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剥离式经尿道前列腺电切术对前列腺增生症患者性功能、尿流动力学及生活质量的影响 *

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摘要 目的：探讨剥离式经尿道前列腺电切术（TURP）对前列腺增生症（BPH）患者性功能、尿流动力学及生活质量的影响。**方法：**回顾性分析我院 2016 年 1 月 ~2019 年 2 月期间收治的 267 例 BPH 患者的临床资料，根据手术方式的不同分为 A 组（n=130，TURP 术）和 B 组（n=137，剥离式 TURP 术），对比两组患者围术期指标、性功能、尿流动力学、生活质量及并发症发生情况。**结果：**两组手术时间比较无差异（*P*>0.05），B 组膀胱冲洗时间、拔除导尿管时间、术后住院时间短于 A 组，术中出血量少于 A 组，切除组织重量多于 A 组（*P*<0.05）。两组术后 6 个月国际勃起功能指数 -5（IIEF-5）各项评分、生活质量评分（SF-36）各维度评分均改善，且 B 组优于 A 组（*P*<0.05）。两组患者术后 6 个月最大尿流（Qmax）升高，且 B 组高于 A 组（*P*<0.05）；膀胱残余尿量（RU）降低，且 B组低于 A 组（*P*<0.05）。B 组术后并发症发生率低于 A 组（*P*<0.05）。**结论：**与 TURP 术式相比，BPH 患者应用剥离式 TURP 可获得更好的治疗效果，在性功能、尿流动力学、生活质量等方面的改善效果确切，并发症较少。

关键词：剥离式经尿道前列腺电切术；前列腺增生症；性功能；尿流动力学；生活质量

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Effect of Stripping Transurethral Resection of Prostate on Sexual function, Urodynamics and Quality of Life in Patients with Begmgn Prostatic Hyperplasia*

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ABSTRACT Objective: To investigate the effect of stripping transurethral resection of prostate (TURP) on sexual function, urodynamics and quality of life in patients with begmgn prostatic hyperplasia (BPH). **Methods:** The clinical data of 267 patients with BPH in our hospital from January 2016 to February 2019 were analyzed retrospectively. According to the different operation methods, they were divided into group A (n=130, TURP surgery) and group B (n=137, stripping TURP surgery). The perioperative indexes, sexual function, urodynamics, quality of life and complications were compared between the two groups. **Results:** There was no significant difference in operation time between the two groups (*P*>0.05). The bladder washing time, catheter removal time and postoperative hospital stay time in group B were shorter than those in group A, and the intraoperative hemorrhage was less than that in group A, and the excised tissue weight was more than that in group A (*P*<0.05). The scores of international erectile function index-5 (IIEF-5) scores, quality of life scores-36 (SF-36) in the two groups at 6 months after operation were improved, and those in the group B were better than those in group A (*P*<0.05). The maximum urine flow (Qmax) in two groups at 6 months after operation was increased, and that in the group B was higher than that in group A(*P*<0.05). The residual urine volume(RU) were decreased, and that in group B was lower than that in group A (*P*<0.05). The incidence of postoperative complications in group B was lower than that in group A (*P*<0.05). **Conclusion:** Compared with TURP surgery, patients with BPH can get better treatment effect by using the stripping TURP, with definite improvement effect in sexual function, urine flow mechanics, quality of life, etc, and it has a lower complications.

Key words: Stripping transurethral resection of prostate; Begmgn prostatic hyperplasia; Sexual function; Urodynamics; Quality of life

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前言

前列腺增生症（begmgn prostatic hyperplasia，BPH）是中老年男性的常见疾病，主要表现为解剖学上的前列腺增大，尿动

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力学上的膀胱出口梗阻和尿频、尿急、排尿困难和尿潴留等尿路症状,组织学上的前列腺间质和腺体成分增生的一组疾病[1-3]。目前临床针对该病的治疗以手术治疗为主,经尿道前列腺电切术(transurethral resection of prostate,TURP)是治疗 BPH 的标准术式,但近来不少临床实践证实该术式存在术中及术后出血多、腺体切除不彻底、前列腺外科包膜穿孔出现几率高等不足,一定程度上影响了患者的治疗效果[4-6]。剥离式 TURP 术主要是指在 TURP 的基础上应用前列腺增生腺体剥离器,彻底剥离前列腺,具有出血量少、腺体切除彻底等优势[7-9]。为此,本研究通过探讨剥离式 TURP 对 BPH 患者性功能、尿流动力学及生活质量的影响,以期为临床治疗 BPH 提供参考。

