

## Delayed Presentation of Anastomotic Leak Following Stanford A Aortic Dissection Repair

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### Summary

Anastomotic leak after aorta surgery usually occurs during the peri-operative period. However late presentation of anastomotic leak can be missed and place surgeons in a challenging situation during re-intervention. