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超声定位腔镜深筋膜下交通支离断术联合湿性换药技术 治疗下肢静脉性溃疡*

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摘要 目的:探讨彩超定位下的腔镜深筋膜下交通支离断术(SEPS)联合湿性换药技术治疗下肢静脉性溃疡(VU)的方法及效果。**方法:**回顾性分析了8例VU患者共8条C6级下肢SEPS手术联合湿性换药技术的方法和效果。术前行彩色多普勒超声对功能不全交通支(ICPV)行体表定位,进行SEPS+大隐静脉高位结扎剥脱术+硬化剂注射术,术后湿性换药技术溃疡换药。**结果:**超声准确定位下SEPS联合湿性换药术后所有C6级患肢VU均在短期内愈合,随访期间无溃疡复发。**结论:**SEPS联合湿性换药技术治疗VU术后安全,疗效确切,并发症少。

关键词: 静脉性溃疡;湿性换药;腔镜

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Subfascial Endoscopic Perforator Vein Surgery Under Ultrasound Positioning Combined with Moist Dressing Technique in Treatment of Venous Ulcer*

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ABSTRACT Objective: To explore the treatment method and effect of subfascial endoscopic perforator vein surgery (SEPS) under ultrasound positioning combined with moist dressing technique for venous ulcer (VU). **Methods:** Eight C6 grade VU limbs of 8 VU patients treated with SEPS and moist dressing technique were retro-analyzed. Ultrasound positioning was performed prior to the surgery, which included SEPS combined with high ligation and stripping of great saphenous vein and sclerotherapy, and moist dressing technique postoperatively. **Results:** All the C6 limbs healed well in short period and no recurrence was found during the followup. **Conclusions:** SEPS combined with moist dressing technique might be an effective treatment for VU, with low complication rate.

Key words: Venous ulcer; Moist dressing technique; Endoscope

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前言

下肢慢性静脉功能不全(chronic venous insufficiency, CVI)是临床常见的疾病,患病率较高,慢性静脉功能不全是导致皮肤发生湿疹、色素沉着、溃疡等营养障碍性改变的主要因素,而下肢静脉性溃疡是由下肢慢性静脉功能不全所致的严重并发症^[1]。12%~14%的CVI患者存在静脉性溃疡,人群发病率为0.4%~1.3%^[2],溃疡愈合周期长、复发率高往往迁延不愈为其特点,长期不愈溃疡有癌变可能,以上特点导致下肢静脉性溃疡严重影响患者生活质量。目前认为静脉溃疡发生机制主要与严重静脉高压、静脉湍流、静脉回流不全、组织缺氧、白细胞浸润和蛋白渗出有关^[3],但目前认为小腿段穿通静脉瓣膜功能不全(incompetent perforating vein, ICPV)导致高压的深静脉血倒流入浅静脉及浅静脉曲张导致的浅静脉高压是引起皮肤溃疡的重要原因^[4,5]。我院自2017年1月至2007年10月,针对C6级

ICVI患者共开展了8例共8条下肢静脉溃疡进行腔镜深筋膜下交通支离断术(subfascial endoscopic perforator vein surgery, SEPS)联合湿性换药技术治疗,现汇报如下。

1 材料与方法

1.1 一般资料

选择自2017年1月至2007年10月在我院进行腔镜深筋膜下交通支离断术联合湿性换药技术治疗患者,纳入标准:(1)既往无下肢静脉曲张手术治疗病史;(2)既往无下肢深静脉及交通静脉血栓性疾病病史,术前患者通过彩色多普勒超声检查排除下肢深静脉血栓形成及其后遗症;(3)下肢浅静脉曲张CEAP (Clinical-etiology-anatomic-pathophysiologic-classification)分级为C6级;(4)术前彩色多普勒超声或下肢静脉造影提示下肢浅静脉反流、交通支静脉反流。排除标准:(1)CEAP分级:C1-C5;(2)严重的心脑血管疾病;(3)溃疡面积>15 cm²

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或小于 1 cm^2 ; (4) 彩超提示下肢深静脉、交通静脉血栓或下肢深静脉血栓形成后遗症; 本组 8 例患者, 男 6 例, 女 2 例, 共 8 条病变下肢, 平均年龄 59 岁, 病史 4~13 年。平均下肢溃疡面积约 4.4 cm^2 。

1.2 治疗方案

1.2.1 超声检查 8 例患者术前由固定彩超医师行下肢静脉超声检查, 进行深静脉反流时间测定、股隐静脉瓣反流情况测定及交通支静脉的位置及反流时间, 并于体表标记交通支静脉的位置。有 1 例病例因需要排除动静脉瘘, 进行了 X 线下肢顺行静脉造影术。