1 资料与方法

1.1 临床资料

回顾性分析我院 2016 年 1 月 ~2019 年 2 月期间收治的 267 例 BPH 患者的临床资料,本次研究已获取我院伦理学委员会批准进行。纳入标准:(1)诊断标准参考欧洲泌尿外科学会制定的相关诊断标准[10];(2)均行经腹 B 超检查、直肠指诊等检查明确诊断;(3)均具备手术指征者;(4)术前性功能正常者;(5)临床资料完整,均完成本次随访研究者。排除标准:(1)合并严重的糖尿病、高血压、高血脂者;(2)合并精神心理障碍者;(3)合并尿道狭窄、前列腺癌者;(4)既往接受过膀胱开放手术者;(5)合并严重感染性疾病者;(6)神经源性膀胱的患者。根据手术方式的不同分为 A 组(n=130,TURP 术)和 B 组(n=137,剥离式 TURP 术),其中 A 组年龄 44~69 岁,平均(53.82± 6.14)岁;病程 3~11 年,平均(6.08± 1.17)年;国际前列腺症状评分(IPSS)[11]17~36 分,平均(24.51± 4.08)分;体质量指数 21~28 kg/m^2, 平均 (24.35± 1.06)kg/m^2。B 组年龄 43~65 岁, 平均(54.67± 5.92) 岁; 病程 2~10 年, 平均 (5.81± 0.86) 年; IPSS19~35 分,平均(25.91± 3.57)分;体质量指数 21~27 kg/m^2,平均(24.86± 0.97)kg/m^2。两组一般资料对比未见统计学差异(P>0.05)。

1.2 方法

1.2.1 术前准备 两组入院后给予常规检查,术前常规禁饮禁食、消毒备皮,麻醉方式为腰麻或连续硬膜外麻醉,手术体位均采用膀胱截石位。

1.2.2 A 组治疗方法 A 组给予 TURP 术治疗, 采用美国 Olympus F26 连续灌注前列腺电切镜,电凝功率 60 w,电切功率 120 w,以环状电极为电切器械。经尿道口将电切镜置入膀胱镜,术中以膀胱颈为近端标志,以精阜为远端标志,自中叶 5~7 点方向开始电切,再将电切镜转向 12 点处切割颈部增生组织,直至前列腺包膜,术中电凝止血,术后留置 Foley 三腔导尿管。

1.2.3 B 组治疗方法 B 组给予剥离式 TURP 术治疗,Olympus 针形电极, 专用的前列腺增生腺体剥离器 (专利号为 No: 200420024030.8;No: 200430015609.3)。操作与 A 组类似,应用前列腺增生腺体剥离器, 在前列腺电切镜下物理剥离腺体,直接剥离至外科包膜后针对性止血,术后留置 Foley 三腔导尿管。

1.2.4 术后处理 术后两组患者常规抗炎、抗感染处理,清淡饮食。均以门诊复查的方式随访 6 个月。

1.3 观察指标

(1)比较两组术中出血量、切除组织重量、拔除导尿管时间、手术时间、膀胱冲洗时间、术后住院时间等。(2)于术前、术后 6 个月采用国际勃起功能指数 -5 (international erectile function index-5,IIEF-5)[12]测定两组患者性功能,IIEF-5 量表包括勃起功能、相互满意度、性欲、总体满意度、性高潮满意度。分数越高,性功能越好。(3)于术前、术后 6 个月采用成都维信电子科大新技术有限公司生产 Nidoc970A 尿动力仪器检测两组患者的尿动力学指标,包括最大尿流(maximum urine flow,Qmax)、膀胱残余尿量(residual urine volume,RU)等指标。(4)于术前、术后 6 个月采用生活质量评分 (quality of life scores-36,SF-36)[13]评价两组生活质量,其中 SF-36 量表包括生理功能、情感职能、活力、总体健康、精神健康、躯体疼痛、生理职能、社会功能这 8 个维度。每个维度均为 0~100 分,分数越高,生活质量越好。(5)记录两组并发症发生情况。

