

· 临床病理讨论 ·

**Clinicopathological Conference (the 52<sup>nd</sup> case)**

**Endovascular therapy in an elderly patient with peripheral artery disease and diabetic foot**

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**Background**

With the arrival of an aging society in China, patients with atherosclerosis of the lower extremity increased, and frequently, many suffered with combined diabetes. We describe an elderly male patient with arteriosclerosis obliterans and diabetic foot admitted in our department.

**Clinicopathological Conference**

An elderly man was presented with chronic lower limb ischemia combined with diabetic foot ulcer. This case presentation is of a 75-year-old man admitted to the Department of Vascular Surgery, Peking Union Medical College Hospital on October 18th. According to his statement, he suffered with intermittent claudication, cold, numbness and tingling in both feet for two years, and had received no regular treatment. This patient had gangrene and rest pain in his right toe on Oct 2010, so he was hospitalized for an endovascular operation for the dilation of the popliteal artery, right peroneal artery and posterior tibial artery. He was discharged from hospital when feeling better. The patient suffered from a more serious left lower limb intermittent claudication six months ago, and the claudication distance was about 100 meters. He was admitted for rest pain and fester on his left foot 20 days ago.

**Past History:** The patient had type 2 diabetes for 20 years (insulin administration for 10 years); cerebral infarction for 16 years (recovered after systemic treatment except speech disorders); hypertension for 10 years with the highest record at 180/85 mmHg; chronic bronchitis for 6 years (with intermittent light cough and white, viscous phlegm); benign prostatic hyperplasia for two years; and a right arm fractures eight days ago (with plaster external fixation of right upper limbs).

**Physical examination:** His body temperature was 36.0°C, pulse rate of 65 beats/min, and respiratory rate 20 times/min. Blood pressure was 144/80 mmHg at the left upper arm, 140/63 mmHg at the right arm,

respectively, and ABI of left leg of 0.7. The patient was conscious, but his speech was not fluent. The moist rales in bilateral upper lung were heard. Bilateral neck pulses were palpated. No jaundice, rash or hemorrhage was seen on his skin of his right lower limb. The temperature of the skin felt warm. The skin of the left lower limb looked a little pale, and left foot had ulceration, without gangrene, exudation or odor (Figure 1). Skin temperature on the left lower leg was cooler than the other. The right popliteal artery pulses were weak, and the right dorsal and posterior tibial pulses were not palpable. The left popliteal pulses were weak, and left foot back and posterior tibial pulses were not palpable. The Burger sign of the left lower limb was positive.



Figure 1 Left foot has ulcer

**Treatment:** (1) anticoagulation: he took clexane (low molecular heparin) for anticoagulation; (2) expansion of small arteries: Lipo-PGE1 was administrated; (3) antiplatelet therapy: aspirin was administered orally 100mg daily; (4) improve microcirculation: anplag was administrated; (5) antihypertension: nifedipine controlled release tablets were administrated orally 30 mg daily; (6) regulate the blood glucose disorder: insulin were administrated; (7) intensive lipid-lowering: Simvastatin; (8) improve neuropathy: mecobalamin, compound vitamin B were administrated; (9) treatment of the benign prostatic hyperplasia: cardura and finasteride were administered.

## Clinical discussion

**Resident Zhiqiang Xi from Department of Vascular Surgery:** The patient is an old men with a long history of lower limb ischemia. The auxiliary examination: (1) There was nothing abnormal in lab test results. (2) Electromyography (2011-10-11) displayed peripheral neuropathy, which was heavy in lower limbs and sensory neuropathy. (3) Chest X-ray and electrocardiogram displayed no abnormal results. (4) Pulmonary function examination showed COPD. (5) The right ABI was 0.42 and the left was 0.34. (6) CTA (2011-10-17) showed artery atherosclerosis change located in the abdominal aorta section and bilateral lower limbs, a mild stenosis in abdominal aorta and a severe stenosis bilateral deep femoral arteries. There was arterial thrombosis in the left popliteal artery, anterior tibial artery, tibifibular and posterior tibial artery. Arterial thrombosis was found in the right tibial arterial, tibifibular and posterior tibial artery. Encapsulated effusion in the right chest was found by CT. Current diagnosis: (1) double lower limb ischemia; (2) diabetic foot; (3) high blood pressure level 3 (very high risky); (4) old cerebral infarction; (5) prostate hyperplasia; (6) chronic bronchitis; (7) right pleural effusion package. In short, this patient had severe ischemia symptom with his left foot, and his condition was poor.