1.2.2 手术方法 所有病例均选用硬膜外+腰麻麻醉方式。所有患者均采用腔镜筋膜下交通支离断术+大隐静脉高位结扎剥脱术+硬化剂注射术, 麻醉完成后于胫骨粗隆内下 4-5 cm 处切开皮肤约 2 cm, 后锐性分离皮下组织达深筋膜, 钳夹深筋膜, 以尖刀划开深筋膜, 置入 1 cm 直径 Trocar, 注入 CO_2 气, 气压为 8-10 mmHg, 建立足够的筋膜下空间。经此 Trocar 置入腔镜, 在腔镜直视下, 于此切口内下方约 5-8 cm 处取一纵行切口, 置入直径 0.5 cm Trocar, 后置入超声刀, 通过腔镜光源的指引, 判定超声刀位置, 根据术前体表标记的交通支区域, 依次找到并游离交通支静脉, 应用超声刀凝闭后离断, 自近心端至远心端依次离断后达内踝关节水平。止血后撤出腔镜及超声刀, 挤出 CO_2 气体, 后于腹股沟韧带下近心端方 1 cm 处取平行于腹股沟韧带走形的斜行切口 2 cm, 逐层分离组织, 找到大隐静脉主干, 高位结扎, 内踝前方取 1 cm 纵行切口, 寻找大隐静脉远端, 离断后结扎远端, 近心端置入剥脱器并剥脱大隐静脉主干, 较为粗大的静脉团块给予点式剥脱, 细小曲张静脉给予泡沫硬化剂注射, (1% 聚桂醇 2 mL 加 8 mL 空气经混合制成 10 mL 泡沫硬化剂), 后皮内缝合切口。弹力绷带加压包扎。术毕。如图 1。

1.2.3 溃疡处理 所有病例因溃疡周围炎性反应, 入院后进行有效的抗生素静点治疗, 入院后进行创面坏死组织、渗出物清除, 并进行抗感染处理, 溃疡无坏死组织及溃疡周围无炎性反应后进行手术治疗, 入院至手术最短为 6 天, 最长为 13 天, 平均为 9.2 天, 术后抗感染治疗同时使用磺胺嘧啶银促进创面愈合, 敷料包扎, 并弹力绷带进行循环压力治疗。

1.2.4 术后治疗 术后 2 小时常规使用低分子肝素抗凝一次, 依据术前细菌培养及药敏结果应用敏感抗生素, 患肢抬高, 手术次日下床活动, 术后 1 周出院。并门诊换药至下肢溃疡愈合。

1.2.5 并发症 8 例患者术后均无切口感染、筋膜下血肿、出血、深静脉血栓形成等并发症, 术后均无皮下气肿, 有 1 例患者术后出现蜂窝组织炎, 经抗炎治疗 1 周后炎症消失。有 1 例患者术后出现溃疡周围淤积性皮炎糜烂表皮坏死脱落, 范围约 $1\text{ cm} \times 1\text{ cm}$ 大小, 新生成溃疡表浅, 术后 1 周愈合。

1.2.6 随访 所有患者术后 1 个月、6 个月进行门诊随访。6 名患者随访至 6 个月。

2 结果

2.1 超声检查

本组 8 条下肢均发现反流交通静脉, 最粗为 1.0 cm, 检出率 100%, 共发现 26 条交通静脉, 平均直径 0.52 cm。术中均证实交通支的存在及位置, 术中发现彩超所报以外共 8 条交通静脉。

2.2 溃疡愈合情况

溃疡术后未发现皮下气肿, 有一例病人出现术后软组织感染, 抗生素治疗 1 周后炎症消退, 1 例病人出现溃疡面积扩大, 但为糜烂表皮脱落所致, 溃疡较浅, 故未延长溃疡愈合时间, 于原有溃疡之前愈合。患者术后下肢疼痛、酸胀感均缓解, 皮肤溃疡最短为术后 14 天愈合, 最长为 35 天愈合, 平均为 21.3 天。术后足靴区色素沉着明显变淡, 溃疡周围糜烂皮肤干燥脱落后生出新表皮, 无糜烂。

2.3 随访结果

患者出院后 1 个月、6 个月复查, 随访, 共 8 例患者术后一个月随访, 5 例患者随访 6 个月, 所有随访患者均临床症状消失, 浅静脉曲张消失、色素沉着逐渐变淡, 活动性静脉溃疡全部愈合, 无复发。见图 2、3、4。



