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腹膜后腹腔镜技术在泌尿外科的应用*

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摘要 目的:对比腹膜后腹腔镜手术起步阶段和相对成熟阶段的临床资料,总结手术经验,提高应用水平。**方法:**对2005年1月至2008年12月起步阶段腹膜后腹腔镜手术65例患者,及2016年1月至2016年12月相对成熟阶段腹膜后腹腔镜手术148例患者进行回顾性分析。**结果:**起步阶段:中转开放手术5例,术后发热及切口延迟愈合7例;相对成熟阶段:中转开放手术4例,术后发热及切口延迟愈合6例,无大血管破裂、腹腔内脏器损伤、死亡等并发症。在肾囊肿去顶减压手术及肾上腺手术中,成熟阶段患者的各项指标包括手术时间、出血量、中转开放手术比例、术后拔除引流管时间及住院时间均显著优于起步阶段,差异有统计学意义($P<0.05$)。**结论:**腹膜后腹腔镜技术适于治疗上尿路及肾上腺疾病,具有患者创伤小、安全、术后康复快等优点,早期起步阶段适合选择简单术式,随着手术技术的熟练可逐步开展复杂的手术。

关键词:腹膜后腹腔镜;上尿路疾病;肾上腺疾病;外科手术治疗

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Development of Retroperitoneal Laparoscopy Technology in the Urinary Surgery*

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ABSTRACT Objective: To compare the clinical data of the initial stage and the relatively mature stage of retroperitoneoscopic surgery, summarize the surgical experience and improve the application level. **Methods:** 64 cases in the initial stage from January 2005 to December 2008 and 148 cases in the relatively mature stage from January 2016 to December 2016 underwent retroperitoneoscopic surgery were analyzed retrospectively. **Results:** In the early stage, 5 cases converted to an open surgical procedure and postoperative fever, oliguria and delayed healing of incision occurred in 7 cases. In the relatively mature stage, 4 cases converted to an open surgical procedure and postoperative fever, oliguria and delayed healing of incision occurred in 6 cases. No large vessel or viscera damage happened in the operation. In decompression of renal cysts and adrenal gland surgery, relatively mature stage of patients indexes including operation time, amount of bleeding, the percentage of open surgery, removal of drainage tube time and length of hospital stay were significantly better than the beginning, the difference was statistically significant ($P<0.05$). **Conclusion:** Retroperitoneoscopic surgery is suitable for treating upper urinary tract disease and adrenal gland diseases, with the advantages of lesser trauma, safety and rapid recovery. Simple operations could be chosen in the early stage, and complicated surgery should be developed gradually, with the improvement of surgical skills.

Key words: Retroperitoneal laparoscopy; Upper urinary tract disease; Disease of adrenal gland; Surgery

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前言

以腹腔镜手术为代表的微创技术是今后外科的发展方向。随着技术的发展和经验的积累,腹膜后腹腔镜手术已成为治疗某些泌尿外科疾病的首选术式,该技术具有对腹腔干扰少,较少引起并发症及术后恢复快等优点^[1-3],但经腹膜后途径局部解剖有异于人们所熟悉的经腹腔途径的固定解剖关系,时常有周

围脏器损伤等严重并发症发生,尤其在开展该技术早期阶段,学习曲线较长,所以需不断总结经验,提供参考借鉴,以利于该技术的进一步提高。

多年来,我们致力于该技术的应用发展,已基本涉及所有泌尿外科腹膜后脏器的手术,积累了丰富的临床资料和手术经验。为积极研究和发展腹膜后腹腔镜技术,故查阅分析具有代表性的我院同一术者起步阶段和相对成熟阶段的泌尿外科腹

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膜后腹腔镜手术的临床资料,比较手术类型和数量变化,分析手术疗效,归类分析并发症的种类,提出防治策略;总结手术经验,提高临床应用水平,为早期开展此类手术的泌尿外科同道提供借鉴的经验。

