

doi: 10.13241/j.cnki.pmb.2023.23.031

三种不同手术方式治疗中老年女性压力性尿失禁疗效 及对患者膀胱功能和术后并发症的影响*

高柳琴 李 青 李志芳 许冬娣 王根生[△]

(安庆市立医院妇产科 安徽 安庆 246000)

摘要 目的:探讨耻骨后膀胱尿道悬吊术(Burch)、阴道无张力尿道悬吊术(TVT)及经闭孔经阴道尿道中段悬吊带术(TVT-O)三种不同手术方式治疗中老年女性压力性尿失禁(SUI)疗效及对患者膀胱功能和术后并发症的影响。**方法:**回顾性分析 2019.1-2022.4 收治的 101 例中老年女性 SUI 患者资料,按手术方式分为 Burch 组($n=30$, Burch 术治疗)、TVT 组($n=31$, TVT 术治疗)和 TVT-O 组($n=40$, TVT-O 术治疗),观察三组患者临床疗效和手术情况[手术时间、出血量、住院时间、尿管留置时间],并发症发生率,治疗前后膀胱功能[24h 排尿次数、膀胱容量、每次排尿量、残余尿量]及尿道功能指标[尿道长度(FUL)、最大尿道闭合压(MUCP)、Valsalva 漏尿点压(VLPP)]变化。**结果:**Burch 组、TVT 组、TVT-O 组治愈及改善率分别为 83.34%、87.10%、87.50%,13.33%、12.90%、12.50%,三组之间比较差异无统计学意义($P>0.05$);TVT 组、TVT-O 组患者手术时间、出血量、住院时间、尿管留置时间均显著短于 Burch 组($P<0.05$),且 TVT-O 组患者手术时间显著短于 TVT 组($P<0.05$);治疗后,三组患者 24 h 排尿次数、残余尿量均显著降低($P<0.05$),膀胱容量、每次排尿量、FUL、MUCP、VLPP 水平均显著增加($P<0.05$),但三组之间比较差异无统计学意义($P>0.05$);Burch 组、TVT 组、TVT-O 组并发症总发生率分别为 20.00%、12.91%、15.00%,三组之间比较差异无统计学意义($P>0.05$)。**结论:**三种术式治疗中老年女性 SUI 疗效相当,均可有效改善膀胱功能及尿道指标,但 TVT 与 TVT-O 术患者康复快,TVT-O 手术时间最短,TVT 并发症低,可依据患者情况酌情选择。

关键词:压力性尿失禁;疗效;膀胱功能;并发症

中图分类号:R694.54 **文献标识码:**A **文章编号:**1673-6273(2023)23-4555-05

Efficacy of Three Different Surgical Methods on Stress Urinary Incontinence in Middle-aged and Elderly Women and Their Effects on Bladder Function and Postoperative Complications*

GAO Liu-qin, LI Qing, LI Zhi-fang, XU Dong-di, WANG Gen-sheng[△]

(Department of Obstetrics and Gynecology, Anqing Municipal Hospital, Anqing, Anhui, 246000, China)

ABSTRACT Objective: To explore the efficacy of three different surgical methods of retropubic bladder urethral suspension surgery (Burch), tension-free vaginal tape procedure (TVT) and transobturator vaginal tape inside-out (TVT-O) in the treatment of middle-aged and elderly women with stress urinary incontinence (SUI) and their effects on bladder function and postoperative complications. **Methods:** The data of 101 middle-aged and elderly women with SUI admitted from January 2019 to April 2022 were retrospectively analyzed, and the patients were divided into Burch group ($n=30$, Burch treatment), TVT group ($n=31$, TVT treatment) and TVT-O group ($n=40$, TVT-O treatment) according to the surgical methods. The clinical efficacy, surgical conditions (surgical time, blood loss, hospital stay, urinary catheter indwelling time), incidence rates of complications and changes in bladder function (24 h urination frequency, bladder capacity, volume per urination, residual urine volume) and urethral function indicators [functional urethral length (FUL), maximum urethral closure pressure (MUCP), Valsalva leak point pressure (VLPP)] before and after treatment were observed among the three groups of patients. **Results:** The cure rates in Burch group, TVT group and TVT-O group were 83.34%, 87.10% and 87.50%, and the improvement rates were 13.33%, 12.90% and 12.50% respectively ($P>0.05$). The surgical time, blood loss, hospital stay and urinary catheter indwelling time in TVT group and TVT-O group were significantly shorter than those in Burch group ($P<0.05$), and the surgical time in TVT-O group was significantly shorter than that in TVT group ($P<0.05$). After treatment, the 24h urination frequency and residual urine volume were significantly decreased in the three groups ($P<0.05$) while the bladder capacity, volume per urination, FUL, MUCP and VLPP were significantly increased ($P<0.05$), but there were no statistical differences among the three groups ($P>0.05$). The total incidence rates of complications in Burch group, TVT group and TVT-O group were 20.00%, 12.91% and 15.00% respectively ($P>0.05$). **Conclusion:** Three surgical methods have similar efficacy in the treatment of middle-aged and elderly women with SUI, and can

