

## • 血管介入 Vascular intervention •

## 移植肾动脉狭窄的介入治疗

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【摘要】 目的 探讨移植肾动脉狭窄(TRAS)的介入治疗。方法 35 例 TRAS 患者从肾移植到出现肾动脉狭窄症状平均 6.9 个月(3 ~ 18 个月),记录经皮血管成形术(PTA)前后血压变化和血肌酐水平。经对侧股动脉或左肱动脉入路,使用普通球囊导管(5 F,直径 4 ~ 6 mm,长度 20 ~ 30 mm)和微球囊导管(2.6 F,直径 3 mm,长度 36 mm)分别对 35 例 TRAS 行 PTA 术,其中 11 例放置支架。结果 35 例 TRAS 患者共行 46 次 PTA(行 1 次 PTA 20 例,2 次 12 例,3 次 3 例),其中 26 次经对侧股动脉,20 次经左肱动脉穿刺插管。PTA 治疗前肾动脉狭窄率为 75% ~ 98%,PTA 后狭窄率降为 10% ~ 30%。PTA 前收缩压 150 ~ 210 mmHg(1 mmHg = 0.133 kPa),平均 170 mmHg,舒张压 90 ~ 145 mmHg,平均 120 mmHg;PTA 后收缩压降为 100 ~ 190 mmHg,平均 135 mmHg,舒张压降为 80 ~ 125 mmHg,平均 85 mmHg。首次 PTA 后再狭窄率 39%,再次 PTA 后狭窄率 15%。46 次 PTA 共使用普通球囊导管 26 个,微球囊导管 20 个。11 枚支架 8 枚为自膨式支架,3 枚为球囊扩张式。术后随访 3 ~ 60 个月(平均 23 个月)。35 例中最终治愈 11 例,改善 15 例,好转 7 例,无效 2 例。除 1 例肱动脉入路发生术后穿刺点血肿外无其他并发症。结论 TRAS 的 PTA 治疗安全有效,配合肱动脉入路和微球囊导管有助于提高手术成功率;合理选用支架能降低再狭窄率。

【关键词】 血管成形术; 肾动脉梗阻; 肾移植; 治疗结果

中图分类号:R543.5; R692.16 文献标识码:A 文章编号:1008-794X(2008)-12-0853-05

**Interventional treatment of transplanted renal artery stenosis** OUYANG Qiang, DONG Wei-hua, XIAO Xiang-sheng. Department of Radiology, Xinhua Hospital, Medical College, Shanghai Jiaotong University, Shanghai 200092, China

【Abstract】 **Objective** To analyze the treatment of transplant renal artery stenosis (TRAS) by percutaneous transluminal angioplasty (PTA) and stenting. **Methods** The average time duration from transplantation to the on set symptom of TRAS was 6.9 months (3 - 18 months) in 35 TRAS patients. BP and creatinine level were recorded before and after the procedure. PTA was performed through contralateral femoral or left brachial approach with ordinary balloon (5 F, length 20 ~ 30 mm) and/or small balloon catheters (2.6 F, length 36 mm) in all patients, and stents were embedded in 11 of them. **Results** A total of 46 PTA were successfully performed (1 time, 20 cases; 2 times, 12 cases, and 3 times, 3 cases) via contralateral femoral approach (26) and left brachial approach (15). Stenosis were significantly decreased from 75% ~ 98% pre-PTA to 10% ~ 30% post-PTA. Systolic pressure decreased from 170 mmHg (150 ~ 210 mmHg) pre-PTA to 135 mmHg (100 - 190 mmHg) post-PTA and diastolic pressure decreased from 120 mmHg (90 - 145 mmHg) to 85 mmHg (80 - 125 mmHg) respectively. Restenosis rates were 39% after first PTA and 15% after the second time. All 46 times of PTA used 26 ordinary balloon catheters and 20 microballoon catheters. 8 self-expandable stents (Wallstent) and 3 balloon-dilatation stents (Palmaz) were released in 11 cases. There were healed case ( $n = 11$ ), melioration ( $n = 15$ ), improvement ( $n = 7$ ), and inefficiency ( $n = 2$ ) after follow-up of 23 months (3 - 60 month). No complication occurred except puncture site hematoma via the brachial artery approach in 1 case. **Conclusions** PTA is safe and effective in the treatment of TRAS and high rate of procedure success may be achieved with the help of brachial approach and micro-balloon catheter. Reasonable use of stents is beneficial in decreasing the restenosis. (J Intervent

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Radiol, 2008, 17: 853-857)

【Key words】 Angioplasty; Renal artery obstruction; Kidney transplantation; Treatment Outcome

