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## Rare case of primary sternal osteomyelitis in immunocompetent patient caused by *Candida albicans*

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### Abstract

Sternal Osteomyelitis is common in post CABG patients/with chest injury. Causative organisms in immunocompetent, non-surgical patients are Streptococcus, Pseudomonas & Candida. *Candida albicans* is extremely rare with limited number of cases reported.

**Materials and Methods:** Observational type of case study using Contrast enhanced MDCT in a 68-year male with continuous pain of insidious onset over anterior chest wall for 6 days with history of Diabetes mellitus of 20 years.

**Results:** MDCT helped in diagnosing & intervention in sternal osteomyelitis & its extension. Early surgical intervention, culture & appropriate treatment prevents high morbidity & mortality.

**Conclusion:** Based on the patient's clinical, culture, & radiological characteristics, "Primary fungal sternal osteomyelitis" was diagnosed. Incision and drainage of abscess followed by Partial Sternectomy with was done.

**Keywords:** Primary sternal osteomyelitis, *Candida albicans*, mediastinum & diabetes mellitus

### Introduction

Sternal Osteomyelitis from *Candida albicans* in immuno competent, nonsurgical patients is extremely rare with limited number of cases reported so far. Osteomyelitis of sternum most commonly occurs as a complication of median sternotomy or other operative incisions<sup>1</sup>. Etiological agent is usually Staphylococcus aureus or gram-negative bacteria. Although *Candida albicans* is occasionally cultured from these chronic wounds, it is usually considered a superficial contaminant.

### Materials and Methods

Observational type of case study using Contrast enhanced MDCT.

A 68-year male patient was admitted with pain over anterior chest wall for 6 days. Pain was insidious in onset, continuous in nature & pricking type. There was no history of anorexia, nausea, weight loss or fever. He had a long-standing diabetes mellitus for 20 years, had no other comorbidities & no history of tuberculosis, drug abuse or administration of long-term steroids or immunosuppressive agents. He was a nonsmoker & nonalcoholic. No history of surgery or trauma to the chest wall. Local examination showed a soft, tender swelling in the upper sternal region (anterior chest wall) measuring 10 x 10 cm which was fluctuant & with adjoining cellulitis. HbA1c level was high at 9.1 indicating uncontrolled diabetes. Total counts (14000 mm<sup>3</sup>), CRP (12.1 mg/dl) and ESR (25 mm/hr) were elevated. Diagnosis of myocardial infarction was ruled out by normal ECG. MDCT was advised for further management.

### Results

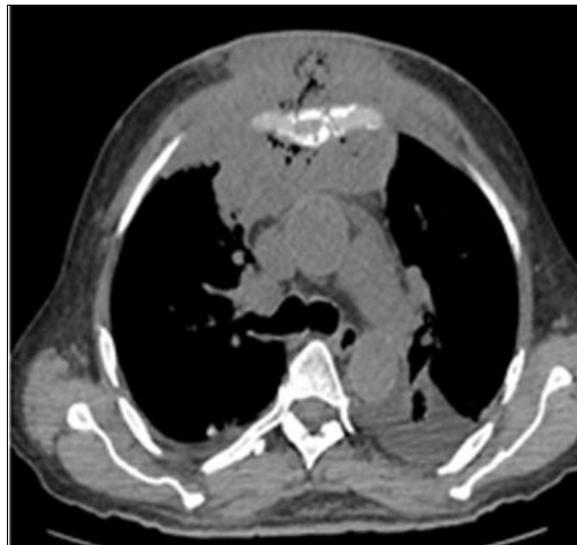
A contrast enhanced CT scan of chest revealed sternal osteomyelitis with anterior mediastinal extension, having few air foci. (Figure 1a). The collection extended from D1 to D9 vertebral level with low attenuation contents & mildly enhancing septae. (Figure 2a). The collection appears to be abutting aortic arch, pericardium & superior vena cava, right ventricle & pericardium posteriorly. (Figure 2b).

