

Research Progress on the Anterior Cervical Surgery

Junxiao Gao, Qin Fu

First Department of Orthopaedics, Shengjing Hospital of China Medical University, Shenyang Liaoning
Email: 1193259315@qq.com, fuq@sj-hospital.org

Received: May 3rd, 2019; accepted: May 21st, 2019; published: May 28th, 2019

Abstract

Surgery is the most effective way to treat cervical spondylosis. Anterior cervical surgery can effectively relieve the compression from the front of the spinal cord. With the development of treatment philosophy and science and technology, anterior cervical surgery is also improving. Orthopedists are also increasingly focusing on long-term outcomes. This article reviews the development of this kind of surgical method and the characteristics of each surgical method. The commonly used techniques such as intervertebral fusion cage and artificial intervertebral disc are introduced.

Keywords

Cervical Spondylosis, Anterior Cervical Discectomy and Fusion, Treatment Outcome

颈椎前路手术的研究进展

高骏晓, 付 勤

中国医科大学附属盛京医院第一骨科, 辽宁 沈阳
Email: 1193259315@qq.com, fuq@sj-hospital.org

收稿日期: 2019年5月3日; 录用日期: 2019年5月21日; 发布日期: 2019年5月28日

摘 要

外科手术是治疗颈椎病的最有效的方式, 颈椎前路手术可有效解除来自脊髓前方的压迫。随着治疗理念以及科学技术的发展, 颈椎前路手术方式也不断在进步, 骨科研究者们也越来越重视治疗的远期疗效。本文综述该种手术方式的发展以及各个手术方式的特点, 并对现在经常使用到的椎间融合器及人工间盘等技术加以介绍。

关键词

颈椎病, 颈椎前路手术, 疗效

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1. 引言

随着社会现代化的进一步发展, 数码产品的不断普及, 椎间盘退行性疾病的发病率逐年提升, 且年轻化 and 多节段化趋势也越来越明显。颈椎病通常分为脊髓型、神经根型、椎动脉型、交感神经型和混合型, 其中神经根型和脊髓型最为常见。颈椎病通常是由于椎体后缘骨质增生、椎间盘突出、颈椎退行性变等病理因素造成的[1]。颈椎病的治疗分为保守治疗与手术治疗。保守治疗有药物治疗、运动疗法、牵引治疗、手法按摩及热敷理疗等方法。通常而言, 颈椎病在长达 6 周以上的保守治疗无效, 或是在治疗过程中病情加重后都需考虑手术治疗, 而脊髓型则在病程早期就建议手术。正确的应用经颈前路各个术式均能达到有效减压的目的, 有助于改善颈椎病的远期疗效。

2. 颈椎手术的前期发展

治疗颈椎病的手术方法繁多, 且较为复杂。颈椎病通常伴有椎间隙狭窄和生理曲度改变, 因此术后恢复并维持椎间隙高度和颈椎前凸是判断临床疗效的重要因素。颈椎病手术根据路径可分为前路和后路两大类。经后路手术虽然更加便捷, 且手术视野更大, 但对颈椎前方的减压疗效较差, 而且容易发生轴性症状和 C5 神经根麻痹等术后并发症[2]。因此 Smith [3]在 1958 年提出一种颈椎前路手术, 即颈椎前路减压植骨融合内固定术(Anterior cervical discectomy and fusion, ACDF), 此术式至今为止一直是治疗颈椎病的主要选择。

ACDF 通过前路直接切除病变部位的椎间盘, 有效地解除病灶对脊髓硬膜囊、神经根以及椎动脉的压迫, 然后通过植骨填充切除后的椎间盘空隙, 维持颈椎生理曲度, 保持椎间隙的高度。与此同时, 为求进一步减压, 颈椎前路椎体次全切除融合术(Anterior cervical corpectomy and fusion, ACCF)也逐渐被术者选择用于伴有椎体后方水平存在压迫的患者, 此术式是在 ACDF 的基础上扩大切除上下椎体的压迫部分[4]。此外, 在多节段颈椎病变中, 术者还可根据不同患者的不同病变情况, 选择前路混合减压融合技术(Anterior cervical hybrid decompression and fusion, ACHDF) [5]或跳跃式椎体切除减压术[6]。