图 1 术中超声刀电凝病变交通静脉

Fig.1 Separated the target communication veins with HLFU(high intensity focused ultrasound) during the procedure



图 2 术前

Fig.2 Preoperation



图 3 术后 22 天

Fig.3 Postoperative day 21



图 4 术后 31

Fig.4 Postoperative day 30

3 讨论

下肢静脉性溃疡为临床工作中较为常见的外科疾病,是下肢静脉慢性功能不全严重并发症,在发达国家发病率可达1%~2%,发展中国家的发病率更高^[6]。且因疾病特点所致,所累及者常为从事重劳动或长期站立工作的患者,有一定的社会影响。慢性静脉功能不全时导致下肢静脉溃疡的根本原因,慢性静脉功能不全包括原发性下肢深静脉瓣膜功能不全、原发性下肢浅静脉瓣膜功能不全、交通支静脉瓣膜功能不全、下肢深静脉血栓形成后综合征等。而其中,小腿段穿通静脉瓣膜功能不全(incompetent perforating vein, ICPV)是导致下肢静脉性溃疡的重要原因^[7]。小腿段穿通静脉瓣膜功能不全后导致压力较高的深静脉血流倒流入浅静脉引起浅静脉压力增高,引起浅静脉静脉血瘀滞,从而出现足靴区皮肤组织液回流障碍,继发水肿,引起皮肤营养障碍,最终皮肤糜烂导致皮肤溃疡^[8]。临床上较重要的交通静脉分布在小腿中、下段内侧的足靴区,通常为3~4支^[9]。下肢静脉性溃疡患者单纯浅静脉手术通常切断或切除溃疡周围浅静脉,但无法将交通支全部破坏,这个原因被认为是单纯大隐静脉术后溃疡不愈或复发的重要原因之一^[10,11]。而且邻近溃疡的皮肤为糜烂状态,皮肤水肿、缺血、缺氧状态,故此切口容易导致切口感染和延迟愈合或不愈合^[12]。本组8例静脉性溃疡患者超声检查交通静脉反流的阳性率为100%,也充分说明了小腿交通静脉反流与下肢静脉溃疡密切相关。

手术:传统的交通支离断术切口较大,因交通支功能不全时足靴区皮肤处于缺氧状态,此处切口不愈合可能极大,故传统的交通支离断术被摒弃^[13]。1985年,Hauer首先利用腹腔镜器械行SEPS治疗下肢静脉性溃疡,取得良好效果^[14]。腔镜下交通支离断术与传统的交通支离断术相比因创伤小,不需要在足靴区切口,并且手术效果确切,有明显优势,是下肢静脉性溃疡首选治疗方法^[15]。目前SEPS被认为是一种安全、有效的治疗小腿交通静脉瓣膜功能不全的手术方法,不仅能解决慢性静脉功能不全,同时对促进溃疡愈合很有帮助^[16]。因为大部分下肢静脉性溃疡病例同时伴有下肢深静脉瓣膜功能不全及下肢浅静脉曲张^[17],故本组8例患者均行SEPS+大隐静脉高位结扎剥脱术+硬化剂注射术,手术目的为阻断静脉溃疡周围静脉反流,减少组织水肿,降低毛细血管通透性,减少溃疡渗出,同时有效降低静脉压力,达到溃疡愈合目的^[18]。同时也治疗了下肢浅静脉曲张。应用泡沫硬化剂注射术,尽可能的减少了手术创伤^[19],术前需要评估深静脉功能,术后需要弹力袜配合治疗,促进下肢静脉回流。术中使用超声刀止血效果确切,避免了金属钛夹等异物存留,尽可能减少感染风险^[20]。

术中部分曲张静脉团块进行泡沫硬化剂注射,泡沫硬化剂可减少手术切口,有效封闭曲张血管,硬化剂治疗是1853年Cassaigne首先提出的,即向曲张静脉内注入化学性硬化剂,使静脉管壁继发炎症反应,术后持续压迫使静脉萎陷,肉芽组织继之纤维化在萎陷的静脉腔内生长,最终形成纤维索条,达到治疗曲张静脉萎陷的目的^[21]。泡沫硬化剂是指把液体硬化剂与气体混合而形成的新型泡沫状硬化剂物质,可应用于曲张静脉团块及大隐主干静脉^[22],泡沫硬化剂的安全性和有效性已得到世界范围的公认^[23]。本组病例应用1%聚桂醇(中国陕西天宇