随着移植肾患者的不断增多,术后移植肾动脉狭窄(transplant renal artery stenosis,TRAS)也越来越受到临床重视。随着介入操作经验的积累、球囊支架等医疗器械的不断发展以及病例的增多,现将我们 15 年来用经皮血管成形术(percutaneous transluminal angioplasty, PTA)和支架治疗 TRAS 的情况作一总结。

## 1 材料与方法

### 1.1 病例资料

35 例 TRAS, 男 28 例, 女 7 例。年龄 21 ~ 68 岁, 平均 34 岁。所有患者均接受同种尸肾移植, 移植术采用髂内外动脉和移植肾动脉端-端及端-侧吻合, 移植肾置于髂窝内。从肾移植到出现肾动脉狭窄症状平均 6.9 个月(3 ~ 18 个月)。TRAS 的临床表现为: ①高血压: 收缩压 150 ~ 210 mm Hg (1 mmHg = 0.133 kPa), 平均 175 mmHg, 舒张压 90 ~ 145 mmHg, 平均 120 mmHg。②肾功能损害: 除 5 例外, 余 30 例均有不同程度血清肌酐升高, 平均血清肌酐值为 433  $\mu$ mol/L。

### 1.2 方法

1.2.1 PTA 和支架释放术 采用 Seldinger 术经对侧股动脉穿刺, 用 5 F Cobra 导管插管至移植侧髂内动脉, 行移植肾动脉造影(3 ml/s  $\times$  3 s)以显示狭窄情况。采用 DSA 软件(Siemens Digitron III, 点校正法)自动测量血管的直径和狭窄程度。用软头交换导丝通过病变血管段达肾段动脉以远, 但应避免过深而发生肾动脉甚或肾脏穿孔, 引入球囊导管(5 F,

直径 4 ~ 6 mm, 长度 20 ~ 40 mm) 后经导管注入 5 000 u 肝素后行 PTA 术, 方法同文献<sup>[1]</sup>。经股动脉引入球囊导管失败者, 则采用经左肱动脉穿刺插管入路。

病变远端肾动脉干较短而限制普通球囊导管使用者, 以及血管重度狭窄(大于 95%)使普通球囊导管难以通过者则采用微球囊导管(2.6 F, 直径 3 mm, 长度 36 mm, Scimed 公司)扩张或预扩张后再用普通球囊导管扩张。

8 例患者 PTA 治疗 2 次后因血压再次升高, 第 3 次行 PTA 时同时放置支架; 3 例患者于第 1 次 PTA 时即放置支架。

1.2.2 疗效评定标准 技术成功定义为术后残余狭窄低于 30%。临床疗效的评定主要依据血压改变情况分为: ①治愈, 停用降压药物, 血压正常。改善, 降压药物用量减少, 血压有所降低。好转: 降压药物用量没有减少, 血压有所降低。无效, 降压药物以及血压均无变化, 或需药物加量、或病情加重。

## 2 结果

### 2.1 技术成功率

35 例 TRAS 患者共行 46 次 PTA, 其中 26 次经对侧股动脉 1 次插管成功, 20 次经对侧股动脉入路失败后改由左肱动脉入路成功, 10 次为 PTA 后高血压复发而再次行 PTA 术者, 因有前次失败教训而直接经左肱动脉穿刺插管成功(图 1)。PTA 治疗前肾动脉狭窄率为 75% ~ 98%, PTA 后狭窄率降为 10% ~ 30%。

