Non-small Cell Lung Cancer with Superior Vena Cava Syndrome Effectively Treated with Implantation of Intravascular Stent and Chemotherapy — A Case Report and Review of the Literature

Jun-Ted Chong,1 Jung-Chou Wu,1 Chih-Hsien Chang1 and Erh-Jung Hsueh2

Superior vena cava syndrome is caused by obstruction of the superior vena cava due to a variety of malignant and benign entities. The most common malignant entities are lung cancer and mediastinal tumor. Conventional treatments include bypass surgery, external beam radiation therapy, chemotherapy, and medical treatment. In this report, we performed an intravascular metallic stent deployment and combined chemotherapy with Vinorelbine in a case of non-small cell lung cancer with superior vena cava syndrome. The tumor regressed and symptomatic improvement was achieved after 124 days of follow-up. However, stent migration was noted and possibly due to tumor shrinkage and subsequent luminal enlargement. The choice of stent size is critical and should allow for possibility of tumor regression.

Key Words: Superior vena cava syndrome • Intravascular stent

INTRODUCTION

Superior vena cava syndrome (SVCS) occurs when obstruction or stenosis of the superior vena cava diminishes venous return flow from the head and upper extremities. Symptoms include facial swelling, head fullness, lightheadedness and syncope.1 SVCS secondary to malignancy often presents with slowly progressive symptoms worsening over weeks to months. Life-threatening complications include laryngeal obstruction and cerebral edema. Choices of treatment modality should be individualized. Current treatment modalities include chemotherapy, radiotherapy, surgical bypass and intravascular stenting. Radiotherapy and chemotherapy are often used to treat SVCS caused by malignancy. However, resolution of symptoms may occur slowly or may be unsatisfactory with these treatments.2 Corticosteroid and diuretics may relieve the condition temporarily but do not offer a long-term solution. Surgical bypass is often compromised by the patient’s advanced condition and thrombosis of the surgically created graft.3-5 Intravascular stenting has been shown to be an effective and minimally invasive procedure for rapid, long-lasting relief of malignant obstruction due to SVCS.6

CASE REPORT

A 72-year-old man presented with anterior chest pain, fever and productive cough for 2 weeks. He sought medi-
cal treatment at a local clinic and took anti-pyretics. Because of hemoptyis and high fever, he visited our hospital on 2002-11-13. Physical examination revealed an acutely ill-looking patient with puffy face, swollen eyelids and distended jugular vein. No enlarged lymph nodes were noted. Chest x-ray (Figure 1) showed widening of the upper mediastinum. Chest computed tomography showed soft tissue mass in the medial aspect of the right upper lung and mediastinum with brachiocephalic vein and superior vena cava (SVC) compression. Mediastinotomy diagnostic examination with tumor biopsy was performed. Poorly differentiated adenocarcinoma was confirmed. Tissue immunohistochemical stain showed positive in cytokeratin-18 (CK-18) and epithelial membrane antigen (EMA). After clinical evaluation, radiotherapy was started, but the patient was unable to tolerate the treatment. To relieve the patient’s symptoms, we decided to do an intravascular stent procedure after getting his informed consent. We performed an inferior vena caval venography via right femoral vein using 6 Fr Pig-tail catheters; injection of contrast showed the presence of “dumbbell” sign indicating a stenotic lesion (Figure 2a) in the SVC. We introduced a 0.033-inch Terumo guidewire (Terumo, Tokyo, Japan) passed

Figure 1. The standing chest X-Ray, PA (A) and Lat (B) views showed upper mediastinal mass lesion.

Figure 2. The chest A-P view of SVC venography showed critical stenotic lesion “Dumb-bell” sign (A); two stents for appropriate cover of the stenotic lesion (B).
through the stenotic lesion and deployed a self-expandable Wall stent 65-mm length, 10-mm diameter at the stenotic site. Because the stenotic lesion could not be covered appropriately by a single stent, an additional stent 38-mm length and 12-mm diameter was placed. The radial force of the stents alone was still insufficient to relieve the obstruction, so the stenotic site was forcefully expanded with a 12 mm-sized balloon using 12 ATM pressure (Figure 2b). Final venography showed a fully expanded stent. The patient’s symptoms of puffy face and swelling of eyelids disappeared the next day. On the 124th day following the procedure, chest x-ray showed the two stents were separated but still in adequate position (Figure 3). The patient received long-term anti-platelet therapy after the procedure. Palliative chemotherapy with 6 courses of Vinorelbine was given for 3 months following the procedure.

