MYOCARDIAL INFARCTION DUE TO METASTASIS OF CHORIOCARCINOMA IN A 29-YEAR-OLD WOMAN


Choriocarcinoma of uterus origin often causes metastatic lesion in various organs such as lung, vagina, brain, liver and kidney, but hardly ever in the heart. Few cases of terminal cardiac metastasis without any other serious symptoms have been reported so far.

The present report concerns clinical and pathological findings on a patient who had suffered from myocardial infarction due to metastasis of choriocarcinoma in succession to a hydatid-form mole for three years, and died suddenly of pericardial tamponade caused by rupture of a myocardial metastatic lesion. Therefore, in the differential diagnosis of myocardial infarction in young women with hydatid-form mole, one must take metastasis of choriocarcinoma into consideration.

CASE REPORT

A 29-year-old woman was urgently admitted to hospital, complaining of a rapid onset of malaise and precordial pain, on February 14th, 1973. She had been healthy and had given birth to a boy in October 1970. In 1971 curettage had been carried out three times in the fifth month of a hydatid-form mole.

Physical Findings on Admission:
Constitution: moderate, pulse rate: 94/min, regular, body temperature: normal, blood pressure: 106/80 mmHg, chest: crepititation audible on the left front, heart sound: pure, abdomen: no abnormalities.

Laboratory Findings:
ESR: 10 mm/2h, RBC: $426 \times 10^4$/mm$^3$, Hb: 12.8 g/dl, Ht: 40%, Platelet: $20.8 \times 10^4$/mm$^3$, WBC: 13,100/mm$^3$, GOT: 180 RF-Units, LDH: 1200 Units, CRP: +++ , CPK was not checked.

Fig.1. Chest roentgenogram at supine position in February 1973 revealed pulmonary congestion and slightly enlarged heart.

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Chest roentgenogram at the supine position (Fig. 1) revealed pulmonary congestion and slight enlargement of the heart. Electrocardiogram showed evidence of myocardial infarction; marked elevation of ST segment in I, II, aVF and from V2 to V6, abnormal Q wave in aVF and from V4 to V6 (Fig. 2).

As the serum enzyme became normal following treatment and only QS pattern remained fixed in the electrocardiogram, she was discharged on March 31st, 1973.

On April 19th, 1973 a coronary angiography was performed at the Tokyo University Branch Hospital in order to investigate the cause of infarction. There were no pathological findings in the left coronary artery. Examination of the

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### TABLE 1 Course of the Disease During the First Admission to the Tokyo University Branch Hospital

<table>
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<th>Feb. 14, 73</th>
<th>March, 73</th>
<th>Apr. 19, 73</th>
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<th>June, 73</th>
<th>Oct. 21, 73</th>
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<td><strong>Myocardial</strong></td>
<td><strong>Chest-XP</strong></td>
<td><strong>First</strong></td>
<td><strong>Extirpation</strong></td>
<td><strong>EEG</strong></td>
<td><strong>Hemoptysis</strong></td>
<td><strong>Thrombopenia</strong></td>
<td><strong>Chest-XP</strong></td>
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<td><strong>Therapy</strong></td>
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<td><strong>Actinomycin D</strong></td>
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<td><strong>Cholest.</strong></td>
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<td><strong>GOT</strong></td>
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<td><strong>GPT</strong></td>
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<td><strong>LDH</strong></td>
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<td><strong>BSG</strong></td>
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<td><strong>Friedmann KE</strong></td>
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right coronary artery was not possible due to the patient's exhaustion. The chest X-ray examination just before cardiac catheterization revealed a solitary round shadow, 4 cm in diameter, in the middle field of the left lung (Fig. 3). A metastatic lung lesion of choriocarcinoma of the uterus was suspected and was confirmed by a urinary pregnancy test. She was admitted to the gynecological section.

As friedmann's reaction was positive in 10,000 KE, one course of Methotrexate 50 mg and Actinomycin-D 2.5 mg was administered, and on May 29th a total extirpation of the uterus and the adnexes was carried out, but no choriocarcinoma was found in the specimen (Table 1). Three courses of combined chemotherapy were administered in July and the fourth in August.

On June 19th the patient complained suddenly of severe headache, vomiting and stiffness of the neck. A lumbar puncture showed evidence of subarachnoidal bleeding with hemorrhagic fluid and a pressure of 230 mmH₂O. Headache and tinnitus continued, but no abnormalities were found in the electroencephalogram and the brain scintigram. Cerebral angiography was not carried out because of shock during the test. On November 9th the chest X-ray shadow was hardly recognizable (Fig. 4), and Friedmann's reaction became negative in 100 KE and positive in 50 KE. On November 13th the patient was discharged and continued to attend the outpatient clinic. In December the X-ray shadow enlarged again and another round shadow was discovered in the right lower lung field. On 12th January 1974 the patient was readmitted and treated by chemotheraphy without significant effect.

In May 1974 she was transferred to the National Nakano Hospital, and on June 4th a resection of the ninth right and sixth left segments was carried out. Thereafter Vinblastin in a dose of 7.6 mg per week was administered and the urinary pregnancy test became negative. On July 1st the patient was discharged.

