·临床研究　Clinical research·

变异的原始三叉动脉夹层动脉瘤的血管内治疗一例并文献复习

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【摘要】 **目的**　探讨夹层动脉瘤的发生机制及变异性原始三叉动脉(primitive trigeminal PTA)动脉瘤的血管内治疗。**方法**　报道并分析我院治疗存在 PTA 并发夹层动脉瘤的病例；Medline 数据库检索 PTA 动脉瘤及所有关于变异型原始三叉动脉(PTAV)的文献，行文献复习。**结果**　通过闭塞夹层动脉瘤及 PTAV 本身的术式治愈患者，出院及 1 年随访的 MRS 评分均为 0 分。存在原始三叉动脉者颅内动脉瘤的发病率约为 3%，其中动脉瘤发自 PTA 本身约占 2%，见 37 例报道，其中 2 例为夹层动脉瘤。PTAV 动脉瘤的发生率约为 9.8%，其中夹层动脉瘤的发生率在 PTAV 组及 PTA 组分别为 50%和 5.4%。**结论**　血管发育异常是除血流动力学因素以外的动脉瘤，特别是夹层动脉瘤的发病原因之一，在无其他并存血管异常时，闭塞载瘤动脉是对 PTAV 动脉瘤安全和有效的治疗方法。

【关键词】 变异原始三叉动脉；夹层动脉瘤；血管内治疗

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Endovascular therapy of persistent trigeminal arterial variant dissection: A case report and literature review

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【**Abstract**】 **Objective**　To investigate the mechanisms of the development of intracranial dissection and the endovascular treatment of PTAV aneurysms. **Methods**　The cases with PTAV and PTAV aneurysms treated in our hospital, the literature involving PTA aneurysms and PTAV from Medline database and finally the literature review were carried out and comprehended. **Results**　The occlusion method for the patients of our hospital with PTAV aneurysm and the aneurysm together with PTAV were successfully performed. The modified ranking scale(MRS)on the discharging day and 1 year follow up was 0. The prevalence of aneurysms in patients with PTA was 3%, and the aneurysms located on PTA itself was only 2%, with 37 cases report including 2 dissection aneurysms. The prevalence of PTAV aneurysms was 9.8% including the incidences of dissection with PTAV and PTA were 50% and 5.4% respectively. **Conclusions**　A defect harboured vessel is one of the mechanisms for developing aneurysm besides the hemodynamic stress, especially the dissection aneurysm. If there's no concomitant deficit in adjacent vessels, occlusion of the PTAV aneurysm together with the parent artery is rather safe and effective.(J Intervent Radiol, 2008, 17: 510-514)

【**Key words**】 Persistent trigeminal artery variant; Dissection aneurysm; Endovascular treatment

原始三叉动脉(PTA)或胚胎型三叉动脉是一种较常见的颈内动脉与基底动脉之间的永久吻合，临床上多偶尔发现，常伴有其他脑血管异常，包括动脉瘤。但 PTA 本身发出的动脉瘤并不多见。由于胚胎发育过程中的异常，PTA 并非只表现为颈内动脉与基底动脉之间的吻合，还存在多种变异。其中一种表现为 PTA 由颈内动脉发出，直接供血小脑，文献中多称其为变异型原始三叉动脉(PTAV)。现报道 1 例我院成功经血管内介入途径治疗的 PTAV 夹层动脉瘤病例并对相关文献进行复习。

1　材料与方法

1.1　病例报告

患者男，48 岁。既往有高血压病史，2006 年 11 月 11 日突发剧烈头痛，颈项强直，恶心、呕吐，意识丧失并小便失禁。CT 提示广泛蛛网膜下腔出血，入

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院时 Hunt-Hess 分级Ⅲ级，入院诊断为自发性蛛网膜下腔出血，疑诊颅内动脉瘤。

急症行全脑血管造影，显示从右侧颈内动脉入海绵窦前发出一直接供血小脑前下动脉（AICA）区域的血管，在接近其自颈内动脉的起始部处见一 2.90 mm × 3.53 mm × 1.96 mm 大小的夹层动脉瘤。动脉瘤远端的血流缓慢，右侧的后交通动脉（PComA）发育良好并参与了同侧大脑后动脉（PCA）的供血。右侧椎动脉发育不良，仅供血同侧小脑后下动脉（PICA）区域。左侧椎动脉发育良好，左侧小脑前下动脉发达，同时提供左侧 PICA 的供血区域。右侧 AICA 发育不良但可见一长回旋动脉显影

