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Ascending Aortic Dissection without Intimal Tear: A Case Report

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ABSTRACT

Aortic dissection may occur without the presence of intimal tear, and it may occur with medial dissection and intramural hematoma. We report a case in which mediastinal enlargement was found in the chest x-ray of a 79-year-old patient with chest and back pain that had started suddenly 1 week before. The patient had a decrease in hematocrit, and transthoracic echocardiography revealed around the heart pericardial fluid 5 cm thick. The ascending aorta could not be evaluated because of the presence of this fluid. The preoperative diagnosis, based on the computerized tomography findings (dissection of ascending aorta and pericardial fluid), was ruptured dissection of the ascending aorta. The patient underwent an emergency operation. Two liters of hemorrhagic fluid was aspirated from the pericardium during the operation. The ascending aorta was opened, but there was no intimal tear. Medial dissection and intramural hemorrhage were seen. The ascending aorta was replaced with a tube graft. Cases such as this, of medial dissection and intramural hematoma in which intimal integrity is preserved, should be approached in the same manner as classical dissections with intimal tear.

INTRODUCTION

Aortic medial dissection and intramural hematoma without the presence of intimal tear is among a special subgroup of aortic dissections, and it carries the risk of rupture. Therefore it has a high morbidity and mortality [Lansman 1999]. We report a case involving a 79-year-old patient on whom we performed surgery for this pathology.

CASE REPORT

A 79-year-old male patient who had dyspnea for the preceding year was admitted to our clinic complaining of chest and back pain that had suddenly started 1 week before. He had a 10-year history of hypertension. Chest x-ray revealed serious mediastinal enlargement (Figure 1). The possibility of ruptured dissection of the ascending aorta was suggested because of the suddenness of chest pain, mediastinal enlargement indicated on the chest x-ray, and significant decrease in hematocrit (from 38 to 28 mg/dL); transthoracic echocardiography and thoracic computerized tomography were performed. Echocardiography revealed around the heart pericardial fluid 5 cm thick, which prevented evaluation of the ascending aorta. Thoracic computerized tomography with contrast administration revealed a dissection of the ascending aorta starting from the beginning of the ascending aorta and ending at the beginning of the arcus aorta; there was also pericardial fluid (Figure 2). A diagnosis of myocardial ischemia was excluded by results from laboratory investigations. Transesophageal echocardiography was not performed lest it cause extension of the rupture. The initial diagnosis was ruptured dissection of ascending aorta with acute tamponade.

Surgical Technique

The patient was taken on emergency basis to the operating theater 2 hours after his admission. Femoral arterial cannulation was first performed anticipating confirmation of a ruptured ascending aorta. Following midsternal incision, 2 liters of blood and fresh thrombus was aspirated from the pericardial space. Origin of active bleeding could not be determined at the first evaluation. There were chronic inflammatory changes and some weakened and lacerated areas over epicardium. The noncoronary sinus side of the aorta was aneurysmatic, and there were areas of laceration also on the aortic adventitia. Venous cannulation was done via the right atrium, and cardiopulmonary bypass was initiated. The ascending aorta was opened under cross-clamp. Evaluation of intima did not reveal any tear. Because intimal integrity was preserved, there was no need for evaluating the arcus aorta under total circulatory arrest. The aortic valve was competent and there was no aortic insufficiency. No pathology was observed at coronary orifices.

However, there were some areas of laceration at adventitia. Examination of aortic layers revealed medial dissection and intramural hemorrhage. The ascending aorta was replaced with a 28 No Dacron tube graft. Concomitantly, tissue samples of the ascending aorta, the epicardium, and the pericardium were sent for pathological examination.

There were no postoperative complications, and the patient was discharged on the ninth postoperative day. As of this writing, his case has been followed for 7 months postoperatively and he is alive and healthy.

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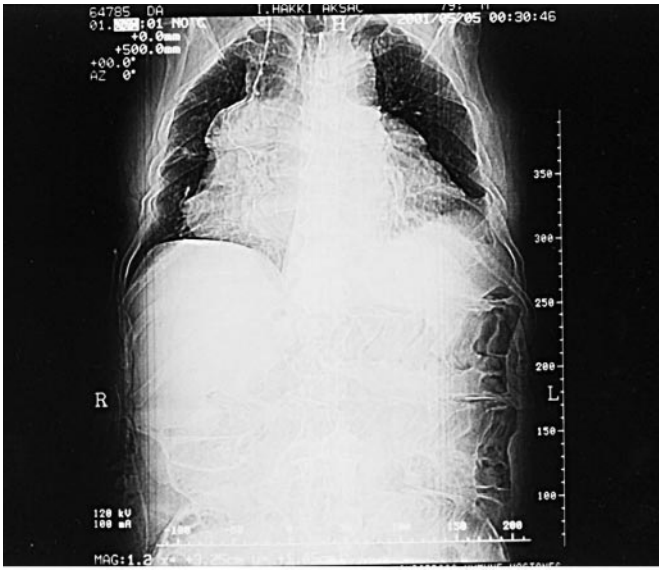

Figure 1. Appearance of mediastinal enlargement in preoperative chest x-ray.

