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· 主动脉疾病专题研究 ·

腹主动脉瘤腔内修复术中髂动脉瘤的处理策略

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摘要

目的: 探讨腹主动脉瘤合并髂动脉瘤的腔内修复术 (EVAR) 方法。

方法: 回顾性分析 2007 年 8 月—2014 年 3 月 35 例腹主动脉瘤合并髂动脉瘤行 EVAR 术患者资料, 其中 9 例合并单侧髂内动脉瘤, 1 例合并双侧髂内动脉瘤, 14 例合并单侧髂总动脉瘤 (直径 >18 mm), 11 例合并双侧髂总动脉瘤, 所用腔内技术包括栓塞髂内动脉瘤后覆盖, 髂内动脉瘤单纯覆盖, “喇叭口”支架, 以及“三明治”技术重建一侧髂内动脉等。

结果: 所有腔内技术均获得成功, 手术时间 (125 ± 40) min, 出血量 (173 ± 65) mL。术中发现内漏 8 例 (22.9%), 其中 I 型内漏 4 例 (近端 2 例, 远端 2 例) 均经球囊扩张后内漏消失, III 型内漏 1 例, 经扩张及部分加弹簧圈栓塞后内漏消失, II 型内漏 2 例及 IV 型内漏 1 例, 均未予处理。35 例术后随访 6~60 个月, 无动脉瘤破裂, 2 例术后 6 个月发现腹主动脉瘤体增大, 造影确诊远端 I 型内漏, 经弹簧圈栓塞后内漏消失, 其余 33 例瘤体直径无增大。

结论: 对于合并髂动脉瘤的腹主动脉瘤患者, 有效处理髂内动脉, 然后根据髂总动脉直径选择合适的治疗方法可以达到理想的近期效果。

关键词

动脉瘤; 主动脉, 腹; 髂动脉瘤; 血管腔内疗法
中图分类号: R654.3

Treatment strategy of iliac artery aneurysm in endovascular repair for abdominal aortic aneurysm

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Abstract

Objective: To investigate the method of endovascular aneurysm repair (EVAR) for abdominal aortic aneurysm (AAA) combined with iliac artery aneurysm.

Methods: The clinical data of 35 patients with AAA and concomitant iliac artery aneurysm undergoing EVAR from August 2007 to March 2014 were retrospectively analyzed. The patients consisted of 9 cases complicated with unilateral internal iliac artery aneurysm, one case with bilateral internal iliac artery aneurysm, 14 cases with unilateral common iliac artery aneurysm (diameter larger than 18 mm) and 11 cases with bilateral common iliac artery aneurysm. The endovascular procedures performed included internal iliac artery embolization followed with stent coverage, simple stent coverage of the internal iliac artery aneurysm, use of a braided stent, and Sandwich technique for internal iliac artery endorevascularization.

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Results: All endovascular procedures were successfully performed, with an average operative time of (125±40) min and blood loss of (173±65) mL. Intraoperative endoleak was observed in 8 patients (22.9%), including type I endoleak in 4 cases (2 from the proximal and 2 from the distal attachment site) which were all resolved after balloon dilatation, type III endoleak in one case which was resolved by dilatation plus adjunctive coil embolization, type II endoleak in 2 cases and type IV endoleak in one case, none of which received further intervention. Postoperative follow-up was conducted for 6 to 26 months in the 35 patients, during which time no aneurysmal rupture occurred; AAA enlargement was found in 2 cases 6 months after procedure, which was identified as distal type I endoleak by radiography and resolved by coil embolization, and no aneurysmal enlargement occurred in any of the remaining 33 cases.

Conclusion: Ideal short-term results may be obtained in patients with AAA and concomitant iliac artery aneurysm by appropriate treatment of the internal iliac artery and then suitable endovascular techniques according to the diameter of the common iliac artery.

Key words Aneurysm; Aorta, Abdominal; Iliac Artery; Endovascular Therapy

CLC number: R654.3

随着腔内器具的发展以及介入治疗的进步, 腹主动脉瘤腔内修复术 (endovascular aneurysm repair, EVAR) 目前已成为治疗腹主动脉瘤 (abdominal artery aneurysm, AAA) 的主要方法^[1-2]。AAA合并髂动脉瘤 (iliac artery aneurysm, IAA), 既要保证至少一侧髂内动脉 (internal iliac artery, IIA) 血供^[3], 又要防止移植物与动脉壁贴附不佳所致内漏, 仍是目前AAA腔内治疗的难点。现对我院自2007年8月—2014年3月35例AAA合并IAA接受EVAR术的患者临床资料进行总结, 报告如下。

