CASE REPORT

Acute Thoracic Aortic Dissection Presenting as Sore Throat: Report of a Case

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Acute dissection of the aorta can be one of the most dramatic of cardiovascular emergencies. Its symptoms can occur abruptly and progress rapidly. Prompt recognition and appropriate intervention is crucial. However, not all aortic dissections present with classic symptoms of abrupt chest, back, or abdominal pain, and the diagnosis may be missed. Aortic dissection presenting as a sore throat is quite unusual. A 53-year-old man presented with sore throat as the early symptom of an acute thoracic aortic dissection. Unfortunately, the diagnosis was delayed, and the patient died. Given the high morbidity and mortality after delayed recognition or misdiagnosis, aortic dissection should be considered in the differential diagnosis of a patient presenting with sore throat and normal findings of neck and throat, even when there is no classic symptoms.

INTRODUCTION

Acute thoracic aortic dissection, one of the most common and serious diseases of the aorta, carries a high morbidity and mortality rate when it is not recognized and treated promptly. The mortality of untreated aortic dissection may be as high as 1 percent within 1 hour, and 40 to 50 percent of patients died within 48 hours [1, 2]. For those fortunate enough to survive the initial 48 hours, the disease was thought to carry a 90 percent one-year mortality rate [1, 2]. Since the introduction of modern treatment regimens, the fatality rate has declined dramatically. Patients with proximal ascending dissections who rapidly undergo surgery in experienced tertiary centers have a 30-day survival rate of 80 to 85 percent and a 10-year survival of 55 percent [3]. Realization of the dramatic benefits of early intervention is dependent upon rapid establishment of the diagnosis of aortic dissection.

Aortic dissection may not always present with classic symptoms of abrupt chest, back, or abdominal pain that suggest an acute cardiovascular event. By understanding the pathophysiology of aortic dissection, the clinician may better understand the relationship between the dissection process and the resulting symptomatology. We present one case of acute thoracic aortic dissection with the main feature of sore throat.

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†Abbreviations: CT, computed tomography; ECG, electrocardiogram; TEE, transesophageal echocardiography; TTE, transthoracic echocardiography.
A 53-year-old man came to the emergency room of China Medical University, Taichung, Taiwan, in the early morning with a few hours history of sore throat after betel nut chewing last night. The discomfort was first noted as a foreign body sensation of throat while he was resting in bed. The pain got worse rapidly, prompting him to seek medical evaluation.

He had habits of betel nut chewing and cigarette smoking (one pack per day) for more than 30 years. His medical history included gastric ulcer and left renal calculi. He had received proton pump inhibitor and eradicated treatment of *Helicobacter pylori* completely. He had no any predisposing factors of aortic dissection such as hypertension, Marfan syndrome, bicuspid aortic valve, or history of cardiac surgery, etc.

He had no history of trauma, cough, rhinorrhea, dyspnea, dysphonia, fevers, chills, chest, or back pain. On arrival, the patient's temperature was 36.8°C, his blood pressure was 134/86 mmHg, and he had a pulse of 78 beats per minute, and a respiratory rate of 18 breaths per minute.

On examination, he was conscious but uncomfortable. There was no tenderness, palpable mass of the neck, or enlargement of thyroid gland. There were clear breathing sounds and regular heart beats with no murmur. The abdomen was soft and flat, with no tenderness or palpable mass. There was no foreign body, wound, or any abnormal finding in throat by laryngoscopy. The radiography of neck soft tissue showed no notable abnormal finding. Due to no obvious abnormal finding of neck and throat, the patient was prescribed analgesic (ketorolac 30 mg intramuscular injection) and observation in the emergency room. After a one-hour observation, the patient felt better and was discharged.

