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## 人工颈椎间盘置换术需要关注的问题

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**【摘要】** 人工颈椎间盘置换术作为治疗颈椎病的新方法, 正逐渐成为基础和临床研究的热点。人工颈椎间盘置换术与颈前路椎间盘切除术及融合术相比最大的区别在于重建了颈椎的高度和生理曲度, 最大限度地保留脊柱的生理运动功能的同时减少相邻节段的退行性改变。目前临床结果表明人工颈椎间盘置换术可成为替代颈前路椎间盘切除术及融合术的一种手术方式。然而, 其特有的并发症以及假体本身存在的问题也逐渐暴露出来, 如假体尚无法完全模拟人体椎间盘的生物学效应, 以及包括手术方式与假体在内的其他因素。同时, 如何预防并发症等问题有待解决, 其疗效是否能够长期保证手术节段的活动度, 减少相邻节段退变的设计初衷等问题越来越多地引起了学者们的关注。

**【关键词】** 颈椎病; 手术后并发症; 综述文献

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**ABSTRACT** Cervical artificial disc replacement (CADR) as a new method for the treatment of cervical spondylosis, is becoming a basic and clinical research. Compared with the anterior cervical discectomy and fusion (ACDF), the biggest difference of CADR lies in the reconstruction of the cervical vertebra height and physiological curvature, retaining the spinal physiological function maximally and reducing the degenerative changes in adjacent segments. A large number of clinical investigation have suggested that ACDF can become an operation method to replace the ACDF. However, the complications and the problems of prosthesis itself are gradually exposed, such as that the prosthesis, can't completely simulate the biological effects of human intervertebral disc, the other factors and including the operation methods and prosthesis itself. At the same time, the problem that how to prevent complications and problems is required to be solved. Whether, the effect of CADR on the activity of the operation segment, and the prevention of adjacent segment degeneration can be guaranteed for a long time has drawn more and more attention from scholars.

**KEYWORDS** Cervical spondylosis; Postoperative complications; Review literature

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颈椎病指颈椎间盘退行性变及其继发性椎间关节退行性变所致的脊髓、神经、血管损害所表现的相应症状和体征,是骨科临床中常见的疾病之一,严重影响着患者的身体健康和生活质量。出现的原因是遗传和生物力学之间复杂的相互作用<sup>[1]</sup>。人工颈椎间盘置换术作为替代传统融合术的手术方式逐渐被学者们认识和使用,然而与其相关的问题也逐渐增多,逐步引起了学者们的注意<sup>[2-3]</sup>。

### 1 人工颈椎间盘置换术的特点

人工颈椎间盘置换术的特点在于重建了颈椎的高度和生理曲度,保持椎间关节的运动,维持颈椎的生物力学性能,防止融合术后邻近节段退变的发生。因此,人工颈椎间盘置换术具有保留手术节段活动度、保留置换节段的生物力学环境、减少邻近节段退变等优点<sup>[4]</sup>。从生物力学的角度上讲,假体能够模拟颈椎复杂的生理运动,具备椎间盘在矢状位、冠状位和轴位各个平面上的正常运动,并且在运动中应能够吸收震荡。Nica 等<sup>[5]</sup>通过对患者颈部活动的观察认为,椎间盘假体可以为患者提供相当好的活动力,且可以促进骨质长入其钛涂层内而保证其更加稳定,进而防止植入体的移动而导致再次手术。

人工颈椎间盘置换能有效解除神经压迫、缓解症状,其良好的生物相容性值得肯定。美国食品和药物管理局(FDA)对人工颈椎间盘进行了长期的体外测试,目的是为了测试其生物耐久度,结果证明了这种设备可以安全存在于人体,不会对人体造成损害,并且长时间的工作后极少出现老化及失效<sup>[6]</sup>。

