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## Case Report

# Triple barreled aortic dissection: The Mercedes-Benz sign<sup>☆</sup>

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## ABSTRACT

Triple barreled dissection is an extremely rare form of aortic dissection with only a few cases reported in the literature. It is characterized by 3 lumens separated by 2 intimal flaps, resembling the appearance of the 'Mercedes Benz' sign. We present an unusual case of triple barreled aortic dissection in a 71-year-old patient with history of hypertension. Chest radiography showed a widened mediastinum. The CT images showed a thoraco-abdominal type B aortic dissection with three lumens giving the appearance of the 'Mercedes Benz' sign. As the CT-scan showed no complications of the aortic dissection, the patient received medical conservative treatment.

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## Introduction

Aortic dissection is the most common acute aortic syndrome, caused by a tear in the intimal layer of the aorta, resulting in a second lumen or false lumen within the vessel wall [1]. Risk factors include hypertension, atherosclerosis and connective tissue disorders such as Marfan syndrome [1]. However, the triple barreled aortic dissection is a very rare finding [2,3]. In a series of 505 cases of aortic dissection published by Hirst and Johns in 1958 [4], no case of triple barreled dissection was reported. The second false lumen appears as a result of a tear in the fragile wall of the first false lumen [2]. We report

the case of a triple barreled aortic dissection in a 71-year-old patient.

## Case report

We report the case of a 71-year-old male patient, with a history of hypertension treated with monotherapy, admitted to the emergency room for chest pain.

The physical examination was poor. Blood pressure was 120/80 mmHg and the pulses were symmetrical and palpable. There was no clinical finding of connective tissue disorder.

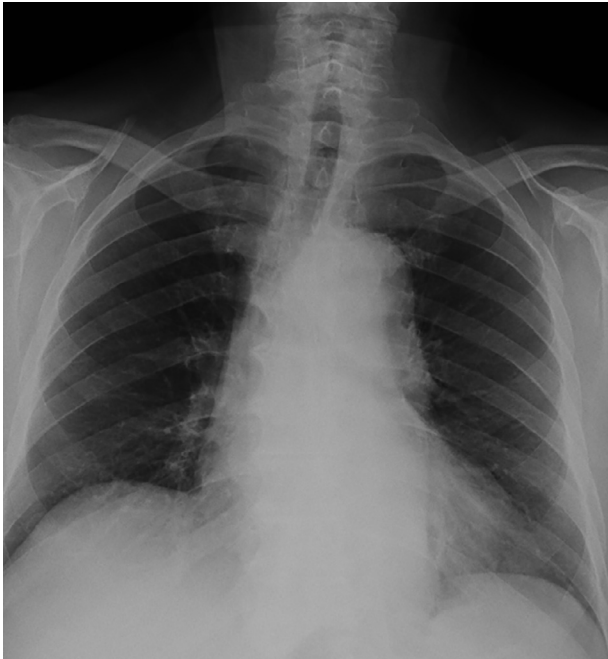
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**Fig. 1 – Plain chest radiography showing a widened mediastinum in a 71-year-old patient with type B triple barreled aortic dissection.**

Before aortic dissection is suspected, it is standard practice for any patient with chest pain to undergo initial investigations, including an electrocardiogram (ECG), blood tests for troponin levels and a chest X-ray. These routine investigations help to rule out common causes such as acute coronary syndrome or pulmonary problems.

In our case, the ECG was normal and the chest x-ray showed a widened mediastinum (Fig. 1).

CT angiography showed a Stanford type B aortic dissection extending from the descending thoracic aorta to the right common iliac artery. In the lower half of the thoracic aorta appears a third channel, creating the appearance of the 'Mercedes Benz' sign, with 1 true lumen (posterior and left side) and 2 anterior false lumens from either side. The false lumens were partially thrombosed and larger than the true lumen, but all 3 were equally opacified after intravenous administration of contrast medium. Only the celiac trunk emerged from one of the false lumens, without signs of hypoperfusion. All the other main visceral trunks emerged from the true lumen. The third channel disappeared in the remainder of the abdominal aorta. The CT scan showed no signs of impending aortic rupture or organ ischemia (Fig. 2).

As the aortic dissection was uncomplicated, the patient was managed medically with adjustment of antihypertensive treatment and regular follow-up.

## Discussion

CT angiography is essential to confirm the diagnosis of aortic dissection, to determine the type of dissection and to look for distal complications with a sensitivity and specificity of almost 100% [2,5]. It shows a dilatation of the aorta with an intimal flap dividing the vessel lumen into 2 channels: the true channel and the false channel which is often larger and of lower contrast density [6–8]. The false lumen is often thrombosed in chronic dissections [8]. Non-contrast CT may show subtle findings such as the displacement of atherosclerotic calcifications into the lumen [8].

