Clinical Medicine

Emergency treatment of endobronchial stent placement for serious main bronchial stenosis following high-risk orthotopic heart allotransplantation: One case report*☆

Zhao Yong-xiang [1,2], Zhao Ling-ling [1], Shan Zhong-gui [2], Tang Qi [1], Yang Ling [1], Fan Qin-ming [2], Yi Bo [1], Liao Chong-xian [2], Zhou Zhi-ming [1], Ou Yang-wen [1], Zhu Yue [3]

Abstract

BACKGROUND: Ventilation dysfunction caused by bronchomalacia induced bronchostenosis following high-risk heart transplantation is an acute clinical disease, which seriously impairs the function of transplant heart. The case of emergency bronchial stent placement following heart transplantation with high-risk multi-complication has not been reported yet.

OBJECTIVE: To investigate the curative effect of emergency stent placement for worse left main bronchial malacia, stenosis and collapse following orthotopic heart allotransplantation.

DESIGN: A case analysis.

SETTINGS: National Ministry of Health Transplantation Engineering and Technical Research Center, the Third Xiangya Hospital, Central South University; Department of Cardiosurgery, Zhongshan Hospital affiliated to Xiamen University.

PARTICIPANTS: An 18-year-old female patient with dilated cardiomyopathy accompanied by moderate to severe pulmonary artery hypertension, who sequentially carried out orthotopic heart allotransplantation, was selected from the Department of Cardiosurgery, Zhongshan Hospital affiliated to Xiamen University in April, 2004. She had suffered from dilated cardiomyopathy for 15 years, and the mean pulmonary artery pressure (MPAP) was 50- 51 mm Hg, she was also accompanied by left main bronchial malacia, stenosis and collapse, mixed (mainly central-) sleep apnea syndrome, left inferior pulmonary sequestration, right emphysema, and rheumatoid arthritis for half a year.

METHODS: After heart transplantation, bronchus inflammation, congested edema aggravated the severity of bronchial malacia, stenosis and collapse, tenosis reduced to 4/5, and led to obstructive type of ventilation, and the patient was also accompanied by supraventricular tachycardia, ventricular extrasystole, and hypofunction of transplant cardiac systolic function (peak E < peak A, ejection fraction reduced to 40%, inharmonious motion of ventricular wall). Attempted with inotropic agents and ventilatory support were not relieved, which resulted in the aggravation of illness. In order to improve the post-transplant cardiac function, to relieve bronchial collapse and stenosis, and correct the obstructive type of ventilation, an emergency bronchial stent placement surgery was carried out on the sixth day after heart transplantation. Under monitoring of electrocardiogram (ECG) and percutaneaous oxygen saturation (SpO_2), patient was awake and in supine to relieve left main bronchial stenosis with a nickel-titanium shape memory alloy stent (Diameter: 12 mm; length: 20 mm) by D20 fiberoptic bronchoscope. Fibrobronchoscopy was used to observe the proximal end of bronchostenosis and set the proximate location mark by using video fluoroscopy; the patency of distal end was explored by stricture, and set the distal location mark; guidewire was inserted into working path of bronchofibroscope and led through the stricture; then loaded the Ni-Ti stent on a special placement apparatus, and led in bronchial stent implantation apparatus along guidewire. When targeting well, the stent was slowly released and adjusted properly. When it was completely released, the stent implantation apparatus was drawn out. Bronchofibroscope was performed postoperatively to observe the adherence of stent; immediately photographed to observe its unfolding. Synchronized intermittent mandatory ventilation (SIMV) was given postoperatively as supportive treatment.

MAIN OUTCOME MEASURES: Ameliorations of the cardiac and pulmonary functions of the patient.