**Doctor Rong Huang from Department of Respiratory Medicine:** The patient is an old men, with a long history of chronic bronchitis. Now a pulmonary function examination displayed ventilation functions of the patient were decreased significantly, which means poor lung function. The patient currently had mild cough and sputum, so we should pay attention to volume and color of his sputum, observe any change of body temperature, and do a sputum culture when necessary. At present, the patient was administrated for the elimination of phlegm and an atomization treatment. The characteristic of the right pleural encapsulated effusion was undetermined, but we considered it a chronic and benign disease. We can get an optional biopsy under the CT-guided puncture.

**Professor Yuxiu Li from Department of Endocrinology:** The patient had more than 20 years history of diabetes, and there was no detailed medical record about his diabetes. At present the patient's glycated hemoglobin was 9%, that meant recent hyperglycemia was uncontrolled. The patient's foot symptom was considered to be associated with diabetic disease, so short acting insulin treatment should be suggested. We closely monitored the blood glucose level, and then the dose of insulin will be changed according to the blood glucose level. Hypoglycemia should be avoided, with the blood glucose level kept in 6 to 8 mmol/L.

**Professor Zhonghuang XU from Department of Anesthesiology:** Owing to the poor cardiopulmonary function of this patient, surgery may cause greater trauma with a higher risk of lung infection, a regional or local anesthesia was recommended.

**Doctor Xiaojun Song from Department of Vascular Surgery:** The patient's foot had ulceration, but no gangrene. Anticoagulation and vascular-dilation drugs were effective, so we could carry on conservative therapy.

**Professor Yuehong Zheng from Department of Vascular Surgery:** Now the patient's left lower limb had severe ischemia with left foot ulceration, and blood supply should be improved as soon as possible in order to prevent worsening results and to promote ulcer healing. Only drug therapy was not enough which had increased risk of diabetic foot, with ulcer expand and possible infection of the foot with gangrene. Bypass or minimally invasive surgery should be performed as soon as possible.

**Professor Yongjun Li from Department of Vascular Surgery:** The diagnose of patient is clear at present, including arteriosclerotic obliteration, diabetic foot; and ulcer of the left lower limb was more severe. Rest pain can be eased after surgery. But numbness and tingling are associated with peripheral diabetes neuropathy which may not get better after surgery. This should be disclosed to his relatives before any operation.

**Professor Changwei Liu from Department of Vascular Surgery:** Owing to the patients' poor general conditions, old age, and complicated disease history, it was first suggested to remove the distal stenosis of the left shallow artery by minimally invasive surgery. And then his left foot blood supply was improved by enlarging the popliteal artery blood supply, and the occlusion of the knees artery relieved by operation afterwards.

**The comprehensive opinion of the Department:** (1) The patient with critical left limb ischemia and left foot skin ulcerations should undergo surgery. (2) The patient is an old man with conditions of poor arterial and other diseases. The surgical operation will be very dangerous. If the patient with poor cardiopulmonary function has conventional bypass surgery. The risk of cardio-cerebral vascular accident is very high. Lung infection in the patient will happen after anesthetic endotracheal intubation. Secondly, the patient has a history of diabetes for many years, so it is difficult for wound healing and the risk of wound infection is high. Revascularize after bypass surgery is not satisfactory in elderly patients with a poor general condition, in particular with poor distal outflow tract of artery. Compensatory collateral vessels will be broken during the bypass surgery, and it may be not benefit the

patient. For these reasons, we will try endovascular treatment first, if not successful, bypass surgery will be done on another day. (3)The surgical operation will improve the blood flow of the limbs but will not improve the symptoms such as pain in the foot. We should inform the patient and his relatives of the risks and benefits before the operation. (4) The further therapy includes the arterial treatment and diabetic treatment. (5) The patient needs suitable physical exercise and to keep the limbs warm. (6) He needs to see an endocrinologist for DM after surgical operation. He is admitted for pleural effusion in the department of pneumology or department of thoracic surgery.