1 资料与方法

1.1 一般资料

本组35例, 男27例, 女8例; 年龄58~90岁, 平均73岁; 均为真性动脉瘤, 其中25例为体检发现, 7例不规则腹痛症状考虑AAA先兆破裂, 3例腹痛急诊入院; 瘤体最大直径45~91 mm, 平均59 mm。单侧IIA瘤直径15~40 mm, 双侧IIA瘤直径约25 mm, 1例IIA瘤破裂, 直径约40 mm。没有累及IIA者, 髂总动脉 (common iliac artery, CIA) 最大直径18~30 mm, 平均22 mm, 其中14例单侧CIA瘤, 直径18~30 mm, 7例CIA瘤直径<25 mm, 3例一侧CIA直径<25 mm, 对侧≥25 mm。1例双侧CIA瘤直径≥25 mm, 合并高血压病32例, 糖尿病9例, 冠心病17例, 陈旧性心梗7例。

1.2 病例选择标准

有症状及无症状的AAA, 合并IAA, 包括CIA瘤, 以及IIA瘤。AAA瘤体直径≥5 cm, 或者IIA瘤直径>2.5 cm, 或者破裂。AAA近端瘤颈锚定区长≥15 mm, 瘤颈角≤60°。

1.3 方法

32例全身麻醉, 3例局部麻醉 (少部分预计手术耗时短且患者体型较瘦、配合的病例可以选择局麻)。平卧位, 经双侧股动脉切开。穿刺先行腹主动脉造影, 确定肾动脉、IIA开口位置, 测量近端瘤颈直径、长度; 肾动脉至IIA长度、CIA直径、髂内外动脉分叉处直径等数据, 选取合适的覆膜支架。35例使用覆膜支架包括先健科技 (深圳) 有限公司19例, 美国Medtronic公司Endurant 11例, 美国Cook公司Zenith 2例, 微创 (上海) 医疗器械有限公司3例。

1.3.1 单侧IIA瘤 首先从对侧股动脉翻山后栓塞IIA瘤, 然后经该侧股动脉置入分叉型支架血管移植物, 近端根据瘤颈情况精确定位, 将远段锚定于髂外动脉 (external iliac artery, EIA)。覆膜部分完全覆盖IIA开口, 精确测量主体至对侧IIA开口的距离以及EIA分叉处的直径, 精确将髂腿覆盖至IIA开口近端而保留该侧IIA血供, CIA瘤样扩张者则选择大口径髂支-“喇叭口”支架保证充分贴壁 (图1)。1例双侧IIA瘤者, 双侧覆膜支架均覆盖至EIA, 覆盖IIA开口, 造影示进入IIA瘤内血流明显缓慢, 造成瘤体慢性栓塞, 避免双侧

IIA 急性缺血所致臀肌缺血或者内脏缺血(图2)。

1.3.2 单侧 CIA 瘤 (1) CIA 瘤累及 IIA, 栓塞该侧 IIA 并将髂腿支延伸至 EIA; (2) CIA 瘤未累及该侧 IIA, CIA 远近段有足够的锚定区 ($\geq 1\text{ mm}$), 根据近髂动脉分叉部位直径选择合适的髂腿支覆盖至髂内外动脉分叉处。

1.3.3 双侧 CIA 瘤 (1) 双侧 CIA 瘤直径均 $<25\text{ mm}$, 选择合适“喇叭口”髂腿支覆盖至髂内外动脉分叉处, 可保留双侧 IIA; (2) 一侧 CIA 最大直径 $\geq 25\text{ mm}$,

栓塞该侧 IIA 并将髂腿支延伸至 EIA, 对侧选择“喇叭口”支架(图3); (3) 1例双侧 CIA 直径均超过 25 mm 者, “三明治”技术重建一侧 IIA, 对侧覆膜支架封盖 IIA 开口至髂外动脉, 然后分别从左侧肱动脉及对侧股动脉入路, 置入2根导丝, 肱动脉入路导丝穿主体髂支分叉选入拟重建一侧 IIA, 导入 vibahn 支架人工血管, 该侧 EIA 入路导丝选入主体, 导入髂支与 vibahn 支架人工血管“对吻”, 同时释放髂支与 vibahn, 支架结合部球囊后扩(图4)。