Ten hours later, the patient was sent to the emergency room again due to aggravation of sore throat, severe chest pain, diaphoresis, and syncope at home. On examination, he was drowsy. His face was pale and sweating. Blood pressure was 78/34 mmHg, pulse rate was 127 beats per minute, and respiratory rate was 26 breaths per minute. The jugular vein distension was noted. There was no obvious difference of pulse rate and blood pressure between the four extremities. There were clear breathing sounds and regular heart beats without murmur. The abdomen was soft and non-tender to palpation with no mass. An endotracheal tube was inserted,

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Figure 1. The chest radiography showed widening of mediastinum, deviation of the trachea to the right, depression of the left main stem bronchus, obliteration of the aortic knob, enlargement of heart size, and left pleural effusion. AK, aortic knob; E, ECG conductive adhesive electrode; ET, endotracheal tube (ET); LB, left bronchus; T, trachea.
and mechanical ventilation support and fluid resuscitation were given immediately. The electrocardiogram (ECG)† showed sinus rhythm and no abnormal change. The creatinine phosphokinase, myocardial band, Troponin I, and other laboratory data were within normal limits. The chest radiography showed widening of mediastinum, deviation of the trachea to the right, depression of the left main stem bronchus, obliteration of the aortic knob, enlargement of heart size, and left pleural effusion (Figure 1). According to the symptoms, signs, laboratory data, and chest radiography, aortic dissection was highly suspected.

Under the impression of aortic dissection, we requested a computed tomography (CT) of chest and abdomen (from the fourth cervical spine level to pelvis). This was interpreted as showing intimal flaps in ascending aorta with extension to proximal arch, hemopericardium, and hemothorax (Figures 2A and 2B). Stanford type A aortic dissection with cardiac tamponade and hemothorax was the diagnosis. Emergency operation was performed, but the patient died during the operation process.

**DISCUSSION**

Dissection of the aorta begins with a tear in the intimal layer. This tear permits blood to enter the aortic wall, creating an intramural hematoma progressing distally in the aorta. A common site for the initiation of an intimal tear is at the proximal portion of the ascending aorta due to the thrust of blood ejecting from the left ventricle. Upon intimal disruption, blood enters the media permitting dissection. Medial abnormalities are a result of atherosclerosis, cystic medial necrosis, and systemic hypertension. Hypertension is considered the most significant contributing factor in the pathogenesis of aortic dissection [4].

Aortic dissections have been classified by two separate systems. DeBakey classifies aortic dissection by the extent of the dissecting process and its anatomic location [5]. There are three classifications: Type I involves the ascending aorta and the remaining distal portions of the aorta. When the dissection is limited to the ascending aorta, it is classified as Type II. Type II usually has a transverse tear in the intima anteriorly just above the aortic valve with separation of the intramural layers that terminate proximally to the...
innominate artery. Type III arises distal to the left subclavian artery and extends distally. The Stanford classification is based on the presence or absence of involvement of the ascending aorta. Type A includes the ascending aorta, whereas Type B does not [6]. Lesions of the ascending arch (Type A) have an unfavorable outcome and usually require surgical intervention. Type B lesions may be amenable to medical management with antihypertensives [7]. This patient had a Type II or Type A aortic dissection.

Because a dissection of the aorta has high morbidity and mortality, its protean symptoms must be appreciated. The symptoms may be secondary to compression of the surrounding nerves, involvement of branch vessels or adjacent structures by the expanding aneurysm. The symptoms and signs may present as abrupt chest pain, abdominal pain, back pain, acute cerebral infarction, myocardial infarction, spinal cord ischemia, intraabdominal disorders, peripheral arterial occlusion diseases, and so on [1, 8-15].

Patients presenting with sore throat to emergency rooms are very common. The common differential diagnosis of sore throat includes pharyngitis, tonsillitis, epiglottitis, peritonsillar abscess, retropharyngeal abscess, mild trauma, and foreign bodies in the throat. This patient had sore throat for a few hours after betel nut chewing. Up to 76 percent of patients who had a betel nut chewing habit experienced burning sensation, sore throat and xerostomia [16]. Due to no abnormal finding in physical examination, radiography of neck soft tissue, and laryngoscopy, the patient was discharged. Pharyngitis or mild pharyngeal injury by mis-swallowing of a betel nut was suspected at that time. However, these conditions, if ever, must present local abnormal finding. We had a serious mistake by making a thoughtless diagnosis.