The endovascular operation was performed on Oct 21st, 2011. The self-expandable stents (6-40mm Cordis, Smart Control) were placed in the stenosis of the femoral artery and dilated in stent with a balloon (5-40mm Invatec, Admiral Xtreme). and also in the popliteal artery. The angiography displayed normal blood flow of the lower extremity after surgery (Figure 2). The pulse of the popliteal artery can be touched but the pulse of brachial artery could not be

located. The symptoms, including cold and rest pain, were improved and the ulcer of the foot got better. Burger sign disappeared, The flow through capillaries became better, and he could walk at least a distance of 400-meters. and was discharged on Oct 25th. He had received medication according to the opinion we have mentioned above, and on the 2 month follow-up, the ulcer was cured.

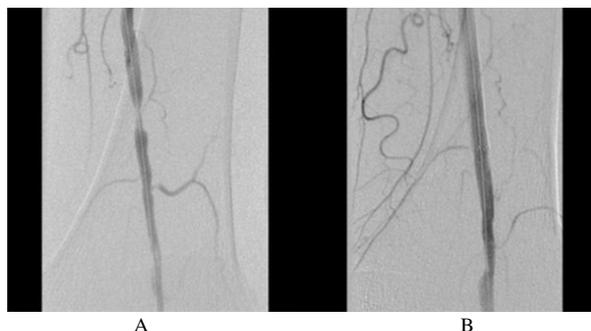


Figure 2 CTA image  
A: before stent implantation; B: after stent implantation

(Translator: XI Zhiqiang)

## 高龄男性糖尿病足合并膝下动脉闭塞外科治疗 1 例

随着我国社会老龄化的到来, 下肢动脉硬化症患者呈日益增多趋势, 动脉硬化闭塞症合并糖尿病足患者已不罕见, 下面报告我科 1 名高龄男性下肢动脉硬化合并糖尿病足病例, 供大家讨论。

### 1 病历摘要

患者, 男, 75 岁, 因“左下肢严重静息痛伴左足破溃 20 余天”入院。

**现病史:** 患者 2 年前无明显诱因出现双侧间歇性跛行, 伴双下肢小腿发凉、双足麻木及针刺感, 未正规治疗, 2010 年 10 月患者右足足趾坏疽而入我院, 行右腘动脉、腓动脉、胫后动脉球囊扩张术, 术后患者症状好转出院。患者半年前出现左下肢间歇性跛行加重, 行走约 100 米。20 天前患者出现左足静息痛, 逐渐加重, 伴左足皮肤破溃, 患者为求进一步治疗而于 2011 年 10 月 18 日入我科。

**既往史:** 糖尿病 20 年余, 现胰岛素治疗, 血糖控制尚可。患脑梗死 16 年余, 遗留有言语不利, 无肢体等其他后遗症。高血压 10 年余, 血压最高可达 180/85 mmHg (1 mmHg=0.133 kPa), 现口服硝苯地平控释片 (商品名: 拜新同) 30mg, 每日 1 次, 血压控制在 130/70 mmHg 左右。慢性支气管炎 6 年余, 目前有间断轻咳, 伴咳白色黏痰。良性前列腺增生 2 年

