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SUPERIOR VENA CAVA SYNDROME SECONDARY TO HICKMAN CATHETER IN THE ADVANCED CERVICAL CANCER PATIENT TREATED WITH CONCURRENT CHEMORADIOTHERAPY: A CASE REPORT

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Most of superior vena cava syndrome are caused by malignant tumors involving the mediastinum (usually lung cancer or lymphoma). However, iatrogenic cause has become more important since it has become common to utilize long-term central venous catheters for chemotherapy or hyperalimentation therapy. Although the cancer patients are also at relatively high risk, there are only few case reports of superior vena cava syndrome in gynecologic cancer. We present a case of iatrogenic superior vena cava syndrome related with Hickman catheter in advanced cervical cancer patient treated with concurrent chemoradiotherapy.

Keywords: Superior vena cava syndrome; Central venous catheter; Hickman catheter; Chemoradiotherapy; Cervical neoplasm

Superior vena cava (SVC) syndrome was first described in 1757 in a patient with an aorta aneurysm [1]. Although in most cases, it results from direct tumor infiltration with compression, recently many other risk factors have been identified including infection and iatrogenic causes, such as pacemaker or central venous access devices. With the increasing use of long-term central venous catheters for chemotherapy in cancer patients, there have been also some case reports of catheter related SVC syndrome. There are 18 cases of SVC syndrome reported in gynecologic cancer [1-3], 7 of them are catheter-related.

Currently, concurrent chemoradiation (CCRT) is the standard therapy for locally advanced cervical cancer. Although paclitaxel and carboplatin combination therapy appears promising [4], the 5-fluorouracil (5-FU) and cisplatin (FP) combination therapy which usually requires Hickman catheter insertion is still one of the representative regimens for CCRT. [5]

We report a case of iatrogenic superior vena cava syndrome secondary to venous thrombosis produced by a Hickman catheter successfully treated with catheter removal and heparinization.

Case Report

A 56-year-old woman visited the emergency room of Samsung Seoul Medical Center for massive vaginal bleeding. The patient was immediately referred to the gynecology department and underwent diagnostic endometrial and endocervical curettage. The pathology revealed as squamous cell carcinoma of uterine cervix. Although International Federation of Gynecology and Obstetrics

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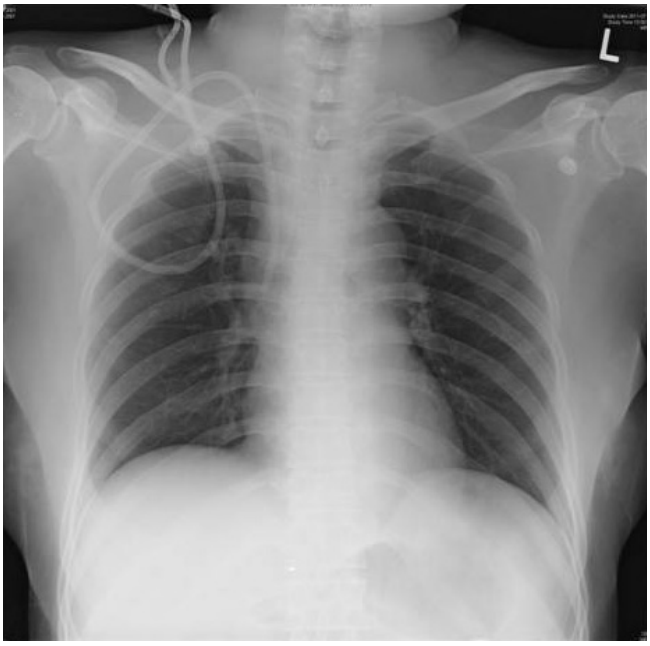

Fig. 1. Normal chest X-ray findings.

(FIGO) stage was Ib, magnetic resonance imaging (MRI) and positron emission tomography-computed tomography (PET-CT) showed a 6cm-sized endocervical mass and paraaortic lymph node metastasis. The patient was planned to receive CCRT with combination of 5-FU and cisplatin. For administration of chemotherapeutic agents and medications, a Hickman catheter was placed through the right internal jugular vein. Subsequent patency of the catheter was maintained by weekly flushing with 3 mL of heparin (10 units/mL in saline). The patient had been received CCRT with completion of four cycles of chemotherapy.