Neck discomfort may be a symptom of unstable angina and myocardial infarction. Patients with myocardial ischemia suffered from neck discomfort about 13 percent to 31 percent of the time [17]. Notwithstanding the final diagnosis of this case was aortic dissection, the myocardial ischemia should be considered initially. The ECG and cardiac enzyme did not be examined at the first visit.

The aortic dissection was initially manifested only by sore throat. Because the patient did not have chest pain or back pain on arrival to the emergency room, aortic dissection was not recognized then. After severe chest pain, hypotension, and chest radiography findings, aortic dissection was diagnosed. In our knowledge, aortic dissection presenting as sore throat has not been previously reported. In this patient, there was no involvement of head and neck vessels on CT. The pain was most likely secondary to compression of the surrounding nerves or involvement of adjacent structures by the expanding aneurysm of the ascending aorta close to the throat.

Physicians are dependent upon the clinical history and examination to determine which patients require further study. There are various tools to help physicians diagnose aortic dissection. Plain chest radiographs are quickly available in emergency room. The sensitivity of chest radiography is 64 percent, and the specificity is 86 percent [18]. Transthoracic echocardiography (TTE) is limited in its ability to examine the descending thoracic aorta. The sensitivity and specificity of TTE for diagnosis of aortic dissection ranges from 77 to 80 percent, and 93 to 96 percent, respectively [19, 20]. Erbel et al. [21] evaluated the usefulness of transesophageal echocardiography (TEE) in assessment of aortic dissection. The sensitivity and specificity of TEE were 99 percent and 98 percent, respectively.
Aortography remains the most definitive tool for confirming this disease [2]. A number of investigators evaluating the effectiveness of contrast-enhanced CT scanning in diagnostic aortic dissection have demonstrated a sensitivity of 83 to 100 percent and a specificity of 90 to 100 percent [22-24]. CT could be utilized in the diagnosis of aortic dissection. However, the full extent of the dissection is likely to be underestimated since even by scanning at multiple levels it is unlikely that extension into the carotid artery will be demonstrated. Early studies of the usefulness of magnetic resonance imaging in the diagnosis of aortic dissection were encouraging, with a sensitivity of 90 to 100 percent and a specificity of 100 percent [25, 26]. If there are any suspicions of aortic dissection, these methods should be considered and may be useful.

While advanced imaging techniques can confirm the diagnosis of thoracic aortic dissection in patients, it is obviously inefficient, uneconomic, and unrealistic to image every patient. Indiscriminate use of diagnostic imaging in poorly chosen patients with very low pretest probability of having dissection has been predicted to yield up to an 85 percent rate of false-positive results depending on the imaging modality chosen [27]. An extensive investigation of aortic dissection would not be practical in all cases of sore throat.

In conclusion, aortic dissection presented by sore throat is very rare but prompt recognition and expeditious surgical treatment may increase the rate of survival of this catastrophic injury. Given the high morbidity and mortality after delayed recognition or misdiagnosis, aortic dissection should be considered in the differential diagnosis of a patient presenting with sore throat with no abnormal finding of neck, throat, ECG, and cardiac enzymes, even when there is no history of chest pain. Because treatment is relatively simple and effective if instituted in time, emphasis should be placed on early diagnosis.