余, 予以非那雄胺 (商品名: 保列治) 治疗, 仍有夜尿增多。8 天前右上肢骨折, 右上肢石膏外固定治疗。

**查体:** 体温 36.0℃, 脉搏 65 次/min, 呼吸 20 次/min, 血压, 右上缺, 左上 144/80 mmHg, 右下 140/63 mmHg, 左下 100/50 mmHg。神志清楚, 言语欠流利, 查体合作; 肺部听诊可闻及少许湿啰音; 双颈动脉搏动正常可及; 右下肢皮色可, 皮温暖; 左下肢小腿皮色偏白, 左足皮肤破溃, 无坏疽, 未见明显渗出, 无臭味 (图 1), 小腿中部以下皮温凉; 双下肢股动脉搏动正常可触及; 右腘动脉搏动较弱, 右足背及胫后动脉搏动未触及; 左腘动脉搏动弱, 左足背及胫后动脉搏动未触及; 左下肢 burger 试验 (-)。

**给予处置:** (1) 抗凝: 低分子肝素, 依诺肝素钠注射液 (商品名: 克赛); (2) 扩张小动脉: 前列地尔注射液 (商品名: 凯时); (3) 抗血小板: 拜阿司匹林。(4) 改善微循环: 沙格雷酯 (商品名: 安步乐克); (5) 降压: 拜新同 30mg/d; (6) 控制血糖: 皮下注射胰岛素, 检测血糖, 调整胰岛素用量; (7) 强化降脂: 辛伐他汀 (商品名: 舒降之); (8) 改善神经病变: 甲钴胺 (商品名: 弥可保)、复合维生素 B。(9) 治疗前列腺增生: 多沙唑嗪控释片 (商品名: 可多华), 非那雄胺 (商品名: 保列治)。

### 2 临床病理讨论

血管外科席志强住院医师汇报病历: 患者老年

男性, 病史、查体无补充。辅助检查: (1) 生化检查未见明显异常; (2) 2011年10月11日肌电图: 周围神经病变, 下肢较重, 以感觉神经病变为主; (3) 胸部 X 线片及心电图未见明显异常; (4) 肺功能提示: 阻塞性通气功能障碍, 弥散功能障碍; (5) 双下肢踝臂指数右 0.42, 左 0.34; (6) 2011年10月17日 CT 血管造影: 腹主动脉下段及双下肢动脉多发粥样硬化改变, 腹主动脉轻度狭窄, 双侧股浅动脉远端重度狭窄, 股深动脉重度狭窄, 左侧腘动脉、胫前动脉、胫腓干、胫后动脉闭塞, 右侧胫前动脉、胫腓干、胫后动脉闭塞; 右侧胸腔包裹性积液。目前诊断: (1) 双下肢缺血; (2) 糖尿病足; (3) 高血压 3 级 (极高危); (4) 陈旧性脑梗死; (5) 前列腺增生; (6) 慢性支气管炎; (7) 右侧胸腔包裹性积液。目前患者左足症状较重, 有严重静息痛, 全身情况欠佳。

**呼吸内科黄蓉医师:** 患者老年男性, 多年慢性支气管炎病史, 肺功能提示患者通气功能及换气功能均有降低, 肺功能欠佳。患者目前有轻度咳嗽、咳痰, 应注意患者痰量及颜色, 观察患者体温变化, 必要时行痰培养。目前建议给予患者化痰药物, 术后加强雾化治疗。患者右侧胸腔包裹性积液性质待定, 考虑为慢性及良性病变, 可尝试在 CT 引导下穿刺, 确定患者病变性质, 择期处理。

**内分泌科李玉秀教授:** 患者有 20 余年糖尿病史, 既往血糖控制不详, 目前患者糖化血红蛋白为 9%, 近期血糖控制较差。患者足部症状符合糖尿病足慢性病变, 建议患者胰岛素治疗改为短效, 密切监测血糖, 根据血糖水平调整胰岛素用量, 不建议患者血糖过低, 保持在 6~8 mmol/L 之间, 以免发生低血糖事件。