RESULTS: ① Carbon dioxide retention and hypercapnia were remarkably improved as compared with those preoperatively; hypertensive pulmonary vascular disease was alleviated gradually, and MPAP reduced to 30 mm Hg. One week later, re-examination of bronchofibroscopy was carried out, and the results showed that bronchi of left upper lobe, lingual lobe as well as left lower lobe could be seen distinctly, mucous membrane had slightly congested edema, and lumens were unobstructed. ② Supraventricular tachycardia and premature ventricualr contraction disappeared, and the transplant cardiac function recovered well (peak E > peak A, ejection fraction 70%, FS 41%), and the heart rate fluctuated at 100-110 beats per minute. ③ The chest-radiography and CT postoperatively indicated the relief of left main bronchial stenosis. When the ventilation function of the patient was improved, the parameters of breathing machine were reduced gradually, and replaced by low-flow oxygen. There was no recurrence of obstructive ventilatory disorder. The sleep apnea syndrome of the patient was moderated.

CONCLUSION: Emergency treatment with stent placement for bronchial malacia, stenosis and collapse occurring after orthotopic heart allotransplantation cAN improve ventilation dysfunction caused by bronchial malacia and stenosis, and increase the survival rate of heart transplantation.

[1]National Ministry of Health Transplantation Engineering and Technical Research Center, Third Xiangya Hospital, Central South University, Changsha 410013, Hunan Province, China; [2]Department of Cardiosurgery, Zhongshan Hospital of Xiamen University, Xiamen 361003, Fujian Province, China; [3]Organ Transplantation Institute, University of Pittsburgh, 200 Lothrop Street C-700, Pittsburgh, PA 15213, USA

Zhao Yong-xiang ☆, Doctor, Professor, National Ministry of Health Transplantation Engineering and Technical Research Center, Third Xiangya Hospital, Central South University, Changsha 410013, Hunan Province, China; Department of Cardiosurgery, Zhongshan Hospital of Xiamen University, Xiamen 361003, Fujian Province, China

Correspondence to: Liao Chong-xian, Professor, Department of Cardiosurgery, Zhongshan Hospital of Xiamen University, Xiamen 361003, Fujian Province, China
chongxianliao@yahoo.com.cn

Supported by: Central South University Key Academic Discipline Foundation, No. 2004-24*

Received: 2007-03-29
Accepted: 2007-05-20
(07-50-3-1913/YWY)

Zhao YX, Zhao LL, Shan ZG, Tang Q, Yang L, Fan QM, Yi B, Liao CX, Zhou ZM, Ou YW, Zhu Y. Emergency treatment of endobronchial stent placement for serious main bronchial stenosis following high-risk orthotopic heart allotransplantation: One case report. Zhongguo Zuzhi Gongcheng Yanjiu yu Linchuang Kangfu 2007;11 (25): 5011-5015(China)

[www.zglckf.com/zglckf/ejournal/upfiles/07-25/25k-5010(ps).pdf]

INTRODUCTION

Heart transplantation is now an established technique for the effective treatment of end-stage or inoperable heart disease, including dilated cardiomyopathy, rheumatic heart diseases and ischemic heart diseases [1-4]. However, worse serious bronchial obstruction from severe bronchial malacia, mucosa congested edema and stenosis following heart transplantation with a high risk is rare.

Based on literature retrieval, combined sequential heart transplantation for end-stage heart disease and stent placement for serious bronchial obstruction have not been performed during a perioperative period.

Tracheobronchial obstruction from either benign or malignant disease is associated with high morbidity and possible early death by asphyxia1 [5]. Even in the absence of parenchymal lung disease, ventilation failure frequently occurs if the obstruction is not relieved[6].

A variety of benign etiologies can underlay airway obstruction, including tracheomalacia, tracheal stricture, inflammatory diseases such as Wegener's granulomatosis and relapsing polychondritis, and anastomotic stricture following lung transplantation [7]. Central airway obstruction can result in dyspnea, cough, and impaired clearance of respiratory secretions.