造影诊断：自发性蛛网膜下腔出血，PTAV 夹层动脉瘤。

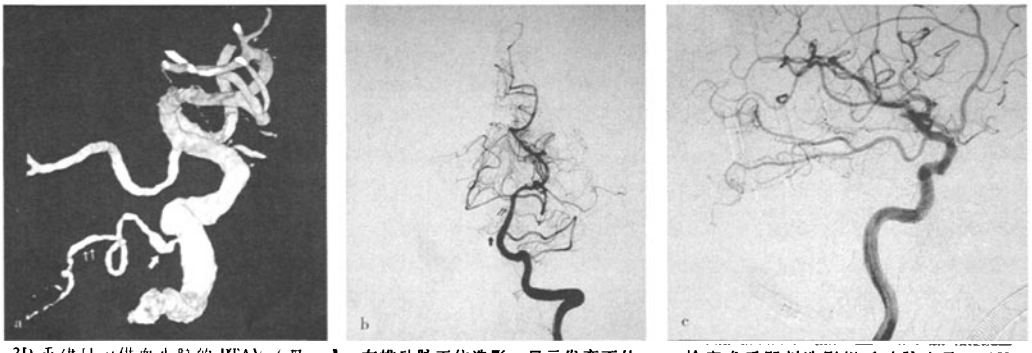
术前分析：PTAV 细小，动脉瘤为夹层动脉瘤，栓塞同时保留载瘤动脉不易。而 PTAV 远端血流缓慢，患者术前体检无局灶性神经功能缺损，包括无同侧 AICA 缺血表现，同时右侧细小 AICA 发育不良。右侧 PICA 供血区域由同侧的椎动脉满意供血，同侧小脑上动脉发育正常，另外基底动脉右侧可见一长回旋动脉显影。考虑到小脑半球血供的广泛吻合与代偿，确认闭塞动脉瘤连同载瘤动脉是安全而确切的治疗。

治疗经过：6 F 导引导管，Prowler-14 微导管超选动脉瘤后置入 Microplex-10 helical 2 mm × 20 mm 弹簧圈，造影提示动脉瘤及 PTAV 远端仍有缓慢少量的血流，继续填入 Hydrocoil 10 2 mm × 20 mm 弹簧圈 1 枚及 Microplex-10 helical 2 mm × 20 mm 弹簧圈 1 枚，造影提示动脉瘤内几乎无对比剂显影，10 min 后再次造影，提示动脉瘤及载瘤 PTAV 完全不显影。超选左椎动脉造影，提示从长回旋动脉发出的代偿血流充盈了 PTAV 供血的原 AICA 供血区域的远端。患者术后无即刻神经功能缺损。

术后处理：低分子肝素皮下注射抗凝 3 d，同时予以包括解痉的常规治疗。

术后随访：术后 2 周行脑血管造影，确认动脉瘤及 PTAV 闭塞确实无显影，小脑前部原 PTAV 供血区域已建立完善侧支循环（图 1）。

患者术后 2 周出院时 MRS 评分 0 分。1 年随访



a 3D 重建显示供血小脑的 PTAV（双箭）及其上的夹层动脉瘤（白箭）

b 左椎动脉正位造影，显示发育不佳的右侧 AICA（黑箭），右侧可见一小的回旋动脉显影（双箭）

c 栓塞术后即刻造影提示动脉瘤及 PTAV 不再显影

d 术后左椎造影显示来自回旋动脉（双箭）的血流向原 DTAV 供血区域代偿（黑箭）

e 右侧颈内动脉术后 2 周造影，证明夹层动脉瘤及 PTAV 的确切闭塞

f 左椎动脉术后 2 周的造影显示进一步完善的由回旋动脉向 AICA 区域的代偿血供（双箭）

图 1 PTAV 动脉瘤诊治过程

MRS 评分 0 分,无迟发的神经功能缺损。

1.2　文献复习

PubMed 检索所有关于 PTA 合并颅内动脉瘤的文献以及所有有关 PTAV 的文献。

PTA 合并颅内动脉瘤的发病率约为 3%，与无 PTA 的一般人群动脉瘤发病率无差别[1]。PTA 本身的动脉瘤比较少见,Morisson 等[2]报道在 PTA 合并动脉瘤的患者中仅 2%其动脉瘤发自 PTA 本身。事实上，截至目前仅有 37 例 PTA 动脉瘤的报道[3-18]。其中 16 例动脉瘤位于 PTA 与 ICA 的连接部,12 例在 PTA 主干,3 例位于基底动脉(BA)与 PTA 的连接部。大部分动脉瘤为囊性,仅 2 例为夹层动脉瘤。

