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Aortic Dissection with Periodontitis: A Case Report

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Keywords: Periodontal pain; Aortic dissection.

Abbreviations: AD: Aortic Dissection; CTA: Computed Tomography Angiography; EEG: Electrocardiogram.

Abstract

Background: Aortic dissection (AD) is the most common catastrophic lesion in aortic diseases, the main cause of which is related to inflammation, but there are still no reports of periodontitis and aortic dissection.

Patient concerns: A 57-year-old male patient was first admitted to hospital with "periodontal pain on both sides ". He was diagnosed with periodontitis and underwent treatment for periodontal disease. Three days later, the patient was re-visited to the hospital for periodontal pain recurred. Computed Tomography Angiography (CTA) of chest and abdomen revealed that a severe DeBakey type I aortic dissection. Because of the serious disease of the aorta, he was transferred to a higher hospital for surgical treatment.

Conclusions: Persistent periodontal pain may be potentially associated with the risk of aortic dissection. Physical examination and blood routine examination usually helps in arriving at a correct diagnosis. Special attention should be paid to an association between periodontal disease and AD.

Introduction

Aortic Dissection (AD) is the most common catastrophic lesion in aortic disease and the hospital mortality is as high as 30% [1]. Hypertension and aortic media disease are the most important factors for the occurrence of aortic dissection. Although great progress has been made in the diagnosis and treatment of aortic dissection, registration data from the International AAD Center show that about 1/3 of AD patients have atypical initial symptoms or signs and need to be identified [2]. Pulse defect, systolic blood pressure differential and focal neurological dysfunction in the results of physical examination are considered to be clinical risk markers of AD [2,3]. Therefore, timely diagnosis and control of early lesions of AD are very necessary to reduce the mortality. Especially in the diagnosis, we should pay more attention to the clinical physical examination of the patients with high risk factors in AD.

We present a case of AD accompanied by persistent periodontal pain as the obvious symptom. The neglect of the correlation between periodontitis and aortic disease delayed the timely diagnosis and surgical treatment of AD, leading to the occurrence of severe De Bakey type I AD.

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Case presentation

A 57-year-old male patient visited the second Hospital of Shijiazhuang City in July 2019 with the chief complaint of severe periodontal pain. An initial clinical examination revealed that gingival papilla of 35, 36 and 37 were generally red, swollen and proliferated and exhibited bleeding on probing, had periodontal pocket depth of 3-4 mm, a large number of plaques, detected a lot of subgingival dental calculus. We carried out active treatment for his periodontal condition. However, 3 days later, the patient was re-visited because of persistent periodontal pain and "occasional chest tightness". We examined the patient's oral condition and recovered well. In view of the patient's current clinical symptoms, we performed a basic clinical physical examination on the patient. Physical examination: Pulse (P) 66 times / min, Respiration (R) 19 times / min, Blood pressure (Bp) 130/70 mmHg (left upper limb), Bp 106/60 mmHg (right upper limb), the pulsation of the right radial artery disappeared and the pulsation of the left radial artery existed. He had a history of severe periodontitis, smoking for 20 years and hypertension for 10 years. The highest Bp was 180/90 mmHg, regularly took Levamlodipine Besylate Tablets 2.5 mg and captopril 50 mg once a day, and the Bp was well controlled. The patient had a history of coronary heart disease and dyslipidemia, and random blood glucose test was 11.9 mol/L.

Blood routine examination: C reactive protein (CRP) 47.8 mg/L, Erythrocyte sedimentation rate (ESR) 45 mm/h, fibrinogen 5.2 g/L, White blood cells (WBCs) 31.7 × 109 / L, neutrophils 59.6%, were abnormally high. The patient had thoracic and abdominal aortic murmur on auscultation, ECG showed sinus bradycardia and T wave in lead V5-V6 was low and flat (Figure 1). Echocardiography showed mitral regurgitation and a membranous structure in the aortic arch. According to the patient's clinical symptoms and inflammatory phenotype, oral examination, hypertension medication history, family history and smoking history, the preliminary diagnosis may be accompanied by aortic inflammatory disease.

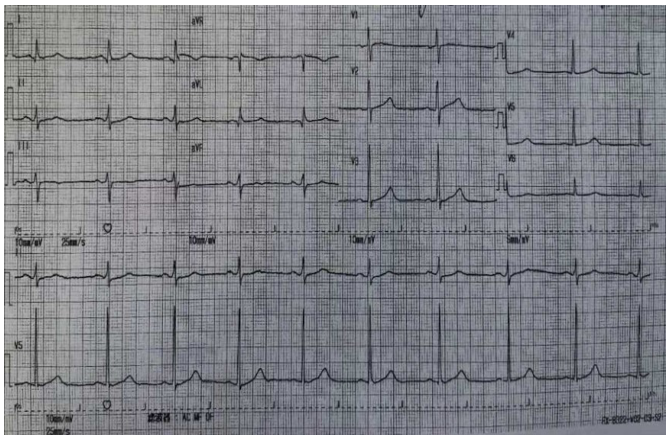

Figure 1: Results of electrocardiogram, patient had a sinus bradycardia and T wave in lead V5-V6 was low and flat.

In order to further confirm the diagnosis, thoracic and abdominal CTA was performed after communicating with the patient's families. The results demonstrated that thoracic and abdominal aortic dissection, brachiocephalic trunk, bilateral common carotid artery, bilateral subclavian artery, celiac trunk artery, right common iliac and external iliac artery were all involved (Figure 2). According to the results of physical examination, the patient was diagnosed as thoracic and abdominal aortic dissection (DeBakey type I). For his critical condition, the patient was transferred to hospital after communicating with his family, and the patient died 2 hours later because of missing the best time for surgical treatment.