* 基金项目:安徽 2022 年度高校自然科学研究项目(2022AH050735)

作者简介:高柳琴(1987-),女,本科,主治医师,研究方向:压力性尿失禁,E-mail: 18297769765@163.com

△ 通讯作者:王根生(1981-),男,硕士,研究方向:压力性尿失禁,E-mail: 18055650948@163.com

(收稿日期:2023-05-28 接受日期:2023-06-23)

effectively improve the bladder function and urethral indicators. However, TVT and TVT-O have rapid rehabilitation, TVT-O has the shortest surgical time and TVT has low complications, which can be selected according to the patients' conditions.

Key words: Stress urinary incontinence; Efficacy; Bladder function; Complications

Chinese Library Classification(CLC): R694.54 **Document code:** A

Article ID: 1673-6273(2023)23-4555-05

前言

压力性尿失禁(Stress Urinary Incontinence, SUI)是一种因用力、劳累、打喷嚏或咳嗽等引起腹内压升高,从而导致尿液不自主流出为特征的病症^[1]。据调查,女性 SUI 患病率远高于男性约为 33.5%,且随着年龄增长,女性 SUI 患病率有逐渐增高的趋势^[2]。SUI 主要通过手术治疗^[3],其中耻骨后膀胱尿道悬吊术(Bladder urethral suspension surgery, Burch)可提升耻骨联合后腹内压力区的膀胱颈和近端尿道,使尿道上的压力传递得以改善,主要通过增加功能性尿道长度以及尿道闭合压力,从而达到治疗目的^[4];阴道无张力尿道悬吊术(Tension-free vaginal tape procedure, TVT)利用聚丙烯网带置于尿道中段,待网带外鞘去除后形成大量粘连,牢固固定于准确位置,增强耻骨韧带功能及阴道壁吊床"作用"^[5];经闭孔经阴道尿道中段悬吊带术(Transobturator vaginal tape inside-out, TVT-O)是将吊带悬于穿

刺通路,可避免耻骨后间隙盲目穿刺,减少对血管及组织器官的损伤^[6]。以上三种手术方式均能改善 SUI,但三种治疗方式对患者疗效的影响尚有待深入探究。基于此,本文旨在探究 Burch、TVT 及 TVT-O 三种不同手术方式对中老年女性 SUI 疗效的影响。

1 资料与方法

1.1 临床资料

回顾性分析 2019.1-2022.4 收治的 101 例中老年女性 SUI 患者。纳入标准:①符合 SUI 诊断标准^[7];②年龄 32~78 岁之间;③尿道黏膜封闭功能减退;④首次患病。排除标准:①生命体征不稳定;②伴有严重心脑血管疾病;③神经系统严重障碍;④身体严重虚弱意识不清晰。按手术方式分为 Burch 组(n=30)、TVT 组(n=31)和 TVT-O 组(n=40),三组患者一般资料无显著差异($P>0.05$),具有可比性,见表 1。

表 1 三组患者一般资料比较

Table 1 Comparison of general data among the three groups of patients

Groups	n	Age (years old)	Disease course (months)	Degree of urinary incontinence(n)			Vaginal and uterine prolapses(n)		
				Mild	Moderate	Severe	Anterior vaginal wall	Posterior vaginal wall	Uterus
Burch group	30	54.38±2.08	4.02±0.57	12	15	3	21	8	4
TVT group	31	54.41±2.16	4.08±0.61	13	14	4	23	9	3
TVT-O group	40	54.19±2.27	4.13±0.51	17	18	5	28	13	5
Statistical value		0.108	0.331		0.267			0.412	
P		0.897	0.719		0.992			0.982	