自 1972 年首次报道小脑上动脉（SCA）直接发自颈内动脉以来[19]，就本文检索迄今仅 72 例 PTAV 见于报道（包括 2 例我中心的病例)[20-23]。其中约有 71.6% PTAV 终止于 AICA，28.4% 供血 SCA,18.0% 供血 PICA。PTAV 动脉瘤除本例外仅见 6 例报道[20,21,24-27]。

由此可以得出,PTAV 动脉瘤的发生率约为 9.8%。远高于 PTA 动脉瘤的发生率(不足 3%)。而对于夹层动脉瘤占所有动脉瘤的比例,PTAV 和 PTA 分别约是 50%和 5.4%。

PTA 是最常见的颈内动脉与基底动脉之间的原始吻合,其造影发现率为 0.1% ~ 0.2%[28]。在胚胎发育过程中,PTA 最早见于胚胎 3 mm 期,是第一主动脉弓的第 2 个分支,该动脉与节段性的成对的纵神经动脉相交通，后者于胚胎 4 mm 期形成了最终的基底动脉。PTA 在后交通动脉、基底动脉和椎动脉发育过程中开始退化，至胚胎 14 mm 期,PTA 完全消失[29]。

沿着腹侧纵神经动脉不同程度的融合,或是沿着三叉动脉的退化发生在吻合干的过近或过远处,或是退化过程伴随着邻近胚胎管道异常,将出现一系列不同于通常 PTA 的 PTAV,例如从颈内动脉发出的直接供血小脑的动脉,从基底动脉发出的脑膜中动脉,基底动脉发出鞍旁的颈内动脉而颈内动脉节段性退化,颈内动脉、三叉动脉均起源于脑膜中动脉等。但目前文献中的 PTAV 多仅讨论因纵神经动脉的不完全融合而产生的自颈内动脉发出的直接供血小脑的变异类型[30]。本文也仅讨论此种 PTAV。

从文献可见,PTAV 动脉瘤的发生率及夹层动脉瘤的发生率均较 PTA 为高,考虑可能存在以下机制:①作为未正常退化的胚胎管道,PTAV 存在先天的管壁发育异常。Lasjaunias 等[31]认为,动脉发育的异常,例如不完全融合提示了动脉壁成熟过程的不完全,这可能预示着内皮细胞的薄弱,更容易发生动脉瘤。Lelong 等[32]也认为先天的血管壁缺陷是从内皮细胞的功能异常开始。但目前未发现 PTA 血管壁发育异常的病理学证据[11]。②血流动力学因素也发生了作用。从已有资料可见,动脉瘤更多地位于 PTA 或是 PTAV 自颈内动脉分支的地方。持续的血流冲击在急剧分支的地方,使原本存在发育异常的血管承受了更多的血流冲击。PTAV 的管腔更细,走行更迂曲,因而尤其容易受损。③动脉壁的粥样硬化与夹层的形成有相关性,在 5 例 PTAV 夹层的报道中有 2 例有明确的高血压病史。另外,对于 PTA 动脉瘤的病理检查显示了动脉壁的粥样硬化改变,尤其是在动脉瘤近端。

PTA 及 PTAV 在发生动脉瘤后,往往有相应的临床症状出现。其中最常见的症状是破裂导致的蛛网膜下腔出血。有时,位于与颈内动脉连接部的动脉瘤破裂可导致颈内动脉海绵窦的产生。另外,症状尚可因为动脉瘤的占位效应引起:如因外展神经麻痹而导致复视;因三叉神经受压而表现为三叉神经痛；或表现为受压颅神经分布区域的痛觉减退;此外,还有部分患者表现为脑缺血[4,26,33]。

外科夹闭及介入栓塞均有成功治疗 PTA 和 PTAV 动脉瘤的报道,我们认为,成功的治疗首先来自于对载瘤动脉血流动力学及动脉瘤结构的准确分析。而对于 PTA 及 PTAV 动脉瘤治疗的关注点是不同的。