There was also bilateral pleural effusion. (Figure 1b) Percutaneous needle aspiration yielded 180 ml thick purulent discharge confirming a sternal abscess. Patient was taken up for Partial Sternectomy & abscess drainage in view of persistent swelling increasing intensity of pain. (Figure 3) Post-operatively, patient was treated with appropriate antifungal medications based on culture & sensitivity report with tight glycemic control. Culture & sensitivity report showed the presence of *Candida albicans*. Hence, patient was started on treatment with antifungal agents & discharged after 20 days. At the time of discharge, purulent discharge had significantly reduced. Fewer sloughs were observed in the wound & tissues looked healthy. Antifungal treatment was continued for 3 months. Patient continued to be stable & sternal wound healed.

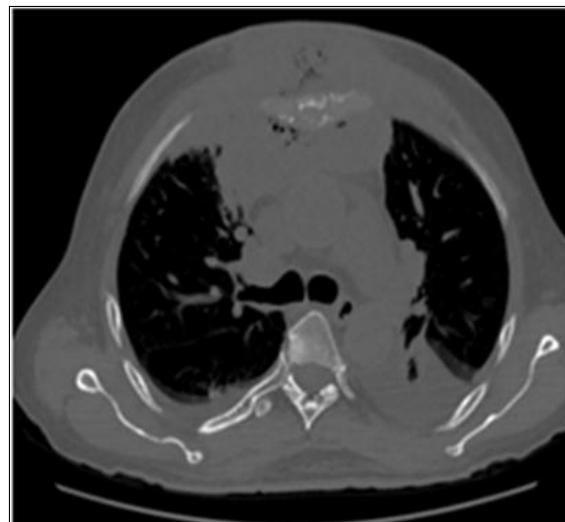
### Discussion

Primary osteomyelitis is a rare clinical condition & has only been found in 0.3 –1.8% of cases of osteomyelitis, of which only 5% occur in the sternum<sup>1</sup>. It can be seen as a complication following median sternotomy, subclavian intravenous line insertion, blunt chest trauma & cardiopulmonary resuscitation. Without these preceding factors, sternal osteomyelitis is termed “primary” as seen in

our case & is most likely due to a hematogenous source or lymphatic spread from a distal site of infection<sup>2</sup>. Most isolated organism in both primary & secondary sternal osteomyelitis is *Staphylococcus aureus*<sup>3</sup>. Delay in diagnosis can lead to insufficient treatment, increased morbidity & poor outcomes. Histological identification of *Candida* pseudo hyphae in excised tissue is the absolute criterion for diagnosis of invasive *Candida* infection. Definitive treatment involves prolonged antibiotics & antifungal agents with aggressive debridement of the infected bone & anterior periosteum. Although there are many cases of Primary Sternal Osteomyelitis reported in the literature, only a handful are of fungal etiology. Sternal osteomyelitis secondary to *Aspergillus fumigatus* after cardiothoracic surgery have been reported in literature<sup>4</sup>. However, only a few cases of *Candida* isolated from sternal wounds post sternotomy can be found. In a series of 11 patients who developed deep sternal wound infections due to *Candida albicans*, Preeti N. Malani, Shelly A. McNeil found that these infections were characterized by a chronic, indolent & recurrent course<sup>5</sup>. However, in our case the patient had an acute presentation without predisposing factors. This is therefore a very rare case of Primary Sternal Osteomyelitis of fungal origin, caused by *Candida albicans* in an immunocompetent patient.



**Fig 1a:** NCCT Mediastinal window showing ill-defined heterogenous collection measuring ~9cm x8cm x6cm (vol~230cc) in anterior chest wall causing minimal erosion of bony sternum & adjacent skin thickening. Few air foci are seen within the lesion, extending into anterior mediastinum.



**Fig 1b:** NCCT Lung window showing bilateral pleural effusion



**Fig 2a:** CECT showing extent around sternum (from D1 to D 9 vertebral level) with low attenuation contents & mildly enhancing septae.



**Fig 2b:** Collection appears to be abutting aortic arch, pericardium & superior vena cava, right ventricle & pericardium posteriorly



**Fig 3:** Showing incision and drainage of the abscess followed by debridement

computed tomography, culture & appropriate treatment will prevent high morbidity and mortality associated with the condition.

#### Acknowledgments

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#### How to Cite This Article

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#### Conclusion

There is a severe paucity of literature on *Candida albicans* causing primary sternal osteomyelitis. Diagnosis requires high index of suspicion, as initial blood tests & chest X-Rays may not be conclusive. Definitive & early intervention based on