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不同体位下输尿管硬镜对输尿管上段结石患者的疗效及安全性分析 *

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摘要 目的：对比不同体位下输尿管硬镜对输尿管上段结石患者的疗效及安全性。**方法：**2018 年 8 月到 2021 年 1 月选择在本院诊治的输尿管上段结石的患者 88 例作为研究对象，根据随机信封抽签 1:1 原则把患者分为头高臀低组与水平位组各 44 例。所有患者均给予输尿管硬镜手术治疗，头高臀低组给予头高臀低截石位，水平位组给予水平截石位，记录与随访疗效及安全性。**结果：**所有患者顺利完成手术，头高臀低组碎石时间等围手术指标少于水平位组（$P<0.05$）。头高臀低组术后 14 d 的总有效率为 97.7 %，高于水平位组的 86.4 %（$P<0.05$）。头高臀低组术后 14 d 的假道形成、输尿管穿孔、粘膜撕脱、感染等总发生率为 4.5 %，低于水平位组的 25.0 %（$P<0.05$）。两组术后 14 d 的血清同型半胱氨酸（Hcy）和 β2- 微球蛋白（β2-MG）含量较术前 1 d 低（$P<0.05$），头高臀低组低于水平位组（$P<0.05$）。所有患者术后随访 6 个月，头高臀低组的复发率为 2.3 %，低于水平位组的 13.6 %（$P<0.05$）。**结论：**相对水平截石位，头高臀低截石位在输尿管上段结石患者输尿管硬镜手术患者的应用能提高总体治疗效果，促进患者康复，也可降低血清同型半胱氨酸和 β2- 微球蛋白，减少并发症的发生，降低复发率。

关键词：水平截石位；头高臀低截石位；输尿管上段结石；输尿管硬镜

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Efficacy and Safety Analysis of Rigid Ureteroscope in Different Positions for Patients with Upper Ureteral Calculi*

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ABSTRACT Objective: To compare the efficacy and safety of rigid ureteroscope in different positions for patients with upper ureteral calculi. **Methods:** From August 2018 to January 2021, 88 cases of patients with upper ureteral calculi diagnosed and treated in our hospital were selected as subjects, and the patients were equally divided into head-high butt-low group and horizontal position group accorded to the 1:1 principle of random envelope drawing. example. All patients were treated with rigid ureteroscopy. The head-high butt-low group were given head-high buttock-low lithotomy position, and the horizontal group were given horizontal lithotomy position. The efficacy and safety of the two groups were recorded and followed up. **Results:** All patients were successfully completed the operation. The lithotripsy time, stone clearing time and postoperative hospital stay in the head-high-but-low group were less than those in the horizontal group ($P<0.05$). The total effective rates of the head-high butt-low group were 97.7 % at 14 days after surgery, which were higher than 86.4 % in the horizontal group ($P<0.05$). The incidence rates of complications such as false canal formation, ureter perforation, mucosal avulsion, infection and other complications in the head-high-but-low group were lower than those in horizontal group($P<0.05$). The levels of serum homocysteine and β2-microglobulin in the two groups at 14 days after operation were lower than those in the preoperative 1 day ($P<0.05$), and the head-high but low-butt-low group were lower than the horizontal group ($P<0.05$). All patients were followed up for 6 months after the operation, the recurrence rate of the head-high-but-low group were 2.3 %, which were lower than the 13.6 % of the horizontal group ($P<0.05$). **Conclusion:** Compare to the horizontal lithotomy position, the application of the head-high butt-low lithotomy position in patients with upper ureteral calculi with rigid ureteroscopy can promote the recovery of patients, improve the overall therapeutic effect, and reduce serum homocysteine and β2- Microglobulin reduces the occurrence of complications and reduces the recurrence rate.