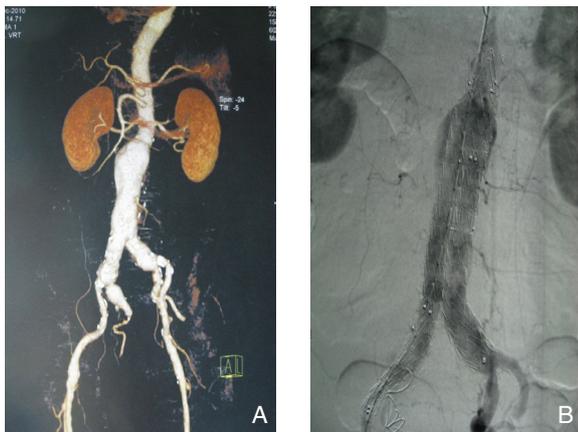


图1 AAA并右IIA瘤 A:左CIA瘤样扩张;B:右IIA栓塞后封盖,左CIA“喇叭口”支架覆盖至髂动脉分叉

Figure 1 AAA with right IIA aneurysm A: Aneurysmal dilatation of the left CIA; B: Embolization followed by coverage of the right IIA, and coverage of the left CIA to bifurcation with a braided stent

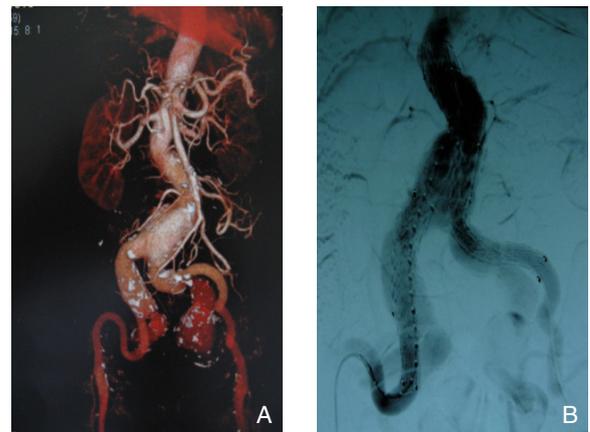


图2 AAA合并双侧IIA瘤 A:CTA;B:双侧IIA单纯封盖,术毕造影示双IIA瘤腔内延迟显影

Figure 2 AAA with bilateral IIA aneurysm A: CTA image; B: Bilateral IIA simple coverage, and radiography showing delayed visualization of the aneurysmal cavity after operation

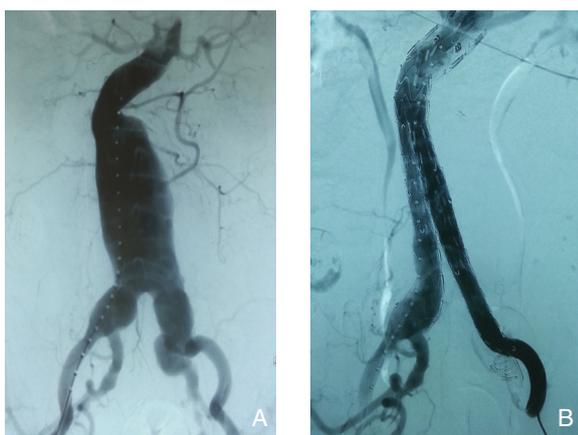


图3 AAA合并双侧CIA瘤 A:左CIA瘤;B:左IIA栓塞后封盖,右CIA“喇叭口”支架覆盖至髂动脉分叉

Figure 3 AAA with bilateral CIA aneurysm A: Left CIA aneurysm; B: Embolization followed by coverage of the left IIA, and coverage of the right CIA to bifurcation with a braided stent



图4 AAA合并双侧CIA瘤 A:瘤体均 $>25\text{ cm}$;B:右侧封盖IIA,左侧Vibahn重建IIA血流

Figure 4 AAA with bilateral CIA aneurysm A: Both aneurysm volume larger than 25 cm ; B: Right IIA coverage and left Vibahn IIA endorevascularization

1.4 随访

术后了解患者生存情况以及有无臀肌缺血、肠缺血等手术相关并发症。每3、6、12个月及此后每年复查主动脉CTA，重点了解有无支架内血栓形成、支架移位、内漏、瘤腔扩张、IIA闭塞等情况。

2 结果

2.1 早期结果

35例均成功完成腔内修复，手术时间(115±36)min，出血量(173±65)mL，无围手术期死亡或心脑血管意外等严重并发症。术中发生程度不同内漏8例，其中I型内漏4例(近端2例，远端2例)，经球囊扩张后内漏消失；III型内漏1例，经球囊扩张及部分加弹簧圈栓塞后内漏消失；II型内漏2例及IV型内漏1例，未予处理。所有IIA栓塞后封盖者无显影。