最早有学者提出用同种异体骨进行植骨, 但随访显示术后患者骨性融合率低, 且愈合时间长[7]; 之后又有学者提出用自体髂骨进行移植, 随访研究发现自体骨移植融合率较异体骨提升了 2 倍[8], 但是术后患者常出现植骨处持续性疼痛、神经刺激、损伤和感染等[9], 因此学者们开始考虑用其他人工材料进行椎间融合。PEEK 材料 Cage、钛合金 Cage、碳纤维 Cage 等用于椎间融合的人工生物材料相继出现。这些 Cage 比异体骨和自体髂骨的术后稳定性都更加优良, 发生移位和下沉的概率都更低。

3. 颈前路钢板内固定系统

在对外伤性颈椎病进行手术时, 由于颈椎的不稳定性, 术者们开始尝试用钢板和螺钉改善术后植入物被挤出的情况, 发现此方法不仅能增加术后融合率, 还能改善颈椎整体的序列, 并且在随后的 10 年随访中都无与钢板相关的临床损伤[10]。这种椎间盘切除减压融合术联合颈前路钢板内固定系统, 是目前普

及率最高、最为传统的颈椎前路融合手术[11]。但随着长期临床研究的逐步开展,其缺点也渐渐显现。主要有如下几个方面:1) 手术需固定钢板、钛板,对椎体的破坏较大,术中出血多[12]。2) 术中置入的钢板等易损伤食管或喉部神经,患者术后常伴有异物感严重、吞咽困难,甚至声音嘶哑[13]。研究表明,前路钛板的厚度与吞咽困难的发生率呈正相关[14],而移除患者的前路钛板可显著改善其吞咽困难的状况[15]。3) 随着患者年龄增加骨量下降,融合器易发生松动甚至下沉。

4. 零切迹椎间植骨融合内固定系统

零切迹椎间植骨融合内固定系统(Zero-Profile implant, Zero-P)是在传统钢板内固定系统的基础上改良的一种新的颈前路椎间融合系统,主要由 PEEK 椎间融合器、钛合金固定板和螺钉组成,近年来逐渐应用于颈椎病的手术治疗并获得较好的临床疗效[16]。此系统无需放置前路钛板,且椎间融合器固定在椎间隙内,可显著减少对食管的刺激。一项平均随访时间为 13.9 个月的回顾性队列研究($n = 70$)结果显示,采用 Zero-P 治疗的患者与采用传统钢板治疗的患者术后临床和影像学结果相似,且 Zero-P 组的术后吞咽困难率显著低于钢板组($P = 0.027$) [17]。黄彦等[18]在治疗多节段颈椎病患者时联合运用 Zero-P 系统和钢板内固定系统获得了良好的术后效果,既实现了颈椎结构重建,也维持了节段间的稳定性,还避免了长钢板附带的术后并发症。目前普遍认为,Zero-P 系统操作简便且安全有效,手术时间短,暴露范围小,是理想的具有广阔前景的新型选择。