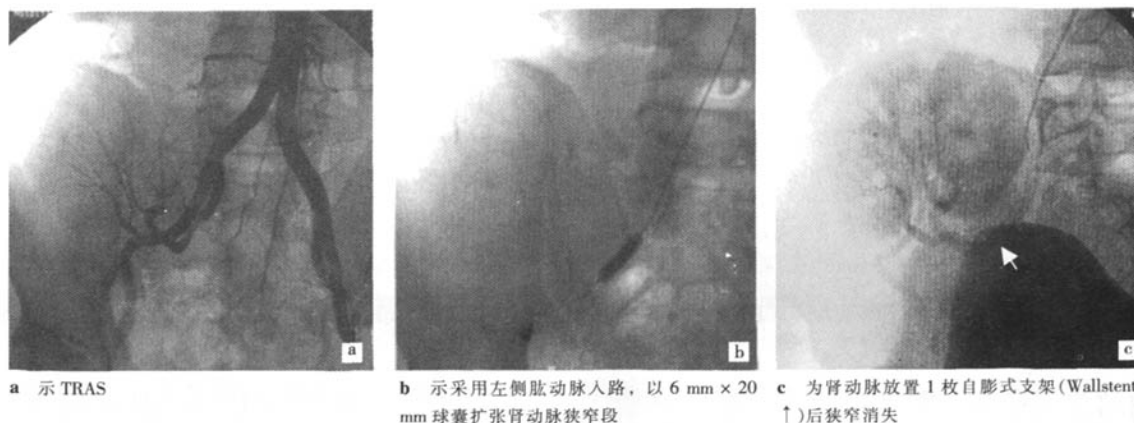


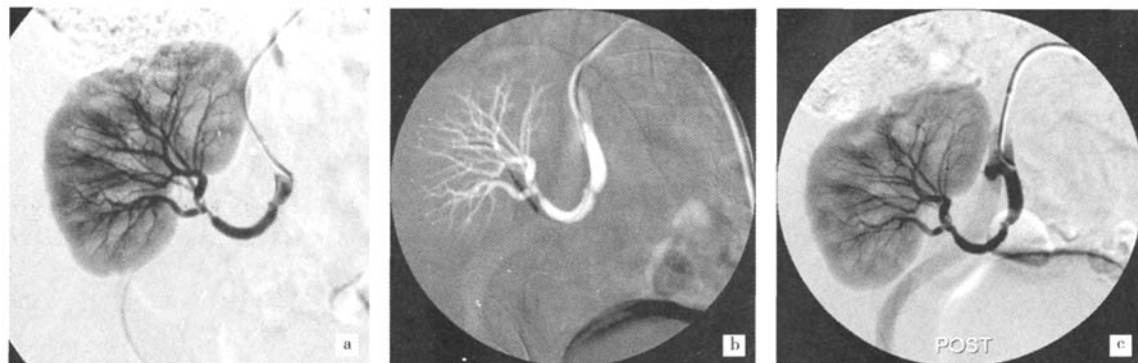
图 1 示左肱动脉入路治疗 TRAS

## 2.2 球囊导管和支架

26 次 PTA 术使用普通球囊导管成功, 17 次因狭窄程度高(狭窄段直径小于 1.5 mm)而先用微球囊导管扩张后行普通球囊导管扩张, 另 3 次因远端

正常肾动脉干短(小于 20 mm)而采用微球囊导管扩张成功(图 2)。11 枚支架 8 枚为自膨式支架(Wallstent), 3 枚为球囊扩张式(Palmaz)支架。

## 2.3 疗效和并发症



a 示肾动脉狭窄邻近肾门

b 重叠透视下用 3 mm × 36 mm 微球囊导管对狭窄段进行扩张

c 示扩张后 TRAS 明显好转

图 2 球囊扩张导管治疗肾门附近 TRAS

术后随访 3 ~ 60 个月(平均 23 个月)。35 例中行 1 次 PTA 者 20 例, 2 次 12 例, 3 次 3 例。首次 PTA 后再狭窄率 39%, 再次 PTA 后狭窄率 15%。35 例中最终治愈 11 例, 改善 15 例, 好转 7 例, 无效 2 例。2 例无效均为肾实质内动脉分支纤细, 最终进行透析。

术后患者收缩压降为 100 ~ 190 mmHg, 平均 135 mmHg, 舒张压降为 80 ~ 125 mmHg, 平均 85 mmHg。术前 30 例血肌酐水平升高者术后 22 例有不同程度下降, 平均血肌酐降至 108  $\mu\text{mol/L}$ , 但仍有 8 例高于正常水平。手术前后血压变化和血肌酐值变化经统计学处理有统计学意义( $P < 0.05$ )。

除 1 例肱动脉入路术后发生左上臂大面积血肿而致急诊筋膜切开减压术外, 本组未见其他并发症。

## 3 讨论

移植肾的动脉狭窄占全部肾移植患者的 1% ~ 10%<sup>[2]</sup>, 随着彩色多普勒、CTA 和 MRA 的不断普及, 近年统计其发生率较以往有增高趋势。TRAS 大多发生于肾移植后 6 个月左右<sup>[3]</sup>, 临床表现主要为舒张压明显的顽固性血压升高和移植肾区血管杂音。持续的高血压导致肾动脉进一步狭窄, 进而引起肾脏灌注减少、肾功能损害, 最终导致移植肾丢失。移植肾的动脉狭窄部位多在吻合口处或吻合口后的肾动脉主干, 也可以在肾段动脉(本组未见)。随着肾移植术式的改进, 目前供肾从主动脉开窗后行髂外动脉端-侧吻合, 狭窄率大大降低。