Key words: Horizontal lithotomy position; Head high buttock low lithotomy position; Upper ureteral calculi; Rigid ureteroscope

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前言

输尿管结石患者当前在人群中比较常见，临床症状主要表现为肾积水、尿急等[1,2]。严重时可引起肾功能衰竭、肾积脓，甚至危及生命。输尿管上段结石为输尿管结石的主要类型，占 1/2 左右，男性发病多于女性（比例约为 3:1）[3,4]。该病在临床上主要具有复发率高、发病率高等特点，当前发病人数逐年增加，也有年轻化的趋势[4]。随着医学技术的不断革新，微创手术得以广泛应用，特别是输尿管硬镜手术具有安全性高、操作方便、恢复快、无手术切口等优点，减轻创伤，也促进康复，已成为肾结石的标准术式[5,6]。在输尿管硬镜手术，患者多采用传统截石位，不利于麻醉管理，且在术后产生大量的并发症，不利于患者康复[7]。头高臀低截石位兼具截石位及水平位的优点，具有很好的应用效果，特别头高臀低位因患侧抬高约 20°，可建立足够范围的经皮肾穿刺通道，也能扩大腰部空间[8,9]；截石位方便输尿管硬镜的操作，有利于结石更易冲出。头高臀低截石位有利于麻醉监护，也能避免水平截石位的消极影响[10,11]。本文通过分析不同体位下输尿管硬镜对输尿管上段结石患者的疗效及安全性，希望为临床上选择体位提供参考。

1 资料与方法

1.1 研究对象

2018 年 8 月到 2021 年 1 月选择在本院诊治的输尿管上段结石的患者 88 例作为研究对象。

纳入标准：择期手术；术前检查血常规尿常规，尿培养无感染；血压、血糖在术前检测均为正常状态；单侧结石；所有患者签署了知情同意书；0.6 cm≦结石直径≦1.5 cm；符合输尿管结石的诊断标准[12]；腹部平片显示输尿管结石位于 L4 以上；具有手术指征；医院伦理委员会批准了此次研究。

排除标准：肾解剖学异常患者；移植肾患者；血液系统疾病、凝血功能异常患者；合并精神疾病与肿瘤者；妊娠与哺乳期妇女；

根据随机信封抽签 1:1 原则把患者分为头高臀低组与水平位组各 44 例，两组患者结石侧别等对比无差异（P>0.05）。见表 1。

表 1 一般资料对比

Table 1 Comparison of general data

Groups	n	Diameter of stone (cm)	Side calculi (left/right)	Gender (male/female)	Age (years)	Body mass index (kg/m²)	Heart rate (beats /min)	Blood sugar (tendency/L)
Head high and hip low group	44	1.74± 0.15	23/21	34/10	54.19± 3.55	22.57± 1.57	85.79± 2.76	5.01± 0.62
Horizontal position group	44	1.75± 0.22	22/22	32/12	54.22± 2.58	22.19± 1.11	85.38± 3.16	5.06± 0.33

1.2 治疗方法

所有患者都给予输尿管硬镜手术治疗，全身麻醉。使用德国 Wolf 公司 F8/9.5 输尿管硬镜。同时使用瑞科恩钬激光，激光参数：频率 20-25 次 /min，能量 0.8-1.2 J。

头高臀低组：给予头高臀低截石位，胸背部用托架固定，适当托高腰部，患侧臀部下缘及背部尽量靠近手术床缘，躯体抬高与术床成 20°，健侧下肢内收并屈膝抬高，躯体状态：躯体整个固定，大腿与躯干呈 90°、小腿与大腿呈 90°，躯体置于脚架上，患侧下肢外展置于腿架，腿架高于手术台 30 cm 左右，腿架高于手术台 8 cm 左右，腿架高于手术台 30 cm 左右。水平位组：给予水平截石位。

在两组手术中，插入泥鳅导丝，于导丝引导下将硬镜插入输尿管，置入钬激光光纤，使用钬激光纤击碎结石，将结石粉碎至直径≦0.2 cm，术后常规留置双 J 管，术后 3-4 周拔除。

1.3 观察指标

1.3.1 围手术期指标 观察与记录术后住院时间、结石排净时间、碎石时间。

1.3.2 总体疗效判定 在术后 14 d 进行总体疗效判定，显效：临床症状消失，顺利排出结石；有效：临床症状改善，≧90 %结石排出；无效：无达到上述标准。总有效率 =（显效 + 有效）/ 总例数× 100.0%[13]。