Pathological Examination

Pathological examination showed the presence of a regular structure in intima and dissection at the junction of media and adventitia, hemorrhage in adventitial fatty tissue, and structural findings secondary to this pathology (Figures 3 and 4).

DISCUSSION

Aortic intramural hematoma and aortic dissection without intimal tear, which are special clinical entities, are occurring more frequently [Neri 1999]. Krukenberg first described this pathology in 1920 as "dissection without intimal tear"; he reported that in histological examination there was a hematoma disrupting the medial layer of the aorta [Coady 1999]. In this pathology of the ascending aorta there is neither intimal laceration nor discontinuity. The condition may occur in older or hypertensive patients following blunt trauma, or it may originate from an atherosclerotic ulceration of the ascending aorta. In such cases, intimal tear would not be seen, because it is not in relation with the lumen [Coady 1999, Ohge 1995].

Intramural hematoma is a spontaneous and localized hemorrhage into the aortic wall without the presence of an intimal tear. There are 2 types of intramural hematoma: a traumatic type that has a favorable prognosis and a nontraumatic type that has an unfavorable prognosis because it is the early stage of classic aortic dissection. One indicator of subadventitial or intramural hematoma is hemorrhage into the media or pericardial space. Rupture of the vasa vasorum may be the mechanism initiating the pathology. Intramural hematoma is the indicator of classic dissection and rupture, and it may be the early sign of progression to aortic dissection [Neri 1999].

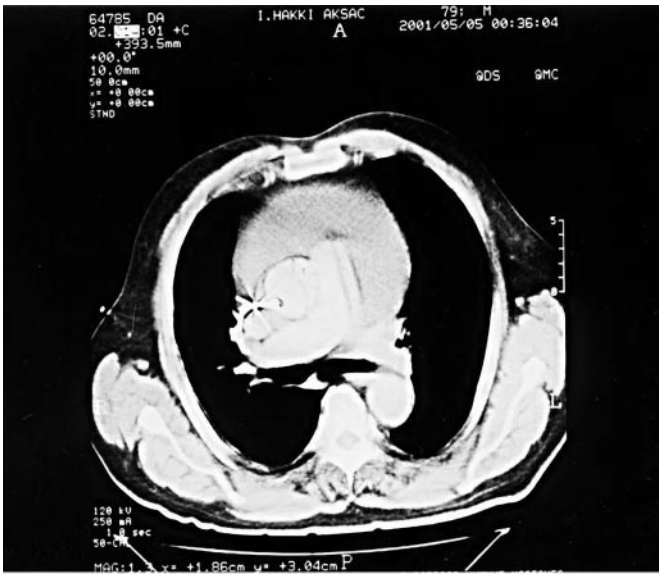

Figure 2. Appearance of dissection of ascending aorta in preoperative computerized tomography.