1 资料与方法

1.1 临床资料

2005年1月至2008年12月起步阶段采用腹膜后腹腔镜手术治疗泌尿系疾病的患者65例,其中男性27例,女性38例,女:男=1.41:1;年龄29~78岁,平均年龄47.1岁;肾囊肿去顶减压术34例,肾上腺手术31例;肾囊肿手术中单纯肾囊肿30例,肾盂旁囊肿1例,多囊肾3例;肾上腺手术中皮质腺瘤28例,其他病变3例(嗜铬细胞瘤、肾上腺囊肿)。

2016年1月至2016年12月相对成熟阶段采用腹膜后腹腔镜手术治疗泌尿系疾病的患者148例,其中男性73例,女性75例,女:男=1.03:1;年龄27~84岁,平均年龄55.4岁;肾囊肿去顶减压术48例,肾上腺手术36例,肾根治性切除术36例,肾部分切除术20例,肾盂癌根治术8例。肾囊肿手术中单纯肾囊肿41例,肾盂旁囊肿2例,多囊肾5例。肾上腺手术中皮质腺瘤30例,其他病变6例(嗜铬细胞瘤、肾上腺囊肿)。同期行腹腔镜膀胱根治性切除术5例。所有患者在手术前均进行了泌尿系超声检查、IVU及肾脏CT等检查以确诊。

1.2 手术方法

所有患者均采用经腹膜后腹腔镜技术治疗。患者全麻后,留置尿管,采取侧卧位。于腋后线12肋下处纵行切开皮肤2 cm,以中弯钳垂直体表插入,钝性分离肌层至腹膜后腔,经切口置入自制气囊。注入空气500~800 mL扩张腹膜后间隙,扩张后放出气体并取出气囊。于腋中线与髂嵴上缘交点上2 cm处横行切开皮肤1 cm,经切口置入10 mm Trocar套管,充气后置入腹腔镜观察^[4-7]。于腋前线12肋下水平横行切开皮肤0.5 cm(左侧)或1 cm(右侧),直视下置入5 mm(左侧)或10 mm(右侧) Trocar套管。撤出手指后,于第一切口置入10 mm Trocar套管并缝合切口至不漏气。充分分离腹膜外脂肪,纵行切开肾周筋膜^[8]。肾囊肿手术患者,分离肾周筋膜及肾周脂肪囊后充分暴露肾囊肿,用电钩凝穿囊壁后用吸器抽吸囊液,待囊液吸干后于距离正常肾组织0.5 cm处环形切开囊壁,并用电钩凝烧切缘。肾上腺手术患者,游离肾上腺,优先结扎肾上腺上动脉^[9-11],之后依次处理中央静脉及肾上腺下动脉,而后剪断已夹闭的肾上腺上动脉并取出标本^[12]。最终皆于直视下置入引流管,位置确切后撤镜,缝合切口并固定引流管。

1.3 观察指标

观察所有患者术中指标(手术时间、出血量及是否中转开放手术)、术后指标(术后拔除引流管时间及住院时间)及手术并发症。

1.4 统计学方法

采用SPSS 22.0版统计学软件对数据进行统计学分析,计量资料以均数 $\pm$ 标准差($\bar{x} \pm s$)的形式表示,组间比较应用t检验,计数资料以率(%)表示,比较采用 χ^2 检验。以 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 起步阶段

本阶段采用腹膜后腹腔镜技术行肾囊肿去顶减压术34例,有3例中转开放手术,其中2例分别因囊肿临近肾盂部,恐损伤肾盂;囊肿与周围组织黏连较重,出血较多而中转开放手术;1例因囊肿囊壁厚透声差易出血,可能合并其他疾病,中转开放手术并行术中冰冻病理检查。余31例均手术顺利,手术时间40~200 min,平均为 (107.5 ± 31.8) min;出血量10~50 mL,平均 (45.0 ± 7.1) mL;术后拔除引流管时间1~3天,平均 (2.5 ± 0.7) 天;住院时间7~14天,平均 (9.0 ± 1.4) 天。术后5例出现术后发热,但患者均恢复较快,所有患者切口处均正常拆线。

行肾上腺手术31例,有2例中转开放手术,均因为腹膜后间隙狭小,肿瘤位于腹侧显露困难,而中转开放手术。余29例均手术顺利,手术时间60~180 min,平均 (127.5 ± 53) min;出血量5~100 mL,平均 (65.0 ± 49.5) mL;术后拔除引流管时间2~6天,平均 (5.0 ± 1.4) 天;住院时间8~15天,平均 (10.0 ± 1.4) 天。术后1例出现术后发热,1例出现切口延迟愈合。