1.3.3 并发症情况 观察与记录术后 14 d 出现的假道形成、输尿管穿孔、粘膜撕脱、感染等并发症情况。

1.3.4 检测同型半胱氨酸和β2- 微球蛋白的含量 所有患者在术前 1 d 与术后 14 d 采集患者的空腹静脉血 2-3 mL，在室温条件下静置 30 min，3000 rpm/min 离心 10 min，取上层血清，采用酶循环法检测同型半胱氨酸（Homocysteine, Hcy），采用乳胶增强免疫比浊法检测 β2- 微球蛋白（β2-microglobulin, β2-MG）的含量，同型半胱氨酸试剂盒购自美康生物科技股份有限公司，β2- 微球蛋白试剂盒购自宁波瑞源生物科技有限公司。

1.3.5 复发情况 所有患者术后随访 6 个月，采用影像学进行复查，并记录复发情况。

1.4 统计方法

统计软件为 SPSS24.00，计数资料以（n/%）表示，对比为 x^2 检验；计量资料以（$\bar{x}\pm s$）表示，对比为 t 检验，检验水准为 α=0.05。

2 结果

2.1 围手术期指标对比

所有患者顺利完成手术，头高臀低组的碎石时间等围手术期指标均少于水平位组（P<0.05）。见表 2。

2.2 总有效率对比

头高臀低组术后 14 d 的总有效率为 97.7 %，高于水平位组的 86.4 %（P<0.05）。见表 3。

2.3 并发症情况对比

头高臀低组术后 14 d 的假道形成、输尿管穿孔、粘膜撕脱、感染等总体发生率为 4.5 %，低于水平位组的 25.0 %（P<0.05）。见表 4。

表 2 围手术期指标对比($\bar{x}\pm s$)

Table 2 Comparison of perioperative indicators between the two groups($\bar{x}\pm s$)

Groups	n	Time to clear stones (d)	Gravel time (min)	Length of postoperative hospital stay (d)
Head high and hip low group	44	11.67± 1.53*	45.61± 4.55*	6.51± 0.67*
Horizontal position group	44	14.51± 1.61	60.53± 4.77	8.93± 0.64

Note: Compared with Horizontal position group, *P<0.05.

表 3 总有效率对比(n)

Table 3 Comparison of total effective rate between the two groups (n)

Groups	n	Excellent	Valid	Invalid	Total effective rate
Head high and hip low group	44	41	2	1	43(97.7 %)*
Horizontal position group	44	32	6	6	38(86.4 %)

Note: Compared with Horizontal position group, *P<0.05.

表 4 并发症情况发生对比(n)

Table 4 Comparison of complications (n)

Groups	n	False way form	Ureteral perforation	Mucosa avulsion	Infection
Head high and hip low group	44	1	0	0	1
Horizontal position group	44	3	2	3	3

Note: Compared with Horizontal position group, *P<0.05.

2.4 血清同型半胱氨酸和 β2- 微球蛋白变化对比

两组术后 14 d 的血清 Hcy 和β2-MG 含量低于术前 1 d,头高臀低组低于水平位组(P<0.05)。见表 5。

表 5 手术前后血清 Hcy 和 β2-MG 变化对比($\bar{x}\pm s$)

Table 5 Comparison of serum homocysteine and β2-microglobulin before and after surgery ($\bar{x}\pm s$)

Groups	n	β2-MG (mg/L)		Hcy (μmol/L)	
		Preoperative 1 d	Postoperation 14 d	Preoperative 1 d	Postoperation 14 d
Head high and hip low group	44	14.82± 1.54	4.34± 0.54*#	31.46± 2.23	11.32± 1.11*#
Horizontal position group	44	14.47± 1.32	7.37± 0.45#	31.36± 2.57	18.84± 1.09#

Note: Compared with Preoperative 1 d, #P<0.05, Compared with Horizontal position group, *P<0.05.