Two months after Hickman catheter insertion, the patient presented to emergency room for head trauma after loss of consciousness with extreme swelling in her face and neck. She also had complaints of mild dyspnea and cough refractory to medication. Chest X-ray (Fig. 1) and Brain CT were normal, then a chest/neck CT was performed to evaluate the obstructing tumor. Massive thrombosis was shown in SVC, right subclavian vein, left brachiocephalic vein and azygous vein (Fig. 2). A diagnosis of superior vena cava syndrome was made. Vascular surgical part and radiological inter-

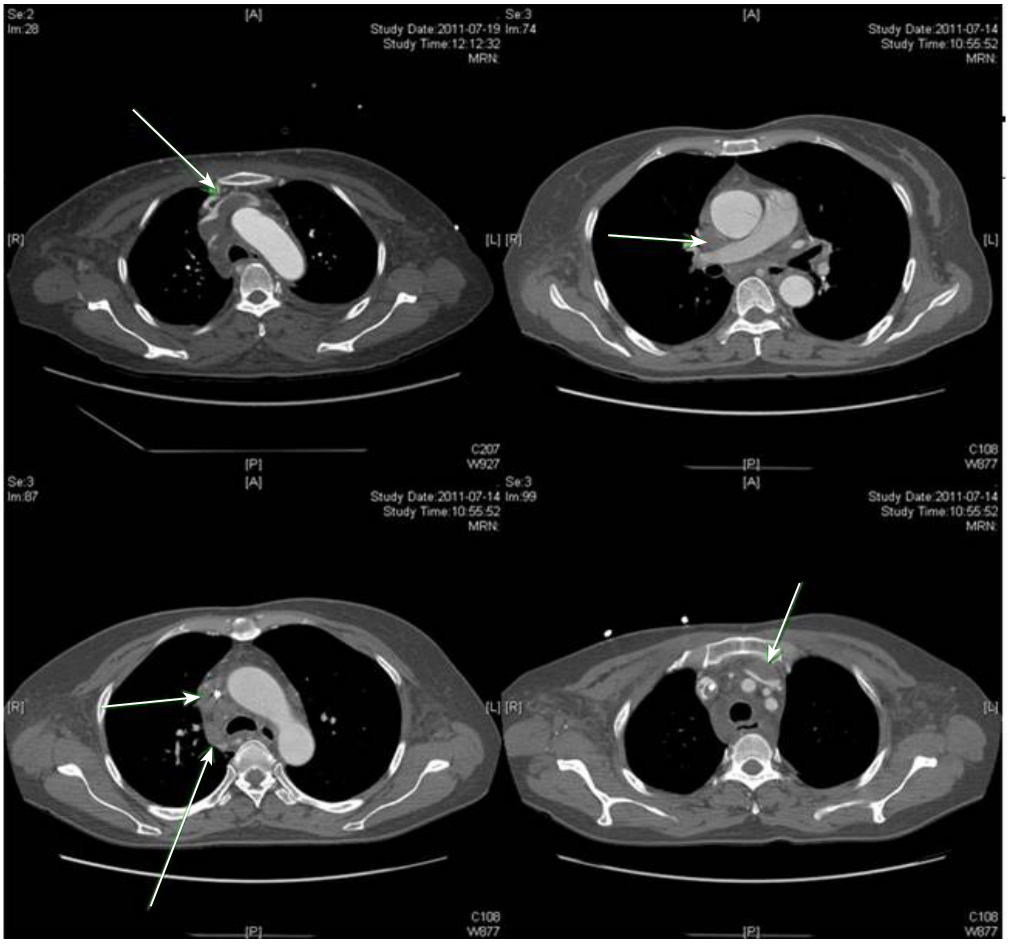

Fig. 2. Chest computed tomography revealed thrombosis in superior vena cava, right subclavian vein, left brachiocephalic vein and azygous vein without evidence of cancer metastasis.

vention consultation were obtained and thrombolytic therapy was instituted. The catheter was removed, and the patient was treated with systemic heparinization for 5 days until the international normalized ratio (INR) reaches therapeutic level.

Anticoagulation was also begun with warfarin. She had symptomatic relief and obvious improvement of facial edema within 3 days after beginning of heparinization. Follow-up CT angiography showed remaining thrombus, and the patient continued on oral anticoagulation for additional 3 months.

Discussion

Superior vena cava syndrome has been rarely described in patients with gynecologic malignancies. There has been a few case reports only [2] and no previous description about SVC syndrome in gynecologic malignancy in Korea. This is the first case of SVC syndrome in gynecologic cancer in Korea.

The most common underlying cause of SVC syndrome in adults is malignancy involving the mediastinum, constituting greater than 90% of cases. Only a small proportion of the cases of SVC syndrome were caused by benign etiology (Table 1) [6]. However, recently iatrogenic cause in case of central venous access devices has become important [7,8].

