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## 通道大小对经皮肾镜取石患者出血的影响\*

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**摘要 目的:**探讨通道大小对经皮肾镜取石患者围手术期出血的影响及治疗策略。**方法:**回顾性分析 2016 年 1 月至 2017 年 1 月在我院行 F24 和 F18 通道的经皮肾镜取石术的 189 例患者临床资料, 分别比较具有不同临床特征患者围手术期出血的发生情况。**结果:**95 例 F24 通道患者平均出血量为  $125 \pm 19.6$  mL, 其中 5 人进行输血治疗; 94 例 F18 通道患者平均出血量为  $103 \pm 17.6$  mL, 其中 3 人进行输血治疗。F18 通道经皮肾镜取石术的出血组和非出血组糖尿病、高血压的发生率、结石表面积、通道数量、手术时间比较差异均具有统计学意义( $P < 0.05$ )。F24 通道经皮肾镜取石术的出血组和非出血组孤立肾、高血压发生率、结石面积、肾实质厚度、通道数量和手术时间比较差异均具有统计学意义( $P < 0.05$ )。F18 通道经皮肾镜取石围手术期出血量显著少于 F24 通道( $P < 0.05$ )。**结论:**孤立肾、高血压、结石面积大、肾实质厚、肾积水轻、通道数量多和手术时间长均会导致经皮肾镜围手术期出血几率和出血量增加, 并且 F24 通道相较于 F18 通道出血量更多。

**关键词:**经皮肾镜取石术; 通道大小; 出血

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## Analysis of the Causes of Bleeding in Patients Undergoing Percutaneous Nephrolithotomy with Channel Size\*

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**ABSTRACT Objective:** To investigate the causes of perioperative bleeding in patients with percutaneous nephrolithotomy and their treatment strategies. **Methods:** The clinical data of 189 patients who underwent percutaneous nephrolithotomy in F24 and F18 channels from January 2016 to January 2017 in our hospital were retrospectively analyzed. The clinical data of patients were collected. **Results:** The mean bleeding volume of 95 patients with F24 channel was  $125 \pm 19.6$  mL. Five of them were transfused. The average blood loss of 94 patients with F18 channel was  $103 \pm 17.6$  mL, of whom 3 were transfused. Multivariate regression analysis of F18 and F24 channels found that isolated kidney, hypertension, stone area, renal parenchyma, hydronephrosis, passage number and operation time had significant effects on the amount of bleeding, while F18 channel bleeding less than F24 channel ( $P < 0.05$ ). **Conclusion:** Isolated kidney, high blood pressure, large area of stone, thick parenchyma, mild hydronephrosis, large number of passages and long operation time all lead to increased perioperative risk of hemorrhage and perioperative bleeding in percutaneous nephrolithotomy. Compared with F18 channel, more bleeding was found in the F24 channel.

**Key words:** Percutaneous nephrolithotomy; Channel size; Bleeding

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### 前言

尿路结石是泌尿外科常见疾病, 经皮肾镜取石术(PCNL)具有清石速度快、创伤小、清石率高等特点, 现已成为治疗复杂性上尿路结石的首选方法<sup>[1-5]</sup>。但术后急性或迟发型出血仍是 PCNL 的常见并发症<sup>[6]</sup>。影响经皮肾镜术中或术后出血的原因很多, 包括肾皮质厚度、手术时间、结石表面积、高血压、皮肾通道数量等, 如何正确术前评估, 提高手术技巧, 减少出血几率和出血量仍是临床亟待解决的问题<sup>[7-12]</sup>。PCNL 标准通道通道大、

清石速率高、手术时间短, 现已被广泛接受。我们前期研究发现肾皮质厚度、手术时间、结石表面积、高血压、皮肾通道数量都会影响 PCNL 出血, 与 Ganpule AP 等研究结论相同<sup>[3,7,9-11]</sup>。PCNL 治疗应个体化为主, 充分进行术前评估。本研究选取 2016 年 1 月 -2017 年 1 月在我院进行 F24 和 F18 通道经皮肾镜取石 189 例患者, 探讨了不同通道大小对于经皮肾镜出血量的影响, 结果如下。

