SUPERIOR VENA CAVAL OBSTRUCTION: SCINTIGRAPHIC FINDINGS WITH REPORT OF A CASE CAUSED BY SUBSTERNAL NON-TOXIC GOITER

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Abstract: Superior vena caval obstruction
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A benign substernal thyroid goiter which represented an unusual cause of superior vena caval obstruction in a 72 year old female patient was reported. The condition was documented by a simple and safe radionuclide superior vena cavography.

วิจัย: นำมาวิเคราะห์การอุดตันหลอดเลือดต่ำ Superior vena cava มีเกิดจากมะเร็งเกิดในปอดที่ไม่เป็นทางอำนาจได้รายงานผู้ป่วย 1 รายที่มีอาการอุดตันหลอดเลือดต่ำ Superior vena cava ยุคปัจจุบัน โดยมีการผ่าตัดนิรภัย Thyroid goiter with substernal extension ให้การวินิจฉัยโดยใช้วิธีการตรวจทางcxซึ่งมีผลดีที่สุด.

Introduction
Occlusion of superior vena cava and innominate veins are often caused by malignant tumors of the mediastinum in about 80% of all cases(1.2,3). However, benign processes such as mediastinitis, cystic hygroma, substernal thyroid goiter, mediastinal hematoma, aneurysm of the ascending aorta and dermoid cyst have been reported(4). Obstruction of the superior vena cava may be suggested by the clinical findings of facial edema, edema of the head, neck and upper extremities, collateral circulation which results in a prominent venous pattern visible on the chest wall. The chest roentgenogram almost invariably shows a mediastinal mass, mostly on the right side. The
diagnosis of the condition can be confirmed by venography which will provided accurate information concerning obstruction of the superior vena cava. Injection of a large volume of contrast medium in the superior vena caval obstruction patients may have unfavorable side effects. A radionuclide superior vena cavaography may be an alternative method for evaluation of the superior vena cava and its tributaries and thought to be the most easily way to confirm the diagnosis.

In addition to the demonstration of the obstruction and collateral circulation, it also provides a noninvasive means to follow the response to therapy serially.

As a representative of this condition, a case with an unusual cause of obstruction by a substernal thyroid is reported.

CASE REPORT

A 72-year-old Thai female was admitted to Maharaj Nakorn Chiang Mai Hospital with a two-year history of neck mass. Physical examination revealed an old woman with multinodular cystic masses of the thyroid gland and there were dilated superficial veins of the neck and upper chest wall. Indirect laryngoscopic examination demonstrated normal movements of the vocal cords. Chest roentgenogram depicted a widened mediastinum (Fig. 1). Twenty-four hour thyroidal uptake of radioiodine was 45%. Free thyroxin index was 0.5. A radioiodine thyroid scan showed enlargement to thyroid gland with substernal extension into the mediastinum and irregular distribution of radioiodine (Fig. 2). Partial occlusion of right innominate vein with filling of collateral vessels were demonstated by Tc. superior vena cavaography (Fig. 3).

Explore median sternotomy with collar incision was performed. Findings were multinodular enlargement of the thyroid gland with inferior extension into the mediastinum and compression of superior vena cava. Partial thyroidectomy was done. Unfortunately, The patient has a complicated post operative course and expired 2 weeks after the operation.

Fig. 1 A postero-anterior chest roentgenogram shows a mass in the right side of the superior mediastinum (arrow) with pressure effect on trachea (arrow head).
Fig. 2 Radioiodine thyroid scan shows enlargement of thyroid gland with substernal extension into the mediastinum (arrows). Note irregular distribution of radioiodine (SN = Sternal Notch).

Fig. 3 Serial gamma camera images at two second intervals after injection of $^{99m}$Tc-S-Colloid into both antecubital veins disclose partial obstruction of the right innominate vein (arrow) with the collateral vessels (arrow head).

Discussion:

Superior vena caval obstruction is often caused by a malignant process such as bronchogenic carcinoma or lymphoedema and a small percentages of this conditions are due to benign disease\(^4\). Substernal non toxic goiter is a relatively uncommon condition causing superior vena caval obstruction. Out of 733 cases of superior vena caval obstruction reported since 1949, only 9 were caused by benign intrathoracic tumors\(^3\). Including among these were 2 cases of caval obstruction caused by intrathoracic goiter seen at the Cleveland Clinic\(^{13}\) and the two additional instances where substernal thyroid was presumed to be the etiologic factor\(^{14}\). Since then, in numerous, isolated reports, a large number of substernal nontoxic goiter has been implicated as the cause of superior vena caval obstruction\(^{16,16,17}\).

A radionuclide superior venacavography using Tc-$^{99m}$S-Colloid has been used in our nuclear medicine section for dynamic study in every cases of superior vena caval obstruction from any causes. ($^{99m}$Tc-S-Colloid was used because the study was performed in conjunction with liver imaging) The technique has been found to be valuable in determining intrathoracic venous obstruction comparable to that obtained with conventional venography. In the presence of malignancy, serial studies have been of value in characterizing response to radiation therapy\(^{16}\) .
We propose that $^{99m}$Tc superior vena cavography is a useful, simple and safe procedure for evaluation of superior vena caval obstruction.

**Summary**;

A benign substernal thyroid goiter which represented an unusual cause of superior vena caval obstruction in a 72 year old female patient was reported. The condition was documented by a simple and safe radionuclide superior vena cavography.

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**Reference**


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