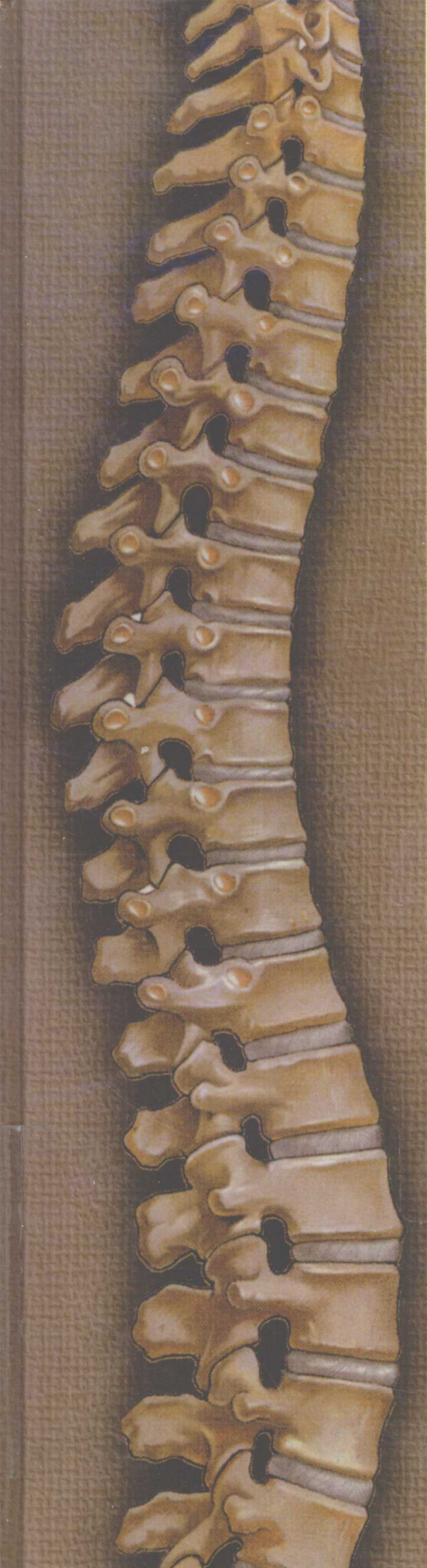




儿童和成人 脊柱外科并发症

Complications of
Pediatric and Adult
Spinal Surgery

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Complications of Pediatric and Adult Spinal Surgery

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By Alexander R. Vaccaro, et al.

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党耕町 等译

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1.

脊柱手术并发症预防、诊断和处理的基本原则

I. 前言

与脊柱手术操作的文献和书籍相比,有关脊柱手术并发症的预防、诊断和处理的文献和书籍却很少,可见后者所受的重视程度远远不够。即使是最好的医疗机构,患者得到最好的诊疗和护理,脊柱手术的并发症都不可避免。如何最大限度地预防并发症发生、对已经出现的并发症尽早诊断和处理,仍然是每个外科医师必须掌握和关心的问题。

并发症的发生将给随后的治疗造成巨大的困难,并导致不良的医患关系。积极面对并发症,主动与患者和家属沟通,减少患者心理障碍,在患者充分配合情况下采取积极的补救措施是防止并发症进一步发展和出现严重后果的关键。此外,尽可能寻求相关医学专家的帮助,往往能够获得事半功倍的效果。

II. 并发症预防

并发症预防应该从术前谈话和同意书签字开始,此时医师应向患者讲清楚脊柱疾病病情和手术计划,让患者知道这种疾病有几种可能的治疗选择,告诉患者采取这种手术方法的原因,同时告诉患者手术常见并发症和严重并发症。在讲述这些潜在的并发症时,医师应说明发生并发症的情形、发生率和并发症出现后采取的补救治疗措施。这让患者在发生并发症后能够密切配合诊断和治疗。在同意书上签字时,患者家属应尽可能在场并同时签字,可以减少并发症发生后的一些纠纷。

充分的术前准备和认真手术设计是防止并发症的关键。诊断所需的各种影像资料必须具备,手术间内手术台、X线影像设备、计算机影像导航设备、手术显微镜、术中内固定操作器械和其他辅助材料等需要术前预定并配备齐全。

合并其他内科疾病患者必须请相关学科的专家会诊。术中出血估计,准备足够血源。手术人员及其他配合的外科医师、麻醉医师、神经电生理医师、血细胞回收人员、内植入物代表、护士都必须被告知将要进行的手术和手术方案。术后病房和护理应事先安排,尤其对需要特殊术后护理的患者。

手术体位摆放是减少并发症发生关键的一步,注意对容易受压部位的护理,避免神经、血管和重要部位如眼睛和颜面部受压。采用俯卧位患者应使用特殊体位架保证腹部悬空,对减少术中出血量非常重要。