Surgical tracheal sleeve resection and reconstruction remains the "gold standard" treatment for most benign airway strictures, however, the management of patients with tracheobronchial strictures of benign etiology can be quite challenging[8]. There are a large number of patients with lesions not amenable to surgery, or who are considered medically inoperable [9]. Endoscopic implantation of airway prostheses (stents) in these patients has gained increasing popularity over the last decade. So far, it is demonstrated that stenting has shown efficacy in such benign airway conditions such as relapsing polychondritis[10], tuberculosis[11] and post-lung transplant stenosis [12]. In these patients, airway stenting may represent the only possible treatment. Currently, various inoperable benign airway disorders are considered indications for airway stenting[8,9]. The goal of stent placement is to relieve airflow obstruction [6]. The indication for stent placement is significant extraluminal compression causing severe symptoms such as dyspnea and stridor in patients with tracheobronchial malacia. Advances in techniques to insert airway prostheses have provided clinicians with a variety of pneumatic dilators, and expandable metallic and silicone stents[13].

Ventilation dysfunction caused by bronchostenosis following high-risk heart transplantation is an acute clinical disease, which seriously impairs the function of transplant heart, and increases the death possibility of transplant patients. The case of emergency bronchial stent placement following heart transplantation with high-risk multi-complication has not been reported yet.

We applied a nickel-titanium shape memory alloy stent for emergency placement to rescue a patient with severe bronchostenosis 6 days after high-risk heart transplantation, and acquired a satisfied result.

SUBJECT AND METHODS

Subject

An 18-year-old female patient with dilated cardiomyopathy accompanied by moderate to severe pulmonary artery hypertension, who sequentially carried out orthotopic heart allotransplantation, was selected from the Department of Cardiosurgery, Zhongshan Hospital affiliated to Xiamen University in April, 2004.

She had suffered from dilated cardiomyopathy for 15 years, and the mean pulmonary artery pressure (mPAP) was 50-51 mm Hg, she was also accompanied by left main bronchial malacia, stenosis and collapse, mixed (mainly central-) sleep apnea syndrome, left inferior pulmonary sequestration, right emphysema, and rheumatoid arthritis for half a year.

Methods

In fact, there would also be a stronger relative indication for combined heart and lung transplantation in this recipient. Before operation, the enlargement heart of patient long-term compressed the left main bronchus, and caused bronchus dysplasia, malacia, collapse and stenosis with left inferior pulmonary separation (Figure 1a). Bronchus inflammation, congested edema accompanied with the similar above bronchial pathological changes (Figure 1b) occurring after heart transplantation led to obstructive type of ventilation, carbon dioxide retention, hypercapnia, hypoxemia, and secondary severe pulmonary hypertension (PCO_2: 103 mm Hg, PO_2: 53 mm Hg, HCO_3: 31 mmol/L, SaO_2: 78%, pH 7.241, maximal MPAP: 52 mm Hg), which seriously impaired the function recovery of patient after heart transplantation.

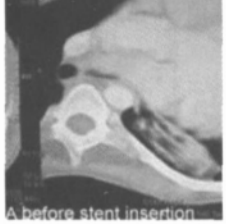
Postoperatively, the patient was complicated with supraventricular tachycardia (heart rate > 130-140 beats per minute), ventricular extrasystole (5-7 beats per minute), and hypofunction of transplant cardiac systolic function (peak E < peak A, ejection fraction reduced to 40%, inharmonious motion of ventricular wall). The patient appeared hypotension (Min: 90/45 mm Hg) and increased heart rate (Max: 158 beats per minute). Attempted with inotropic agents and ventilatory support were not relieved the obstructive type of ventilation, or alleviated carbon dioxide retention, hypercapnia, hypoxemia, or mitigated secondary severe pulmonary hypertension, which resulted in the aggravation of illness. In order to save patient's life, improve the post-transplant cardiac function, to relieve bronchial collapse and stenosis, and correct the obstructive type of ventilation, an emergency bronchial stent placement surgery was carried out on the sixth day after heart transplantation.

