

• 综 述 General review •

血液透析患者中心静脉闭塞性疾病手术再通的研究现状

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【摘要】 血液透析通路是终末期肾病患者的生命线,许多患者依赖该通路进行定期透析,以维持生命。保证通路的长期通畅至关重要,多种因素对通路的通畅性产生影响,如植入支架、电子设备的长期刺激、静脉高压等会导致血管内膜反应性增生,通路出现狭窄或闭塞。目前,维持血液透析通路通畅性的常规方法包括 PTA 和经皮腔内支架置入术(percutaneous transluminal stenting,PTS)。然而,部分患者的阻塞部分已经完全机化或钙化变硬,常规方法难以实现再通,需要进行锐性穿刺才能再通。该文就血液透析患者中心静脉闭塞性疾病(central venous occlusive diseases,CVOD)手术再通方式进行综述,以期临床实践提供参考。

【关键词】 血液透析;中心静脉狭窄或闭塞;锐性再通;射频导丝

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Surgical recanalization of central venous occlusive diseases in hemodialysis patients: its research status WANG Hanfei, ZHOU Shi, ZHAO Xuya. School of Medical Imaging, Guizhou Medical University, Guiyang, Guizhou Province 550004, China

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【Abstract】 Hemodialysis access is a lifeline for patients with terminal stage renal disease. Many patients with terminal stage renal disease rely on this access for receiving regular hemodialysis to stay alive. Therefore, it is essential to ensure long-term patency of the access. However, the patency of access can be affected by a lot of factors, such as stent implantation, prolonged irritation from electronic devices, and venous hypertension, all of which can cause reactive endothelial hyperplasia with consequent stenosis or occlusion of the access. Nowadays, the conventional methods to maintain the patency of hemodialysis access include percutaneous transluminal angioplasty (PTA) and percutaneous transluminal stenting (PTS). However, in some patients the tissue of the obstructed site has already been completely organized or has become calcified and hardened. In this case, the recanalization of the obstructed site is difficult to be accomplished by the conventional method, and sharp puncturing is required to achieve effective recanalization of the obstructed site. This paper aims to make a comprehensive review concerning the surgical recanalization methods used for central venous occlusive diseases in hemodialysis patients so as to provide useful reference for clinical practice.

【Key words】 hemodialysis; central venous stenosis or occlusion; sharp puncturing recanalization; radiofrequency guidewire

血液透析通路对长期血液透析患者的生活质量起着决定性作用,70%~90%的患者依赖此途径进行治疗^[1-2]。中心静脉闭塞性疾病(central venous occlusive diseases,CVOD)是血透患者最常见的并发症之一,对 CVOD 进行有效的治疗,可提高长期血液透析患者的生存率和生活质量。本文介绍了血液

透析患者中心静脉闭塞的病因/病理及临床表现、使用锐性再通后的并发症、通畅率以及影响因素。

1 病因、病理及临床表现

中心静脉指颈内静脉、锁骨下静脉、头臂静脉、上腔静脉和下腔静脉胸内段部分,是血液透析不可

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或缺的通路。一旦发生狭窄或闭塞,透析流量将不足、静脉回流不畅。目前认为,先前长期透析导管置入史、心脏起搏装置置入病史和有动静脉瘘的高流速是中心静脉狭窄或闭塞的主要原因。导管/导线对血管壁的长期机械刺激使血管壁损伤,血管内皮反应性增生、纤维化、钙化,使管腔进行性狭窄或闭塞,左侧的发生率较右侧高,这可能是由于左侧血管走行较右侧弯曲,导管/导线与血管壁多点接触所致。临床症状主要有肢体疼痛、肿胀、头面部肿胀、静脉高压、通路血栓形成等^[3-11]。

2 对中心静脉狭窄的处理

在出现透析流量不足或临床症状之前,大多数中心静脉狭窄无症状。常规再通首选 PTA,若 PTA 再通结果不理想,则采用 PTA 联合经皮腔内支架置入术(percutaneous transluminal stenting, PTS)^[12]。Cordon 等^[13]首次在血透通路中应用 PTA,术后成功率达 100%。不同类型的球囊(普通球囊、高压球囊、紫杉醇涂层球囊、切割球囊等)具有不同的特点及优势。有研究表明,球囊直径是临床疗效的独立预后因素^[14]。紫杉醇抑制血管平滑肌的增殖与迁移,延长通路再狭窄的时间^[1]。研究表明,紫杉醇涂层球囊治疗后无干预期显著优于其他类型的球囊^[7, 15-16]。但是,单纯应用 PTA 会发生血管弹性回缩影响通畅性。Haskal 等^[17]的研究表明,支架血管成形术的通畅率高于球囊血管成形术(51%比 23%);支架植入组 6 个月后脱离干预的发生率也高于球囊成形术组(32%比 16%),且球囊成形术组 6 个月时二次再狭窄的发生率高于支架移植组(78%比 28%);而 6 个月不良事件的发生率相当,但再狭窄发生率在球囊成形术组更高($P < 0.001$)。说明 PTA 后行 PTS 能够提高通路通畅性,降低术后干预和二次狭窄的风险。有研究表明,对于血液透析中心静脉狭窄患者,植入覆膜支架的疗效明显优于裸支架^[18]。