In addition to the previous treatment digitalis had been administered because of cardiac insufficiency and tachycardial attacks. Urgent hospital care was needed several times because of heart attacks, and meanwhile Propranolol proved to be effective. Until July 1975 the urinary pregnancy test had been negative, however it became strongly positive in October. Coughing and hemoptysis developed in December. Chest X-ray film reveal-
ed many nodular shadows in both lung fields. Macroscopic hematuria occurred temporarily on December 18th. The patient was readmitted on December 24th.

Laboratory Findings on Last Admission:
RBC: $334 \times 10^4$/mm$^3$, Hb: 10.2 g/dl, Ht.: 31%, WBC: $5,900$/mm$^3$, plat: $17.4 \times 10^4$, prothrombin time: 98%, thrombotest: 76%, plasma fibrinogen: 386 mg/dl, ESR: 64 mm/1h, urinary pregnancy test: positive, urine protein: +++, erythrocytes in the urine sediment: 2–3 in one visual field, sputum cytology: no atypical cells, GOT: 54 RF-Units, GPT: 30 RF-Units, LDH: 1653 Units.

On January 10th, 1976, 1 mg of Actinomycin-
D was added to Vinblastin for treatment. On January 11th the patient died suddenly when changing from a sitting to a supine position.

Autopsy:

Autopsy revealed main lesions in the heart, lungs and kidney. The heart weighed 310 g and a hemorrhagic tumor measuring 8 x 6 x 3.5 cm was found from the base through to the apex in the region of the left anterior descending coronary artery (Fig. 5). The visceral pericardium was partly ruptured and 600 ml of pure blood had collected in the pericardial cavity. This tamponade seemed to be the direct cause of death. The right coronary artery was elastic without any obstruction or stenosis and very little sclerotic change was detected. The stem of the left coronary artery was also intact, but the anterior

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descending branch was embedded in the tumor at a distance of nearly 6 cm from the bifurcation and extensive fibrosis of the myocardium was observed from the lateral wall of the left ventricle to the apex which belonged to the territory of the artery. Especially transmural myocardial fibrosis was found in the apex including the part belonging to the left anterior descending branch. There was no abnormality in the valves and no thrombi were found in either the atrium or the ventricle. Numerous hemorrhagic tumors, up to 2 cm in diameter, were found in the lungs. In the upper region of the left kidney a similar tumor measuring 11 x 11 x 10 cm was found, a part of which extended to the pelvis.

Histological findings of the tumors in the heart, both lungs and left kidney resembled each other. They consisted of syncytial cells with remarkable eosinophilic protoplasma and several pyknotic concentrated nuclei on the one hand, and clear cells with distinctly demarcated, polygonal protoplasma and round nuclei of moderate size on the other hand. The former was regarded as syncytiia trophoblast and the latter as cytotrophoblast. Chorionic villi could not be detected. Histological diagnosis of the tumors was choriocarcinoma. (Fig. 6).

A part of the dilated wall of the left coronary anterior descending branch was found embedded in the tumor, but a greater part of the wall was destroyed and could hardly be identified. In the part of the obstructed circumflex branch a recanalized old thrombus was discovered, but no tumor was found. (Fig. 7).

There was an old hemorrhagic lesion in the parietal lobe of the brain. No recurrence of choriocarcinoma was found in the vaginal stump after hysterectomy was performed.

**DISCUSSION**

In 1893 Schmorl reported a metastasis of chorioepithelioma in the pulmonary vessels for the first time and this was followed by similar reports. The hematogenous spread to pulmonary vessels is reported by many authors in and outside of Japan.

In the literature, however, we could not find such a case like ours.

According to Nakamura's metastasis of malignant tumors in the heart was found in 21.2% of 622 cases. The metastasis to the heart is found to be caused more often by the lungs than the other organs. This is easily understood from the standpoint of hemodynamics. Choriocarcinoma is liable to cause metastasis in pulmonary vessels as stated above. Park reported pulmonary metastasis in 60% of 516 cases in choriocarcinoma.

In the literature we could find only one case of cardiac metastasis by Busse. He reported a 39-year-old woman who had an abortion in January 1902 and died of chorioepithelioma on Jul 3rd, 1902. The autopsy revealed a metastatic lesion measuring 7 x 4 x 4 cm from the left ventricular wall and from septum spreading into both cavities in the form of polypoid tumors.

Hertig, Park, and Ishizu reported that the hematogenous metastasis was found most often in the lung, followed by brain, liver, kidney, bone, stomach, intestine and spleen, corresponding to the circulating blood volume. The reason why the heart escapes the metastasis must be studied further.

In our case the lesion in the left lung seems to be the origin of metastasis in the coronary artery. Histologically, dilated destruction of the left anterior coronary artery in the tumor suggests strongly expansive proliferation of the tumor embolus in the artery. Myocardial infarction of the region belonging to the left circumflex branch seems to be a sequel of the same accident of the artery, although tumor was not revealed in the region at autopsy. Also an old hemorrhagic lesion in the brain is probably a similar sequel. Concerning the fact that a tumor in the region of the left circumflex branch and in the brain was not revealed at autopsy, both spontaneous regression of the tumor and therapeutic effect of cytostatics must be taken into consideration.

**SUMMARY**

A rare and instructive case of myocardial infarction in a 29-year-old woman was presented. In this case it was clinically suspected that myocardial infarction was due to metastatic choriocarcinoma of the heart. This was confirmed by autopsy.

It was emphasized that metastatic choriocarcinoma of the heart could be a cause of myocardial infarction in young women.

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