## 3.1 介入技术的选择及分析

3.1.1 左肱动脉入路 本组资料除 1 例采用髂外动脉与移植肾动脉端-侧吻合外, 余均采用髂内动脉和移植肾动脉端-端吻合。移植肾位于髂窝内, 肾动脉与髂内动脉常成角。当从对侧股动脉入路引入导管时, 需跨越腹主动脉分叉, 然后在移植肾动脉吻合口形成 1 个向上的折返, 当该折返角较小甚至呈锐角时, 难以将张力较大的球囊导管置入狭窄段肾动脉。而从左肱动脉入路, 顺应血管走向, 减少导管扭曲, 选择性插管容易成功。本组左肱动脉入路的比例为 43.5%(20/46), 高于原位肾动脉狭窄 PTA 术需经左肱动脉入路比例(一般为 10%), 当然这也与操作者的习惯和经验有关。当从左肱动脉入路时, 穿刺时应防止正中神经损伤而导致前臂麻木疼痛<sup>[4]</sup>。导管、球囊推送器以及交换导丝等器械均应选择较长型号, 术前应做好准备。引入导丝时应在透视下, 避免误入升主动脉和心脏。

3.1.2 内支架选择 35 例 TRAS 患者中 2 例表现为卧床休息时血压平稳正常, 起床活动后则血压逐渐上升, 劳累后更加明显。这种体位性高血压可能是因为移植肾及肾动脉周围缺乏正常肾周围的支撑保护组织, 如韧带、筋膜等, 移植肾和肾动脉之间以及吻合口处容易受体位影响而旋转、弯曲, 从而导致肾动脉受压, 肾血流量减低进而产生高血压。对于这种肾移植后的体位性高血压患者, 应该选择自膨式而非球囊扩张式支架, 因为自膨式支架柔顺性较好, 能满足此时对支架的高弹力要求。这和原

位肾动脉狭窄常采用球囊扩张式支架有所不同。

与其他血管领域一样,何时只需行常规 PTA,何时需置放支架仍然存在争议。通常是在 PTA 后再狭窄或 PTA 后狭窄率仍大于 30% 时置放支架,因为大部分病例 PTA 后临床症状和血压均有明显改善。本组 11 例置放支架后 9 例随访 1 年无再狭窄发生;2 例置放支架 6 个月后又出现水肿,B 超及 DSA 均显示再狭窄,球囊扩张后随访 6 个月无临床症状,但更长期的通畅率还需进一步观察。鉴于支架术后有一定比率的再狭窄(10%~15%),对于单个移植肾而言,再狭窄存在肾丢失的风险,这也就是本组病例支架置入术比率较低(11/35)的考虑因素。Sierre 等<sup>[5]</sup>报道 1 组 6 例 TRAS 患者,行 PTA 及外科手术治疗后复发,放置支架(2 例 Palmaz,4 例 Wallstent 支架)后随访 7~60 个月(平均 34 个月),仅 1 例患者有不到 50% 的狭窄且无明显临床症状,余均保持通畅;患者所需降压药物也从术前平均 2.5 种降为 1.6 种。Bertoni 等<sup>[6]</sup>报道 1 组 9 例 TRAS 患者行 PTA 治疗复发者放置支架(Palmaz)后随访 1

~3 年的结果:平均动脉压(1/3 收缩压+2/3 舒张压)、肾动脉峰值流速和血肌酐水平均较术前有明显降低,且未出现再狭窄症状。

### 3.2 关于假性 TRAS

假性 TRAS 是指继发于受者自身病变而引起的移植肾动脉吻合口近端的髂动脉狭窄。胰岛素依赖型糖尿病、肥胖和受者年龄是其影响因素。Becker 等<sup>[7]</sup>对 92 例疑似 TRAS 患者进行 MRA 和 DSA 后发现,24 例为真性 TRAS 而 15 例为假性,还有 5 例真、假阳性同时存在。Patel 等<sup>[8]</sup>报道了 3 例假性 TRAS,2 例最终肾丢失而需透析,1 例经外科血管旁路移植术治愈。本组虽然未见,但应加以识别。

### 3.3 介入手术的注意事项及其评价

3.3.1 对比剂 碘对比剂有相当的肾毒性,而为了充分显示移植肾动脉和髂动脉及分支,常需改变投照角度多次造影,增加了对比剂的用量,进一步损害了肾功能。CO<sub>2</sub> 作为一种可替代的对比剂,应用于移植肾这种特殊类型的孤立肾,具有一定的临床价值(图 3)<sup>[9,10]</sup>。