2.2 成熟阶段

本阶段采用腹膜后腹腔镜技术行肾囊肿去顶减压术48例,其中1例因术中出血过多、视野不清而中转开放手术,余47例手术顺利,手术时间45~135 min,平均 (81.0 ± 10.6) min;出血量5~50 mL,平均 (16.1 ± 7.1) mL;术后拔除引流管时间1~3天,平均 (1.7 ± 1.4) 天;住院时间5~10天,平均 (7.3 ± 1.4) 天。术后3例出现术后发热,所有患者切口处均正常拆线。

行肾上腺手术36例,均手术顺利,无中转开放手术。手术时间45~180 min,平均 (100.8 ± 3.5) min;出血量5~50 mL,平均 (20.0 ± 10.6) mL;术后拔除引流管时间2~6天,平均 (3.4 ± 2.8) 天;住院时间5~40天,平均 (8.9 ± 3.5) 天。术后1例出现术后发热,2例出现切口延迟愈合。另行肾根治性切除术36例,其中2例中转开放手术,1例因肾及输尿管与周围组织黏连严重无法分离;1例因术中出血过多,视野不清而中转开放手术。余34例手术顺利,手术时间75~225 min,平均 (138.0 ± 10.6) min;出血量20~600 mL,平均 (112.4 ± 56.6) mL;住院时间5~22天,平均 (11.0 ± 4.1) 天。肾部分切除术20例,其中1例因肿瘤位置欠佳镜下缝合困难,而中转开放手术。余19例手术顺利,手术时间90~180 min,平均为 (145.2 ± 42.4) min;出血量10~200 mL,平均 (64.7 ± 106.1) mL;住院时间7~23天,平均 (10.9 ± 2.1) 天。肾盂癌根治术8例,无中转开放手术,手术时间180~360 min,平均 (225.0 ± 31.8) min;出血量50~300 mL,平均 (150.0 ± 70.7) mL;住院时间9~15天,平均 (12.8 ± 1.4) 天。患者均无严重术后并发症发生。

2.3 两阶段患者各项指标水平比较

2.3.1 肾囊肿去顶减压术 成熟阶段患者的各项指标包括手术时间、出血量、中转开放手术比例、术后拔除引流管时间及住院时间均显著优于起步阶段,差异有统计学意义($P < 0.05$)。见表1。

2.3.2 肾上腺手术 成熟阶段患者的各项指标包括手术时间、出血量、中转开放手术比例、术后拔除引流管时间及住院时间均显著优于起步阶段,差异有统计学意义($P < 0.05$)。见表2。

表 1 两阶段行肾囊肿去顶减压术患者指标水平比较($\bar{x} \pm s$)

Table 1 Comparison of the index between two groups of patients with renal cyst unroofing decompression($\bar{x} \pm s$)

Stage	Operation time (min)	Amount of bleeding (mL)	Time of pull out the tube (d)	Hospital stay(d)	Conversion to open surgery (%)
Early stage (n=34)	107.5± 31.8	45.0± 7.1	2.5± 0.7	9.0± 1.4	8.82
Mature stage (n=48)	81.0± 10.6*	16.1± 7.1*	1.7± 1.4*	7.3± 1.4*	2.08*

*Note: Compared with the early stage, P<0.05.

表 2 两阶段行肾上腺手术患者指标水平比较($\bar{x} \pm s$)

Table 2 Comparison of the index between two groups of patients with adrenal surgery($\bar{x} \pm s$)

Stage	Operation time (min)	Amount of bleeding (mL)	Time of pull out the tube (d)	Hospital stay(d)	Conversion to open surgery (%)
Early stage (n=31)	127.5± 53	65.0± 49.5	5.0± 1.4	10.0± 1.4	6.45
Mature stage (n=36)	100.8± 3.5*	20.0± 10.6*	3.4± 2.8*	8.9± 3.5*	0*

* Note: Compared with the early stage, P<0.05.

