

Isolated Right Atrial Mass in a Candidate of Coronary Bypass Grafting

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Abstract- Hepatocellular carcinoma (HCC) is not uncommon neoplasm, and its occurrences with coronary artery disease (CAD) is more confronted by cardiac surgeon today. In most cases, when the HCC is detected, it has invaded to regional or distant sites. The most frequent location of HCC metastasis includes pulmonary system, musculoskeletal, lymphatic system, and central nervous system. Indeed, intra-atrial metastasis is a rare phenomenon and associated with poor outcome. We report a case of CAD with known HCC that referred for CABG before scheduling for hepatic tumor management. His severe typical chest pain, aggravated by mild activity so his abdominal pain is shadowed by chest pain. The abdominal ultrasound revealed a large mass in the left hepatic lobe. Chest x-ray was unremarkable. Routine preoperative transthoracic echocardiography (TEE) exhibits a large sessile mass in the right atrium. The patient underwent combined resection of right atrial mass and off-pump coronary artery bypass grafting. The most of HCC patients with RA involvement usually presenting with lengthy thrombus that continues from vascular invasion site to RA, however, as in our patient, isolated and sole metastasis to RA is an exceptional phenomenon in HCC. The clinical postoperative course was uneventful, and the patient discharged on the 10th day of operation. The six-month follow-up revealed no recurrence of right atrial mass when the patient completed his treatment by hepatic lobectomy and combined adjuvant chemotherapy.

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Introduction

Cardiac tumors are classified as primary and secondary types. The primary tumors also subdivided into benign and malignant types. The incidence of primary tumor is ranged between 0.0017 to 0.033 percent and primary malignant tumor is 50-100 times rarer than secondary types. Secondary tumors are much common but still are a rare entity, constituted of neoplasm with diverse origin and variable natural course (1). Malignant tumors of any organs and structures have potential, to involve the right atrium by blood-borne dissemination or by locoregional extension by direct spreading from diaphragm or by emboli of malignant cells to lymphatic channels, thoracic duct and then to subclavian vein and right atrium (2). Partial blood stasis in the right atrium in addition to thrombophilia state of malignancy and prolonged hospital stay makes the right atrium a suitable location for malignant cell nesting and their subsequent growth. Any malignant tumors, could have potential for right atrial encroachment by Ven-

lymphatic dissemination that classified to their corresponding incidence rate such as renal cell carcinoma as a most common secondary tumor and, Wilm's tumor as a rarest metastatic mass (3). The others malignancy has a middle position between these two extreme. In most cases, importing and existing venous systems of the liver could be involved in combination of right atrial metastasis (4). These include vena cava, Portal venous system, hepatic veins (HV), and the peripheral veins. HCC, gallbladder carcinoma, pancreatic and colon carcinoma, gastric and esophageal metastasis all have a variable incidence so the, HCC ranks a middle score between these common cancers. Indeed, HCC is the first ranking primary carcinoma of the liver, but resting in 8th position in between others malignant metastasis (5). This contradiction related to various tendencies of malignant tumor for dissemination to the right atrium. The most frequent location of distant metastasis of HCC is pulmonary system that strongly supposes this idea that right atrial box in opposed to others malignancy is not a suitable site of HCC cells

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nesting (6). Despite high prevalence rates of HCC in countries where hepatitis C and B is endemic and if we consider that the CABG is the most common type of cardiac surgery that performed in many developing countries, it is evident that HCC malignant cells do not have a tendency to nesting in RA. In other hand, HCC is estimated to be the third to fourth leading cause of malignancy death world widely, but its incidence has not any accommodation with its rare incidence in RA. Our case report shows a very rare, isolated metastasis of HCC as a mass in the right atrium in a case with known HCC. The uniqueness of our case related to its isolation property I.e. there was no connection between the origin site of HCC in the hepatic veins to the destination site in RA by lengthy thrombosis.

Case Report

We report a 67-year-old man known to have HCC and be a chronic hepatitis c virus carrier, with unknown transmission route, presented to our clinic electively by a general surgeon for CABG before he will scheduling for resection of mass in his left liver lobe. He complained of vague right upper abdominal quadrant pain for 3 months earlier months, which was complicated by CAD and its severe retrosternal pain that aggravating with mild activity and completely reliving with rest. These symptoms were associated with weight and appetite loss, fatigue and malaise and vomiting. The Patient had not had any associated dyspnea, lower extremity edema or skin rash. His blood pressure and rate were 124/76, 110 subsequently. On physical exam, the patient's skin was pallor as his mucus membrane, and he was cachectic. In abdominal exam, a non tender and large mass were palpated in right upper quadrant with no ascitis. His neurologic exam was unremarkable. Cardiac examination showed no abnormal murmur or soufflé. Also no engorged jugular veins were observed. Laboratory exam were as White cell count of 7000/, low serum Hb (11 mg/dl), Electrocardiogram (EKG) except for sinus tachycardia was normal (WCC): 2.70; hemoglobin (Hb): 13.3 mg/dL; platelet count was 198,000/mm³; sedimentation rate was 55 mm/h, PT,PTT,BT, total serum protein, albumin: were in normal range. Aspartate aminotransferase (AST): alanine transaminase (ALT): ALP: were in upper normal ranges. Total bilirubin was 2.4 mg/dl; direct bilirubin was 1.1 mg/dl. Hepatitis B surface antigen was negative. A serum marker of hepatitis C was positive. HIV virus was negative. A tumor marker of alpha fetoprotein was very high. Chest X-ray (CXR) finding was