由此可知,人工颈椎间盘置换术的优势为减压彻底,术后可保留相应节段椎间盘运动功能,可防止邻近节段椎间盘的退变,有效避免因颈椎融合带来的颈椎运动功能缺失,提高并改善患者术后的生活质量。影像学证实椎间盘置换对临近节段有一定的保护作用,且患者恢复快,术后当天可下床活动,术后无须外固定,并能较早地恢复工作和(或)劳动。

### 2 人工颈椎间盘置换术的适应证与禁忌证

#### 2.1 适应证

目前临床认为其适应证包括:(1)因退行性病变而导致的神经根性症状<sup>[7]</sup>;(2)多节段病变<sup>[8-9]</sup>;(3)全部或阶段性颈椎前凸<sup>[1]</sup>;(4)病变位于 C<sub>3</sub>-T<sub>1</sub> 节段;(5)椎体活动度良好;(6)椎间隙高度尽量 < 4 mm;(7)相邻节段出现轻度退变。

#### 2.2 禁忌证

禁忌证包括:(1)中度或重度骨质疏松<sup>[10]</sup>;(2)关节突明显退变,椎间盘重度钙化,强直性脊柱炎,颈椎管狭窄,椎间隙过窄;(3)脱位或骨折,后纵韧带钙化;(4)胰岛素依赖性糖尿病;(5)单纯性轴性症状,

指颈肩部疼痛为患者的惟一症状,患者常会感觉颈肩部疼痛酸胀、无力僵硬;(6)后凸畸形,椎体不稳,活动性感染;(7)活动性风湿性疾病;(8)影像学无法定位者;(9)材料过敏者、麻醉相关问题及不能耐受手术的患者。

### 3 人工颈椎间盘置换术的并发症

与常规颈椎前路手术一样,人工颈椎间盘置换术也可发生类似的手术并发症,如伤口血肿、硬脊膜撕裂引起脑脊液漏、喉返神经损伤引起声音嘶哑和并发感染等<sup>[11]</sup>。同时,由于假体的植入,也会发生与假体相关的并发症,如异位骨化、假体下沉、假体磨损以及颈椎后凸等。

#### 3.1 异位骨化

人工颈椎间盘置换术的核心意义在于保留手术节段的活动度,如出现异位骨化,便可能限制术后手术节段的活动度,则该手术没有取得应有的效果,故需加以重视<sup>[12]</sup>。异位骨化是人工颈椎间盘置换术后发生率较高的一种并发症,目前尚不能确定其发病原因,但可能与术中的操作有关<sup>[13-14]</sup>。如对颈长肌以及相邻软组织的牵拉或使用磨钻造成骨质微粒在伤口聚集。笔者认为在术中应尽量避免对相关组织的牵拉以及应反复对术野进行冲洗,术后常规给予非甾体类药物进行预防,其原理为抑制环氧化酶而达到阻止前列腺素的合成,最终抑制间充质细胞分化为成骨细胞<sup>[15]</sup>。异位骨化按照 McAfee 等<sup>[16]</sup>分级法可分为 5 级:1 级,无骨化;2 级,骨化仅出现在椎体前部;3 级,椎间隙出现骨化,能出现影像假体活动的情况;4 级,形成骨桥,但不影响假体活动;5 级,出现骨性融合,影响假体活动。同时,短期内不同种类的颈椎间盘置换术,其术后表现是乐观的,相对应的并发症报告也是很少<sup>[17]</sup>。然而对于长期的随访结果显示,异位骨化成为了少数患者出现的临床症状,其原因目前尚无定论,有许多因素可能导致该结果,所以正确的手术技巧成为关键所在<sup>[18]</sup>。需要注意的是,在多节段的颈椎关节置换后大剂量使用止痛剂造成异位骨化的发生率明显偏高<sup>[19]</sup>。相关研究证实<sup>[20-21]</sup>,虽然异位骨化的发生率较高,但出现影响假体活动的 4、5 级异位骨化并不常见。因此,在颈椎间盘置换术获得长期支持之前,仍需长期研究。