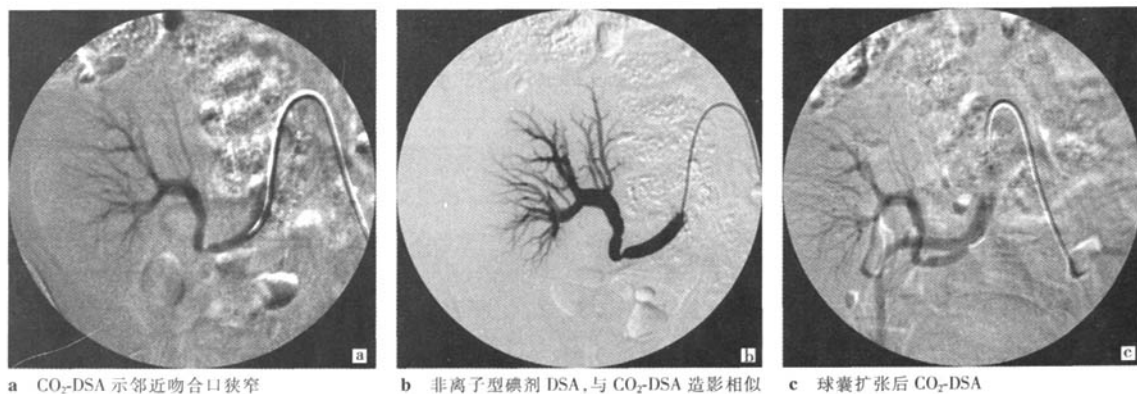


图 3 CO<sub>2</sub>-DSA 对比剂比较

3.3.2 并发症 肱动脉入路同传统的股动脉入路相比,包扎较困难,容易出现血肿。本组 1 例术后包扎先期过紧,患者左前臂麻木、冰冷,后略做松解发生大面积血肿,当晚骨科急诊行左上臂筋膜切开减压术。此时 PTA 后的抗凝和术中止血成为矛盾,处理十分棘手,所幸最终移植肾动脉内无血栓形成,左上肢亦恢复正常。

最严重的并发症是肾动脉血栓形成,彭志毅等<sup>[11]</sup>曾报道应用经皮血管内支架成形术治疗 3 例移植肾动脉狭窄患者,2 例成功并放置支架,1 例多次努力并更换导管最终仍未能插管进入移植肾动脉,术后超声提示肾动脉血栓形成,最终导致移植肾丢失。3 例移植肾均位于髂窝内,作者均采用对侧

股动脉插管,从中可以吸取的经验仍然是下述 2 点:①肾动脉缺血时间不能过长,反复插管不成功时不应勉强继续,使用微导丝和微球囊有时事半功倍;②对侧股动脉入路不成功时应考虑左肱动脉入路。③鉴于移植肾为单一功能肾,保护肾功能尤为重要,必要时可使用保护伞以保护肾功能。

内科治疗 TRAS 收效甚微,外科通过切除狭窄段重新吻合或用自身静脉将肾动脉和髂动脉旁路移植。尽管外科手术不断进步,但仍有较高的移植肾丢失和肾功能损害。

总之,PTA 创伤小,具有可重复性,治疗效果立竿见影,是治疗移植肾动脉狭窄的首选方法;配合内支架的合理选用,大多数患者均有较好的效果。

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(收稿日期:2008-10-07)

## ·消 息·

## 第五届中国东部介入放射学学术会议征文通知

由中华医学会安徽省放射学分会介入学组、《介入放射学杂志》编委会共同主办的第五届中国东部介入放射学大会将于 2009 年 4 月在安徽省黄山市举行。届时会议将邀请国内外著名介入放射学专家进行专题讲座。此次会议内容包括医学继续教育讲座、学术交流、影像设备与介入器材展示等内容, 欢迎广大义务和科研工作者撰写论文并参加会议, 与会代表可获得国家级 I 类学分。

## 会议征文内容:

1. 各种恶性肿瘤的介入治疗;
2. 胸腹主动脉搏瘤的介入治疗;
3. 脑血管性疾病的介入治疗;
4. 介入治疗的规范化与标准化讨论;
5. 非血管性疾病的介入治疗;
6. 相关介入治疗的新材料与器材的研究;
7. 介入病房的管理及护理;
8. CT 及 MRI 三维成像在血管性疾病介入方面的应用;
9. 基因技术在介入治疗中应用。

## 征文要求:

专题讲座由组委会约稿, 亦可自荐需全文; 论著需 1 000 字以内的标准论文摘要; 来稿请标明题目、作者姓名、单位、详细地址、邮编、联系电话, 请自留底稿, 恕不退稿; 所有稿件一律要求 word 格式打印, 邮寄者需附光盘, 欢迎用 E-mail 投稿, 网址: gaobinrm@hotmail.com。

征文截止日期: 2009 年 3 月 15 日以当地邮戳为准。


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中华医学会安徽省放射学分会介入学组  
中华医学会江苏省放射学分会介入学组  
《介入放射学杂志》编委会

2008-11-28

## 移植肾动脉狭窄的介入治疗

作者: 欧阳强, 董伟华, 肖湘生, OUYANG Qiang, DONG Wei-hua, XIAO Xiang-sheng  
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刊名: 介入放射学杂志   
英文刊名: JOURNAL OF INTERVENTIONAL RADIOLOGY  
年, 卷(期): 2008, 17(12)  
被引用次数: 0次

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## 相似文献(10条)