1.2 方法

Burch 术治疗:对截石位患者进行全身麻醉,首先给予消毒处理,并常规放置导管。于下腹正中切约 1 cm 切口,脐孔处穿刺,建立 CO₂ 气腹。在下腹两侧髂前上棘内侧 3 cm 进行穿刺,以单极高频剪刀切开膀胱顶腹膜,使两侧到达闭锁脐韧带,远端与耻骨相连。当操作至耻骨后间隙时,小心分离 Cooper 韧带与耻骨及阴道与膀胱颈尿道。从阴道顶起尿道膀胱筋膜,并将阴道壁肌层和尿道旁筋膜缝合在 Cooper 韧带上,缝合过程中抬高膀胱颈与近端尿道,利用可吸收线对腹膜进行缝合,控制缝合线的松紧,当无血流出时对腹膜间断进行缝合。

TVT 术治疗:患者体位、导管等术前准备与 Burch 术一致。全身麻醉后在患者阴道前壁、尿道下纵向切开 1 cm 切口,分离尿道间隙与阴道壁。于腹部及耻骨上中线两侧各切开 0.5 cm 切口。穿刺过程中针沿着两侧间隙向耻骨上部穿刺,从腹壁切口处穿出,放置膀胱镜,仔细检查膀胱内部将穿刺针拔除。调整

网带至合适程度,通过注入适量的生理盐水,观察尿道口溢尿情况,去掉多余吊带。

TVT-O 术治疗:患者体位、导管等术前准备与 Burch 术一致。全身麻醉后将尿道外口上方 2 cm 位置双侧大腿内侧处作为聚丙烯网状吊带的穿出点,在阴道前壁中段纵向切开 1 cm 切口,分离阴道壁和尿道间隙,将导引器置入间隙内,利用弧形筋膜穿刺器连接吊带一端的牵引线,然后经上述间隙依从穿过闭孔膜、闭孔肌、内收肌内侧缘,在大腿内侧皮肤皱褶处穿出,适当调整吊带松紧度,并剪掉过长部分,利用可吸收线缝合阴道内切口,术后对阴道进行止血、消毒处理。

1.3 观察指标

(1)临床疗效^[7]:术后 12 个月评估患者临床疗效,具体疗效评估方案见表 2。(2)手术情况:记录三组患者手术时间、出血量、住院时间及尿管留置时间。(3)膀胱功能:治疗前及治疗 6 个月后,通过影像学检查治疗前后患者 24h 排尿次数、膀胱容

量、每次排尿量、残余尿量。(4)尿道功能指标:治疗前及治疗 6 个月后,利用三腔膀胱测压管向患者尿道内注入 0.9% NaCl 溶液,利用尿动力学分析仪获取患者尿道压力分布曲线,记录尿

道长度(FUL)、最大尿道闭合压(MUCP)、Valsalva 漏尿点压(VLPP)。(5)记录术后 12 个月内三组患者并发症发生情况。

表 2 疗效评估标准

Table 2 Efficacy evaluation criteria

Evaluation	Method
Cured	Without urine leakage in case of increased cough and other abdominal pressure
Improved	Urine leakage occurs in cases of increased cough and other abdominal pressure, and urine pad test shows that urine leakage decreases by $\geq 50\%$ within 1 h compared with that before treatment
Ineffective	Urine leakage occurs in cases of increased cough and other abdominal pressure, and urine pad test shows that urine leakage decreases by $<50\%$ within 1 h compared with that before treatment

1.4 数据分析

数据分析采用 SPSS 23.0 软件,手术情况、膀胱功能、尿道功能指标等计量数据均以($\bar{x} \pm s$)形式表示,多组间比较采用单因素方差分析,进一步两两比较采用 LSD-*t* 检验,组内不同时间比较采用配对 *t* 检验,临床疗效、并发症等计数数据以百分数(%)形式表示,采用 χ^2 检验或秩和检验, $P < 0.05$ 表示有显著差异。