做好体表标记,并对照影像资料进行标记,可以避免做错手术部位。有些术者喜欢在X线片上做标记然后放在读片盒上,这是一种很好的习惯。术中对可疑或不清楚骨骼解剖和内固定,应保证能够随时进行清晰X线影像检查。应用金属标记物,如将穿刺针插入棘突或椎板间隙进行X线术中定位。对肥胖、脊柱畸形和翻修手术患者进行术中标记更需要注意。对一些特殊脊柱部位,如肩膀宽大患者在俯卧位时,颈胸椎交界处等部位,很难采用普通X线进行清楚定位,必要时需要延伸切口到特定的部位才能进行定位。

避免术中操作导致的并发症。借助清晰照明,适当的,而非过度的手术暴露、保持术野干净和解剖清楚是外科医师必须具备的良好操作风格。关闭伤口前彻底止血和必要的引流,内固定者应清晰X线影像检查。对于手术大、时间长的手术,应保证术者有足够体力和精力,避免疲劳导致的手术失误。

并发症的预防还包括术后积极的护理和完善的康复计划。对破坏大、重建固定不理想的患者应适当延长卧床时间,避免过早下地活动。术后患者的代谢状态应进行仔细评估,定时检查血液和电解质情况,一旦发现异常应立即纠正。制订有效的止痛计划可以促进患者早期活动。

遵循以上原则，可以最大限度地减少并发症的发生。

III. 并发症诊断

首先必须认识并发症，才能及时发现并对其进行治疗。对各种脊柱手术，应针对手术入路和方案，明了其潜在的并发症，进行必要的监测以便提前预示并发症发生。认真检查临床表现，借助必要辅助检查和特殊检查，如 CT 和 MRI，进行认真的评估。才能做到早发现、早补救、早治疗，减少和避免不良后果。

神经电生理监测有助于发现术中操作导致神经系统损伤，术中 X 线检查可以发现内固定物位置是否正确，一旦发现问题应立即采取补救措施。术后如果出现与手术操作无关的病变，应密切观察直到寻找到病因，并寻求其他相关学科专家的帮助(如卒中)。对一些早期临床表现不明显的，如术后伤口深部低毒性感染，应保持高度警惕，对术后不明原因的发热、白细胞增高、CRP 和 ESR 持续不降低的患者，应该提出来进行讨论，制订一系列诊断治疗措施。

IV. 并发症处理

一旦出现严重的并发症，寻求有关专家的帮助是非常必要的。这里所说的专家包括本专业的高级医师和其他相关学科的高级医师。第一，专家们的意见可以发现一些没有考虑到的医学问题。第二，专家在专业上具有更高的专业知识，能够平衡外科医师的观点。第三，一旦遇到棘手问题，患者及其家属通常更倾向于接受专家的意见。第四，通过专家的会诊和协调，能够帮助减少医疗纠纷发生。第五，也是最重要的，通过专家会诊，提高诊疗水平，寻求补救措施，减少和避免医疗纠纷发生。

脊柱手术并发症可以导致医疗纠纷，尽管有些不是手术操作直接导致，如内植入材料问题、术前谈话和同意书签字出现的问题、术后护理上问题，以及不良的医患关系等。因此，如何处理这些问题更多是对一些细节的预防。手术医师必须注重各种医疗文献完整记录、管理和保存。

V. 结论

尽管采取了各种预防措施，但是脊柱手术围术期并发症仍然不能完全消灭。外科医师必须尽最大的努力，尽可能仔细地、有准备、有计划地进行脊柱手术。从术前谈话和同意书签字开始，就应认识到并发症的潜在风险。一旦发生并发症，应准确判断，积极寻求补救措施。本书中的作者将对小儿和成人脊柱手术中出现的各种各样并发症进行详细的叙述。除了外科基本要求外，脊柱手术具有特殊的技术要求，脊柱外科医师应首先认识脊柱外科并发症，并在工作中不断收集、总结经验，才能提高脊柱外科的诊疗水平。

(郑丰裕 译)

2.

脊柱手术中与麻醉和体位有关的并发症

I. 与麻醉有关的并发症

A. 控制性低血压

控制性低血压有助于减少脊柱手术中的失血。血压维持在平均动脉压水平是安全的，能够保证脊髓和主要器官足够的血液灌注。对于非脊髓病患者，中等程度的控制性低血压是安全的，如平均动脉压在65mmHg以上或不低于正常基础血压20mmHg的水平。但必须注意过低的血压引起脊髓局部缺血导致神经系统损伤，如果患者术前存在高血压、低碳酸血症、贫血，或术中快速失血等导致突然血压下降，控制性低血压的风险将明显增加。因此控制性低血压的不良反应包括所使用的降压药和降压程度。