#### 3.2 假体下沉、松动、移位和脱出

当假体陷入上下椎体时,称为假体下沉。Wang 等<sup>[22]</sup>研究发现人工颈椎间盘置换术后部分患者可出现假体下沉的情况,其主要原因是没有严格掌握手术适应证,骨质疏松以及椎体不稳是绝对手术禁忌。笔者认为,出现假体下沉会导致手术节段的活动度下降,并且可增加相邻节段的应力;其次,也应注意

术中不可将椎体间隙撑开过大,选择假体时应尽量选择适合的尺寸,使假体与上下两椎体保持固定,以防止松动、移位和脱出。

### 3.3 假体磨损

不同种类的人工颈椎间盘假体在进入人体前都做了各项体外测试,防止假体在人体内出现异常情况,但如操作不当,可能引起相关并发症。Fan 等<sup>[23]</sup>报道了 1 例 55 岁女性在行颈椎间盘置换术后 8 年出现颈部肿物。随后手术将肿物切除,探查发现假体上出现一大约 5 mm 的横向裂痕。发现该肿物与假体出现的裂痕有关。笔者认为,正常的假体疲劳试验足以满足其在人体内的使用寿命,问题的关键在于体外生理盐水测试环境与体内微循环存在差异。血清酶最有可能造成假体的寿命降低,破损后的游离体造成囊肿的形成。同时,术后常规影像学复查对该类型的并发症有重要意义。

### 3.4 颈椎后凸

正常的颈椎呈现前凸,但颈椎病患者由于受其疾病本身的影响,会出现颈椎曲度改变,造成颈椎曲度变直甚至出现后凸畸形。同时,术中假体植入的角度、后纵韧带的切除均可能也会对此产生影响。Kim 等<sup>[24]</sup>对 52 例行人工颈椎间盘置换术的患者进行随访时,发现手术节段颈椎后凸发病率为 15.6%,全颈椎后凸发病率为 14.3%,故认为由于假体具有可压缩性,长期的压力导致后凸的形成。同时 Fong 等<sup>[25]</sup>的研究中也发现,颈椎曲度的改变与术中切除颈后纵韧带有关。Yanbin 等<sup>[26]</sup>认为,在手术时应将患者颈椎处于中立位,术中透视注意保持手术前后颈椎的曲度不变,并且注意椎体前后缘切除不可过多,打磨椎体时尽量保持与椎体后部的切线平行,以保证假体与椎体的紧密接触,最后还要注意假体植入的角度。

### 3.5 吞咽困难

吞咽困难作为人工颈椎间盘置换术后并发症比较常见。Bazaz 等<sup>[27]</sup>对 249 例患者进行评估发现,有 50.2% 的患者术后出现了吞咽困难,但大部分随着时间的推移有所好转,其中 2、6、12 个月的发生率分别为 32.2%、17.8%、13.6%。研究表明<sup>[28]</sup>,术中对气管食管的牵拉力度以及时间是引起吞咽困难的主要因素。同时,通过影像学观察颈前软组织影是否增厚也被作为评估术后出现吞咽困难的一项指标。增厚的软组织往往在术后因手术切口肿胀而影响呼吸并且出现吞咽困难,进而增加术后吞咽困难的发生率<sup>[29-30]</sup>。Kang 等<sup>[31]</sup>认为增厚的颈前软组织可能与术中操作造成软组织损伤以及术后血肿、瘢痕形成等一并成为造成术后吞咽困难的危险因素。

## 4 小结

人工颈椎间盘置换术是基于人工髌和膝关节以及近年来人工腰椎间盘的成功运用而逐步发展起来的一项新技术。该技术能够恢复和维持椎间隙的高度,保持节段稳定性和颈椎的正常活动,是治疗颈椎间盘疾病的一大进步。但对其适应证与禁忌证尚无统一的指南。术后并发症的发生机制和处理方法,也有许多疑问,这些都将是该项技术今后重点关注的问题。随着学者们对人工颈椎间盘置换术研究的深入,其理念将不断更新、技术将不断提高,最终该技术在治疗颈椎病上会有更广阔的发展。

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