2 结果

2.1 三组患者临床疗效比较

Burch 组、TVT 组、TVT-O 组治愈及改善率分别为 83.34%、87.10%、87.50%,13.33%、12.90%、12.50%,三组之间比较差异无统计学意义($P > 0.05$)。见表 3。

表 3 三组患者临床疗效比较

Table 3 Comparison of clinical efficacy among the three groups of patients

Groups	n	Cured	Improved	Ineffective
Burch group	30	25(83.34)	4(13.33)	1(3.33)
TVT group	31	27(87.10)	4(12.90)	0(0.00)
TVT-O group	40	35(87.50)	5(12.50)	0(0.00)
<i>Hc</i>		2.415		
<i>P</i>		0.660		

2.2 三组患者手术情况比较

TVT 组、TVT-O 组患者手术时间、出血量、住院时间、尿管

留置时间均显著短于 Burch 组($P < 0.05$),且 TVT-O 组患者手术时间显著短于 TVT 组($P < 0.05$)。

表 4 三组患者手术情况比较

Table 4 Comparison of surgical status among the three groups of patients

Groups	n	Surgical time(min)	Blood loss(mL)	Hospital stay(d)	Urinary catheter indwelling time(h)
Burch group	30	52.66 $\pm$ 10.87	64.25 $\pm$ 8.24	5.63 $\pm$ 1.04	32.11 $\pm$ 6.24
TVT group	31	33.24 $\pm$ 8.78 ^a	43.61 $\pm$ 6.75 ^a	3.84 $\pm$ 0.78 ^a	24.21 $\pm$ 5.02 ^a
TVT-O group	40	28.64 $\pm$ 7.25 ^{ab}	40.12 $\pm$ 6.42 ^a	3.65 $\pm$ 0.85 ^a	25.34 $\pm$ 5.14 ^a
<i>F</i>		66.765	108.937	48.200	19.073
<i>P</i>		< 0.001	< 0.001	< 0.001	< 0.001

Note: Compared with Burch group, ^a $P < 0.05$; Compared with TVT group, ^b $P < 0.05$.

2.3 三组患者治疗前后膀胱功能比较

治疗后,三组患者 24 h 排尿次数、残余尿量均显著降低($P < 0.05$),膀胱容量、每次排尿量均显著增加($P < 0.05$),但三组之间比较无显著差异($P > 0.05$)。见表 5。

2.4 三组患者治疗前后尿道功能指标比较

治疗后,三组患者 FUL、MUCP、VLPP 水平均显著增加

($P < 0.05$),但三组之间比较无显著差异($P > 0.05$)。见表 6。

2.5 并发症发生情况比较

Burch 组、TVT 组、TVT-O 组并发症总发生率分别为 20.00%、12.91%、15.00%,三组之间比较差异无统计学意义($P > 0.05$)。

表 5 三组患者治疗前后膀胱功能比较

Table 5 Comparison of bladder function before and after treatment among the three groups of patients

Indicator	Time point	Burch group(n=30)	TVT group(n=31)	TVT-O group(n=40)	<i>t</i>	<i>P</i>
24h urination frequency (times)	Before treatment	12.61±2.15	12.68±2.27	12.75±2.04	0.037	0.964
	After treatment	8.63±1.54*	8.43±1.61*	8.39±1.51*	0.223	0.800
Bladder capacity (mL)	Before treatment	270.15±30.26	273.24±31.47	271.64±30.57	0.077	0.926
	After treatment	358.84±42.18*	361.24±44.81*	361.42±40.21*	0.037	0.964
Volume per urination(mL)	Before treatment	182.64±30.25	183.54±28.69	182.45±32.15	0.012	0.988
	After treatment	254.32±35.12*	258.12±36.24*	258.54±37.41*	0.131	0.877
Residual urine volume(mL)	Before treatment	134.52±20.15	132.88±21.02	133.54±20.59	0.049	0.952
	After treatment	78.62±16.35*	76.58±17.24*	75.42±17.62*	0.301	0.741

Note: Compared with before treatment, **P*<0.05.