1.4 统计学方法

数据采用 SPSS25.0 进行统计分析。计量资料均通过正态性检验,以均数± 标准差($\bar{x}$± s)表示,行 t 检验。计数资料采用率(%)描述,行 x^2 检验。检验标准设置为 α=0.05。

表 1 两组围术期指标比较($\bar{x}$± s)

Table 1 Comparison of perioperative indexes between the two groups($\bar{x}$± s)

Groups	Operative time (min)	Intraoperative hemorrhage(mL)	Weight of excised tissue(g)	Bladder washing time(d)	Catheter removal time(d)	Postoperative hospital stay time(d)
Group A(n=130)	64.77± 4.75	196.88± 16.57	46.17± 4.14	2.97± 0.46	5.84± 0.38	7.25± 1.80
Group B(n=137)	63.30± 5.24	128.25± 18.98	59.23± 3.07	1.28± 0.32	3.73± 0.42	5.23± 1.52
t	2.398	31.406	29.156	34.996	42.972	9.925
P	0.067	0.000	0.000	0.000	0.000	0.000

2 结果

2.1 围术期指标比较

B 组膀胱冲洗时间、拔除导尿管时间、术后住院时间短于 A 组,术中出血量少于 A 组,切除组织重量多于 A 组(P<0.05);两组手术时间比较无差异(P>0.05);详见表 1。

2.2 两组性功能比较

两组患者术前 IIEF-5 量表各项评分比较差异无统计学意义 (P>0.05); 两组患者术后 6 个月 IIEF-5 量表各项评分均升高,且 B 组高于 A 组(P<0.05);详见表 2。

表 2 两组性功能比较($\bar{x}\pm s$,分)

Table 2 Comparison of two groups of sexual functions($\bar{x}\pm s$, scores)

Groups	Time	Erectile Function	Mutual satisfaction	Sexual desire	Overall satisfaction	Orgasm satisfaction
Group A (n=130)	Before operation	10.85± 2.59	3.92± 0.41	2.92± 0.53	3.54± 0.48	0.97± 0.07
	6 months after operation	14.79± 2.75*	8.13± 0.56*	4.84± 0.48*	5.05± 0.52*	1.79± 0.11*
Group B (n=137)	Before operation	10.28± 3.06	3.84± 0.54	3.03± 0.44	3.90± 0.35	0.91± 0.12
	6 months after operation	19.41± 2.09*#	11.47± 0.89*#	6.03± 0.35*#	7.15± 0.62*#	2.85± 0.28*#

Note: compared with before operation, *P<0.05; compared with group A, #P<0.05.

2.3 两组生活质量比较

两组患者术前 SF-36 各维度评分比较差异无统计学意义(P>0.05)；两组患者术后 6 个月 SF-36 各维度评分均升高，且 B 组高于 A 组(P<0.05)；详见表 3。

表 3 两组生活质量比较($\bar{x}\pm s$,分)

Table 3 Comparison of quality of life between the two groups($\bar{x}\pm s$, scores)

Groups	Time	Physiological function	Social function	Emotional function	Somatic pain	General health	Mental health	Physiological function	Vitality
Group A (n=130)	Before operation	52.15± 7.86	57.75± 8.93	43.48± 7.18	47.26± 6.91	49.15± 8.73	51.39± 8.74	52.84± 7.61	51.97± 8.58
	6 months after operation	64.46± 8.81*	67.36± 7.74*	61.36± 7.03*	65.95± 8.92*	62.08± 7.86*	72.01± 9.68*	73.78± 8.73*	70.24± 8.46*
Group B (n=137)	Before operation	52.34± 7.54	56.18± 8.65	42.94± 8.13	48.46± 7.26	48.52± 6.41	5.93± 9.35	52.53± 8.54	50.77± 9.94
	6 months after operation	76.28± 9.43*#	82.35± 8.53*#	80.99± 7.18*#	78.79± 8.23*#	75.09± 7.38*#	83.56± 8.31*#	84.13± 9.27*#	82.79± 9.62*#

Note: compared with before operation, *P<0.05; compared with group A, #P<0.05.