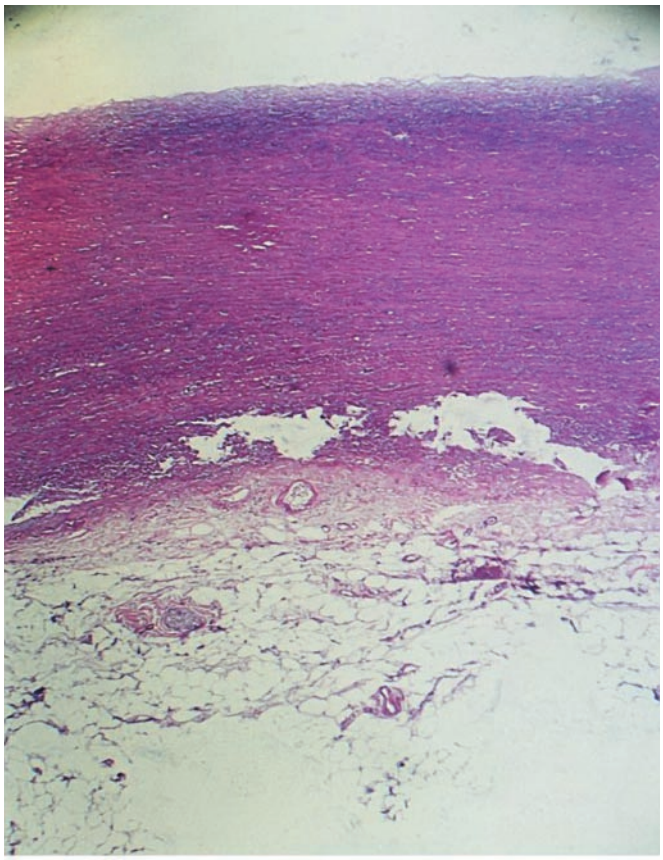

Figure 3. Regular intimal structure and presence of dissection at the junction of media and adventitia (original magnification ×40, hematoxylin eosin stain).

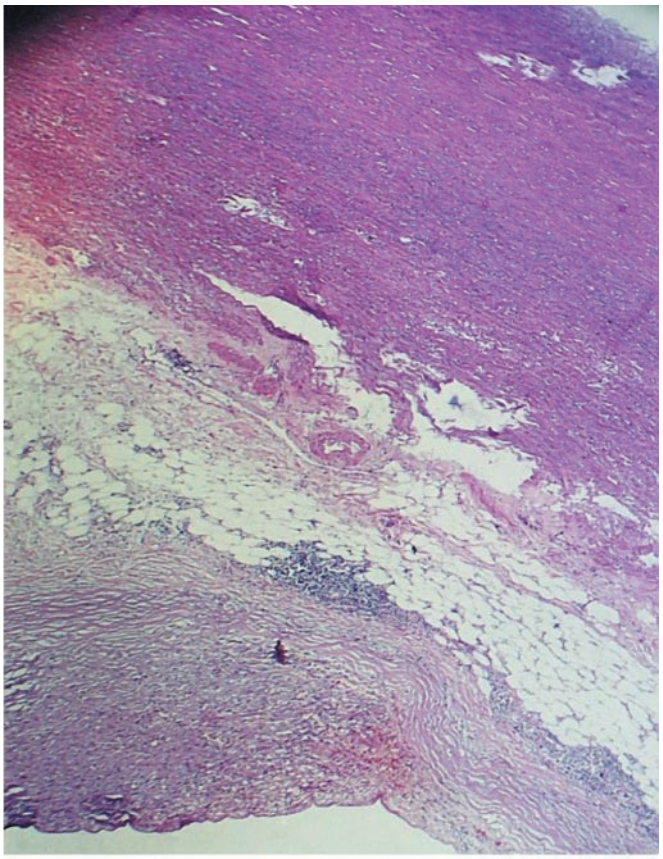

Figure 4. Presence of dissection at the junction of media and adventitia, bleeding at adventitial fatty tissue and secondary structural findings (original magnification ×40, hematoxylin eosin stain).

Patients with aortic intramural hematoma are older, and in these older patients mediastinal hemorrhage and pericardial or pleural effusions are seen more frequently than aortic dissections. Intramural hematoma may regress and disappear within time, but it may also lead to dissection [Neri 1999].

Transesophageal echocardiography, computerized tomography, and magnetic resonance imaging have important roles in diagnosis. Today, helical computerized tomography and magnetic resonance angiography are important diagnostic tools for making a diagnosis before the development of complications. Computerized tomography is helpful in evaluating the type A aortic intramural hematoma and its thickness, detection of compression over true lumen and the presence of pericardial or pleural effusions, and determination of progression of intramural hematoma to aortic dissection [Coady 1999]. Intramural hematoma and medial dissection may be observed by transesophageal echocardiography, but it cannot be detected by aortography. Aortography may indicate only the decrease in the diameter of the lumen [Lui 1992].

In hypertensive patients, intramural hematoma manifests clinically as acute thoracic pain, showing similarity with classical aortic dissection. Increase in the thickness of aortic wall in aortic dissection may be an early sign of intramural hemorrhage [Ohge 1995].

Intramural hematoma and medial dissection should be approached in the manner that type A aortic dissection is approached. Early diagnosis is important for the prevention of possible complications. Antiimpulsive treatment is recommended during preoperative period. This treatment includes beta blockers and medications that decrease afterload. An early and aggressive surgical approach is preferred, and the condition should be managed as true aortic dissection, because it may rupture and may lead to a fatal outcome [Neri 1999, Vaccari 2001].

CONCLUSION

We conclude that cases of aortic dissection without intimal tear and intramural hematoma (which may be described as nonflap lesion of aorta) should be treated as if they are cases of typical aortic dissection. In the differential diagnosis of tamponade cases, the probability of ruptured medial dissection should be kept in mind, and early and aggressive surgical intervention should take place.

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