



METASTATIC ADENOCARCINOMA IN THE PERICARDIUM, WHERE IS THE 'PRIMARY'? A CASE REPORT

Pathology

Dr. Kurdukar M.D. Department of Pathology, Dr.V.M.Govt. Medical College, Solapur-41 3003

Dr.Khiste J.A.* Department of Pathology, Dr.V.M.Govt. Medical College, Solapur-41 3003 *Corresponding Author

Dr. Pandit G.A. Department of Pathology, Dr.V.M.Govt. Medical College, Solapur-41 3003

Dr. Bele T.T. Department of Pathology, Dr.V.M.Govt. Medical College, Solapur-41 3003

ABSTRACT

INTRODUCTION – Cardiac metastasis is the least explored entity in oncology. Diligent review of literature is found to report cardiac metastasis ranging from 2.3 % to 18.3 %. Cardiac metastasis is commoner than primary cardiac tumours.

CASE REPORT – Very scant history was available in this medicolegal autopsy of a 55 years male who succumbed to death during travel by a train. Pieces of lungs, liver, spleen, kidneys, brain and heart were received for histopathology. Grossly heart was enlarged with biventricular hypertrophy. Pericardium was thick, opaque, lusterless with adhesions and synechia. Pericardial space was obliterated with thick yellow exudate. Rest of the received organs were unremarkable.

Histopathology revealed metastatic adenocarcinoma in pericardium with tumour emboli in lungs.

Algorithmic immunoprofile showed negativity for CK20,CEA, CDX2,TTF1,Napsin A, Mammoglobin,GCDFP15, Pax8, thyroglobulin, CD 10. Only pan-cytokeratin and CK7 were expressed by tumour cells.

Immunohistochemical profile helped to arrive at a diagnosis of possible primary from pancreatobiliary tract.

DISCUSSION- Rya Nakayama et al noted 74 cases of cardiac metastasis in 466 autopsies representing 17 different types of malignancies. Common primary tumours metastasizing to heart came from breast, lung, oesophagus, pancreas, melanoma and lymphoma.

CONCLUSION – The cardiac metastasis from pancreatobiliary tract is the rarest of rare. Searching the primary site of adenocarcinoma needs a rational immunohistochemical algorithm considering the possibility of almost all organs. A panel of useful antibodies with its organ sensitivity and specificity is of great value for the accurate diagnosis.

KEYWORDS

Cardiac Metastasis, Immunoprofile , Primary Cardiac Tumours.

INTRODUCTION:-

In oncology, cardiac metastasis is a less explored entity and it is assumed to be rare. But its incidence is not as low as expected. Pertinent and detailed literature searches have found variable incidences of cardiac metastasis ranging from 2.3% to 18.3%. Bhardwaj Cheruvu et al quoted it to be as high as 20% in autopsies with malignancies. Cardiac metastasis is commoner than primary cardiac tumours and is generally associated with poor prognosis. Cardiac metastasis is defined as the spread of a tumor to any of the structures of heart viz-pericardium, epicardium, myocardium, endocardium, great vessels, coronaries, heart cavities and production of an intra-cavitary neoplastic thrombus. Metastatic involvement of the heart is said to occur via four different pathways – 1) Hematogenous 2) Lymphatic 3)lodging of tumour cells from chambers of the heart 4) Direct extension

CASE REPORT:-

A 55 years gentleman travelling by train suddenly collapsed during a journey and succumbed to death before he could receive any medical help. A medicolegal autopsy was performed by a forensic expert. He noticed an enlarged heart and hence sent the whole heart, pieces of lungs, liver, spleen, kidneys, and brain for histopathological examination.

A thorough gross examination of all received organs was done. The heart was enlarged weighing 450 grams. (Fig.1)The pericardium was thick, opaque, lustreless with adhesion and synechia formation. Pericardial space was obliterated with thick yellow exudate. The heart was dissected by the inflow-outflow tract method. It showed biventricular hypertrophy having a thickness of the left and right ventricle to be 2.0cm and 0.8cm respectively. The interventricular septum was also thickened and shifted towards the right reducing the cavity of the right ventricle. Atria and valves were unremarkable. Coronaries were thickened and gritty to cut. The rest of the received organs were unremarkable.