2.4 两组尿动力学指标比较

两组患者术前 Qmax、RU 比较差异无统计学意义(P>0.05)；两组患者术后 6 个月 Qmax 升高，且 B 组高于 A 组(P<0.05)；RU 降低，且 B 组低于 A 组(P<0.05)；详见表 4。

表 4 两组尿动力学指标比较($\bar{x}\pm s$)

Table 4 Comparison of urodynamic indexes between the two groups($\bar{x}\pm s$)

Groups	Time	Qmax(mL/s)	RU(mL)
Group A(n=130)	Before operation	14.27± 3.17	18.90± 2.02
	6 months after operation	19.52± 2.46*	14.86± 2.28*
Group B(n=137)	Before operation	13.62± 2.94	19.16± 2.39
	6 months after operation	24.66± 2.85*#	10.29± 1.32*#

Note: compared with before operation, *P<0.05; compared with group A, #P<0.05.

2.5 两组并发症发生率比较

随访期间，A 组出现 4 例尿道狭窄、7 例膀胱颈痉挛、10 例包膜穿孔，并发症发生率为 16.15%(21/130)；B 组出现 2 例尿道狭窄、2 例膀胱颈痉挛、1 例包膜穿孔，并发症发生率为 3.65%(5/137)；B 组术后并发症发生率低于 A 组(x^2=11.866，P=0.001)。

3 讨论

BPH 临床症状主要表现为尿频、尿急、排尿困难、急迫性尿失禁等，虽不至于威胁患者性命，但 BPH 临床症状所带来的困扰严重影响着患者的生活质量[14,15]。近年来，随着人口老龄化的加剧，BPH 的发病率呈逐年递增趋势。现临床针对该病的治疗主要有保守药物治疗和手术治疗，而药物治疗仅可缓解临床症状，无法彻底阻止疾病进展，疗效欠佳，故临床以手术治疗居多[16,17]。以往 TURP 被誉为治疗 BPH 的金标准术式，但是随着人们对舒适化医疗的追求，该术式的弊端也不断凸显。通常情况下，TURP 是边切割边止血，越接近包膜切割的深度越浅，容易导致同一血管在切至包膜处往往需要电凝止血数次，易造成穿孔[18]。此外，解剖学研究发现[19]，勃起神经集中于前列腺的 5~7 点的位置，TURP 时可导致供应阴茎勃起的血供受损，使阴茎勃起神经受损。剥离式 TURP 术由日本学者平冈保纪首创，可将剥离器可以安装在前列腺电切器械上，在直视下控制剥离器逆推腺体，通过机械推剥，从而有效地避免了前列腺包膜穿孔[20,21]。

本次研究结果显示，B 组术后住院时间、拔除导尿管时间、膀胱冲洗时间、切除组织重量、术中出血量等围术期指标改善均优于 A 组，分析其原因，传统的 TURP 一般先切割再止血，由浅入深切除腺体，越接近腺体下刀越浅，切除的腺体越少，而剥离式 TURP 可将腺体直接剥离至外科包膜，止血具有针对