3 讨论

在有效治疗疾病的基础上最大程度地减少创伤是外科治疗的宗旨,在这种理念下,微创外科应运而生。腹腔镜技术正是微创外科的分支,在诞生以来,该技术在各个学科中得到了广泛的应用^[13-15]。泌尿外科应用腹腔镜技术可以追溯到 1991 年 Clayman 开展了首例腹腔镜肾切除术。最初泌尿外科采取经腹腔入路进行手术,具有解剖层次清晰、适合初学者的特点,但对腹腔脏器干扰大,不是泌尿外科常规开放手术常用的手术入路。随着泌尿外科微创技术的发展,腹膜后入路成了泌尿外科腹腔镜手术的常用方式。腹膜后间隙与一般空腔脏器不同,其不存在自然腔隙且与外界不连通,因此需要经过穿刺以建立通道,并以注气的方式创造人工腔隙^[16,17]。我国腹腔镜技术经过 20 余年的发展,从生疏走向成熟,从大型医院走向基层,腹腔镜技术开始逐渐取代开放手术成为泌尿系统手术的金标准^[18,19]。

目前的研究表明对于复杂的腹腔镜手术,人们更倾向于经腹腔入路而不是腹膜后入路^[20-22]。经腹腔入路的腹腔镜手术能够提供更大的操作空间,这是主要的优势,特别是对于积水的肾脏。同时,经腹腔入路解剖标志容易定位^[23,24]。对于腹膜后入路腹腔镜手术而言,泌尿外科近年来开展较多,为泌尿外科常规开放手术常用的手术入路,符合术者手术操作习惯,便于处理肾蒂,对腹腔脏器干扰小,腹腔脏器损伤的几率也大为减少^[25]。但腹膜后入路腹腔镜手术由于操作空间狭小以及受到腹膜后脂肪的影响,学习曲线略长,需要对手术入路足够熟悉并且积累足够多的手术经验^[26-30]。

我院从 2005 年开始开展泌尿外科腹腔镜手术,10 余年间腹腔镜手术由单一病种开展逐步转变为多病种的应用。本研究中,与起步阶段相对比,成熟阶段腹腔镜肾囊肿去顶减压术、腹腔镜肾上腺手术时间明显减少、手术出血量大幅下降、拔除引流管时间显著缩短、住院时间有所缩短。在起步阶段偶有意外情况出现,需及时中转开放手术,随着手术经验的积累,手术技术趋于成熟,中转开放手术的病例明显减少。随着腹膜后腹腔镜手术例数的增多,可显著提升术者手术操作的熟练程度,使得术者对于手术的入路及腹膜后手术的处理方式有更为深入的理解,从而能够有效提升该团队的手术质量,并且减少术中

不稳定因素及术后并发症的发生。通过对成熟阶段数据的分析,可见腹膜后腹腔镜技术在泌尿外科中具有较大优势,随着术者手术经验的提升可凸显该手术入路的优势,早期起步阶段适合选择简单术式,随着手术技术的熟练可逐步开展复杂手术。

综上,微创技术是泌尿外科未来发展的必然方向,随着腹腔镜技术的不断发展与创新,以及腹膜后腹腔镜技术优势的显现,其必将逐步取代传统开放手术,为患者带来更为微创、精准、有效的治疗前景。

参考文献(References)

