



# Sudden Cardiac Death in Non-Cardiac Primary Hematolymphoid Malignancy

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## >> INTRODUCTION

Cardiac involvement by leukemia or lymphoma may be under-diagnosed and directly responsible for significant morbidity and mortality. We describe five patients with non-cardiac primary leukemia or lymphoma who experienced sudden cardiac death. All had extensive cardiac involvement by tumor identified at autopsy, clinically unrecognized in four of the cases.

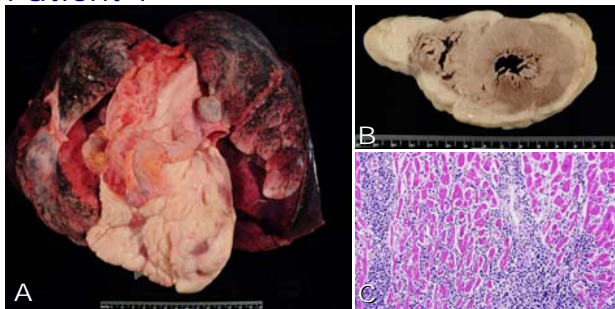
## >> PURPOSE

- To report a series of autopsy cases with known hematolymphoid malignancy and subsequent cardiac involvement, unknown in 4 of 5 cases, which led to sudden cardiac death.
- To increase awareness and facilitate early clinical recognition of cardiac involvement in patients with hematolymphoid malignancy.

## >> DESIGN

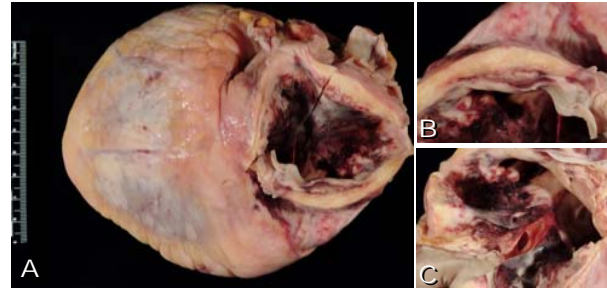
Autopsy was performed in four cases with en bloc removal of organs, dissection of the heart, and evaluation of the coronary arteries and conduction system. One case was limited to solid organ biopsies through a small posterior incision. Routine histochemical staining was performed according to standard methods.

### Patient 1



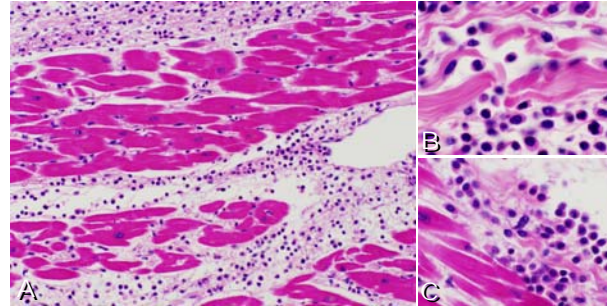
A - Firm yellow-white mass, 14 x 10 x 6 cm, in the anterior mediastinum with (B) infiltration of the epicardium and myocardium. C - Interstitial lymphoma infiltrate.

### Patient 2



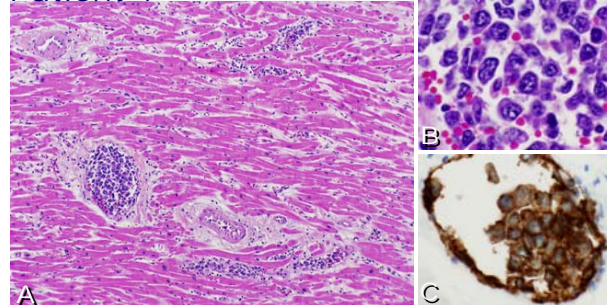
A, B, C - Right atrial infiltration by tumor, with wall thickening up to 0.6 cm and diffuse replacement of the interatrial septum.

### Patient 3



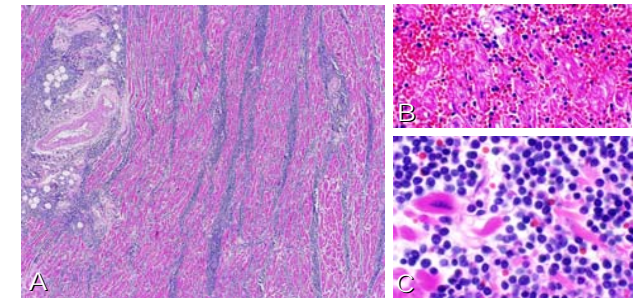
A, B, C - Interstitial infiltration of leukemic cells within the myocardium and destruction of myocytes.

### Patient 4



A, B, C - Intravascular diffuse large B-cell lymphoma with positive immunohistochemical staining for bcl-2(c).

### Patient 5



A, C - Interstitial infiltration of lymphoma cells within myocardium causing wall rupture (B).

## >> RESULTS

Case	Age	Gender	Malignancy	Clinical Findings	Autopsy Cardiac Findings
1	59	M	Burkitt lymphoma	Restrictive cardiomyopathy; bradyarrhythmia	Interstitial and epicardial lymphoma infiltrate, also involving sino-atrial node
2	60	M	Burkitt-like high grade lymphoma	Syncope	Interstitial and epicardial lymphoma compressing the left circumflex artery resulting in 75% luminal stenosis
3	44	F	Acute myeloid leukemia	Chest pain; tachycardia	Interstitial and epicardial leukemic infiltrate; fibrinous epicarditis; right atrial and left ventricular hemorrhages
4	78	F	Diffuse large B-cell lymphoma (DLBL)	Dyspnea; hypotension; pericardial effusion	Intravascular lymphoma with myocardial infarction
5	73	M	DLBL	Chest pain; mediastinal and cardiac mass on MRI	Interstitial lymphoma infiltrate with rupture of ventricular free wall

## CONCLUSIONS

The majority of cardiac tumors are metastatic, with hematopoietic tumors the second most common metastatic cardiac tumor seen at autopsy. This may lead to sudden cardiac death by different pathophysiologic mechanisms, illustrated in this case series. Patient 1 had a refractory bradyarrhythmia with lymphoma involving the sinoatrial node. Patient 2 had syncope with severe coronary artery compression associated with epicardial and interstitial lymphoma. Patient 3 had features of tamponade with an epicardial leukemic infiltrate. Patient 4 had intravascular lymphoma with myocardial infarction, and patient 5 had interstitial lymphoma with ventricular rupture, illustrating the variable distribution and pathophysiology of diffuse large B-cell lymphoma involving the heart. Importantly, patients 1 through 4 had unrecognized cardiac involvement by tumor until the autopsy, reflecting a clinical diagnostic gap that may be improved with greater awareness and earlier clinical recognition of cardiac involvement in patients with hematolymphoid malignancy.