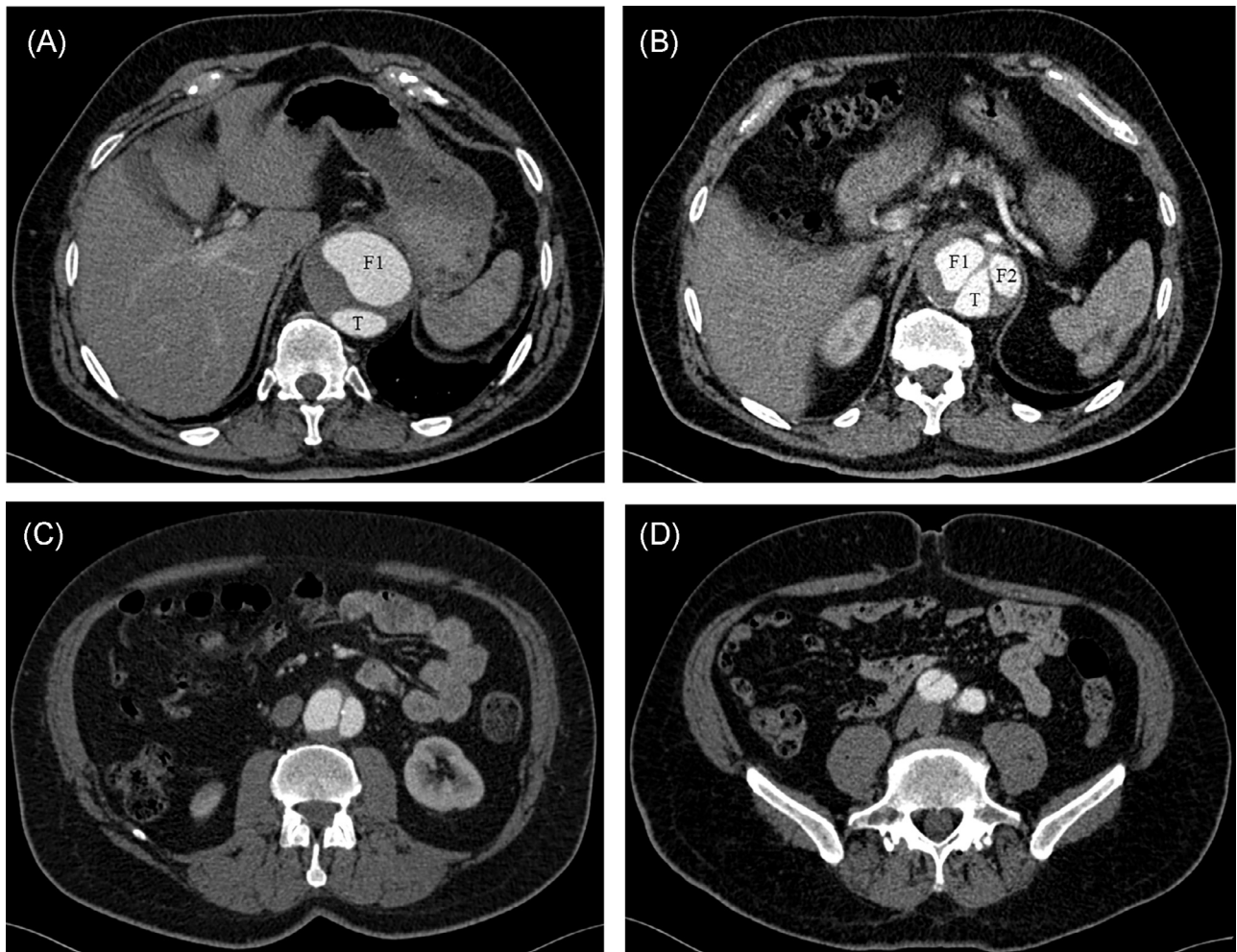
While ECG changes and elevated troponin levels can also occur in aortic dissection, a more specific sign is widening of the mediastinum, which can be seen on chest X-ray in around 60% of patients [9].

Aortic dissection with 3 channels is rarely described, and the identification of the 'Mercedes Benz' sign is even more uncommon [2,3]. It consists of a secondary tear in the fragile wall of the first false lumen [2]. The three channels are generally not equal in size, but may be equally opacified after intravenous contrast administration [2].

Type B aortic dissection typically has a more benign natural history than type A, with complications occurring in only 30% of cases [5]. Dissection is considered uncomplicated if there are no major complications or organ involvement such as malperfusion leading to organ failure, refractory hypertension despite treatment, and increased peri-aortic hematoma or hemorrhagic pleural effusion indicating aortic rupture [5]. In such cases, patients can often be managed medically with antihypertensive therapy [10]. In contrast, complicated type B aortic dissection requires more urgent intervention, often involving endovascular or surgical repair to prevent serious consequences such as organ damage or death [11].

It's recommended that the first repeat CT scan be taken 48 hours after the initial diagnosis to allow early identification of any emerging problems and guide appropriate management [12].

Recurrent pain in patients with known aortic dissection may indicate a secondary tear within the vessel wall and the possibility of multi-barreled dissection should always be considered [13].



**Fig. 2 – Axial CT angiography images showing a type B thoraco-abdominal aortic dissection at different levels (A) Beginning of the aortic dissection in the descending aorta with 2 lumens: posterior true lumen (T) and anterior partially thrombosed false lumen (F1). (B) Appearance of a second false lumen creating the ‘Mercedes Benz’ sign: true lumen on the posterior and left side (T) and false lumens anterior and from either side (F1 and F2). (C) Disappearance of the second false lumen in the abdominal aorta. Note the displacement of atherosclerotic calcifications into the lumen. (D) Extension of the intimal flap to the right common iliac artery.**

## Conclusion

This case highlights the rarity and complexity of triple aortic dissection. Larger studies are essential to better understand its pathophysiology, incidence, risk factors, and outcomes. Further research is needed to assess the natural history of the condition, including the risk of recurrence, progression, and complications, and to provide insight into the effectiveness of different treatment modalities to help refine management guidelines.

## Patient consent

An informed consent was obtained from the patient.

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