The initial diagnosis of superior vena cava syndrome is clinical without extensive laboratory testing [1,3]. This clinical diagnosis is confirmed by imaging study, usually chest CT scan which also helps to evaluate the underlying disease and severity of thrombosis. Common symptoms include facial swelling, dyspnea, cough, arm swelling, and orthopnea (Table 2) [9]. This case describes a patient with both signs (venous distension and facial/arm swelling) and symptoms (dyspnea, cough, loss of consciousness) commonly associated with superior vena cava syndrome.

Treatment of SVC syndrome primarily depends on the underlying cause. In cases of SVC obstruction secondary to thrombosis, thrombolytic therapy or anticoagulant therapy should be instituted [1]. Thrombolytic therapy does offer the most rapid and complete method [3]. When a venous catheter has been implicated as a cause of thrombosis, catheter removal has been reported. However, thrombolytic therapy following stent dilation with central catheter left *in situ* has been reported recently [1]. In case of tumor obstruction, tumor resection, irradiation, stents, and chemotherapy have been utilized successfully in the short term. Especially, patients with recurrent SVC syndrome can be treated with repeated percutaneous intervention [9].

The presence of a thrombosis in the superior vena cava associated with a venous catheter does not exclude the presence of active tumor in the mediastinum. Therefore, evaluation of the mediasti-

Table 1. Historical etiology of superior vena cava syndrome (form Schifferdecker et al. with permission from Wiley-Liss, Inc. [6])

Malignant causes (95%)	Non-malignant causes (5%)
Lung cancer	Iatrogenic
Small cell lung cancer	Pacemaker and defibrillator leads
Non-small cell lung cancer	Indwelling central venous catheters
Lymphoma	Postradiation vascular fibrosis
Almost non-Hodgkin's lymphoma	Infectious disease
Thymoma	Other
Mediastinal germ cell neoplasms	Fibrosing mediasstinitis
Solid tumors with mediastinal metastases	Goiter
Breast cancer most frequently	Aortic aneurysm

Table 2. Clinical features of superior vena cava syndrome [9]

Symptoms	%	Signs	%
Shortness of breath	50	Thorax vein distension	70
Chest pain	20	Neck vein distension	60
Cough	20	Facial swelling	45
Dysphagia	20	Upper extremity or trunk swelling	40
		Cyanosis	15

num as well as superior vena cava is mandatory in the work-up of patients with superior vena cava syndrome [7]. In our case, there is no evidence of mediastinal tumor although other reported cases had mediastinal metastasis.

Anticoagulation may be important because cancer patient are in a hypercoagulable state. However, the risk of thrombosis has to be balanced against possible problems arising from the combination of anticoagulation and thrombocytopenia resulting from chemotherapy [10,11]. According to the large scale of Cochrane review about prophylactic anticoagulation for cancer patients with central venous catheter, there are no statistically significant effect of heparin or vitamin K antagonists [12-14]. Otherwise, Minassian et al. reported that subcutaneous port had much lower rates of complications including thrombotic occlusion, infection, and catheter failure [15].

We report a case of SVC syndrome related to Hickman catheter in the advanced cervical cancer patient treated with concurrent chemoradiotherapy. Hickman catheter is important for gynecologic malignancy cancer patients for administration of chemotherapeutic agent or total parenteral nutrition. Central venous catheter including Hickman catheter leads these patients to more hypercoagulable state [10]. However, there are no evidence that thromboprophylaxis for patients with central venous catheter is beneficial.

In conclusion, physicians must assume a SVC syndrome when treating cancer patients with central venous catheter present facial swelling, dyspnea, cough or orthopnea. The choice of treatment depends on patients' symptoms or causes. Prophylactic anticoagulants is controversial at present, however thrombolysis or stent insertion can be an effective treatment option.

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히크만 카테터를 시술한 자궁경부암 환자에게서 이차적으로 발생한 상대정맥증후군 1예

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대부분의 상대정맥증후군은 폐암이나 림프종과 같이 종격동을 침범하는 종양과 관련하여 발생한다. 하지만 항암치료 및 정맥내 영양주입요법을 시행하기 위해 히크만 카테터와 같은 중심 정맥관을 장기간 사용하는 것이 일반화되면서, 외인성 요인도 중요해지고 있다. 따라서 중심 정맥관 시술이 흔한 부인과 종양 환자들도 비교적 높은 위험에 처해있으나 임상적으로 보고된 바는 많지 않다. 이에 저자 등은 진행된 자궁경부암으로 진단받고 히크만 카테터 삽입 후 동시 항암 화학요법을 시행하던 중 상대정맥증후군으로 진단된 1예를 경험하였기에 문헌고찰과 함께 보고하는 바이다.

중심단어: 상대정맥증후군, 중심 정맥관, 히크만 카테터, 혈전증, 동시항암화학요법, 자궁경부암