Stent placement protocol

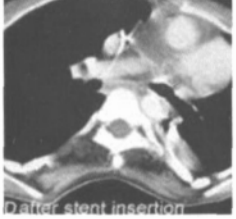
Under monitoring of electrocardiogram (ECG) and percutaneaous oxygen saturation (SpO_2), patient was awake and in supine to relieve left main bronchial stenosis with a nickel-titanium shape memory alloy stent (Diameter: 12 mm; length: 20 mm) by D20 fiberoptic bronchoscope (outer diameter, 5.2 mm)(Figure 1c, Figure 1d, Figure 1e, Figure 1f).

The patient was anaesthetized by local anesthesia at cricothyroid membrane puncture and laryngeal anesthesia via lidocaine spray was examined by fibrobronchoscopy to observe the proximal end of bronchostenosis and set the proximate location mark by using video fluoroscopy; the patency of distal end was explored by stricture, and set the distal location mark; guidewire was inserted into working path of bronchofibroscope and led through the stricture; then the bronchofibroscope was removed, loaded the Ni-Ti stent on a special placement apparatus, and led in bronchial stent implantation apparatus along guidewire. When targeting well, the stent was slowly released and adjusted properly. When it was completely released, the stent implantation apparatus was drawn out. Bronchofibroscope was performed postoperatively to observe the adherence of stent; immediately photographed to observe its unfolding.

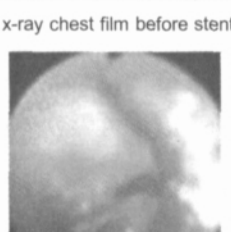
Endotracheal purulent secretion was cleared, and locally stopped bleeding with 0.005% -0.010% epinephrine. Synchronized intermittent mandatory ventilation (SIMV) was given postoperatively as supportive treatment. The ameliorations of the cardiac and pulmonary functions of the patient were observed postoperatively by clinical physical signs, fibrobronchoscopy, chest-radiography and CT.



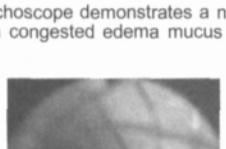
a: Inspiratory thoracic CT image before stent placement demonstrates a total collapse of the left main bronchus



c: Thoracic x-ray chest film before stent placement

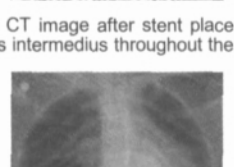


b: The fibreoptic bronchoscope demonstrates a near-total collapse of the left main bronchus with congested edema mucus mixed secretion before stent placement



d: Inspiratory thoracic CT image after stent placement demonstrates the patency of the bronchus intermedius throughout the respiratory cycle

e: The fibreoptic bronchoscope demonstrates a patent left main bronchus intermedius with congested edema mucosa after stent placement



f: X-ray chest film after stent placement demonstrating the stent's suitable position

Figure 1 Dynamic thoracic X-ray chest film, CT scanning and fibreoptic bronchoscope before and after expandable metal stent placement

Treatment of complication after stent placement

The patient suffered from the left main bronchial stenosis, left lower atelectasis, and right lung compensatory emphysema preoperatively, in addition, flushing dose of immunodeppressant were used for heart transplantation, thus bronchus mesh stent as a extraneous matter increased the risk of pulmonary infection. Alpha hemolytic streptococcus, staphylococcus aureus (MRSA) and enterobacter cloacae were found in the sputum, and patching-shape blurred shadow was found in double lung fields through chest-radiography; the patient appeared to fever (body temperature up to 40.8 ℃), accompanied by cough and expectoration (white sputum crudum), but no hemoptysis and respiratory embarrassment. Hemoculture found MRSA and enterobacter cloacae. The hemogram heightened, of which white blood cells (WBC) > 20×10^9, N 94%. According to the susceptibility test and antibiotics serum bactericidal test to choose antibiotics, the patient with bacterial infection was treated alternatively with teicoplanin+imipenem+fosfomycin, polymyxin E+vancomycin+meropenem, and fosfomycin +polymyxin E. Dual infection was precluded through administrating itraconazole for mycotic infection, and acyclovir for viral infection. Meanwhile, the dose of immunosuppressant was adjusted as below, FK506 maintained at 0.15 mg/kg per day, prednisone reduced from 30 to 5 mg per day, and Cellcept (MMF) discontinued. In addition, it is also essential for the case to enhance turnover, back-patting and postural drainage, to encourage the patient to cough and expectorate, and to reinforce the disinfection and isolation of ward.