- [1] Lonergan PE, Farrelly C, Geoghegan T, et al. Asymptomatic renal pseudoaneurysm following laparoscopic partial nephrectomy[J]. Urology, 2016, 94: e5-e6
- [2] Henderson JM, Fabricius MJ, Fowler S, et al. The complications of laparoscopic renal surgery: A review of 10 years of audit data in the UK [J]. J Clin Urol, 2016, 9(1): 23-31
- [3] Albisinni S, Oderda M, Fossion L, et al. The morbidity of laparoscopic radical cystectomy: analysis of postoperative complications in a multicenter cohort by the European Association of Urology(EAU)-Section of Uro-Technology[J]. World J Urol, 2016, 34(2): 149-156
- [4] Lin YH, Chung HJ, Lin AT, et al. Complications of pure transperitoneal laparoscopic surgery in urology: the Taipei Veterans General Hospital experience[J]. J Chin Med Assoc, 2007, 70(11): 481-485
- [5] Yang WX, Zhu HJ, Chen WG, et al. Treatment of detrusor external sphincter dyssynergia using ultrasoundguided trocar catheter transurethral botulinum toxin a injection in men with spinal cord injury[J]. Arch Phys Med Rehabil, 2015, 96(4): 614-619
- [6] Mayol J, Garciaaguiar J, Ortizoshio E, et al. Risks of the minimal access approach for laparoscopic surgery: multivariate analysis of morbidity related to umbilical trocar insertion [J]. World Journal of Surgery, 1997, 21(5): 529-533
- [7] Nakaoka T, Uemura S, Yoshida T, et al. Umbilical center insertion method for initial trocar placement in pediatric laparoscopic surgery [J]. Osaka City Med J, 2010, 56(2): 21-26
- [8] Zhang X, Fu B, Lang B, et al. Technique of anatomical retroperitoneoscopic adrenalectomy with report of 800 cases [J]. J Urol, 2007, 177(4): 1254-1257
- [9] Shonkwiler RJ, Lee JA. Laparoscopic retroperitoneal adrenalectomy