DISCUSSION

SVCS is a common clinical problem in advanced cancer patients. Surgical intervention and chemotherapy are not absolutely valuable. So, radiotherapy and intravascular stenting for SVCS are the most effective treatment modalities in current practice. However, high equipment cost and frequent radiation exposure is a limitation of radiotherapy. Therefore, alternative treatment options should be considered. Intravascular stenting for relief of SVCS is an effective and rapid-acting procedure. Thrombosis often occurs after a critical level of narrowing. Clot lysis or removal is thus necessary to resolve the symptoms, uncover the morphology of the lesion, and permit optimal stenting or angioplasty to take place. Anti-platelet therapy in cancer patients with SVCS treated with intravascular stenting is not absolutely required in some reports, except in hemodialysis patients.

A few serious complications may be encountered such as stent migration, fever, and cellulitis at the access site. We encountered late-onset stent migration in this case. The cause may be inappropriate stent size or incomplete expansion within the vein. We implanted two self-expanding Wall stents 65-mm length, 10-mm diameter and 38-mm length, 12-mm diameter, respectively. They were smaller than the previously reported cases. Failure to accurately place the stent over the stenosis may also lead to later stent migration or to primary stent failure. To prevent stent migration, Solomon N et al. recommended placing a catheter via the femoral approach across the stent for approximately 30 hours. If dislodgment had occurred, the catheter would prevent the stent from migrating to the right ventricle or pulmonary artery. Hochrein et al. recommended not fully dilating the stent in the area of tightest obstruction. Technically, they attempted to leave both ends flared with a slight “waist” in the center to help ensure against stent migration. In our case, the long-term outcome was excellent compared to past treatment modalities and the stent remained patent even after chemotherapy. Stent migrations might occur after radiotherapy or chemotherapy because of tumor shrinkage, which causes the lumen to be enlarged in diameter. So, if radiotherapy or chemotherapy is planned after stenting, the choice of the stent size is critical and should allow for possibility of tumor regression.

Long-term patency rates depend on treatment of underlying etiology. Primary and secondary patency rates for malignant, benign and hemodialysis patients were 74%, 50% and 22%, respectively, and 74%, 75% and 56% at 1 year. In non-small cell bronchial neoplasm and metastatic disease, radiotherapy was likely to give relief in 90% of cases within 3 weeks. Mean survival in these patients was 5 months. However, because of edema, radiotherapy may
make the condition worse before relief is obtained. If radiotherapy fails to relieve the obstruction, or if the obstruction recurs, further radiotherapy is either contraindicated or has no benefit.\textsuperscript{16} As in the management of this patient, compared with more conventional treatment such as radiotherapy, intravascular stenting can offer patients with malignant disease the chance for immediate and long-term symptomatic relief and improved quality of life.

REFERENCES

血管內支架併化學治療在非小細胞肺癌合併上腔靜脈症候群時的使用 — 病例報告及文獻回顧

張雲德1 吳榮州1 張志賢1 薛爾榮2
屏東基督教醫院 心臟內科1 血液腫瘤科2

上腔靜脈症候群是由於上腔靜脈阻塞或狹窄所引起，其肇因有惡性腫瘤或良性病灶。常見的惡性腫瘤主要是肺癌和縱隔腔腫瘤。治療模式必須根據其潛在病因。在傳統治療上，有外科繞道手術、體外放射線治療、化學治療及內科療法。根據過去的病例報告，本科為1位肺癌病患植入血管內支架及合併化療藥劑，成功有效減小腫瘤體積及解除症狀。然而，在後續追蹤中發現支架移位現象，或由於腫瘤體積縮小以致血管擴大所致。因此，慎選支架大小並考慮腫瘤縮小可能的影響是非常重要的。

關鍵詞：上腔靜脈症候群、血管內支架。