制药有限公司)2 mL加8 mL空气经混合制成10 mL泡沫硬化剂,术中现配,泡沫硬化剂注入曲张静脉团内,达到封闭曲张静脉的目的。

湿性换药:下肢静脉性溃疡的局部治疗主要为清除坏死组织同时控制感染后促进创面愈合,目前常用的方法为清创、伤口敷料的应用,伤口敷料包括水凝胶类、藻酸盐、人角质蛋白敷料以及银浸渍敷料等。敷料的选择取决于溃疡特点,但部分敷料的费用较高,也是敷料选择需要考虑的因素。

所谓湿性愈合就是用外用药物及敷料使创面床保持低氧、微酸、适度湿润的环境,增加细胞生长及移行速度,加速创面愈合,与此同时,可以防止痂皮形成。既往传统换药理念为保持创面干燥,降低病原菌存活,减少感染,但是创面干燥有很多缺点:伤口脱水结痂,不利于上皮爬行;生物活性物质丢失,愈合速度缓慢;创面感染不易减轻,容易感染加重;敷料与创面粘连,更换敷料时疼痛。目前认为,相对于干性愈合,湿性愈合有更大优势,愈合速度加快,减少患者感染及疼痛^[24]。我们对于静脉性溃疡创面进行清除坏死组织、抗感染治疗,并选择费用较低的磺胺嘧啶银软膏促进创面愈合。

但单纯创面处理治疗溃疡愈合周期较长,复发率高,故需要外科治疗交通支、浅静脉反流,并弹力袜治疗深静脉反流,可缩短溃疡愈合周期,降低复发率^[25]。

降低静脉压治疗:下肢静脉性溃疡发病主要发生机制为严重静脉高压、静脉功能不全,有效降低深静脉静脉压可减轻皮肤水肿、改善皮肤营养状态,促进溃疡愈合,降低溃疡复发率^[26]。本组病例通过佩戴弹力袜降低下肢深静脉压力。

超声检查:下肢静脉性溃疡的辅助检查包括彩色多普勒超声、CT静脉造影、X线静脉造影等,X线顺行造影可显示深、浅静脉反流及交通静脉反流情况,但因需要在X线环境内检查,并且需要应用造影剂,不应为首选检查。CTV主要应用与检查下肢静脉内阻塞情况,尤其对血管外压迫性的静脉阻塞有价值,并且价格较为昂贵,对于下肢静脉性溃疡患者应用不多^[27,28]。而彩色多普勒超声可有效判断及评估交通静脉及深静脉反流。且与其他检查相比有价格便宜、无创伤等、定位准确等优点,通常被认为是下肢静脉溃疡术前检查的首选^[29]。

本组手术证实,术前超声检查对较为粗大的交通支定位概率极高,本组达100%,但对于部分交通支未能准确辨别,术中探查的彩超未发现的交通静脉均为直径小于2 mm,可能与部分交通支较为细小或溃疡附近交通支与周围炎性组织粘连较严重,从而影响彩超医生判断,有一例病例进行静脉造影排除静脉曲张,此例病人静脉造影中交通静脉的定位与术前彩超相符。

并发症:SEPS常见并发症为筋膜下血肿、皮下气肿、局部软组织感染等^[30,31]。为减少并发症,我们在手术中彻底止血,严格控制筋膜下气压,并且术后挤压排气,术后抗生素抗感染,8例患者中有一例患者术后出现下肢蜂窝组织炎,经抗炎治疗1周炎症消失,考虑可能术前溃疡周围皮肤炎症虽消退但周围软组织炎症未完全消退有关,并且术中离断了交通支,并进行浅静脉的剥脱导致组织水肿,加重了感染。有1例患者术后出现溃疡周围淤积性皮炎糜烂表皮坏死脱落导致溃疡面积增大,但因溃疡较表浅,未增加溃疡愈合周期,同样考虑为术中离断了交通支,并进行浅静脉的剥脱导致溃疡周围组织回流通道短期

内丧失,并出现营养障碍所致。

下肢静脉曲张发病机制复杂,治疗周期长,易复发,需要综合性治疗^[32,33],对于静脉性溃疡患者的治疗,从本组病例通过腔镜深筋膜下交通静脉离断术治UV,症状体征改善明显。术后配合湿性换药技术换药明显缩短了溃疡愈合时间。腔镜深筋膜下交通静脉离断术较开放手术交通支结扎彻底,并且与传统开放交通离断术相比创伤小,切口感染率及坏死率明显降低。

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