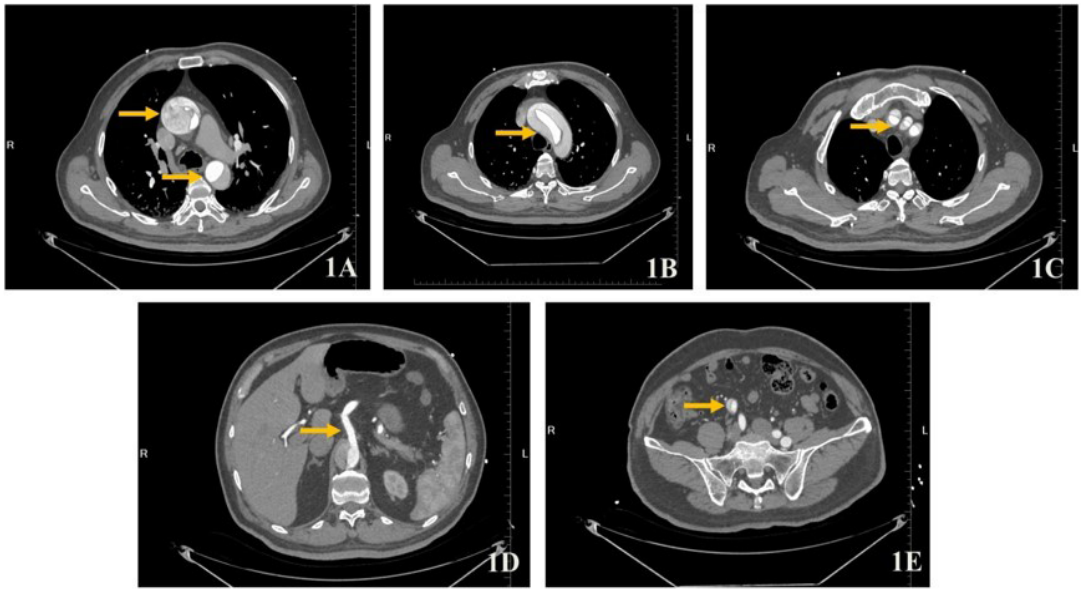

Figure 2: CTA examination (1A: dissection of ascending and descending aorta; 1B: dissection of aortic arch; 1C: dissection of brachiocephalic trunk, left neck and left subclavian artery; 1D: dissection of celiac trunk; 1E: dissection of right common iliac and external iliac artery).

Discussion

AD is difficult to diagnose and if missed carries a significant mortality rate. Sudden severe chest and back pain, hypotension and syncope are common symptoms of AD. According to the location and scope of AD, it can show a variety of atypical clinical symptoms, such as stroke, myocardial infarction and arrhythmia involved in aortic arch, renal failure, abnormal liver function and intestinal ischemia in visceral area, lower limb ischemia in iliac artery [4] and paraplegia in spinal cord vessels [5]. So far, there are few reports of AD with periodontitis. This case is an elderly male patient with initial diagnosis of periodontitis for missing diagnosis of AD leading to a dangerous condition.

The patient was AD with periodontitis, and the causes of missed diagnosis of AD in the first diagnosis are as follows:

① the clinical manifestation of the patient with periodontal pain was atypical, and there was no typical chest and back pain;

② the patient complained of periodontal pain on both sides at the first visit, the doctor only diagnosed unilateral periodontitis and did not carefully analyze its causes. As a result, the patient lost the opportunity for emergency treatment.

The possible reasons why periodontal pain is the clinical manifestation of this patient are as follows.

① This patient is DeBakey type I AD, which considered that the dissection may first form in the carotid artery, then may oppress the glossopharyngeal nerve and cause periodontal pain. When the dissection was downward involving the abdominal trunk, the patient had chest tightness.

② The patient had a history of recurrent periodontitis. The patient formed dissection in the cervical artery first, except for the high risk factor that the patient had a ten-year history of hypertension, chronic periodontitis was also likely to be an accomplice to such a dangerous AD.

Numerous studies have shown [6-8] that periodontal pathogens can invade the adventitia of aorta and play an important role in the development of aortic dissecting aneurysms. Ding et al. [6] showed that 87.6% of aortic aneurysms were complicated with chronic periodontal disease, and there was a relative risk (OR=2.309).

In addition, this report proves the necessity of blood routine examination for the auxiliary diagnosis of AD. Blood routine examination showed that CRP47.8 mg/L, ESR45 mm/h, fibrinogen 5.2 g/L, neutrophils increased abnormally in 31.7 × 109 /L and WBCs 59.6%, indicating that the patients had systemic acute inflammation. Some studies have used the level of CRP on admission as the prognostic assessment of AD patients [9], while fibrinogen / fibrin degradation products value is not only helpful for the diagnosis of AD but can be used as the differential diagnosis between acute ischemic stroke and acute AD [10]. Turner N et al reported 3 cases AD patients with only systemic symptoms, also including ESR and elevated neutrophils increased [11]. In this case, the combined analysis of disease history, physical examination and blood routine examination suggested the possibility of aortic dissecting aneurysm, and further imaging diagnosis was recommended, while CTA confirmed the existence of AD.

Conclusion

AD with periodontal pain as the symptom is very rare. Periodontitis is closely related to the occurrence and development of cardiovascular disease. Thus, we recommend that clinicians should pay more attention to strengthen the clinical physical examination including Bp, pulse, nerve function, as well as blood routine examination, echocardiographic and EEG for patients with high-risk factors that affecting the development of cardiovascular diseases, reducing the occurrence of AD misdiagnosis and the mortality.

Declarations

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