- [J]. Surg Laparosc Endosc Percutan Tech, 2011, 21(4): 243-247
- [10] Zhang X, Shi TP, Li HZ, et al. Laparoendoscopic single site anatomical retroperitoneoscopic adrenalectomy using conventional instruments: initial experience and short-term outcome [J]. J Urol, 2011, 185(2): 401-406
- [11] Strebel RT, Muntener M, Sulser T. Intraoperative complications of laparoscopic adrenalectomy[J]. World J Urol, 2008, 26(6): 555-560
- [12] Yuan X, Wang D, Zhang X, et al. Retroperitoneal Laparoendoscopic single-site adrenalectomy for pheochromocytoma: our single center experiences[J]. J Endourol, 2014, 28(2): 178-183
- [13] Breda A, Castellan P, Freitas RA, et al. Renal and Adrenal Minimilaparoscopy: A Prospective Multicentric Study [J]. Urology, 2016, 92: 44-50
- [14] Kallidonis P, Kontogiannis S, Kyriazis I, et al. Laparoendoscopic single-site surgery in kidney surgery: clinical experience and future perspectives[J]. Curr Urol Rep, 2013, 14(5): 496-505
- [15] Vricella GJ, Ross JH, Vourganti S, et al. Laparoendoscopic single-site nephrectomy: initial clinical experience in children [J]. J Endourol, 2010, 24(12): 1957-1961
- [16] Fu J, Ye S, Ye HJ, et al. Retroperitoneal Versus Transperitoneal Laparoscopic Partial Nephrectomy: A Systematic Review and Meta-analysis[J]. Chin Med Sci J, 2015, 30(4): 239-244
- [17] Khalil M, Omar R, Abdel-Baky S, et al. Laparoscopic ureterolithotomy; which is better: Transperitoneal or retroperitoneal approach?[J]. Turk J Urol, 2015, 41(4): 185-190
- [18] Kumar A, Gupta NP, Hemal AK, A single institution experience of 141 cases of laparoscopic radical nephrectomy with cost-reductive measures[J]. J Endourol, 2009, 23(3): 445-449
- [19] Higashihara E, Hattori R, Nakagawa K, et al. How to use laparoscopic surgical instruments safely[J]. Int J Urol, 2009, 16(3): 225
- [20] Naghiyev R, Imamverdiyev S, Efendiyev E, et al. Laparoscopic transperitoneal and retroperitoneal simple nephrectomy: The impact of etiological factors of the results of surgical treatment [J]. Turk J Urol, 2017, 43(3): 319-324
- [21] Cantiello F, Veneziano D, Bertolo R, et al. Safe introduction of laparoscopic and retroperitoneoscopic nephrectomy in clinical practice: impact of a modular training program [J]. World J Urol, 2016, 35(5): 761-769
- [22] Zhang C, Guo F, Wang H, et al. The Application of Hem-O-Lok Clips Tied with Threads to Improve Surgical View in Retroperitoneal Laparoscopic Surgery for Renal Cell Carcinoma [J]. J Laparoendosc Adv Surg Tech A, 2017, 27(2): 171-174
- [23] Yousuf A A, Frecker H, Satkunaratnam A, et al. The development of a retroperitoneal dissection model [J]. Am J Obstet Gynecol, 2017, 217(4): 483e1-483e3
- [24] Coste T, Caiazzo R, Torres F, et al. Erratum to: Laparoscopic adrenalectomy by transabdominal lateral approach: 20 years of experience [J]. Surg Endosc, 2017, 31(7): 2752
- [25] Toussi A, Granberg CF, Gargollo PC, et al. The Learning Curve of Pure Retroperitoneoscopic Donor Nephrectomy[J]. Int J Organ Transplant Med, 2017, 8(4): 180-185
- [26] Song E, Ma X, An R, et al. Retroperitoneal Laparoscopic Partial Nephrectomy for Tumors Larger than 7 cm in Renal Cell Carcinoma: Initial Experience of Single-Institution [J]. J Laparoendosc Adv Surg Tech A, 2017, 27(11): 1127-1131
- [27] Guo J, Zhou X, Fu B, et al. Retroperitoneal laparoscopic partial nephrectomy for treatment of metanephric adenoma (Report of 6 cases) [J]. Springerplus, 2016, 5(1): 996
- [28] Benoit T, Peyronnet B, Roumiguié M, et al. Laparoscopic nephrectomy for polycystic kidney: comparison of the transperitoneal and retroperitoneal approaches[J]. World J Urol, 2016, 34(7): 901-906
- [29] Sánchez Margallo FM, Díaz-Güemes I, Sánchez Hurtado MA, et al. Training in basic and advanced laparoscopy: Evaluation of a 30-year experience in a training program in Spain[J]. Arch Esp Urol, 2018, 71(1): 63-72
- [30] Pal BC, Modi PR, Rizvi SJ, et al. The Learning Curve of Pure Retroperitoneoscopic Donor Nephrectomy [J]. Int J Organ Transplant Med, 2017, 8(4): 180-185
- (上接第 984 页)
- [23] Ghezzi F, Cromi A, Uccella S, et al. Transumbilical versus transvaginal retrieval of surgical specimens at laparoscopy: a randomized trial [J]. Am J Obstet Gynecol, 2012, 207(2): 112.e1-112.e6
- [24] Redwine DB, Koning M, Sharpe DR. Laparoscopically assisted transvaginal segmental resection of the rectosigmoid colon for endometriosis[J]. Fertil Steril, 1996, 65(1): 193-197
- [25] Palanivelu C, Rangarajan M, Jategaonkar PA, et al. An innovative technique for colorectal specimen retrieval: a new era of "natural orifice specimen extraction" (N.O.S.E)[J]. Dis Colon Rectum, 2008, 51(7): 1120-1124
- [26] Carnuccio P, Jimeno J, Parés D. Laparoscopic right colectomy: a systematic review and meta-analysis of observational studies comparing two types of anastomosis[J]. Tech Coloproctol, 2014, 18(1): 5-12
- [27] Tarta C, Bishawi M, Bergamaschi R. Intracorporeal ileocolic anastomosis: a review[J]. Tech Coloproctol, 2013, 17(5): 479-485
- [28] Awad ZT, Qureshi I, Seibel B, et al. Laparoscopic right hemicolectomy with transvaginal colon extraction using a laparoscopic posterior colpotomy: a 2-year series from a single institution[J]. Surg Laparosc Endosc Percutan Tech, 2011, 21(6): 403-408
- [29] McKenzie S, Baek JH, Wakabayashi M, et al. Totally laparoscopic right colectomy with transvaginal specimen extraction: the authors' initial institutional experience [J]. Surg Endosc, 2010, 24(8): 2048-2052
- [30] Park JS, Choi GS, Kim HJ, et al. Natural orifice specimen extraction versus conventional laparoscopically assisted right hemicolectomy[J]. Br J Surg, 2011, 98(5): 710-715
- [31] Park JS, Choi GS, Lim KH, et al. Clinical outcome of laparoscopic right hemicolectomy with transvaginal resection, anastomosis, and retrieval of specimen[J]. Dis Colon Rectum, 2010, 53(11): 1473-1479