**麻醉科徐仲煌教授:** 患者老年男性, 心肺功能欠佳, 不建议患者进行手术创伤较大的手术, 尽可能进行区域阻滞或者局部麻醉, 避免插管, 减少术后肺部感染。

**血管外科宋小军主治医师:** 患者足部有溃疡, 无坏疽, 给予患者抗凝、扩血管药物保守治疗后患者症状有好转, 可药物保守治疗观察。

**血管外科郑月宏教授:** 患者目前左下肢缺血较重, 且有左足破溃, 应尽快改善血运, 防止破溃扩展, 促进溃疡愈合, 药物保守治疗效果可能欠佳, 患者合并糖尿病足, 溃疡扩大或者感染均可导致患者足部坏疽, 应尽快解决患者血供, 可行左下肢微创或者搭桥手术。

**血管外科李拥军教授:** 患者目前诊断较为明确, 动脉硬化闭塞症, 双下肢动脉硬化闭塞, 左下肢缺血较重, 有左足破溃, 改善血运后能缓解患者静息

痛, 但患者麻木及灼热感与糖尿病足末梢神经病变有关, 术后症状可能不缓解, 需向家属交代。

**血管外科刘昌伟教授:** 患者血管条件较差, 高龄, 伴随疾病较多, 建议先尝试微创介入手段解除患者左股浅动脉远端重度狭窄病变, 尽可能打通患者小腿闭塞血管, 解除股浅动脉远端狭窄后, 保证腘动脉血供, 能很大程度上改善左足血运, 在此基础上尽可能打通膝下动脉闭塞病变。

**科室综合意见:** (1) 患者目前左下肢缺血较重, 左足有破溃, 应尽快手术。(2) 患者高龄, 动脉条件较差, 全身伴随疾病较多, 若行传统搭桥手术, 患者心肺功能欠佳, 心脑血管意外可能性大, 手术风险较高, 全身麻醉手术气管插管后, 患者肺部感染等风险高; 其次患者多年糖尿病史, 术后伤口愈合能力差, 伤口感染风险大, 患者高龄全身情况欠佳, 且血管远端流出道差, 搭桥后通畅率不高, 术中损伤已有代偿侧支, 患者受益不多, 由于以上原因, 先行尝试介入方法, 若不能成功, 则择期行搭桥手术。

(3) 改善血供对破溃愈合作用重大, 但是对糖尿病足麻木感及灼热感改善可能不明显, 详细向患者及家属交代病情。(4) 术后增强血管及糖尿病药物治疗。(5) 术后注意适度功能锻炼, 注意保暖。(6) 出院后调整患者内分泌科门诊随诊, 调整血糖。右侧胸腔包裹性积液可转呼吸科或胸外科进一步治疗。

**治疗:** 患者于 2011 年 10 月 21 在局部麻醉下行左股浅动脉球囊扩张支架植入 + 左腘动脉球囊扩张术, 股浅动脉重度狭窄处放置 6~40 mm 自膨支架 ( Cordis, Smart Control ), 精确定位后释放, 并用 5~40 mm 球囊 ( Invatec, Admiral Xtreme ) 给予后扩张, 腘动脉给予 5~40 mm 球囊 ( Invatec, Admiral Xtreme ) 扩张。膝下动脉至胫腓干水平应用 3~120 mm ( Reecross ) 球囊扩张, 术后造影, 血流通畅 ( 图 2 )。术后患者左腘动脉搏动良好, 左足背及胫后动脉搏动未及, 左足皮温暖, 血供明显较前好转, 患者静息痛症状消失, 左足趾间破溃较前好转。患者穿刺口愈合良好, 无血肿等并发症。患者于 2011 年 10 月 25 日出院, 可自行下床活动, 左足趾间破溃创面渗出明显减少, 间歇性跛行症状消失, burger 试验 ( - ), 毛细血管充盈良好, 皮肤颜色较前明显好转, 皮温暖。出院后嘱患者注意药物治疗, 至内科门诊就诊, 调整血糖、控制血压等。

(参与讨论医师: 席志强, 黄蓉, 李玉秀, 徐仲煌, 邵江, 刘暴, 宋小军, 郑月宏, 李拥军, 刘昌伟)  
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