RESULTS

Postoperative clinical physical signs

Carbon dioxide retention and hypercapnia were remarkably improved as compared with those preoperatively (PCO_2: 35-50 mm Hg, PO_2: 100-120 mm Hg, HCO_3: 34-37 mmol/L, SO_2 99-100%, pH 7.341-7.374); hypertensive pulmonary vascular disease was alleviated gradually (after two month, MPAP reduced to 30 mm Hg). One week later, re-examination of bronchofibroscopy was carried out, and the results showed that bronchi of left upper lobe, lingual lobe as well as left lower lobe could be seen distinctly, mucous membrane had slightly congested edema, and lumens were unobstructed. Supraventricular tachycardia and premature ventricualr contraction disappeared, and the transplant cardiac function recovered well (peak E > peak A, ejection fraction 70%, FS 41%). The vital sign of the patient was stable, the blood pressure fluctuated at about 120/70 mm Hg, and the heart rate fluctuated at 100-110 beats per minute.

Results of chest-radiography and CT postoperatively

The chest-radiography and CT postoperatively indicated the changes of bronchial stent placement after heart transplantation, and relief of left main bronchial stenosis. When the ventilation function of the patient was improved, the parameters of breathing machine were reduced gradually, and replaced by low-flow oxygen. There was no recurrence of obstructive ventilatory disorder. However, it was found that both carbon dioxide partial pressure (average PCO_2, 88 mm Hg) and oxygen partial pressure (average PO_2, 172 mm Hg) were increased during sleep. The patient was orderly treated with BIPAP non-invasive ventilation to assist spontaneous ventilation (respiration parameters, IP: 9 mm Hg, EP: 4 mm Hg, FIO_2: 21%) and American Stars 425 portable bi-level sleep apnea instrument. At the same time, Duxil was administered to reinforce the sensitivity of peripheral chemoreceptor to carbon dioxide partial pressure, and excite respiratory center. The sleep apnea syndrome of the patient was moderated, and the increased carbon dioxide partial pressure was also corrected (PO_2 was controlled between 35 and 50 mm Hg).

Treatment of complications

After effective treatments, the infections caused by bacteria, virus, and mycetes were under control, and body temperature recovered, symptoms of cough and expectoration disappeared, and hemogram normalized. Re-examination of chest-radiography showed that the focus of infection had been absorbed. After continuous culture for 7 days, there was no microorganism found in sputum culture.

DISCUSSION

Orthotopic heart allotransplantation has always been a quite high-risk surgery for those patients who suffered from dilated cardiomyopathy, complicating with severe pulmonary artery hypertension, left pulmonary ventilation dysfunction caused by left main bronchial malacia, stenosis and collapse, and mixed (mainly central) sleep apnea syndrome. Life-threatening risk is more increased by impairment of pulmonary ventilation function caused by serious left bronchostenosis perioperatively. At present, stent placement is the most useful emergency measures for managing dyspnea or respiratory failure caused by tracheobronchial stenosis, as well as recurrent obstructive pneumonia and pulmonary atelectasis when other common measures are ineffective[8,14-16].

In this case, bronchus inflammation, congestion and edema occurring after heart transplantation aggravated the severity of preoperative tracheobronchial stenosis of the patient, and led to carbon dioxide retention, hypercapnia, hypoxemia, aggravating pulmonary hypertension, and finally to cardiac function and respiratory failure, which seriously jeopardized the patient's life. Emergency treatment of bronchus stent placement can relieve the lung hypoventilation caused by bronchiostenosis, improve the state of carbon dioxide retention, and lower pulmonary artery hypertension. All these results produced a significant efficacy on salvage of transplant heart, improvement of prognosis, and diminishing the risk of postoperative death.