表 6 三组患者治疗前后尿道功能指标比较

Table 6 Comparison of urethral function indicators before and after treatment among the three groups of patients

Groups	n	FUL(mm)		MUCP(cmH ₂ O)		VLPP(cmH ₂ O)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Burch group	30	27.34±3.81	29.86±3.92	63.52±9.41	77.02±8.64	81.24±12.64	110.24±17.45
TVT group	31	27.42±3.65	30.42±3.95	63.40±9.04	77.54±8.51	82.41±12.89	112.05±18.42
TVT-O group	40	27.15±3.59	30.72±4.18	63.12±9.75	77.88±8.72	82.01±12.42	112.42±18.63
<i>F</i>		0.051	0.393	0.017	0.085	0.068	0.133
<i>P</i>		0.950	0.676	0.983	0.918	0.935	0.876

Note: Compared with before treatment, **P*<0.05; Compared with Burch group, ^a*P*<0.05.

表 7 并发症发生情况比较

Table 7 Comparison of occurrence of complications

Groups	n	Dysuria	Pubic/groin /medial thigh pain	Bladder detrusor instability	Infection	Total
Burch group	30	2(6.67)	2(6.67)	1(3.33)	1(3.33)	6(20.00)
TVT group	31	1(3.23)	0(0.00)	2(6.45)	1(3.23)	4(12.91)
TVT-O group	40	1(2.50)	3(7.50)	1(2.50)	1(2.50)	6(15.00)
χ^2						0.611
<i>P</i>						0.737

3 讨论

SUI 被定义为 " 在用力、体力消耗、打喷嚏或咳嗽时不自主地漏尿 ", 是最常见的尿失禁类型, 虽然 SUI 不会危及生命, 但却严重影响了患者的生活质量^[8,9]。对于保守治疗失败或中重度 SUI 患者, 目前临床上主要通过手术治疗以改善症状, SUI 手术类型多样, 其中 Burch、TVT 及 TVT-O 是临床治疗 SUI 应用最广泛的三种术式^[10,11]。Burch 是治疗 SUI 的传统方式, 其术中利用腹腔镜的放大作用, 能进行精细分离, 具有增加尿道长度、降低膀胱压力、增加膀胱颈控制力作用, 从而达到控制尿溢的效果, 另可同时行合并的子宫或者卵巢病变的手术, 不增加

手术途径从而减少总的手术损伤及时间^[12]; TVT/TVT-O 可提供有效支撑的耻骨尿道韧带结构, 其疗效卓越而持久, 其中 TVT 是当前女性 SUI 手术金标准, 具有伤口小、痛苦轻、并发症少、恢复快等优点^[13]; TVT-O 是在 TVT 基础上的改良术式, 具有简单、更方便、手术时间更短, 无需膀胱镜操作等优势^[14]。三种手术均有其优缺点这也是一直以来人们争议的主要方面。本文主要探究 Burch、TVT 及 TVT-O 三种术式对 SUI 疗效的影响, 发现三种术式均有较好效果, 各具优缺点。

本研究显示, Burch、TVT、TVT-O 三组之间疗效及术后膀胱、尿道功能改善均差异不显著, 但 TVT 组、TVT-O 组患者手术时间、出血量、住院时间、尿管留置时间均显著短于 Burch

组,且TVT-O组患者手术时间短于TVT组,说明三种手术均具有良好的治疗效果,可有效改善患者膀胱功能及尿道指标,但TVT术与TVT-O术对患者损伤较小,其治疗效果略优于Burch。分析认为Burch术主要从腹部切开进行手术操作,对患者创伤面较大,同时需要以单极高频剪刀切开膀胱顶腹膜,分离阴道与膀胱颈尿道、且将阴道壁肌层和尿道旁筋膜缝合在Cooper韧带上,操作复杂,分离过程中对组织损伤较大,流血较多,术后恢复较慢,且其理论依据并非为“吊床”原理从而使得疗效略低于其它两组,主要适用于轻度~中度压力性尿失禁、尤其是合并子宫或卵巢病变者^[15,16];而TVT术借助膀胱镜的辅助使用、穿刺针穿过各间隙,且行针过程中避开了膀胱、尿道、内收肌等重要组织器官,对患者肌肉组织触碰损伤较小,操作相对简单,具有微创效果^[17,18];TVT-O术从尿道外口及双侧大腿内侧作为穿刺点,仅需分离阴道壁和尿道间隙,利用导引器将针线紧贴耻骨降支,穿破闭孔膜,经闭孔穿出皮肤,该术式无需常规行膀胱镜检查,优化了手术操作,避开了盆腔脏器,膀胱、尿道、血管等器官组织,减少了相应创伤风险,同样具有微创效果,故而手术时间更短,恢复更快^[19],与韩旭等^[20]研究结果一致。