最常用的两种降压药是硝普钠和咪唑吩，其次是硝酸甘油和挥发性麻醉剂。吸入性麻醉剂可以引起低血压。安氟醚和异氟烷可以较大程度地降低血管系统的阻力，而对心肌几乎没有影响，比氟烷较少引起心律失常。然而所有挥发性麻醉剂都会影响术中体感诱发电位的监测，并随麻醉深度增加影响更明显。硝普钠至少在用药初期可有效地降低血压，并可增加脊髓的血流量，但这种药物作用有“天花板”效应，即当硝普钠的应用达到某一剂量时就不能起降压作用。硝普钠的副作用包括快速耐药、毒性反应和伴有心动过速的反射性高血压。麻醉前使用 β -受体阻滞剂或血管紧张素转化酶(ACE)抑制剂有预防其副作用。为了防止手术即将结束时的反应性出血，恢复血压应缓慢。

应用咪唑吩进行控制性降压将使脊髓灌注的自动调节机制消失，然而用硝普钠或硝酸甘油等诱导降压却没有这种现象，因此在脊柱手术中不推荐使用咪唑吩，以免在较低平均动脉压下导致脊髓缺血(1)。

低血压和脊髓局部受压均可分别影响脊髓血供，不建议在脊髓压迫症患者中采用控制性低血压，以免加重脊髓缺血状态(2)。实验发现当脊髓血流量降低时，运动诱发电位监测反应减弱。脊髓的低血流灌注引起诱发电位信号缓慢消失(>15分钟)，而脊髓受压则引起诱发电位信号很快消失(<5分钟)。术中要求脊髓血流灌注量至少要达到基线水平的65%以上，如果血流灌注量只有基线水平的12%以下就有发生瘫痪的可能(3)。

Nielsen(4)指出，在脊柱手术过程中，只要体感诱发电位和运动诱发电位无异常，将平均动脉压控制在55mmHg水平是安全的。

B. 颈椎损伤病人的气管内插管

在事故现场如果需要紧急插管，但不知道患者有否颈椎损伤，此时需要助手用手和前臂帮助固定头部，在轻柔的牵引下逐渐后伸以利插管，否则突然过度后伸颈椎，将加重并导致脊髓损伤。

择期手术患者相对容易进行气管插管，但如果患者存在颈椎受伤，活动受限，采用局麻下经鼻腔插管是一种选择，操作中会增加患者痛苦。另一种方法是，利用光导纤维支气管镜清醒插管，操作中由助手固定头颈于中立位，或应用颈围领固定。

C. 椎管内麻醉

对于短时间能够完成的脊柱手术，可采用蛛网膜下腔或硬膜外注射麻醉。这对于肺部疾病的患者，可以避免插管引起的支气管痉挛以及全麻引起的呼吸抑制。其他优点包括便于术后止痛、较少发生恶心呕吐、能够阻断交感神经兴奋和减少术中失血。

蛛网膜下腔麻醉和硬膜外麻醉的并发症有少见的神经损伤导致的瘫痪(5)。脊柱后路手术在俯卧位下进行,如果时间延长,而区域性阻滞麻醉的时间有限,如果改全麻将很困难。相反如果手术已经结束而区域性阻滞仍未消失,则会给术后神经功能判断带来困难,甚至导致神经损伤的延迟判断,对于需要术中唤醒实验患者,不建议用椎管麻醉。另外,术中患者随意活动、不配合等将增加医源性损伤。

II. 与体位摆放有关的并发症

良好的体位摆放是脊柱手术中最重要的工作,很多并发症与手术体位摆放不当有关。脊柱手术体位因病变部位、病变状况和程度、患者状况以及外科医师经验等分别可以采用俯卧、平卧、侧卧,以及其他特殊体位。必须防止各种不当的体位导致并发症发生。

A. 压迫性损伤

俯卧位手术中最常见的并发症是压迫性皮肤损伤,容易受压部位包括颜面部、胸部、髂嵴、肘后和膝前,应在这些部位放置柔软的衬垫以防止受压。腹部悬空对减少伤口出血非常重要。腹部受压将导致腔静脉压力增高,静脉回流受阻,引起严重的静脉出血,如果手术时间较长,可以引起深静脉血栓形成。Lee 等(6)研究中发现低血压麻醉不能降低腔静脉压,但是使用腹部悬空的俯卧位体位架却能够明显地降低腔静脉压。长时间采取膝胸位进行腰椎后路手术有导致胫前筋膜室综合征的报道(7)。为预防下肢深静脉血栓,在麻醉诱导前就让患者下肢穿弹性袜或使用弹力绷带,使用足底静脉泵也有帮助,但不推荐使用抗凝剂以免增加硬膜外血肿风险。

为防止颜面部受压,可以采用中空的头面部托架使颈椎处于中立位,软泡沫塑料保护颜面部皮肤,气管插管从中空部位穿出,使用一面镜子可以方便地观察面部受压情况(图 1A,图 1B)。对于颅颈和颈椎后路手



(A)

图 1 俯卧体位,采用中空的头面部托架便于使颈椎处于中立位,软泡沫塑料保护颜面部皮肤,气管插管从中空部位穿出(A)。使用一面镜子可以方便地观察面部受压情况(B)