Despite stent placement relieved the pulmonary ventilation dysfunction, it was found that both carbon dioxide partial pressure (average PCO_2, 88 mm Hg) and oxygen partial pressure (average PO_2, 172 mm Hg) were increased during nighttime sleep. As for this current sleep apnea syndrome, simply improvement of ventilation function would not achieve remarkable clinical effect. Considering a preoperative complication of mixed sleep apnea syndrome, mainly as central sleep apnea syndrome, suffered, and long-term dys-ventilating, carbon dioxide retention, respiratory acidosis, as well as insensitivity of respiration central chemoreceptor for CO_2 simultaneously existed, such phenomenon were believed to be induced by the lowering of respiratory central excitability of patient [17,18]. By orderly treatment with BIPAP non-invasive ventilation to assist spontaneous ventilation and American Stars 425 portable bi-level sleep apnea instrument, and in combination with "Duxil" to enhance sensitivity of peripheral chemoreceptor to CO_2 and to excite respiratory center, the symptoms of patient were obviously relieved. Meanwhile, it is proven that BIPAP portable bi-level sleep apnea instrument is an effective means for the treatment of central sleep apnea syndrome. Moreover, because the placement of bronchus mesh stent increases the risk of pulmonary infection, the postoperative monitoring of sputum culture and hemoculture should be performed to discover and diagnose infection, and to adjust antibiotics in terms of the result of susceptibility test. In addition, regular turnover, body-patting, and postural drainage play a positive role on precaution and control of pulmonary infection. So far, the patient has survived more than one year, who is in good clinical and functional condition, i.e., cardiac function class Ⅰ, smooth respiration, and able to manage daily living by herself. Accordingly, we were successful in avoiding combined heart and lung transplantation with a high-rate of death in the young girl patient.

REFERENCES

1 Barnard CN. What we have learned about heart transplants. J Thorac Cardiovasc Surg 1968;56(4):457-468
2 Keon WJ. Heart transplantation in perspective. J Card Surg 1999;14(2):147-151
3 Kanter KR, Vincent RN, Berg AM, et al. Cardiac retransplantation in children. Ann Thorac Surg 2004;78(2):644-649
4 Hosenpud JD, Bennett LE, Keck BM, et al. The registry of the International Society of Heart and Lung Transplantation: eighteenth official report-2001. J Heart Lung Transplant 2001;20(8):805-815
5 Shin JH, Song HY, Shim TS. Management of tracheobronchial strictures. Cardiovasc Intervent Radiol 2004;27(4):314-324
6 Rafanan AL, Mehta AC. Stenting of the tracheobronchial tree. Radiol Clin North Am 2000;38(2):395-408
7 Colt HG, Dumon JF. Airway stents: present and future. Clin Chest Med 1995;16(3):465-478
8 Noppen M, Stratakos G, Haese J, et al. Removal of covered self-expandable metallic airway stents in benign disorders: indications, technique, and outcomes. Chest 2005;127(2):482-487
9 Wood DE, Liu YH, Vallieres E, et al. Airway stenting for malignant and benign tracheobronchial stenosis. Ann Thorac Surg 2003;76(1):173-174
10 Faul JL, Kee ST, Rizk NW. Endobronchial stenting for severe airway obstruction in relapsing polychondritis. Chest 1999;116(3):825-827
11 Lee KW, Im JG, Han JK, et al. Tuberculous stenosis of the left main bronchus: results of treatment with balloons and metallic stents. J Vasc Interv Radiol 1999;10(3):352-358
12 Sonett JR, Keenan RJ, Ferson PF, et al. Endobronchial management of benign, malignant, and lung transplantation airway stenoses. Ann Thorac Surg 1995;59(6):1417-1422
13 Vonk-Noordegraaf A, Postmus PE, Sutedja TG. Tracheobronchial stenting in the terminal care of cancer patients with central airways obstruction. Chest 2001;120(6):1811-1814
14 Eisner MD, Gordon RL, Webb WR, et al. Benign airway obstruction: pulmonary function improves after expandable metal stent placement for benign airway obstruction. Chest 1999;115(4):1006-1011
15 Belleguic C, Lena H, Briens K. Tracheobronchial stenting in patients with esophageal cancer involving the central airways. Endoscopy 2000;12(1):24-26
16 Saad CP, Murthy S, Krizmanich G, et al. Self-expandable metallic airway stents and flexible bronchoscopy: long-term outcomes analysis. Chest 2003;124(5):1993-1999
17 Bradley TD, Floras JS. Sleep apnea and heart failure: Part II. Central sleep apnea. Circulation 2003;107(13):1822-1826
18 Mansfield DR, Solin P, Roebuck T, et al. The effect of successful heart transplant treatment of heart failure on central sleep apnea. Chest 2003;124(5):1675-1681