本研究还发现,Burch组、TVT组、TVT-O组并发症总发生率分别为20.00%、12.91%、15.00%,三组之间比较差异无统计学意义,TVT组并发症发生率略低,与梁云霄^[21]等研究结果一致。三种手术常见的并发症为排尿困难、耻骨/腹股沟/大腿内侧酸痛、膀胱逼尿肌不稳定及感染,其中排尿困难和膀胱逼尿肌不稳定可能是由于治疗过程中悬吊过紧导致膀胱出口梗阻所致,可通过扩张尿道、延长导尿管留置时间进行缓解^[22];TVT-O术后腹股沟/大腿内侧酸痛略高于其它两组,可能是由于吊带体表穿刺点过肌肉附着点所致,不过患者术后一般能自行缓解,必要时可予以镇痛处理^[23];感染可能与导管留置时间过长及手术创伤使患者抵抗力下降,引起阴道内环境发生改变,易受到病毒细菌等侵袭而导致感染,对此术后可加强抗炎治疗^[24]。既往报道TVT并发症主要为膀胱损伤略高于Burch和TVT-O,考虑原因主要为穿刺途径经过膀胱附近,但随着手术熟练程度及膀胱镜的使用,本中心TVT术后并发膀胱损伤与其它两组并无明显差异,这可能因为患者穿刺前均排空膀胱,穿刺时针尖向同侧肩部外缘紧贴耻骨内侧,于前正中线两侧腹部小切口穿出,有助于避免膀胱穿破,此外TVT手术降低了大腿内侧及腹股沟区疼痛概率从而改善患者生活质量^[25]。

综上所述,三种手术方式均能有效治疗中老年女性SUI,改善患者膀胱功能及尿道指标,其中TVT与TVT-O手术患者康复快,对患者膀胱及尿道功能改善略优于Burch手术。

参考文献(References)

