

• 专家论坛 •



夏术阶,教授、博士生导师,上海交通大学泌尿外科研究所所长,上海市领军人才。中国医师协会男科与性医学分会会长、世界华人泌尿外科医师协会会长、中国医学装备协会泌尿外科分会会长、中国医师协会泌尿外科分会副会长。获得国家科技进步二等奖 1 项、省部级一等奖 4 项,获得上海医学发展杰出贡献奖,吴阶平泌尿外科奖,世界杰出华人医师霍英东奖,上海市五一劳动奖章。在国内外期刊发表学术论文 810 篇,其中 SCI 收录 222 篇。获得国家授权专利 66 项,其中发明专利 33 项。主编(译)权威专著共 2 174 万字。创新建立前列腺创面修复新理论与精准外科干预体系。解决了前列腺增生症诊疗相关的关键科学难题,写入了欧洲指南、中国指南、美国坎贝尔沃什泌尿外科和史密斯泌尿外科经典教科书。

从并发症防治探讨经尿道前列腺手术由电切到钬激光转换的发展趋势

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[摘要] 良性前列腺增生(BPH)是引起中老年男性排尿障碍最常见的一种良性进展性疾病,其患者人群日益庞大,亟待手术干预的患者也逐渐增多。经尿道前列腺电切术(TURP)被认为是治疗 BPH 的金标准,但近年来逐渐被激光取代。本文将从并发症防治的角度综述经尿道前列腺手术由电切到钬激光的转换,以期钬激光更安全广泛地应用于 BPH 治疗提供借鉴。

[关键词] 良性前列腺增生;钬激光;经尿道前列腺电切术;并发症

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The development trend of the conversion from TURP to thulium laser in transurethral prostate surgery from the prevention and treatment of complications

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Abstract Benign prostatic hyperplasia(BPH) is the most common benign progressive disease causing urination disorder in middle-aged and elderly men. The patient population is increasing day by day, and the number of patients requiring surgical intervention is also increasing gradually. Transurethral resection of the prostate (TURP) is considered to be the gold standard for the treatment of BPH, but it has been gradually outlawed by laser in recent years. This article will review the transition from TURP to thulium laser from the perspective of prevention and treatment of complications, in order to provide a reference for thulium laser to be used more safely and widely in the treatment of BPH.

Key words benign prostatic hyperplasia; thulium laser; transurethral resection of prostate; complication

良性前列腺增生(BPH)是老年男性最常见的疾病之一,40 岁以后患病率稳步上升^[1]。随着社

会老龄化的进展,BPH 的患者人群日益庞大,药物治疗失败或出现 BPH 并发症需要手术干预的患者也显著增多。因此,手术方式的合理选择及术后并发症的有效防治对改善患者术后生活质量至关重要。

经尿道前列腺电切术(TURP)被认为是治疗

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BPH 的金标准^[2],但其术后并发症众多: TUR 综合征发生率达 0.78%~1.4%^[3],TUR 综合征造成患者低钠血症和高血容量、手术期间出现头痛、意识模糊、呼吸困难和癫痫发作,还可能导致血流动力学不稳定和心律失常,甚至危及生命^[4];术中出血发生率达 4%~11%,输血率达 0.4%~7.1%,继发性出血率为 9.1%,对于接受抗凝的患者手术风险极大^[5];尿道狭窄发生率为 2.2%~9.8%,TURP 期间医源性尿道损伤、电切镜电流泄漏和大尺寸电切镜压缩易导致尿道缺血,从而造成尿道狭窄^[6];膀胱颈挛缩(BNC)发生率为 2%~12.3%,TURP 引起的热损伤在切除前列腺组织时导致新的纤维化病理过程,使 BNC 发生率居高不下^[7];尿失禁发生率为 4%~9.7%,这与电切中产生的电、热刺激或钝性分离牵拉导致尿道括约肌损伤有关^[8-10];勃起功能障碍发生率为 5%~22.7%,有研究已经解释了术后勃起功能障碍与前列腺包膜损伤密切相关,海绵体神经穿过前列腺包膜,而 TURP 期间发生电极加热效应从而损伤性神经^[11-12];逆行射精发生率达 70%~90%,主要与 TURP 过程中发生的膀胱颈(内括约肌)切除有关^[13];远期复发高达 8.3%,TURP 利用电切环片状切除组织,术中切除过浅容易造成增生腺体残留,导致术后症状改善不理想、远期复发等问题^[13]。这些术后并发症严重影响患者的生活质量甚至危及生命,因此 TURP 技术逐渐被激光取代。