高风险原位同种异体心脏移植术后支气管狭窄的急诊支架置入治疗:1 例报告 *☆

赵永祥[1,2],**赵玲玲**[1],**单忠贵**[2],**唐 琪**[1],**阳 玲**[1],**范钦明**[2],**易 波**[1],**廖崇先**[2],**周志明**[1],**欧阳文**[1],**朱 岳**[3]

[1]**中南大学湘雅三医院-卫生部移植医学工程技术研究中心,湖南省长沙市** 410013;[2]**厦门大学附属中山医院心脏外科,福建省厦门市** 361003;[3]**美国匹兹堡大学器官移植研究所,宾夕法尼亚洲,匹兹堡,** 15213 **美国**

赵永祥☆,男,1965 **年生,湖北省石首市人,汉族,**1999 **年中南大学湘雅医学院毕业,博士,**2003 **年美国哈佛大学医学院博士后出站,心胸外科学教授,国家教育部新(跨)世纪优秀人才支持计划入选者,主要从事心肺移植和基因治疗研究。**

通讯作者:廖崇先,教授,厦门大学附属中山医院心脏外科,福建省厦门市 361003

中南大学重点学科建设基金资助项目(2004-24)*

摘要

背景:心脏移植术后支气管软化导致狭窄引起的呼吸功能障碍是一种临床急重症,严重危及移植心脏的功能,高风险多并症心脏移植并支气管支架置入术有待临床观察。

目的:报告极高风险原位心脏移植术后因左主支气管软化狭窄塌陷急诊支架置入 1 例。

设计:病例分析。
单位:中南大学湘雅三医院-卫生部移植医学工程技术研究中心,厦门大学附属中山医院心脏外科。
对象:选择于2005-04在厦门大学附属中山医院心脏外科施行同种异体原位心脏移植术的渐进性扩张型心肌病合并中-重度肺动脉高压患者,女,18岁,渐进性扩张型心肌病病史15年,中-重度肺动脉高压:肺动脉平均压50~51 mm Hg,同时伴有左主支气管软化塌陷狭窄、混合性(中枢性为主)呼吸睡眠暂停综合征、左下肺不张、右侧肺气肿、类风湿性关节炎等合并症半年。
方法:患者心脏移植术后,支气管炎症充血水肿加重了气管软化塌陷狭窄程度,管腔狭窄至4/5,导致阻塞性通气障碍,并发室上性心动过速、室性早搏,移植心脏舒张功能减退(E峰<A峰、移植心脏射血分数降低至EF40%、室壁运动不协调)。予以强心治疗、呼吸机辅助通气,但患者左主支气管狭窄未解除,病情持续恶化。为促使移植心脏功能恢复,解除支气管软化塌陷所致狭窄,纠正阻塞性通气障碍,于心脏移植术后第6天行紧急支气管支架置入治疗。①患者取平卧位清醒状态,在心电监护及经皮血氧饱和度监测下,通过D20光导纤维支气管镜,使用记忆合金网状支架(直径12 mm长20 mm)解除左主支气管狭窄。常规纤维支气管镜检查,观察支气管狭窄近端,并在电视透视下放置近端定位标志,经狭窄孔探测远端通畅程度,并放置远端定位标志,通过纤维支气管镜工作道内插入引导钢丝,钢丝越过狭窄部位,将镍钛支架装入专用置入器内,顺导丝引入支气管支架植入器,到位良好后,缓慢释放支架并作适当调整,待完全释放后退出支架植入器,术后再作纤支镜检查,观察支架贴壁情况;立即摄片,观察其展开的情况。术后予以呼吸机同步间歇指令通气支持治疗。