Fig.1: Gross specimen of Heart

Multiple bits from the pericardium, rest of the heart and coronaries were taken to cover the pathological areas. Representative bits and bits from a pathological area from the rest of the organ pieces were also taken. Processing was done as per the standard protocol for H& E staining. A careful microscopic examination of all submitted tissue bits was done. Pericardium showed metastasis by a tumour composed of neoplastic glands lined by cuboidal epithelium having a vesicular nucleus. Numerous psammoma bodies were also seen. Both ventricles showed myocardial hypertrophy. Coronaries were found to have atherosclerosis. Tumour emboli were observed in the lungs. The rest of the organs were unremarkable. Morphological diagnosis of metastatic adenocarcinoma in pericardium with tumour emboli in the lungs was formulated. As it was a medicolegal autopsy case, the history available was very scant and viscera received was incomplete. Tracing out the primary was very difficult. A rational algorithmic immunoprofile was done to shortlist primary organs. It showed negativity for CK20, CEA, CDX2, TTF1, NAPSIN A, MAMAGLOBIN, GCDFP15, Pax 8, WT1, Thyroglobulin, CD10. Only pan-cytokeratin and CK7 were expressed by the tumour.(Fig.2)

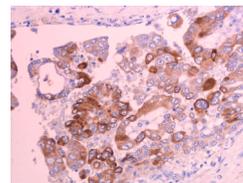


Fig.2: Immunohistochemistry showing pan-cytokeratin positivity

DISCUSSION:-

Cardiac metastasis is considered as a rare phenomenon but the incidence is not as low as expected. Theoretically, any disseminated malignancy can metastasise to heart. The exact incidence of metastatic involvement of the heart is not known. Whatever is known is based on different autopsy studies. This also may not reflect the true incidence. The decreased autopsy rate in most of the hospitals is far lower than 100%.Autopsy rate differs from country to country and institution to the institution which has a direct impact on the incidence of cardiac metastasis and does not represent the actual figure.

R. Bussani et al conducted an autopsy study of 7289 cases of malignancy and found 622 cases of cardiac metastasis representing an incidence of 9.1% of all malignant neoplasms.¹

Deroran el quoted that in 1934 Heminger reported only 5 cases of cardiac metastasis where a diagnosis was made during life. He further added that the incidence of pericardial involvement was seen in 2.3% to 13.1% in different necropsy studies.⁴

Rya Nakayama et al noted 74 cases of cardiac metastasis in 466 autopsies representing 17 different types of malignancies⁵. In this study, the incidence of cardiac metastases in patients with malignant neoplasms was higher in carcinoma of tongue(50%) followed by breast malignancy(25%), reticulum cell sarcoma(20%) and lung cancer(18%). He found only 5 cases of intrahepatic bile duct carcinoma, out of which single case had myocardial metastasis.

J.M.Young M.D. et al reported cardiac metastasis in 19.8% of cases. In his study of 476 cases of tumor deaths, the main bulk was formed by cases of bronchogenic carcinoma followed by lymphoma, carcinoma of the stomach, carcinoma of the esophagus and pancreatic tumours. The highest rate of metastasis was found in malignant melanoma(64.7%) followed by testicular tumours(44.4%) and bronchogenic carcinoma (36.7%). He found 33 cases of pancreatic carcinoma, in which 7 had cardiac metastasis(21.2%), 4 cases metastasised to pericardium in the form of effusion. A single case had serosanguinous effusion and ECG signs of chronic pericarditis. R Bussani et al found 9.8% incidence of cardiac metastasis in his large retrospective study of 7289 autopsy cases of malignancy. The highest rate of metastasis was shown by pleural mesothelioma (48.4%), melanoma(27.8%), lung adenocarcinoma(21%), undifferentiated carcinoma(19.5%), lung squamous cell carcinoma(18.2%) and breast carcinoma(18.5%). High rate has been observed with ovarian carcinoma(10.3%), lymphoproliferative neoplasm(9.4%) and bronchoalveolar carcinoma(9.8%), gastric carcinoma(8%), renal and pancreatic carcinoma(7.3% and 6.4% respectively). Metastasis to the heart takes place by four different mechanisms.^{1,2,3,4,6,7}