1. 期刊论文 [欧阳强, 董生, 董伟华, 肖湘生, 常恒. 介入治疗移植肾动脉狭窄. 中华放射学杂志 2004, 38 \(10\)](#)  
目的探讨移植肾动脉狭窄 (TRAS) 的介入治疗. 方法 21 例 TRAS 患者从肾移植到出现肾动脉狭窄症状平均 6.6 个月 (3~15 个月), 记录经皮血管成形术 (PTA) 前后血压变化和肌酐水平. 经对侧股动脉或左肱动脉入路, 使用普通球囊导管 (5 F, 直径 4~6 mm, 长度 20~30 mm) 和微球囊导管 (2.6 F, 直径 3 mm, 长度 36 mm) 分别对 21 例 TRAS 行 PTA 术, 其中 5 例放置支架. 结果 21 例 TRAS 患者共行 32 次 PTA (行 1 次 PTA 13 例, 2 次 5 例, 3 次 3 例), 其中 22 次经对侧股动脉, 10 次经左肱动脉穿刺插管. PTA 治疗前肾动脉狭窄率为 79%~97%, PTA 后狭窄率降为 10%~30%. PTA 前收缩压 150~210 mm Hg (1mm Hg=0.133 kPa), 平均 170 mm Hg, 舒张压 90~145 mm Hg, 平均 120 mm Hg; PTA 后收缩压降为 100~190 mm Hg, 平均 135 mm Hg, 舒张压降为 80~125 mm Hg, 平均 85 mm Hg. 首次 PTA 后再狭窄率 38%, 再次 PTA 后狭窄率 14%. 32 次 PTA 共使用普通球囊导管 25 个, 微球囊导管 7 个, 5 个支架 4 个为自膨式支架, 1 个为球囊扩张式. 术后随访 3~60 个月 (平均 23 个月). 21 例中最终治愈 6 例, 改善 8 例, 好转 5 例, 无效 2 例. 除 1 例肱动脉入路发生术后穿刺点血肿外无其他并发症. 结论 TRAS 的 PTA 治疗安全有效, 配合肱动脉入路和微球囊导管有助于提高手术成功率; 合理选用支架能降低再狭窄率.
2. 外文期刊 [Nicita, G. Villari, D. Marzocco, M. Li-Marzi, V. Trippitelli, A. Santoro, G. Endoluminal stent placement after percutaneous transluminal angioplasty in the treatment of post-transplant renal artery stenosis.](#)

**PURPOSE:** We report our experience with endoluminal stent placement after percutaneous transluminal angioplasty for the treatment of post-transplant renal artery stenosis. **MATERIALS AND METHODS:** From October 1992 to September 1996, 8 stents were successfully implanted in 7 patients affected by resistant transplant renal artery stenosis. All transplanted kidneys were procured from cadaver donors. The patients were routinely evaluated with duplex sonography and the median interval between transplantation and stenosis detection was 7.4 months (range 0.5 to 17). When serious renal stenosis was diagnosed (greater than 50%), selected angiography and percutaneous transluminal angioplasty were performed. In 8 cases (7 patients) an endoluminal metallic Palmaz stent was placed in the site of the restenosis. One patient received 2 stents repeatedly positioned in different stenosis sites. **RESULTS:** No major complications occurred. Clinical outcome was positive in 5 patients (71.4%) and Stenosis recurred in 2 (28.5%) (less than 50% and less than 35%, respectively). Median followup after stent placement was 14.8 months (range 1 to 37). **CONCLUSIONS:** Percutaneous

endoluminal stent procedures after resistant transplant renal artery stenosis or for ex novo treatment for severe anastomotic stenoses appears to be promising. Longer followup periods are necessary for true evaluation of this procedure.

3. 外文期刊 [Plouin. PF. Chatellier. G. Darne. B. Raynaud. A Blood pressure outcome of angioplasty in atherosclerotic renal artery stenosis: a randomized trial. Essai Multicentrique Medicaments vs Angioplastie \(EMMA\) Study Group.](#)

Data for the effects on blood pressure of renal artery balloon angioplasty are mostly from uncontrolled studies. The aim of this study was to document the efficacy and safety of angioplasty for lowering blood pressure in patients with atherosclerotic renal artery stenosis. Patients were randomly assigned antihypertensive drug treatment (control group, n = 26) or angioplasty (n = 23). Twenty-four-hour ambulatory blood pressure, the primary end point, was measured at baseline and at termination. Termination took place 6 months after randomization or earlier in patients who developed refractory hypertension. In those allocated angioplasty, antihypertensive treatment was discontinued after the procedure but was subsequently resumed if hypertension persisted. Secondary end points were the treatment score and the incidence of complications. Two patients in the control group and 6 in the angioplasty group suffered procedural complications (relative risk, 3.4; 95% confidence interval, 0.8 to 15.1). Early termination was required for refractory hypertension in 7 patients in the control group. Antihypertensive treatment was resumed in 17 patients in the angioplasty group. Mean ambulatory blood pressure at termination did not differ between control (141+/-15/84+/-11 mm Hg) and angioplasty (140+/-15/81+/-9 mm Hg) groups. Angioplasty reduced by 60% the probability of having a treatment score of 2 or more at termination (relative risk, 0.4; 95% confidence interval, 0.2 to 0.7). There was 1 case of dissection with segmental renal infarction and 3 of restenosis in the angioplasty group. No patient suffered renal artery thrombosis. In unilateral atherosclerotic renal artery stenosis, angioplasty is a drug-sparing procedure that involves some morbidity. Previous uncontrolled and unblinded assessments of angioplasty overestimated its potential for lowering blood pressure.