unremarkable. In Abdomen ultrasound, the enlargement of the liver was associated with two large solid hypoechoic masses seen in both right and left lobes; the spleen size was normal and mild ascetic fluid was observed in the pelvic cavity. In abdominal and chest C-T scan two vascular large hepatic lesions that were not associated with pulmonary metastasis were seen. In TEE right atrial lesion was an isolated mass that was not spreading from IVC suggesting blood-borne dissemination of the HCC to the right atrium (Figure 1). Liver biopsy was performed by ultrasound-guided biopsy, and pathology of the mass revealed to be consistent with a mild differentiated HCC. The Patient was consulted by a general surgeon and oncologist, and his treatment was planned as first by cardiac surgery followed by abdominal mass resection and chemotherapy. The CABG was performed by Medine sternotomy and OPCAB bypass of LAD LIMA and on-pump resection of right atrial mass without aortic cross-clamping. The right atrial mass was moderate sized round lesion that attached to the interatrial septum (Figures 2,3). The mass was removed with two-millimeter free zone and the resulting atrial septal defect repaired primarily with 4/0 proline sutures. 4 weeks after OPCAB, liver HCC was respected by a general surgeon that followed by combining adjuvant chemotherapy in 5th weeks of laparotomy. No symptoms of tumor recurrence were present after the 6th month of discharging with TEE, chest x-ray, abdominal ultrasound surveillance.



Figure 1. Shows a right atrial mass



Figure 2. Shows intraoperative view of right atrial mass

Isolated right atrial mass



Figure 3. Shows gross pathology of right atrial mass

Discussion

The incidence of HCC has increased worldwide in recent decades. Experts believe that the recently increased prevalence of HCC is related to increased incidence of immune-compromising diseases such as HIV. Many HCC cases originate in liver infected with chronic viral hepatitis such as HBS and HCV infection (7). Both of these viral hepatitis are estimated to comprise 66% of causes of HCC. The HCC with voluminous intracardiac metastasis may be associated with stenosis of IVC or tricuspid orifice or pulmonary outflow obstruction. The subsequent signs and symptoms were related to imposing geometric and physiologic encroachment of mass on intracardiac structures (8). These symptoms related to IVC or SVC syndrome (upper thoracic plethora, headache, engorgement of jugular vein engorgement, lower extremity edema, and hepatomegaly, and pulmonary symptoms related to the embolic event. HCC malignant cells tend to extend by blood-borne route, abdominal and thoracic lymphatic's network or direct trans-diaphragmatic extension. However, the HCC tendency to blood vessel invasion and subsequent emboli is a well-known phenomenon, but most embolic cells or fragments passed the right cardiac chambers and to be caught in the pulmonary barrier. Hematogenous malignant cells emboli may be the result of abdominal venous system involvement that has surrounded the liver (9). In an autopsy study of Gane (10), intra-atrial tumor metastasis was observed in 4.56% of HCC cases. Of these intra-atrial masses, 15 cases had combined IVC or hepatic venous encroachment by the tumor. Despite high incidence of intra-IVC extension of the HCC cardiac surgeon rarely encountered with HCC-induced RAM. This contradiction relates to the time frame presentation of HCC. In most of these patients when metastasis occurred, the subjects also simultaneously have long, or CNS spread so the clinical picture of RA metastasis is

missed and attributed to plural effusion and the brilliant pulmonary involvement and these end-staged cases referred for medical intervention (11). This contradiction is explained by asymptomatic symptoms in 39.5% of the cases. The activity-induced dyspnea occurred only in 37% of patients that may draw clinician's attention to this cardiac problem. The Budd-Chiari syndrome of cardiac metastasis occurred as bilateral lower extremity edema in 37.5%. In opposition to the lung that its involvement with metastasis is defined as an advanced HCC syndrome, RA involvement is not associated with poor outcome or short survival time (12). This controversy also contributed to the high incidence of clinical asymptomatic cases of RA metastasis. In opposition to RA involvement 80-90 percent of pulmonary metastases are symptomatic. The most common location of HCC metastasis is, pulmonary system, lymphatic system, adrenal glands, and skeletal frame (13). We concluded that despite the high incidence of HCC in recent decades, the RA involvement by HCC is exceedingly rare events and estimated to be 1-2% in various studies. The outcome of HCC with intra-atrial encroachment is poor, in a study that performed by Chang (14), the mean estimated survival time was approximately of 1 to 6 months. In conclusion, our case report alerts cardiac surgeon to HCC patients with cardiac involvement. Based on the literature review, we offer that cardiac metastasis in all HCC cases and probably a routine TTE may be requested even in bereavement of any cardiac symptoms.

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