3 对中心静脉闭塞的处理

部分长期透析患者的中心静脉闭塞部分机化、钙化,常规导丝不能通过,往往需要末端较硬的穿刺工具,如硬末端导丝、穿刺针等^[5]。有关锐性再通的研究显示,通道开通后置入支架可延长通路使用期限^[19-20]。

有研究表明,使用硬端导丝取得了 100% 的手

术成功率,总手术成功率为 92.6%,说明使用硬端导丝锐性再通安全可行^[21]。Liu 等^[22]的研究中没有出现严重并发症,可能与术中首先进行的钝性再通缩短了闭塞病灶的长度,离心性穿刺减少了损伤重要血管有关。但也有研究出现了血胸、心脏压塞等严重并发症,这可能与术中多采用向心性穿刺有关^[23-24]。Zhao 等^[25]在右侧头臂静脉合并右侧颈内静脉闭塞时,通过颈外静脉途径锐性开通右头臂静脉,首次引入 E-S 角(导丝在右锁骨下静脉、右颈外静脉形成的夹角),取得了 100% 手术成功率,随访 10 个月通畅率达 81.3%。Sun 等^[26]的研究首先使用血管鞘进行钝性再通,降低并发症发生率的同时也缩短了闭塞病灶的长度,为随后的锐性再通提供了更好的条件。在使用 RUPS-100 系统开通血液透析患者中心静脉闭塞的研究中,也取得了极好的手术效果^[27]。此外,研究显示,千叶针用于 CVOD 锐性再通也取得了较高的技术成功率^[28-29]。Zhao 等^[3]在中心静脉长节段闭塞的报道中提出分段锐性再通闭塞节段,最后再统一行球囊扩张支架置入,取得了良好的手术效果,但由于是个案,其有效性及安全性还有待进一步评估。对于锐性再通也无法成功的难治性通路闭塞,射频消融再通是另一种选择^[30-31]。射频再通采用射频导丝末端发出的射频能量熔化闭塞节段,但使用不当将造成危及生命的并发症,如气管穿孔、静脉穿孔等^[31]。发生静脉穿孔时,植入覆膜支架是挽救生命的必要措施^[32]。利用母子技术使用血管造影导管进行血液透析患者 CVOD 的再通取得了较高的技术成功率,但同时也出现了静脉穿孔的严重并发症^[33]。Rambhia 等^[34]首次将准分子激光技术用于血液透析患者中心静脉闭塞的再通,随访 24 个月,通路依旧通畅,但该研究是个案分析,样本量小,具体实际疗效还有待进一步研究。也有学者使用 LTD 导管^[35]、TIPS 针^[36]各自成功开通 1 例患者,由于是个案报道,其结果不具有代表性。对于静脉通路耗竭的患者,于右心房放置隧道透析导管已成为抢救治疗措施之一,尽管中位生存期短于常规隧道透析导管,但对于有严重合并症患者不失为一种选择^[37]。锐性再通的手术成功率、远期通畅率都是传统手术无法比拟的,但许多研究的随访时间仅为 6~12 个月,对于远期通畅率及其影响因素尚未明确。

4 对并发症及并发症的处理

手术再通 CVOD 患者的并发症虽然罕见,但手

术再过程中可能会出现疼痛、血/气胸、纵隔血肿、心脏压塞、血管壁损伤/穿孔、气管穿孔、支架移位及支架内狭窄等。如果术中出现血胸,应立即行胸腔引流;出现心包积血/填塞,应立即行心包穿刺引流;出现已经证实的血管穿孔,应立即植入覆膜支架。

并发症的发生与病灶情况、穿刺设备型号、穿刺方向、术者经验等有关。Wen 等^[38]研究发现,机化/钙化、钝性残端和侧支形成的病灶组手术时间明显长于无机化/钙化、钝性残端和侧支形成的病灶组,前者手术难度明显大于后者,术后开放时间也较短,手术难度的增加可能导致相应并发症。理论上来说,穿刺针管径越小,其对血管损伤就越低,导致严重并发症的可能性越低。由于中心静脉靠近心脏,且周围有许多大血管,向心性穿刺损伤周围大血管、导致严重并发症的概率较离心性穿刺大,但由于心脏运动,离心性穿刺针稳定性较差^[22]。术者的经验直接决定着手术的质量,对于高风险的手术,应由经验丰富的医生进行。当然,不管使用哪种再通设备,闭塞节段越短,开通的成功率就越高,相应并发症发生的概率就越低^[22,38]。术前充分了解病史,进行 CT 血管造影评估病灶及侧支情况,术中多次数字减影血管造影、多角度透视和 XperCT 的应用,多平面评估手术进程是避免严重并发症的必要措施^[39]。

对于中心静脉闭塞的血液透析患者,手术再通是挽救血管通路的有效方法。目前的相关研究偏少,随访时间较短,且多为小样本研究,对各种再通设备的安全性及有效性还需大量研究进一步评估。

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