主要观察指标:患者心、肺功能的改善情况。
结果:①术后患者二氧化碳潴留、高碳酸血症较前明显改善,肺动脉高压症逐渐缓解,肺动脉平均压降至30 mm Hg。1周后复查纤维支气管镜检查左上叶、舌叶及左下叶各级支气管清晰可见,粘膜稍充血水肿,管腔通畅。室上性心动过速、室性早搏消失,移植心脏功能恢复良好(E峰>A峰、EF70%、FS41%),心率波动于100~110次/min。②术后肺部胸片和CT观察左主支气管狭窄解除。患者通气功能改善,逐步降低呼吸机参数,撤除呼吸机予低流量吸氧治疗,未再出现阻塞性通气障碍表现,患者睡眠呼吸暂停综合症得以纠正。
结论:原位心脏移植术后支气管软化塌陷狭窄的急诊支架置入治疗可改善支气管软化狭窄所致通气功能障碍,提高心脏移植成活率。
关键词:原位心脏移植;支气管狭窄;支架置入
中图分类号:R617 文献标识码:A 文章编号:1673-8225(2007)25-05011-05
赵永祥,赵玲玲,单忠贵,唐琪,阳玲,范钦明,易波,廖崇先,周志明,欧阳文,朱岳.高风险原位同种异体心脏移植术后支气管狭窄的急诊支架置入治疗:1例报告[J].中国组织工程研究与临床康复,2007,11(25):5011-5015
[www.zglckf.com/zglckf/ejournal/upfiles/07-25/25k-5010(ps).pdf]
(Edited by Yin YL/Wang L)

CRTER 近期组稿重点

种子细胞研究
1. 干细胞生物学特性方面的相关研究;
2. 干细胞实验技术方法及应用技术方法的研究;
3. 干细胞因子/调控因子的相关研究;
4. 干细胞移植中的伦理学、生物技术应用中的相关法规及规范,评估标准的可靠性以及效果的确实可信性;
5. 动物实验与已批准临床实验结果差异的讨论。

生物材料研究
1. 组织工程支架材料、骨科组织工程支架材料;
2. 药物控制释放材料;
3. 新型功能复合生物材料;
4. 口腔生物材料;
5. 人工器官材料;
6. 载体材料及生物反应器工程;
7. 生物材料在临床治疗中的应用性研究。

组织构建研究
1. 组织构建、骨科组织构建;
2. 组织构建与骨科植入体;
3. 组织构建与硬组织修复;
4. 组织构建与软组织修复;
5. 组织构建与骨质疏松;
6. 组织构建研究中具有应用意义的基础和临床实验。

器官移植研究
1. 器官移植方面的相关研究;
2. 组织移植方面的相关研究;
3. 细胞移植方面的相关研究;
4. 器官/组织/细胞移植方面的临床应用性研究;
5. 与器官、细胞移植相关的心理学、伦理学及医疗法规学等问题的研究。

血管植入物研究
1. 支架介入治疗心血管系统疾病的生物相容性;
2. 支架介入治疗脑血管疾病的生物相容性;
3. 支架介入治疗外围血管疾病及脊髓血管疾病的生物相容性;
4. 支架介入治疗颅内、椎管内血管性病变的生物相容性;
5. 支架介入治疗与人体生物相容性的基础及临床研究。

投稿信箱
kf23385083@sina.com
kf22838105@sina.com
kf22838106@sina.com
kf22854097@sina.com