5. 人工颈椎椎间盘置换术

颈椎前路融合术虽然能有效解压,并一定程度的维持正常颈椎生理曲度,但越来越多的文献报道此术式所带来的应力的重新分布会加大邻近节段的椎间盘的压力,引起相邻节段退变[19],甚至在术后 10 年内需行二次手术[20]。人工颈椎椎间盘置换术(cervical disc replacement, CDR)可最大限度的保留手术节段活动度,减少相邻节段退行性病变的发生[21]。目前常用的假体类型有 Bryan 假体[22]、Prodisc-C 假体[23]和 Prestige 假体等。颈椎椎间盘置换术,与接受颈椎人工间盘置换术的患者相比,接受颈椎前路融合术的患者其非手术节段的活动度增加[24]。但此术式也存在一系列的问题,比如自发性融合、异位骨化、置入节段的小关节退变和假体磨损等问题都有待解决。运用此术式还应严格排除手术禁忌症,如严重的椎间隙狭窄、后纵韧带骨化、颈椎畸形、骨性压迫明显、重度骨质疏松、颈椎结构不稳、强直性脊柱炎、风湿性关节炎、颈椎肿瘤和创伤等。此外,人工椎间盘造价昂贵,手术费用是其他术式的数倍[25]。因此,多角度评价患者情况,因人制宜地选择术式尤为重要。

6. hybrid 手术

临床上,多节段颈椎退行性病变的发病率越来越高。目前常用多节段椎间盘切除植骨融合内固定或混合减压植骨内固定术治疗两个及以上的多节段颈椎病变[26],但这些术式均需要长节段地融合颈椎体,降低手术椎体的活动度,同时使邻近节段椎体的活动度代偿性增加,进而加速其退行性病变过程。因此,一种综合这两种手术方法优缺点的 Hybrid 手术目前备受关注,即先对活动度较小的节段采用融合术,再对活动度大的节段,如 C5-6,采用颈椎人工间盘置换(cervical artificial disc replacement, cADR)的非融合术,最大限度的保障术后颈椎的活动度和邻近节段的功能[27]。一项针对 27 例接受 Hybrid 手术患者的回顾性研究结果显示,Hybrid 手术具有良好的安全性和可行性[28]。段硕等[29]通过 5 年以上的长期随访,发现 Hybrid 组与双节段 ACDF 组两者的临床效果及安全性均一致,而且 Hybrid 组患者具有更好的颈椎曲度。

7. 颈前路微创手术

近十年来微创技术在医学界各科都极为流行,患者对此的接纳度也是常年最高。脊柱方面的微创手

术最早是在胸腰椎病变中施行, 并逐步拓展到颈椎。主要微创方式有经皮、内窥镜和通道等。Yang 等[30]对 84 例单节段颈椎病患者在内窥镜下行颈椎间盘切除植骨融合术, 认为此术式不仅具有良好的临床效果, 并且具有创伤小, 患处恢复快等优点。Yao 等[31]对 67 例接受此术式的患者进行了长达 5 年以上的随访, 发现经内镜的颈前路微创术在治疗椎间盘突出、脊髓型和神经根型颈椎病中均有优良临床疗效, 与传统术式相比, 此方法不仅让患者保有良好外观, 还可促进术后恢复, 降低复发率。但有学者认为, 由于手术区域的局限性, 微创术有着更多的并发症, 如误切硬膜囊, 植入物错位, 神经损伤等, 术后总并发症的发生率可达 11% (109/966), 甚至还应该更高[32]。不过笔者认为, 随着术者技术水平的提升和手术硬件的改进, 这些并发症都可以逐渐改善。

8. 总结

经颈椎前路的各种手术方式均能取得良好的临床疗效, 具体采用哪种术式, 应全面结合患者的临床症状、受累节段、身体和经济情况进行选择。在观察术后疗效时, 除早中期疗效外, 还应及时跟进随访, 注意晚期术后改变。就目前技术水平而言, 经颈椎前路融合手术依然是主流, 尤其是 zero-p 系统在临床上的进一步广泛应用, 可以显著改善前路相关并发症。虽然人工间盘置换术也能有效改善这些并发症, 并且在随访中也都保持着良好的临床效果, 但其应用范围十分局限, 而 ACDF 具有更广泛的适应症。除此之外, 微创技术未来在脊柱外科的进一步成熟仍旧是备受瞩目的关键点, 它是未来外科学的总体发展趋势。颈椎前路的手术治疗还需要更多的大样本量的临床研究, 手术效果的完善和应用范围的拓宽也仍需要我们进一步发展新的技术和手段。

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