4. 外文期刊 [Rispoli. P. Conforti. M. Melloni. C. Barile. G. Raso. AM Superior mesenteric and renal artery embolism during PTA and re-stenting of infrarenal abdominal aorta. Report of a case and review of the literature.](#)

The authors report a case of acute superior mesenteric and right renal artery embolism that occurred during an interventional radiological procedure on the abdominal aorta of a young diabetic woman. The onset of a severe abdominal pain during the procedure evoked the clinical suspicion of intestinal ischemia related to the dislodgement of atheroembolic material into the mesenteric artery; the event was correctly diagnosed, but the surgical therapy was delayed by many hours because of the fact that the patient was in a peripheral hospital of the region and had to be transferred to our institution. Fortunately in spite of the considerable delay, the operation was fully successful, probably because of the favourable location of the embolus, which allowed collateral splanchnic circulation to maintain a good metabolic balance.

5. 外文期刊 [Zeller. T Is drug-eluting stent angioplasty indicated for the treatment of atherosclerotic renal artery stenosis and restenosis?](#)

The introduction of stenting has revolutionized percutaneous renal revascularization. In addition to promising single centre reports [1-3], a randomized study proved technical and functional superiority of stenting over conventional balloon angioplasty in the treatment of atherosclerotic ostial renal artery stenosis, the most common occlusive renal entity. Nowadays, using premounted low profile stent devices, atherosclerotic renal artery stenosis can be successfully treated in about 100%. Several variables had been examined regarding their impact on restenosis rates after stenting delivered comparable results as found with the coronary arteries: The only predictor of instant restenosis occurrence was dependent on the renal artery or stent diameter with increasing restenosis rates due to decreasing vessel or stent diameters.

6. 外文期刊 [Beecroft JR. Rajan DK. Clark TW. Robinette M. Stavropoulos SW Transplant renal artery stenosis: outcome after percutaneous intervention.](#)

PURPOSE: To assess the outcome of percutaneous transluminal angioplasty (PTA) and stent placement as the primary treatment for transplant renal artery stenosis (TRAS). MATERIALS AND METHODS: A retrospective review of PTA and stent placement procedures performed for TRAS from April 1997 to July 2003 was conducted. Reviewed parameters included technical success, date of transplantation, dates of percutaneous intervention, mean arterial blood pressure, number of blood pressure medications, and serum creatinine level before and after intervention. Twenty-one interventions were performed in 18 allografts. The primary clinical indication for imaging and treatment was increased creatinine level in 12 allografts and hypertension in six allografts. Patency rates were estimated with use of the Kaplan-Meier method. RESULTS: The technical success rate of PTA/stent placement was 100% and the clinical success rate was 94% (17 of 18 allografts). Thirteen interventions involved PTA alone, with eight combined PTA and stent insertions. The mean preintervention serum creatinine level among 12 allografts presenting with elevated creatinine levels was 2.8 mg/dL +/- 1.4 (SD), compared with a 1-month postintervention mean of 2.2 mg/dL +/- 0.7 (P = .03). Of six allografts that presented with hypertension, significant improvement was seen between the preintervention and 1-month postintervention mean systolic (174 mm Hg vs 135 mm Hg, P = .003) and diastolic (99 mm Hg vs 82 mm Hg, P = .02) pressures. These patients required a mean of 2.3 medications for blood pressure control before intervention, compared with a mean of 1.0 medications at 1 month after intervention (P = .002). Primary patency rates at 3, 6, and 12 months (+/-95% CI) were 94% +/- 6%, 72% +/- 12%, and 72% +/- 12%, respectively. Secondary patency rates at 3, 6, and 12 months (+/-95% CI) were 100%, 85% +/- 10%, and 85% +/- 10%, respectively. Mean follow-up time was 27 months. Of the eight allografts that underwent stent placement,

7. 外文期刊 [Senekowitsch C. Assadian A. Wlk MV. Assadian O. Ptakovsky H. Hagmuller GW Renal artery surgery in the era of endovascular intervention.](#)