- [1] 李巧巧,于霞,罗映娟,等.女性压力性尿失禁疾病负担研究进展[J].中国计划生育和妇产科,2022,14(9):10-16
- [2] Zhang R Q, Xia M C, Cui F, et al. Epidemiological survey of adult female stress urinary incontinence[J]. BMC Womens Health, 2021, 22(1): 172-185
- [3] 王涛,牛晓宇.老年女性压力性尿失禁的发病风险因素及早期预警模型构建[J].实用妇产科杂志,2022,38(6):401-404
- [4] 叶扬,朱兰. Burch手术在压力性尿失禁治疗中的应用[J].中华妇产科杂志,2021,56(5):369-372
- [5] 陈刚,何云锋. TVT和AjustTM治疗女性压力性尿失禁的远期并发症及性功能改善分析[J]. 重庆医学,2018,47(2):209-210
- [6] 赖真真,李丹丹,周文磊,等. TVT-O与TVT-E对女性压力性尿失禁的治疗效果和对患者及其配偶性生活质量的影响[J]. 中国性科学,2021,30(6):94-97
- [7] 中华医学会妇产科学分会妇科盆底学组. 女性压力性尿失禁诊断和治疗指南(2017)[J]. 中华妇产科杂志,2017,52(5):5-41
- [8] 郭婉蓉,唐静,胡笛,等. 悬吊运动训练结合盆底生物反馈电刺激治疗女性压力性尿失禁的临床观察 [J]. 湖南中医药大学学报,2023,43(1):138-142
- [9] 孙肖霞,王志莲,郝敏,等. 转化生长因子- β 1和纤维粘连蛋白在压力性尿失禁大鼠模型阴道前壁中的表达 [J]. 中国临床实用医学,2015,5(1):24-27
- [10] 袁奎,李小丽. 女性压力性尿失禁的治疗新进展[J]. 中国计划生育和妇产科,2022,14(9):6-9
- [11] 杨檬(综述),王为服(审校). 女性压力性尿失禁的治疗进展[J]. 海南医学,2022,33(17):2284-2287
- [12] 董焱鑫,曾锐,高晓康,等. 三孔法腹腔镜外途径腹腔镜下Burch术治疗女性压力性尿失禁25例疗效分析 [J]. 现代泌尿外科杂志,2020,25(4):342-349
- [13] 王明清,郭正飞,李晶,等. 女性压力性尿失禁患者应用不同尿道中段吊带手术方式的临床效果比较 [J]. 临床泌尿外科杂志,2023,38(1):67-71
- [14] 张剑飞,沈鹤,邱建宏,等. 经阴道闭孔无张力尿道中段悬吊术后吊带侵蚀尿道并继发结石一例 [J]. 临床外科杂志,2022,30(9):90-115
- [15] 李军,张雅,朱海松. 改良经闭孔无张力尿道中段悬吊术与腹腔镜下膀胱颈cooper韧带悬吊术治疗中老年女性压力性尿失禁疗效比较[J]. 安徽医药,2021,25(1):95-99
- [16] Abrar S, Razzak L, Mohsin R. The practice of Burch Colposuspension versus Mid Urethral Slings for the treatment of Stress Urinary Incontinence in developing country [J]. Pak J Med Sci, 2021, 37(5):1359-1364
- [17] 李旭东,杜岳峰,刘润明,等. 女性压力性尿失禁术前评估及术后并发症处理:西安交通大学第一附属医院经验[J]. 现代泌尿外科杂志,2022,27(9):711-714
- [18] Itonen Freitas AM, Mikkola TS, Rahkola-Soisalo P, et al. Quality of life and sexual function after TVT surgery versus Bulkamid injection for primary stress urinary incontinence: 1 year results from a randomized clinical trial[J]. Int Urogynecol J, 2021, 32(3):595-601
- [19] Serati M, Braga A, Caccia G, et al. TVT-O for treatment of pure urodynamic stress urinary incontinence: Efficacy and adverse effects at 13-years follow-up[J]. Neurourol Urodyn, 2020, 39(5):1423-1429
- [20] 韩旭,陈德新,汤彪. 经阴道尿道中段线性悬吊术治疗非复杂性压力性尿失禁的临床疗效观察 [J]. 国际泌尿系统杂志,2022,42(2):283-286
- [21] 阙金龙,齐进春,连文峰,等. TVT-E与TVT-O治疗压力性尿失禁的效果比较[J]. 河北医科大学学报,2021,42(1):27-29
- [22] 关星,王菲,覃艳,等. 女性压力性尿失禁行经阴道前壁尿道悬吊手术后发生排尿困难的危险因素分析[J]. 现代泌尿外科杂志,2022,27(9):755-767