Direct extension from organs in the vicinity, hematogenous, lymphatic or intracavitary lodging of tumour cells from chambers of the heart. Amgad N.Makaryus reported a case left ventricular metastasis from the pancreaticobiliary tumour in a 60 years old patient. The tumour was in an infradiaphragmatic location. He attributed left ventricular cardiac metastasis to a transvenous route. But discussed that, the transvenous route will typically involve the right ventricle. The left ventricle would be involved through VSD, ASD or Patent foramen ovale. But such evidence was lacking in his case.

In the present case, authors are of the opinion that pericardial involvement and vascular emboli have occurred through hematogenous dissemination or transvenous route. Evidence of dissemination in other organs could not be proved in the case as pieces of organs were received for examination. The present case had constrictive pericarditis with extensive thickening and fibrosis and synechiae formation in the pericardium. This had put a limitation on the elasticity of heart. Condition is life-threatening if it remained untreated and may lead to heart failure or may turn into slowly developed cardiac tamponade.

CONCLUSION:-

Pancreatic tumours metastasizing to the heart are very rare. The pericardial involvement in present case is either by transvenous route or a manifestation of disseminated malignancy. Extensive pericardial adherence and secondary pericardial effusion might have caused cardiac tamponade and might have led to death in this case. Cardiac metastasis can be from any organ. So thorough work up from X-ray to cardiac catheterisation is essential to define primary tumour.

REFERENCES

1. R Bussani, F De-Giorgio, A Abbate, F Silvestri. Cardiac metastasis. *J Clin Pathol* 2007;60:27-34. doi: 10.1136/jcp.2005.035105.
2. Bhardwaj Cheruvu, Praveena Cheruvu, Michael Boyars. Cheruvu et al. An unusual case of metastasis to the left side of the heart. *Journal of Medical Case Reports* 2011;5:23.
3. Hemlata Verma, Pradeep Pokharna, Sanjeev devgarha, Chandra Prakash Srivastava. Metastatic adenocarcinoma of pericardium of unknown origin. *Indian J Thorac Cardiovasc Surg*(Jan-March2011) 27:56-58 Doi 10.1007/s12055-010-0078-9.
4. DELORAN L. THUYBER, M.D. JESSE E. EDWARDS, M.D., AND RICHARD W.P. ACHOR, M.D. Secondary Malignant Tumours of the Pericardium. *Circulation*, Volume XXVI, August 1962.
5. RYU NAKAYAMA, M.D., Takeshi YONEYAMA, M.D., Osamu TAKATANI, M.D., and Kiyoji KIMURA, M.D. A Study of Metastatic Tumours to the Heart, Pericardium

and great Vessels. Department of Internal Medicine, National Cancer Center Hospital, Tokyo, January 6, 1966.

6. J.M.YOUNG, M.D. AND I.RALPH GOLDMAN, M.D.F.C.C.P. Tumour Metastasis to the Heart. *Circulation*, Volume IX, February 1954.
7. Amgad N. Makaryus 1,2 and Lawrence box3. Left Ventricular Metastasis from a Primary pancreaticobiliary Tumor. *CLINICAL MEDICINE INSIGHTS : CASE REPORTS* 2-25:8.
8. (7a). Fan Lin, MD, PhD; Zongming Eric Chen, MD, PhD; Hanlin L. wang, MD, PhD. Utility of Immunohistochemistry in the Pancreatobiliary Tract. *Arch Pathol Lab Med*- Vol 139, January 2015.
9. (7b) Muhammad Adil Soofi and Mostafa Adel Youssef. Metastatic Adenocarcinoma Presenting as Choroidal Mass and recurrent Cardiac Tamponade. *Journal of the College Of Physicians and Surgeons Pakistan* 2014, Vol. 24 (Special supplement 1):S5-S7.