性,有效避免地毯式电凝止血,减少术中出血量,促进患者术后恢复[22,23]。另两组手术时间比较差异无统计学意义,而左维等学者[24]研究结果显示,剥离式 TURP 可有效缩短手术时间。这与本次研究结果存在一定差异,可能是因样本量存在个体差异性所致,后续报道将扩大样本量严格控制筛选标准以获取更为准确的数据。由于性生活对中老年男性十分重要,和谐美满的性生活可能减少患者神经衰弱、消化不良、失眠等各种疾病的发生[25]。而外科手术治疗 BPH 是否影响到患者性功能是人们首先关注的问题,其次,BPH 的临床症状改善亦是人们较为关注的问题之一,尿动力学是诊断 BPH 的常见标准之一,Qmax 可测定尿流率及膀胱压力,RU 是反映 BPH 病情严重程度的指标之一,两者均可有效判断逼尿肌功能及其损害程度[26]。本研究中两组患者性功能、生活质量、尿流动力学均有所改善,且行剥离式 TURP 术者改善效果更佳。分析其原因,剥离式 TURP 因可直接剥离腺体,层次清晰,一般可不需要修整前列腺尖部,同时对尿道外括约肌收缩功能的影响小,有效改善尿道功能,促进减少对患者性功能的影响,进一步提高患者生活质量[27-29]。另 B 组术后并发症发生率低于 A 组,这可能与剥离式 TURP 可最大程度的切除增生腺体,减少术中出血量,且术中精准止血,减少周围组织的热损伤,进而减少穿孔等并发症发生情况[30]。

综上所述,与 TURP 术式相比,BPH 患者应用剥离式 TURP,可有效改善患者性功能、尿流动力学、生活质量,同时还可减少并发症发生率,临床应用价值较高。

参考文献(References)

[1] Liu J, Fang T, Li M, et al. Pao Pereira Extract Attenuates Testosterone-Induced Benign Prostatic Hyperplasia in Rats by inhibiting 5α-Reductase[J]. Sci Rep, 2019, 9(1): 19703

[2] Zhu F, Pan H, Xiao Y, et al. A case report of primary prostate intravascular large B cell lymphoma presenting as prostatic hyperplasia [J]. Medicine (Baltimore), 2019, 98(50): e18384

[3] Lokeshwar SD, Harper BT, Webb E, et al. Epidemiology and treatment modalities for the management of benign prostatic hyperplasia [J]. Transl Androl Urol, 2019, 8(5): 529-539

[4] Skolarus TA, Dauw CA, Fowler KE, et al. Catheter management after benign transurethral prostate surgery: RAND/UCLA Appropriateness Criteria[J]. Am J Manag Care, 2019 , 25(12): e366-e372

[5] 陈敬锋, 陈磊, 郑德华, 等. 右美托咪定与咪达唑仑镇静对经尿道前列腺电切术患者术中寒战反应及术后早期认知功能的影响 [J].中国老年学杂志, 2016, 36(6): 1409-1410

[6] Zheng X, Han X, Cao D, et al. Comparison of Short-Term Outcomes between Button-Type Bipolar Plasma Vaporization and Transurethral Resection for the Prostate: A Systematic Review and Meta-Analysis [J]. Int J Med Sci, 2019, 16(12): 1564-1572

[7] Alam A, Gomes T, Zheng H, et al. Long-term analgesic use after low-risk surgery: a retrospective cohort study [J]. Arch Intern Med, 2012, 172(5): 425-430

[8] Zheng X, Han X, Cao D, et al. Comparison of Short-Term Outcomes between Button-Type Bipolar Plasma Vaporization and Transurethral Resection for the Prostate: A Systematic Review and Meta-Analysis [J]. Int J Med Sci, 2019, 16(12): 1564-1572

[9] Lai S, Peng P, Diao T, et al. Comparison of photoselective green light laser vaporisation versus traditional transurethralresection for benign prostate hyperplasia: an updated systematic review and meta-analysis of randomised controlled trials and prospective studies[J]. BMJ Open, 2019, 9(8): e028855

[10] 张道秀, 苏明阳, 赵会平, 等. 经尿道前列腺剜除电切术与传统经尿道前列腺电切术治疗大体积前列腺疗效比较[J].中华实验外科杂志, 2016, 33(3): 807-809

[11] 殷虎明, 李纲, 张学锋, 等. 前列腺组织学炎症程度及血清 hs-CRP 水平与 BPH 患者总前列腺体积、国际前列腺症状评分的关系[J].山东医药, 2016, 56(23): 85-87

[12] 解品启, 王兆东, 王奎伟, 等. 补肾活血汤改善非体外循环下冠状动脉旁路移植术后患者勃起功能的临床研究[J].中西医结合心脑血管病杂志, 2014, 12(7): 897-898