REFERENCES

1. Hirst AE, Jr., Johns VJ, Jr., and Kime SW., Jr. Dissecting aneurysm of the aorta: a review of 505 cases. Medicine 1958;37:217-279.
2. Desanctis RW, Doroghazi RM, Austen WG, and Buckley MJ. Aortic dissection. N Engl J Med 1987;317:1060-7.
3. Hagan PG, Nienaber CA, Isselbacher EM, et al. The International Registry of Acute Aortic Dissection (IRAD): new insights into an old disease. JAMA 2000;283:897-903.
4. Dalen JE, Pape LA, Cohn LH, Koster JK, Jr., and Collins JJ, Jr. Dissection of the aorta: pathogenesis, diagnosis, and treatment. Prog Cardiovasc Dis 1980;23:237-45.
5. DeBakey ME, McCollum, CH, Crawford, ES, et al. Dissection and dissecting aneurysms of the aorta: twenty-year follow-up of five hundred twenty-seven patients treated surgically. Surgery 1982;92:1118-34.
6. Miller DC, Stinson EB, Oyer PE, et al. Operative treatment of aortic dissections. Experience with 125 patients over a sixteen-year period. J Thorac Cardiovasc Surg 1979;78:365-82.
7. Wolfe WG. Dissecting aneurysms of the aorta. In: Sabiston DC, Lyerly HK, eds. Textbook of Surgery: the Biological Basis of Modern Surgical Practice, 15th edition. Philadelphia: W.B. Saunders; 1997, pp. 1647-54.
8. Spittell PC, Spittell JA, Joyce JW, et al. Clinical features and differential diagnosis of aortic dissection: experience with 236 cases. Mayo Clin Proc 1993;68:642-51.
9. Khan R, Amaram SF Gomes JA, Kelen GJ, Lynfield J, and El-Sherif N. Myocardial infarction following acute aortic dissection. Catheter Cardiovasc Diagn 1980;6:181-14.
10. Nordt TK, Rauch B, Mattfeldt T, et al. Acute myocardial infarction due to proximal aortic dissection in giant cell aortitis. Am Heart J 1991;122:1151-3.
11. Cambria RP, Brewster DC, Gertler J, et al. Vascular complications associated with spontaneous aortic dissection. J Vase Surg 1988;7:199-209.
12. Kellett MW, Young GR, and Fletcher NA. Paraparesis due to syphilitic aortic dissection. Neurology 1997;48:221-3.
13. Rosen SA. Painless aortic dissection presenting as spinal cord ischemia. Ann. Emerg Med 1988;17:840-842.
14. Pacifico L, and Spodick D. ILEAD-Ischemia of the lower extremities due to aortic dissection: the isolated presentation. Clin Cardiol 1999;22:353-6.
15. Liu WP, Chen WK, and Ng KC. Aortic dissection presenting as acute lower extremity ischemia: report of a case. Yale J Biol Med 2002;75:211-4.
16. Chiu CJ, Lee WC, Chiang CP, Hahn LJ, Kou YS, and Chen CJ. A scoring system for the early detection of oral submucous fibrosis based on a self-administered questionnaire. J Public Health Dent 2002;62:28-31.
17. DeVon HA and Zerwic JJ. Differences in the symptoms associated with unstable angina and myocardial infarction. Prog Cardiovasc Nurs 2004;19:6-11.
18. von Kodolitsch Y, Nienaber CA, Dieckmann C, et al. Chest radiography for the diagnosis of acute aortic syndrome. Am J Med 2004;116:73-7.
19. Kasper W, Meinertz T, Kersting F, et al. Diagnosis of dissecting aortic aneurysm with suprasternal echocardiography. Am J Cardiol 1978;42:291-4.
20. Victor MF, Mintz GS, Kotler MN, Wilson AR, and Segal BL. Two-dimensional echocardiographic diagnosis of aortic dissection. Am J Cardiol 1981;48:1155-9.
21. Erbel R, Engberding R, Daniel W, Roelandt J, Visser C, and Rennollet H. Echocardiography in the diagnosis of aortic dissection. Lancet 1989;1:457-61.
22. Danza FM, Fusco A, and Falappa P. Role of computed tomography in the evaluation of dissecting aortic aneurysms. Radiology 1984;152:827-9.
23. Nienaber CA, von Kodolitsch Y, Nicolas V, et al. The diagnosis of thoracic aortic dissection by noninvasive imaging procedures. N Engl J Med 1993;328:1-9.
24. Hamada S, Takamiya M, Kimura K, Imakita S, Nakajima N, and Haito H. Type A aortic dissection: evaluation with ultrafast CT. Radiology 1992;183:155-8.
25. Amparo EG, Higgins CB, Hricak H, and Solitto, R. Aortic dissection: magnetic resonance imaging. Radiology 1985;155:399-406.
26. Kersting-Sommerhoff BA, Higgins CB, White RD, Sommerhoff CP, and Lipton MJ. Aortic dissection: sensitivity and specificity of MR imaging. Radiology 1988;166:651-5.
27. Barbant SD, Eisenberg MJ, and Schiller NB. The diagnostic value of imaging techniques for aortic dissection. Am Heart J 1992;124:541-3.