

## CASE REPORT

**Bilateral double contour on the cardiac borders and a review of the literature**Uğur GÖNLÜGÜR<sup>1</sup>, Merve YILMAZ<sup>1</sup>, Mustafa REŞORLU<sup>2</sup>, Hasan Oğuz KAPICIBAŞI<sup>3</sup><sup>1</sup>Çanakkale Onsekiz Mart University, Department of Chest Diseases, Çanakkale,<sup>2</sup>Çanakkale Onsekiz Mart University, Department of Radiology, Çanakkale,<sup>3</sup>Çanakkale Onsekiz Mart University, Department of Thoracic Surgery, Çanakkale.

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There is not a systematic review about double contour in thoracic radiography in the literature. We present a 64-year-old male patient with bilateral double density sign in chest X-ray. The case was admitted with complaints of syncope to the emergency department. Arterial blood gas analysis was consistent with respiratory failure. A mucoid impaction in the right lower lobe was aspirated during bronchoscopy. Chest computerized tomography demonstrated a huge diaphragmatic hernia and intrathoracic stomach in the posterior mediastinum. The patient was treated with intravenous diazepam for delirium tremens. All related papers were reviewed with Google and Pubmed search using keywords “double contour sign” or “double density sign”. In conclusion, pulmonary, cardiac, and retrocardiac mediastinal diseases can cause double density sign.

**Keywords:** Diagnosis, radiography, thorax, X-rays, critical care, emergencies.

**Kalp sınırlarında iki taraflı çift kontur ve literatürün incelenmesi****ÖZET**

Literatürde toraks radyografisinde çift konturdan bahseden sistematik bir derleme yoktur. Akciğer grafisinde bilateral çift dansite olan 64 yaşındaki erkek olguyu sunuyoruz. Olgu acil servise bayılma yakınması ile başvurmuştu. Arter kan gazı analizi solunum yetmezliği ile uyumluydu. Sağ alt loba mukus tıkaçı bronkoskopi ile aspire edildi. Göğüs bilgisayarlı tomografisi dev bir diyafragma hernisini ve arka mediyastende intratorasik midenin varlığını gösterdi. Hasta deliryum tremens nedeniyle intravenöz diazepam ile tedavi edildi. Google ve Pubmed “çift kontur bulgusu” veya “çift dansite bulgusu” anahtar kelimeleri ile taranıp tüm ilişkili yazılar incelendi. Sonuç olarak pulmoner, kardiyak veya arka mediyastinal hastalıklar çift dansite bulgusuna neden olabilir.

**Anahtar kelimeler:** Tanı, radyografi, toraks, röntgen, yoğun bakım, aciller.

**INTRODUCTION**

“Double contour sign” or “double density sign” defines the presence of two curvilinear densities on the cardiac border. This finding classically affects the right side and typically due to left atrial enlargement [1]. In this paper, we present an interesting case presenting with bilateral double contour sign. We could not find a review on “double contour sign” in chest x-ray in the literature. All related papers were collected with Google and Pubmed search using keywords “double contour sign” or “double density sign”, and then the reference section of each article was also inspected. The papers about “double contour sign” due to gout or pneumopericardium or foreign body were excluded. The underlying etiology and the side of the involvement of “double contour sign” were recorded.

**CASE REPORT**

A 64-year-old male patient was brought to the emergency department for loss of consciousness. Vital signs were assessed at the first examination, blood

pressure was 110/70 mmHg, pulse 89 beats/min, temperature 37°C, and blood oxygen saturation 84% at room air. Lung sounds were decreased at the right lower zone. Leukocytes 4000/mm<sup>3</sup>, haemoglobin 8.6



Figure 1. Chest X-ray showing bilateral double contour sign.