2.5 复发情况对比

所有患者术后随访 6 个月,头高臀低组的复发率为 2.3 %,低于水平位组的 13.6 %(P<0.05)。

3 讨论

输尿管结石是泌尿外科常见疾病之一,其中多数为输尿管上段结石,男性发病多于女性,南方多于北方[14]。当前输尿管结石的发病率在全年龄段均呈上升趋势,易诱发肾积水、感染、肾功能不全等并发症的发生,需要进行早期手术治疗[15]。传统开放性手术较成熟,手术成功率较高,但手术创伤性较大,多数患者术后恢复较慢,术后并发症多[16]。随着微创医学技术的发展,输尿管硬镜得到了广泛应用,具有非侵入性、安全有效、损伤小等优点[17,18]。

本研究显示:所有患者顺利完成手术,头高臀低组的碎石时间等围手术期指标都少于水平位组;头高臀低组术后 14 d 的总有效率为 97.7 %,高于水平位组的 86.4 %,这一结果与 Boz M[10]等人的结果一致,表明头高臀低截石位在临床上的应用能促进患者康复,提高总体治疗效果。从机制上分析,水平截石位患者易产生术中不适感,且有一定的麻醉风险,头高臀低截石位方便输尿管硬镜的操作,能提供足够的腰部空间用于建立穿刺通道,也可减少手术时间,促进患者康复[19,20]。

输尿管硬镜手术虽是微创手术,但有并发症风险。同时输尿管上段结石由于独特的空间位置,患者个体状况与结石状况均存在差异,对于治疗的要求更高[21]。采用头高臀低截石位,进镜难度降低,减少了碎石时间,提高了碎石效率[22,23]。本研究显示:头高臀低组术后 14 d 的假道形成、输尿管穿孔、粘膜撕脱、感染等总体发生率为 4.5 %,低于水平位组的 25.0 %,这一结果与 Li Y 等人[24]的结果具有相似性,表明头高臀低截石位在临床上的应用能减少并发症发生。从机制上分析,合理的手术体位是手术成功的基础,有麻醉可行性与安全性的要求,患者采用头高臀低截石位可降低肾盂内压,减少出血影响输尿管硬镜视野,使患侧腹腔脏器向对侧偏移,使结肠向内或向前移动,进而降低并发症发生率,同时在手术中要注意以下事项:术中如感觉遇到阻力,绝不允许强行进镜,动作轻柔缓慢,保证手术视野

清晰,避免反复进镜[25,26]。

随着医学技术不断革新，输尿管硬镜可满足微创需求,但依然可导致患者出现应激反应。应激反应可使患者机体的神经分泌代谢发生改变,临床常通过在围手术期测定相关血清指标的变化情况来反映机体应激反应程度[27,28]。同型半胱氨酸可损伤血管内皮,并导致循环功能异常,因此该物质能反映肾血管疾病患者的病情严重程度以及应激反应状况[29]。当前有关输尿管结石形成机制尚不清楚，可能与肾小管的氧化损伤等有关。当肾小管发生炎症、因中毒造成肾小管病变时，肾小管对β2-微球蛋白重吸收出现障碍，血液中 β2- 微球蛋白含量剧增[30]。本研究显示两组:术后 14 d 的血清 Hcy 和 β2-MG 含量低于术前 1 d，头高臀低组低于水平位组。且所有患者术后随访 6 个月,头高臀低组的复发率为 2.3 %,低于水平位组的 13.6 %。表明头高臀低截石位在临床上的应用能抑制血清同型半胱氨酸和 β2- 微球蛋白的释放,且复发率低。这一结果与 Zhu C 等人[31]的结果一致,从机制上分析,头高臀低截石位的应用可使手术通道更加方便,视野较清晰,不受输尿管成角、狭窄的影响,操作更加方便,也能避免腹腔脏器损伤,尤其是头高臀低截石位可使结石暴露在输尿管硬镜视野范围内完成碎石,从而有利于患者康复,减少应激反应的发生[10],头高臀低截石位膀胱内形态的视觉感知与常规体位比较,具有一定的变化,且可随患者转体方向将镜体作适当的旋转从而进行操作,最终可减少术后复发率[32]。本研究也存在一定的不足,主要在于输尿管硬镜不能弯曲且价值较贵,在临床上的应用受到限制。同时本研究随访时间较短,患者数量也较少,将在后续研究中进行探讨。

总之,相对水平截石位,头高臀低截石位在输尿管上段结石患者输尿管硬镜手术患者的应用能提高总体治疗效果,促进患者康复,也可降低血清同型半胱氨酸和 β2- 微球蛋白,减少并发症的发生,降低复发率。

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