2.2 随访结果

35例随访6~60个月，平均26个月，无动脉瘤破裂，髂动脉直径无明显扩张，2例术后6个月发现腹主动脉瘤体增大，造影确诊远端I型内漏，经弹簧圈栓塞后内漏消失，其余33例动脉瘤直径无增大。双侧IIA瘤封盖后3个月复查CTA示瘤腔内血栓形成。

3 讨论

3.1 IIA 瘤的处理

IIA的处理，在AAA腔内修复中远端锚定区的处理选择中至关重要。对于合并单侧IIA瘤，若对侧IIA血供良好，可直接进行栓塞、隔绝^[4]；本组9例患者进行单侧IIA栓塞，并将同侧EIA作为远端锚定区完成EVAR，隔绝IIA，疗效满意，术后患者无臀肌缺血及肠缺血症状。

当双侧IIA出现病变的处理仍有争议^[5-7]，Rayt等^[8]认为栓塞单侧或者双侧IIA，出现急性盆腔缺血症的概率无明显差异。考虑双侧IIA栓塞后导致盆腔急性缺血的严重后果，慢性缺血则有一定的代偿期，本组1例双侧IIA瘤，因瘤体的直径及长度均较大，选择一期行双侧IIA封盖，未行弹簧圈栓塞，术毕造影示双侧IIA显影明显延迟，术后患者出现轻度臀肌跛行，运动锻炼后症状减轻。术后3个月随访双侧IIA瘤内血栓形成。笔者认为，双侧IIA均需封盖者，须防止盆腔急性缺血，采取

单纯覆盖IIA开口，IIA内缓慢继发血栓形成达到动脉瘤的处理，又避免了双侧IIA急性缺血发生，盆腔血供得以代偿。但对于其安全性及有效性仍需大样本资料的证实。从本组资料来看，保证一侧IIA的良好血供完成EVAR是安全、重要的。对于双侧IIA瘤，可考虑选择仅处理其中一侧IIA行隔绝术，保留一侧术后随访，充分代偿对侧盆腔血供，为以后处理作好准备^[9-10]。随访中如果发现IIA瘤进展或者先兆破裂，再次选择行栓塞、隔绝，避免盆腔急性缺血。

3.2 CIA 瘤的处理

有数据表明，17%的腹主动脉瘤合并有IAA，CIA最常受累，其次是髂内、髂外动脉^[11]。一般认为，EVAR远端锚定区长度至少应当≥10mm^[12]。为防止远端I型内漏的发生，必须满足足够的锚定距离。

对于单侧CIA瘤(直径18~25mm)累及IIA开口，避免EVAR术后II型内漏发生^[13]，可以通过栓塞IIA将髂腿支架延伸至EIA从而达到确切锚定的目的。但对于双侧CIA瘤则不适宜。近年来，随着腔内材料技术的发展，大口径髂腿支架能够部分解决扩张髂动脉内的支架贴附问题。即所谓“喇叭口”支架^[14]，EIA直径在18~25mm，选择“喇叭口”支架完成经典EVAR，本组资料疗效满意。目前“喇叭口”有20~28mm的髂支可供选择，但往往仍难以满足所有治疗需要，AAA患者大多髂动脉扭曲不规则，长度及直径均难以精确测量，有时移植物短缩，导致术毕远端I型内漏发生，还需延长髂支等；其次，大口径支架其轴向压力会增加髂动脉扩张的几率。本组2例选择“喇叭口”支架，术后6个月发现远端I型内漏，考虑与支架轴向压力致髂动脉直径增大；或者支架变形扭曲后移位、支架与远端锚定区贴附不佳有关。其远期效果仍需进一步随访观察。

对于一侧髂动脉直径>25mm的病例，目前仍推荐栓塞IIA并将EIA作为远端锚定区^[12]。术后随访效果满意，无支架移位。无远端迟发型I型内漏发生。

而对于双侧CIA瘤直径均超过25mm，虽有报道“喇叭口”支架的基础上，结合CIA外绑扎，但减弱了EVAR的微创理念。本组1例行分叉型支架加viabahn三明治技术^[15-16]，保留一侧IIA行重建术，效果满意。而对于三明治技术中III型内漏，可选择CIA瘤腔内弹簧圈栓塞。国外报道^[17-18]的髂动