近 20 年来,专家团队致力于提升疗效、减少并发症等相关科学问题研究,创新改良设备。目前钬激光仪器已经可以在连续波模式和脉冲模式下工作,同时波长也可在 1.75~2.22 μm 之间调节,兼有脉冲模式的爆破特性和连续模式的组织消融特性使其实现前列腺增生精准剜除。连续波模式可以提供最大限度的止血和凝固,用于进行平滑的切开或汽化、剜切等,而脉冲模式更适用于需要精确切割及爆破外科包膜的情形,如膀胱颈挛缩、尿道狭窄和进行前列腺剜除^[14]。这种多功能性使得钬光纤激光器在 BPH 手术中更具优势。夏术阶教授团队充分发挥钬激光“多面手”的特性,不断改进钬激光 BPH 术式,使术者可以根据不同体积、形态的前列腺以及自己的经验灵活选择手术方式,如经尿道前列腺剥瘤式切除术、剜除术或剜切术,从各个方面减少了 BPH 术后并发症的发生:消除了 TUR 综合征的风险,将 TUR 综合征的风险降为零;术后创面出血率仅为 0.6%^[15];BNC 发生率降至 0~1.6%^[16];尿道狭窄发生率降至 0~5.6%^[17-18];勃起功能障碍发生率仅为 2.7%^[19];钬激光术后复发率仅 0~1.7%^[20]。

同时夏术阶教授团队也在 BPH 术后并发症防治上总结了自己独特的经验。

在术后出血方面,钬激光的热损伤深度仅为 0.1~2 mm,能够有效避免包膜热损伤,同时凝固

层厚度为 0.8 mm,最大限度地降低术后创面出血的可能。另外钬激光功率可调,高功率(最大功率可达 120 W)可以有效切割,无血操作,低功率(30 W)可以更好地紧贴出血点止血,而且加入融合波的特性,可以更精准地封闭血管。

在尿失禁防治方面,夏术阶教授团队提出了前列腺 12 点预切开,提前将前列腺尖部精阜至 12 点侧叶黏膜断开以保护尿道黏膜撕裂,横向断开前列腺两侧叶以保留前列腺前叶(11 点~1 点)部分组织,形成“组织垫”等改良方法更好地保护尿控,预防尿失禁。对 BNC 的预防也提出了完整保留正常膀胱颈环形纤维的重要性,在膀胱颈部仅切开黏膜,尽量避免膀胱颈部组织受热损伤。若膀胱颈部抬高显著,或者膀胱颈部纤维化明显,剜除后可在 5 点和 7 点处对膀胱颈部纤维环进行预防性激光切开,深度达脂肪层,可降低 BNC 发生率^[21]。同时抗增殖剂如丝裂霉素 C(MMC)和类固醇类药物如曲安奈德也已成为内镜治疗的有效辅助手段,可在术中使用以预防 BNC^[22]。

研究证明,钬激光术后尿道狭窄的发生率大大降低。一方面,源于钬激光 BPH 手术时间大大缩短;另一方面,TURP 术中由于电切镜的电流泄漏在电流传输过程中造成对尿道的热损伤,而钬激光热损伤深度浅,最大程度避免了尿道的热损伤^[23];同时钬激光手术器械持续在优化,23Fr 镜鞘可以用于前列腺剜除和连接粉碎器。另外术中充分润滑、轻柔操作保护尿道,选用直径恰当的镜鞘、缩短操作时间,术后早期行尿道扩张能够有效预防尿道狭窄的发生^[13]。

性功能障碍防治方面,我们认为首先应在精阜周围进行 Ω 状切口。切口从精阜近端的水平切口开始,然后在左叶和右叶表面横向切开黏膜。为保留射精功能,应注意保留射精罩,射精罩定义为精阜近端>1 cm 处的滤泡旁和滤泡上组织。如果精阜附近的空间太窄或顶端腺瘤太大,则将 Ω 状切口从滤泡旁沟的基部向上延伸 5 mm 到侧叶下部的黏膜上,以便在精阜周围产生未损伤的黏膜平面^[24]。其次是在精阜内侧寻找外科包膜,应在暴露外科包膜的过程中,将内镜轴的尖端定位在精阜的近侧,通过机械和钝性操作进入移行区背侧下方的区域,从而到达外科包膜平面^[24]。最后鉴于钬激光损伤深度浅的优势,能够更好地保护性神经,有效避免了勃起功能障碍的发生。

钬激光术后复发率已经大幅降低,对于术后再复发的患者,已有研究指出腺瘤的持续存在或复发可能是由于 BPH 的多结节性,少量的包膜下结节可能因此再生并引起梗阻^[25]。因此我们认为对于再次手术的患者,剜除增生腺体以及点状汽化处理镶嵌在外科包膜上的结节是防止再次复发的关键,对于一些嵌入包膜较深的结节,剜除存在困难,可以利用钬激光强大的汽化特性使结节汽化切除。

综上所述,基于钬激光这个强大的“武器”,改良的经尿道前列腺切除术式可以大大降低术后并发症的发生率,是安全有效的治疗手段。对于BPH术后可能出现的并发症也已有较为成熟的解决办法,因此钬激光治疗BPH已成为手术治疗的新趋势。

利益冲突 所有作者均声明不存在利益冲突

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