[13] 余慧青, 冯道春, 田玲, 等. 硬膜外注射与鞘内注射吗啡治疗老年晚期癌症重度癌性疼痛的临床疗效及对生活质量评分的影响[J].中国老年学杂志, 2017, 37(24): 6122-6125

[14] Rojas-Manrique JP, Ramírez Ramírez A, Becerra Méndez LM, et al. Clinical and Histopathological Characteristics of Prostate Cancer Patients Taken to Palliative Transurethral Prostate Resection[J]. Cureus, 2019, 11(9): e5740

[15] 李峰, 陈胜龙, 谢喜, 等. 前列腺增生患者术后并发尿路感染的病原菌分布、耐药性和危险因素分析[J].现代生物医学进展, 2019, 19(16): 3155-3159

[16] Kaplan SA. Re: In-Hospital Cost Analysis of Prostatic Artery Embolization Compared with TransurethralResection of the Prostate: Post Hoc Analysis of a Randomized Controlled Trial[J]. J Urol, 2020, 203(1): 6

[17] Pandya M, Lal J, Karunakaran R. Transurethral resection of bladder tumor in a case of metastatic carcinoma prostate with penile prosthesis implant[J]. Indian J Urol, 2019, 35(4): 301-302

[18] Enikeev D, Netsch C, Rapoport L, et al. Novel thulium fiber laser for endoscopic enucleation of the prostate: A prospective comparison with conventional transurethral resection of the prostate[J]. Int J Urol, 2019, 26(12): 1138-1143

[19] Choi E, Adams F, Palagi S, et al. A High-Fidelity Phantom for the Simulation and Quantitative Evaluation of Transurethral Resection of the Prostate[J]. Ann Biomed Eng, 2020 , 48(1): 437-446

[20] Kaplan SA. Re: Systemic Comorbidity Burden Using the ACTIONS Phenotype Predicts Urologic Medication Discontinuation following Transurethral Resection of the Prostate[J]. J Urol, 2019, 202(6): 1073

[21] Wada N, Kikuchi D, Tateoka J, et al. Long-term symptomatic outcome after transurethral resection of the prostate: A urodynamics-based assessment[J]. Int J Urol, 2019, 26(11): 1071-1075

[22] Law YXT, Chen WJK, Shen L, et al. Is transurethral needle ablation of prostate out of fashion? Outcomes of single session office-based transurethral needle ablation of prostate in patients with symptomatic benign prostatic hyperplasia [J]. Investig Clin Urol, 2019, 60 (5): 351-358

[23] Mishra K, Baeza C, Bukavina L, et al. Modified transurethral resection of the prostate for the management of BPH-related refractory lower urinary tract symptoms in patients with a history of pelvic fracture urethral injury reconstruction[J]. Int Urol Nephrol, 2019, 51(12): 2137-2141

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[18] Girsen AI, Hintz SR, Sammour R, et al. Prediction of neonatal respiratory distress in pregnancies complicated by fetal lung masses [J]. Prenatal Diagnosis, 2017, 37(6): 631-632

[19] Kanda T, Iizuka T, Yamazaki R, et al. Giant fetal hydrometrocolpos associated with cloacal anomaly causing postnatal respiratory distress [J]. Journal of Obstetrics and Gynaecology Research, 2017, 43 (11): 1769-1772

[20] Hopkins J, Miller JL, Butler K, et al. The relation between social support, anxiety and distress symptoms and maternal fetal attachment[J]. Journal of Reproductive and Infant Psychology, 2018, 36(4): 381-392

[21] Emre Sinan Güngör, Gülşah İlhan, Hüseyin Gültekin, et al. Effect of Betamethasone on Fetal Pulmonary and Umbilical Artery Doppler Velocimetry and Relationship With Respiratory Distress Syndrome Development[J]. Journal of ultrasound in medicine: official journal of the American Institute of Ultrasound in Medicine, 2017, 36 (12): 2441-2445

[22] Kuppens SM, Smailbegovic I, Houterman S, et al. Fetal heart rate abnormalities during and after external cephalic version: Which fetuses are at risk and how are they delivered?[J]. BMC Pregnancy and Childbirth, 2017, 17(1): 363-375