脉分叉支架,腔内技术有效重建一侧IIA,具有明显的优势,但因其应用的局限性国内尚未上市。

AAA行EVAR过程中,CIA及IIA的病变复杂多变,往往同时存在,现有器械产品并不能满足所有治疗需要,灵活掌握处理策略,能有效提高技术成功率,但远期效果需进一步随访。

参考文献

- [1] Piffaretti G, Mariscalco G, Riva F, et al. Abdominal aortic aneurysm repair: long-term follow-up of endovascular versus open repair[J]. Arch Med Sci, 2014, 10(2):273-282.
- [2] 舒畅,吕新生,汪忠镐,等.腹主动脉瘤的治疗[J].中国普通外科杂志,2003,12(6):435-438.
- [3] Hosaka A, Kato M, Kato I, et al. Outcome after concomitant unilateral embolization of the internal iliac artery and contralateral external-to-internal iliac artery bypass grafting during endovascular aneurysm repair[J]. J Vasc Surg, 2011, 54(4):960-964.
- [4] Casey K, Al-Khatib WK, Zhou W. Hypogastric artery preservation during aortoiliac aneurysm repair[J]. Ann Vasc Surg, 2011, 25(1):e1-8.
- [5] 刘正军,林智琪,赵国湘,等.结扎双侧髂内动脉的腹主动脉瘤切除术:附5例报告[J].中国普通外科杂志,2008,17(6):616-617.
- [6] Maleux G, Willems E, Vaninbrouckx J, et al. Outcome of proximal internal iliac artery coil embolization prior to stent-graft extension in patients previously treated by endovascular aortic repair[J]. J Vasc Interv Radiol, 2010, 21(7):990-994.
- [7] Kritpracha B, Comerota AJ. Unilateral lower extremity paralysis after coil embolization of an internal iliac artery aneurysm[J]. J Vasc Surg, 2004, 40(4):819-821.
- [8] Rayt HS, Bown MJ, Lambert KV, et al. Buttock claudication and erectile dysfunction after internal iliac artery embolization in patients prior to endovascular aortic aneurysm repair[J]. Cardiovasc Intervent Radiol, 2008, 31(4):728-734.
- [9] Delle M, Lönn L, Wingren U, et al. Preserved pelvic circulation after stent-graft treatment of complex aortoiliac artery aneurysms: a new approach[J]. J Endovasc Ther, 2005, 12(2):189-195.
- [10] Haulon S, Greenberg RK, Pfaff K, et al. Branched grafting for aortoiliac aneurysms[J]. Eur J Vasc Endovasc Surg, 2007, 33(5):567-574.
- [11] Hobo R, Sybrandy JE, Harris PL, et al. Endovascular repair of abdominal aortic aneurysms with concomitant common iliac artery aneurysm: outcome analysis of the EUROSTAR Experience[J]. J Endovasc Ther, 2008, 15(1):12-22.
- [12] 陈宇,刘昌伟,吴巍巍,等.合并双髂总动脉瘤的腹主动脉瘤的腔内治疗[J].中国微创外科杂志,2013,13(9):777-779.
- [13] Marchiori A, von Ristow A, Guimaraes M, et al. Predictive factors for the development of type II endoleaks[J]. J Endovasc Ther, 2011, 18(3):299-305.
- [14] Kritpracha B, Pigott JP, Russell TE, et al. Bell-bottom aortoiliac endografts: an alternative that preserves pelvic blood flow[J]. J Vasc Surg, 2002, 35(5):874-881.
- [15] Lobato AC, Camacho-Lobato L. A new technique to enhance endovascular thoracoabdominal aortic aneurysm therapy--the sandwich procedure[J]. Semin Vasc Surg, 2012, 25(3):153-160.
- [16] Wu IH, Chan CY, Chen YS, et al. Crossover chimney technique to preserve the internal iliac artery in abdominal aortic aneurysm with common iliac artery aneurysms[J]. J Endovasc Ther, 2013, 20(3):298-302.
- [17] Karthikesalingam A, Hinchliffe RJ, Holt PJ, et al. Endovascular aneurysm repair with preservation of the internal iliac artery using the iliac branch graft device[J]. Eur J Vasc Endovasc Surg, 2010, 39(3): 285-294.
- [18] DeRubertis BG, Quinones-Baldrich WJ, Greenberg JI, et al. Results of a double-barrel technique with commercially available devices for hypogastric preservation during aortoiliac endovascular abdominal aortic aneurysm repair[J]. J Vasc Surg, 2012, 56(5):1252-1259.

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