对于 PTA 动脉瘤，我们首要考虑的是 PTA 向后循环供血的程度。Saltzman 等[34]依照这一标准对 PTA 进行分型。另外,病理解剖报道 PTA 上有 2 个重要穿支起源于内囊部,其中之一供血给三叉神经根,另一分支发出向桥脑供血的穿支[11,35-37]。桥脑支为重要的功能血管,如果阻塞 PTA 将可能造成脑干的缺血损害。然而,普通造影中、尤其是合并蛛网膜下腔出血的脑血管痉挛时很难看到这些穿支,因此,在治疗 PTA 动脉瘤时栓塞 PTA 本身并不安全。对于 PTA 的囊性动脉瘤,手术和介入途径均可以达到较好的载瘤血管保护;而对于夹层动脉瘤,外科手术很难保留 PTA,而球囊或是支架辅助的栓塞技术有一定的优势。但在术中,需要预防血栓脱落造成的栓塞事件,文献中已有类似报道[26,38]。

Akimasa 等[21]报道,PTAV 囊性动脉瘤在得到满意栓塞的同时保留了 PTAV;Hanabusa 等[24]报道囊

性动脉瘤位于 PTAV 主干远端,超选没有成功因而最后栓塞了 PTAV 的近端。目前尚无对 PTAV 动脉瘤行开颅夹闭而保留载瘤血管的报道,这可能与 PTAV 的细小迂曲有关。因而,我们认为,对于 PTAV 动脉瘤,介入栓塞更为合理。对于 PTAV 的夹层动脉瘤,要在栓塞同时保留 PTAV 在目前来说是不太可能的,为了避免其再次破裂出血,只能行 PTAV 闭塞术,目前尚无因为闭塞 PTAV 而导致缺血的报道。与 PTA 不同,存在 PTAV 时,基底动脉发育通常正常。由于小脑的血供之间存在广泛地吻合,因此,只要与 PTAV 邻近的供血小脑的血管发育良好,栓塞 PTAV 是安全的。然而,如果 PTAV 供血区邻近的供血血管存在缺陷,那么在闭塞 PTAV 之间,必须首先做相应区域的血管旁路移植手术。

PTAV 本身发生动脉瘤的比率较高。可能与胚胎发育的缺陷和血流动力学因素有关。对于 PTAV 动脉瘤、尤其是夹层动脉瘤的治疗,介入栓塞较之开颅手术更优,通常直接闭塞 PTAV 比较安全和有效。

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·临床研究　Clinical research·

中晚期原发性肝癌合并症的介入治疗研究

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【摘要】 **目的**　探讨中晚期原发性肝癌合并症的综合介入治疗方法。**方法**　将经病理、影像学诊断及 AFP 值证实的原发性肝癌符合筛选条件的患者共 62 例，按住院号数的单、双数随机分成两组：对照组(单纯 TACE 组)32 例，综合治疗组(TACE + 合并症处理组)30 例。综合治疗组行 TACE 术时对肝动静脉瘘、门静脉癌栓及下腔静脉病变等并发症给予综合处理。**结果**　TACE 组治疗 32 例患者，1、2 和 3 年生存率分别为 68%、50%和 19%，中位生存期 1.5 年；综合治疗组 30 例患者 1、2 和 3 年生存率分别为 87%、75%和 48%，中位生存期 2.0 年。综合治疗组的生存率及生存期均显著高于对照组($P < 0.05$)。与对照组相比综合治疗组疗效与死亡风险率差异有统计学意义($P < 0.05$)。**结论**　原发性肝癌合并症的控制可增加 TACE 的疗效，显著提高原发性肝癌患者生存率，延长生存期。

【关键词】 肝癌；介入；肝动脉化疗栓塞；合并症

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Study of interventional therapy for complications in advanced primary hepatocellular carcinoma *LU Li-gong, HU Bao-shan, LI Yong, LUO Peng-fei. Department of Interventional Radiology, Guangdong Provincial People's Hospital, Guangzhou 510080, China*

【Abstract】 Objective　To investigate the interventional therapy for the complication in the treatment of advanced primary hepatocellular carcinoma. **Methods**　62 cases of primary hepatocellular carcinoma confirmed by pathology, imagings and AFP, were randomly divided into 2 groups according to odd or even hospitalization number. 32 patients were enrolled in the TACE group (control group)and 30 patients were

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变异的原始三叉动脉夹层动脉瘤的血管内治疗一例并文献复习

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