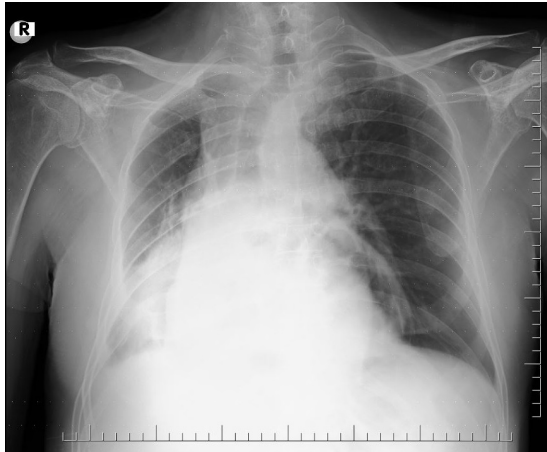


Figure 2. Chest radiograph demonstrating consolidation in right lower lobe associated with volume loss in ipsilateral hemithorax.

g/dL, CRP 5 mg/l, other peripheral blood and biochemical parameters were within normal range. Arterial blood gas analyses showed pH 7.54, PaCO<sub>2</sub> 43 mmHg, PaO<sub>2</sub> 50 mmHg, and HCO<sub>3</sub> 37 mmol/L. Chest X-ray demonstrated bilateral double contour on the cardiac borders (Figure 1). Chest X-ray repeated because dyspnea became progressively worse, and revealed a new opacity at right lower zone, and volume loss with ipsilateral shift of mediastinum (Figure 2). Chest CT-scan indicated a space-occupying tumor containing fat, air and soft tissue densities in posterior mediastinum and volume loss in right hemithorax (Figure 3). Mucus plug at right lower lobe bronchus was removed by fiberoptic bronchoscopy. Then, haemoglobin saturation was increased from 84% to 94% after bronchoscopy. Multiplanar reconstruction of CT images verified the diagnosis of diaphragmatic hernia (Figure 4), and lung collapse due to intrathoracic stomach (Figure 5). The patient had a long history of alcoholism. He showed significant improvement after administration of intravenous diazepam for delirium tremens. Although the patient did not undergo any surgical procedure, he was discharged by motivating to go a rehabilitation outpatient clinic for his alcohol use disorder.

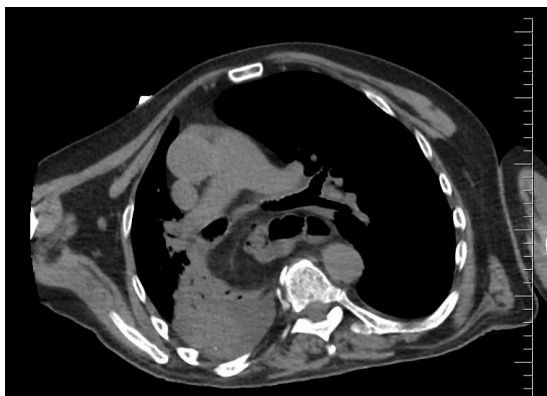


Figure 3. Chest CT-scan revealing a huge heterogeneous tumour at posterior mediastinum.



Figure 4. Multiplanar reconstruction of CT images demonstrating hiatal hernia.

## DISCUSSION

It is necessary to perform chest X-ray in a patient admitted to emergency department with syncope. In the presence of double contour sign, syncope might be due to free-floating thrombus in the dilated left atrium by obstructing the mitral valve orifice [2]. The combination of double contour sign and syncope is one of the medical emergencies. Consequently, rapid differential diagnosis is important. Left atrial or ventricular compression due to enlarged giant hiatus hernia can cause syncope and bilateral double contour sign like our patient [3,4]. Intrathoracic stomach can cause acute heart failure [5] or cardiac arrest due to obstructive shock [6]. Our patient also had respiratory failure, but this condition was immediately resolved after the aspiration of mucus plug. On the other hand, giant paraoesophageal hernia (where more than half of the stomach is located in the mediastinum) can cause acute [7] or recurrent [8] respiratory failure.



Figure 5. Chest CT-scan showing lung collapse due to intrathoracic stomach

Cardiac haemangioma [9] and myxoma [10] originating from left atrium can cause right-sided double contour sign. On the other hand, pulmonary diseases such as intralobar sequestration [11], and carcinoid tumor [12], left ventricle tumors such as cardiac angiosarcoma [13], and pseudoaneurysm [14] can cause left-sided double contour sign. Esophageal varices can be associated with right-sided [15] or left-sided [16] double density sign. Mediastinal lipomatosis can induce with right-sided [17] or left-sided [18] double contour sign. Extramedullary haematopoiesis can cause bilateral double contour sign [19].

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In conclusion, to our knowledge, this is the first systematic review about double contour sign in chest radiograph. Posterior pericardial or subcarinal space occupying lesions can be associated with double contour sign. These lesions can also cause widening of the carinal angle to over 90 degrees in addition to double density sign [1].

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