- Pregnancy Childbirth, 2022, 22(1): 773
- [13] Wu Y, Cai M, Liang X, et al. The prevalence of cervical insufficiency in Chinese women with polycystic ovary syndrome undergone ART treatment accompanied with negative prognosis: a retrospective study [J]. J Obstet Gynaecol, 2021, 41(6): 888-892
- [14] Marchand GJ, Masoud AT, Galitsky A, et al. Complications of Laparoscopic and Transabdominal Cerclage in Patients with Cervical Insufficiency: A Systematic Review and Meta-analysis [J]. J Minim Invasive Gynecol, 2021, 28(4): 759-768
- [15] Roa C, Du Le VN, et al. Auto-detection of cervical collagen and elastin in Mueller matrix polarimetry microscopic images using K-NN and semantic segmentation classification [J]. Biomed Opt Express, 2021, 12(4): 2236-2249
- [16] 王群, 罗明艳. 血清松弛素、弹性蛋白与行剖宫产术后盆底肌功能的关系及其对盆腔器官脱垂的预测价值研究[J]. 中国性科学, 2021, 30(6): 70-73
- [17] Weiss G, Teichman S, Stewart D, et al. Recombinant human relaxin versus placebo for cervical ripening: a double-blind randomised trial in pregnant women scheduled for induction of labour [J]. BMC Pregnancy Childbirth, 2016, 16(1): 260
- [18] Fletcher EE, Yan D, Kosiba AA, et al. Biotechnological applications of elastin-like polypeptides and the inverse transition cycle in the pharmaceutical industry[J]. Protein Expr Purif, 2019, 153(16): 114-120
- [19] Jung EJ, Romero R, Gomez-Lopez N, et al. Cervical insufficiency, amniotic fluid sludge, intra-amniotic infection, and maternal bacteremia: the need for a point-of-care test to assess inflammation and bacteria in amniotic fluid[J]. J Matern Fetal Neonatal Med, 2022, 35(24): 4775-4781
- [20] Park JY, Oh KJ, Lee S, et al. A new quantification system for assessing the degree of acute cervical insufficiency based on physical and sonographic examination [J]. Eur J Obstet Gynecol Reprod Biol, 2021, 256(26): 372-378
- [21] 刘颖琳, 冯紫雅, 谭剑平, 等. 羊水炎症介质水平与子宫颈机能不全孕妇妊娠结局的关系[J]. 中华妇产科杂志, 2018, 53(8): 517-521
- [22] Wang H, Kira Y, Hamuro A, et al. Differential gene expression of extracellular-matrix-related proteins in the vaginal apical compartment of women with pelvic organ prolapse[J]. Int Urogynecol J, 2019, 30(3): 439-446
- [23] Rynkevicius R, Martins P, Andre A, et al. The effect of consecutive pregnancies on the ovine pelvic soft tissues: Link between biomechanical and histological components [J]. Ann Anat, 2019, 222(27): 166-172
- [24] Hoare BL, Bruell S, Sethi A, et al. Multi-Component Mechanism of H2 Relaxin Binding to RXFP1 through NanoBRET Kinetic Analysis [J]. Science, 2019, 11(25): 93-113
- [25] Kim YR, Baek JI, Kim SH, et al. Therapeutic potential of the mitochondria-targeted antioxidant MitoQ in mitochondrial-ROS induced sensorineural hearing loss caused by Idh2 deficiency [J]. Redox Biol, 2019, 20(18): 544-555
- [26] 闫慧慧, 伍绍文, 刘晓巍. 孕中期经阴道紧急子宫环扎术治疗子宫颈机能不全影响妊娠结局的相关因素分析[J]. 实用妇产科杂志, 2022, 38(7): 540-543
- [27] Yagi H, Kageyama K, Kinoshita N, et al. Relaxin-3 regulates corticotropin-releasing factor gene expression in cultured rat hypothalamic 4B cells[J]. Neurosci Lett, 2019, 692(23): 137-142
- [28] Wang JH, Nie WH, Shao XX, et al. Exploring electrostatic interactions of relaxin family peptide receptor 3 and 4 with ligands using a NanoBiT-based binding assay [J]. Biochim Biophys Acta Biomembr, 2019, 1861(4): 776-786
- [29] 蒋惠玲, 司向华. 宫颈分泌物胎儿纤维连接蛋白和血清松弛素表达与孕妇宫颈成熟度的相关性分析[J]. 中华实用诊断与治疗杂志, 2021, 35(10): 1021-1024
- [30] Lee KH, Lee H, Lee CH, et al. Adrenal insufficiency in systematic lupus erythematosus (SLE) and antiphospholipid syndrome (APS): A systematic review[J]. Autoimmun Rev, 2019, 18(1): 1-8

(上接第 4559 页)

- [23] 席俊华, 范毛川, 杨晓亮, 等. "六步法" 经闭孔阴道无张力尿道中段悬吊术治疗女性压力性尿失禁疗效观察 [J]. 新乡医学院学报, 2021, 38(8): 766-769
- [24] 翁锡君, 李南, 忻立萍, 等. 围绝经期压力性尿失禁女性尿道中段悬吊术后尿路感染危险因素及尿动力学特性[J]. 中华医院感染学杂志, 2022, 32(22): 3462-3466
- [25] 梁云霄, 何天基, 韦尔东, 等. 不同手术方式治疗女性压力性尿失禁中长期疗效和并发症的网状 Meta 分析[J]. 中国全科医学, 2020, 23(8): 949-958