### 1 资料和方法

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### 1.1 临床资料

选择 2016 年 1 月至 2017 年 1 月我院收治的 189 例复杂性肾结石患者。进行 F24 通道经皮肾镜取石者 95 例, 包括男 55 例, 女 40 例, 孤立肾 3 例, 结石平均直径为  $22 \pm 9.6$  mm, 肾实质平均厚度  $11.2 \pm 6.7$  mm, 平均出血量  $125 \pm 19.6$  mL; 进行 F18 通道经皮肾镜取石者 94 例, 包括男 47 例, 女 47 例, 孤立肾 3 例, 结石平均直径  $24 \pm 8.2$  mm, 平均出血量  $103 \pm 17.6$  mL。所有尿路结石选取 2-4 cm 肾盂结石。

### 1.2 手术方法

189 例全部采用全身麻醉。截石位后膀胱镜下置入输尿管导管, 改为俯卧位, 超声引导下穿刺, 建立 F24 或 F18 通道。采用气压弹道碎石或钬激光碎石, 配合冲洗及取石钳取出结石,

常规置入双 J 管并留置肾造瘘管。

### 1.3 统计学分析

采用 SPSS 19.0 软件进行统计学分析。计量资料用均数 $\pm$ 标准差( $\bar{x} \pm s$ )表示, 组间比较用 t 检验, 计数资料以百分率表示, 组间比较采用  $\chi^2$  检验, 以  $P < 0.05$  为差异具有统计学意义。

## 2 结果

### 2.1 F18 通道经皮肾镜围手术期患者的临床资料分析

从进行 F18 通道经皮肾镜取石者 94 例的临床数据可见年龄、性别、肾积水程度与围手术期出血无明显相关性, 而出血组和非出血组有糖尿病、高血压的发生率, 结石表面积、通道数量、手术时间比较差异均具有统计学意义(表 1)。

表 1 F18 通道经皮肾镜患者临床资料分析

Table 1 Analysis of the clinical data of patients undergoing F18 channel percutaneous nephrolithotomy

| Feature                              | Blood transfusion group | Non blood transfusion group | P value |
|--------------------------------------|-------------------------|-----------------------------|---------|
| Age(year)                            | 49.3 $\pm$ 3.1          | 50.6 $\pm$ 2.6              | >0.05   |
| Sex(Male/Female)                     | 2/1(66.7)               | 45/46(49.5)                 | >0.05   |
| Hypertension                         | 2(66.7)                 | 11(12.1)                    | <0.05   |
| Isolated kidney                      | 1(33.3)                 | 2(2.2)                      | <0.05   |
| Diabetes                             | 2(66.7)                 | 30(33.0)                    | <0.05   |
| Renal parenchyma thickness(mm)       | 8 $\pm$ 3.1             | 12 $\pm$ 5.2                | <0.05   |
| Hydronephrosis(cm <sup>2</sup> )     | 2.7 $\pm$ 1.83          | 2.8 $\pm$ 1.59              | >0.05   |
| Number of channels                   | 1.8 $\pm$ 0.19          | 1.1 $\pm$ 0.73              | <0.05   |
| Stone surface area(mm <sup>2</sup> ) | 1396 $\pm$ 524.1        | 863 $\pm$ 348.3             | <0.05   |
| Operation time (min)                 | 45.3 $\pm$ 19.6         | 30.5 $\pm$ 14.9             | <0.05   |

### 2.2 F24 通道经皮肾镜围手术期患者的临床资料分析

从进行 F24 通道经皮肾镜取石者 95 例的临床数据可见孤立肾、高血压、结石面积大、肾实质厚度、通道数量多和手术时

间长的患者经皮肾镜围手术期出血的发生率显著升高( $P < 0.05$ )。而性别、年龄、糖尿病与 F24 通道经皮肾镜取石围手术期出血的发生率无明显相关性(表 2)。

表 2 F24 通道经皮肾镜患者的临床资料分析

Table 2 Analysis of the clinical data of patients undergoing F24 channel percutaneous nephrolithotomy

| Feature                              | Blood transfusion group | Non blood transfusion group | P value |
|--------------------------------------|-------------------------|-----------------------------|---------|
| Age(year)                            | 5                       | 92                          | >0.05   |
| Sex(Male/Female)                     | 3/2(60.0)               | 52/38(56.5)                 | >0.05   |
| Hypertension                         | 4(80.0)                 | 16(17.4)                    | <0.05   |
| Isolated kidney                      | 1(20.0)                 | 2(2.2)                      | <0.05   |
| Diabetes                             | 3(60.0)                 | 34(37.0)                    | <0.05   |
| Renal parenchyma thickness(mm)       | 7.9 $\pm$ 2.8           | 11 $\pm$ 6.2                | <0.05   |
| Hydronephrosis(cm <sup>2</sup> )     | 2.6 $\pm$ 1.73          | 2.5 $\pm$ 1.47              | >0.05   |
| Number of channels                   | 1.93 $\pm$ 0.14         | 1.06 $\pm$ 0.87             | <0.05   |
| Stone surface area(mm <sup>2</sup> ) | 1593 $\pm$ 610.1        | 796 $\pm$ 425.2             | <0.05   |
| Operation time (min)                 | 49.2 $\pm$ 18.4         | 31.4 $\pm$ 12.9             | <0.05   |