[23] Zhan Z, Yang Y, Zhan Y, et al. Fetal outcomes and associated factors of adverse outcomes of pregnancy in southern Chinese women with systemic lupus erythematosus[J]. Plos One, 2017, 12(4): e0176457

[24] Lakhno, Igor. Autonomic imbalance captures maternal and fetal circulatory response to pre-eclampsia [J]. Clinical Hypertension, 2017, 23(1): 5-19

[25] Morton C L, Hinch G, Small A. Distress vocalization delay in the neonate lamb as a neurobehavioral assessment tool[J]. Developmental Psychobiology, 2017, 59(4): 523-534

[26] Lima MM, Souza AS, Diniz C, et al. Doppler velocimetry of the uterine, umbilical and fetal middle cerebral arteries in pregnant women undergoing tocolysis with oral nifedipine[J]. Ultrasound in Obstetrics and Gynecology, 2009, 34(3): 311-315

[27] Maged AM, Hashem A MT, Gad Allah SH, et al. The effect of loading dose of magnesium sulfate on uterine, umbilical, and fetal middle cerebral arteries Doppler in women with severe preeclampsia: A case control study[J]. Hypertension in Pregnancy, 2016, 35(1): 91-99

[28] Xiao-Jing C, Jian-Fang Z. Predicting obstetric outcomes of advanced maternal age through determination of hemodynamics of uterine artery,umbilical artery and fetal cerebral middle artery [J]. Journal of Hainan Medical University, 2017, 23(15): 121-125

[29] Kutuk MS, Dolanbay M, Gokmen Karasu AF, et al. Relationship between fetal peak systolic velocity in Middle cerebral artery and umbilical blood gas values and hemoglobin levels in diabetic pregnant women[J]. Journal of Clinical Ultrasound Jcu, 2018, 46(6): 391-396

[30] Migda B. Utility of Doppler parameters at 36-42 weeks' gestation in the prediction of adverse perinatal outcomes in appropriate-for-gestational-age fetuses [J]. Journal of Ultrasonography, 2018, 18 (72): 22-28

[31] Pietryga M, Wender-Ozegowska E, E Biega, et al. P80Combined assessment of the fetal distress in diabetic pregnancy class R/F using uterine, middle cerebral, umbilical artery blood flow and fetal heart rate monitoring [J]. Ultrasound in Obstetrics & Gynecology, 2010, 16 (s1): 84-84

（上接第 787 页）

[24] 左维, 王振中, 薛珺, 等. 剥离式经尿道前列腺切除术与经尿道前列腺电切术治疗良性前列腺增生的比较研究[J]. 中华男科学杂志, 2014, 20(9): 812-815

[25] Agrawal M, Kumar M, Pandey S, et al. Changing profiles of patients undergoing transurethral resection of the prostate over a decade: A single-center experience[J]. Urol Ann, 2019, 11(3): 270-275

[26] Welk B, Reid J, Ordon M, et al. Population-based assessment of re-treatment and healthcare utilisation after photoselective vaporisation of the prostate or electrosurgical transurethral rese-ction of the prostate[J]. BJU Int, 2019, 124(6): 1047-1054

[27] Carmignani L, Clementi MC, Signorini C, et al. Safety and feasibility of thullium laser transurethral resection of prostate for the treatment of benign prostatic enlargement in overweight patients [J]. Asian J Urol, 2019, 6(3): 270-274

[28] Demirbas A, Gunseren KO, Bagcioglu M, et al. A Prediction Model of Operation Efficacy Using Protruding Prostate Lobe Volume in Patients Who Are Candidates for Transurethral Resection of Prostate[J]. Urol Int, 2019, 103(2): 172-179

[29] Kuzmenko AV, Kuzmenko VV, Gyaurgiev TA. The efficacy of fesoterodine in patients after transurethral resection of the prostate [J]. Urologiia, 2019, 4(1): 52-55

[30] Chalari E, Intas G, Zyga S, et al. Perioperative inadvertent hypothermia among urology patients who underwent transurethralresection with either TURis or transurethral resection of the prostate method[J]. Urologia, 2019, 86(2): 69-73