BACKGROUND: In the last decade the therapeutic concept of renovascular disease has changed. The numbers of primary surgical revascularisations have fallen substantially due to the invention of percutaneous transluminal angioplasty (PTA). PATIENTS AND METHODS: Retrospective data analysis. From September 1992 to December 2001, 42 patients were operated on 49 renal arteries at our institution. During the same period, 166 PTA of renal arteries alone and 92 PTA with stent were performed. Twenty-five patients and 27 renal arteries were operated encompassing an aortic reconstruction due to atherosclerosis (aortic occlusion 14, aortic aneurysm 11). The median age at operation was 61 years (range 47 years to 76 years). Four patients were operated on because of renal artery aneurysms with a diameter of more than 2.5 cm. The median age of these patients was 68.5 years (range 60 years to 77 years). Seven patients presented with atherosclerotic changes of the renal artery without aorto-iliac involvement. Their median age was 62.8 years

at operation (range 39 years to 77 years). Of these, one suffered from rupture of the renal artery during PTA and needed emergency surgery: Six patients and 11 renal arteries with FMD were surgically reconstructed. RESULTS: The primary patency rate of all reconstructed renal arteries of surviving patients after 5 years was 92%, the secondary patency rate after 5 years was 98%. Two patients died perioperatively (4.7%). One patient had presented with a symptomatic thoraco-abdominal aneurysm and died ultimately because of a stroke. The second patient had an infrarenal AAA and died after a myocardial infarction. Twenty (47.7%) of all surgically treated patients had had at least one PTA preoperatively. CONCLUSION: During the last decade, primary surgical renal artery reconstruction was performed in about half of the cases. The decrease of primary open surgery of the renal arteries was most striking in patients with aorto-iliac occlusive disease. From 1

8. 外文期刊 [Krijnen P. van Jaarsveld BC. Hunink MG. Habbema JD The effect of treatment on health-related quality of life in patients with hypertension and renal artery stenosis.](#)

The quality of life in patients with hypertension is considered to be impaired mainly by side effects of antihypertensive drug therapy. Since balloon angioplasty for renal artery stenosis has a medication-sparing effect, it may lead to an improvement in quality of life. The objective of the study is to compare the effect of antihypertensive drug therapy and balloon angioplasty on quality of life in patients with hypertension and renal artery stenosis. We compared the quality of life in 56 patients randomised to balloon angioplasty to that in 50 patients randomised to antihypertensive drug therapy after 3 and 12 months of follow-up. Quality of life was measured using a questionnaire on physical symptoms associated with hypertension and antihypertensive drugs, and two generic health questionnaires (MOS Survey and EuroQol instrument). After follow-up, the patients who underwent angioplasty used less antihypertensive drugs than the patients who were treated with antihypertensive drugs only (mean $\pm$ s.d., 1.9 $\pm$ 0.9 vs 2.5 $\pm$ 1.0 drugs after 3 months, P=0.002). They reported similar physical complaints, however, and a similar quality of life. The results after 12 months of follow-up were the same. In conclusion, for patients with hypertension and renal artery stenosis, the decrease in antihypertensive medication after intervention is too small to lead to a detectable improvement in quality of life.

9. 外文期刊 [Zeller. T Is drug-eluting stent angioplasty indicated for the treatment of atherosclerotic renal artery stenosis and restenosis? Society for Cardiac Angiography & Interventions](#)

The introduction of stenting has revolutionized percutaneous renal revascularization. In addition to promising single centre reports [1-3], a randomized study proved technical and functional superiority of stenting over conventional balloon angioplasty in the treatment of atherosclerotic ostial renal artery stenosis, the most common occlusive renal entity. Nowadays, using premounted low profile stent devices, atherosclerotic renal artery stenosis can be successfully treated in about 100%. Several variables had been examined regarding their impact on restenosis rates after stenting delivered comparable results as found with the coronary arteries: The only predictor of in-stent restenosis occurrence was dependent on the renal artery or stent diameter with increasing restenosis rates due to decreasing vessel or stent diameters.

10. 外文期刊 [Akhtar. S. Johnson. KB. Dalton. R. Rees. CR. Marshall. WS. Vallabhan. RC. Anwar. A Balloon rupture during stent implantation: A novel technique of salvage with a new manual power injector.](#)

Pinhole leak or rupture of a stent delivery balloon is a well-recognized technical problem encountered in vascular interventions. This event leads to inadequate stent expansion. These stents cannot be fully deployed with the same balloon and frequently the balloon cannot be retrieved without dislodging the stent. We describe a technique for successful stent deployment in such situations using the Oz Power Syringe, a new manual power injector. Cathet. Cardiovasc. Intervent. 48:74-77, 1999. Copyright 1999 Wiley-Liss, Inc.

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