### 2.3 不同通道出血量的比较

95 例 F24 通道患者平均出血量为  $125 \pm 19.6$  mL, 其中 5 人进行输血治疗; 94 例 F18 通道患者平均出血量为  $103 \pm 17.6$

mL, 3 人输血治疗。F18 通道经皮肾镜取石围手术期出血量少于 F24 通道( $P < 0.05$ ), 输血比例亦低于 F24 通道组, 但差异无统计学意义( $P > 0.05$ )。

### 3 讨论

经皮肾镜取石术具有创伤小、清石率高、操作简单、术后恢复快等特点,现已成为治疗上尿路复杂性结石的首选方法<sup>[13-15]</sup>。术中及术后出血是其不可避免的并发症,提高手术技巧,避免穿刺过程中损伤血管是术中降低出血并发症的主要方法,加强术前评估,了解并治疗基础疾病也尤为重要。本组研究结果显示孤立肾、高血压、结石面积大、肾实质厚、通道数量多和手术时间长会导致出血几率增加,与马靖远等结论一致<sup>[4,16]</sup>。而年龄、性别、糖尿病对于围手术期出血并无明确影响<sup>[17-20]</sup>。

对于孤立肾患者,肾脏代偿性血运增加,肾脏血管增粗增多以维持身体机能,但在穿刺过程中会更易引起血管损伤。高血压导致全身血管动脉硬化性病变,引起全身血管弹性减弱,对于年龄大者,动脉粥样硬化可能性大,PCNL 穿刺时易造成出血。肾实质厚,血运丰富,穿刺过程中易损伤血管<sup>[21]</sup>,在术中推荐建立皮肾通道前建议优先建立“人工肾积水”,尽量避免穿刺针损伤肾脏全层。肾积水压迫肾实质,甚至影响肾功,但会引起肾脏血运减少,反而穿刺碎石过程中出血减少。

本组 189 例患者入组,95 例 F24 通道患者平均出血量为  $125 \pm 19.6$  mL, 其中 5 人进行输血治疗,94 例 F18 通道患者平均出血量为  $103 \pm 17.6$  mL,3 人输血治疗,两组输注主要成分均为去白细胞红细胞悬液。单通道下对于出血的主要影响因素与上相同,并无明显差异。但在不同通道对比下,结果显示 F24 通道出血量明显高于 F18 通道。大通道的优点明确,可加快手术进展,缩短手术时间,提高清石率,但也更容易造成穿刺扩张过程中损伤血管、碎石过程中镜鞘摆动使盏颈撕裂,尿路结石过程中损伤粘膜导致出血量增加<sup>[22-24]</sup>。研究已证实孤立肾、高血压、结石面积大、肾实质厚、通道数量和手术时间会影响 PCNL 出血,本研究所得结论与其他学者基本一致<sup>[25,26]</sup>。本研究首次对于通道大小进行分析,初步探讨不同通道大小选择对于 PCNL 出血量的影响,并得出 F24 通道较 F18 通道而言,更易导致 PCNL 术中出血。PCNL 的通道选择应进行详细的、个体化的术前分析,考虑患者本身的身体健康状况,对于结石位置、大小、数量及手术时间等进行综合评估,选择恰当的通道大小尤为重要<sup>[12-18]</sup>。本研究随机录入通道组,结石大小未严格控制统一,后续研究会针对性分析不同通道在相同大小、位置结石情况下的出血几率和出血量。

总之,PCNL 是治疗复杂性肾结石或输尿管上段结石的首选方法,出血仍是严重且常见的并发症之一,出血可发生在建立皮肾通道、通道扩张、内镜摆动、碎石清石等术中操作过程中,也可发生在术后早期或迟发性出血。正确的术中操作、积极治疗基础疾病,恰当选择通道大小、及时有效的术后对症处理可极大减少出血几率和出血量。

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(上接第 3632 页)

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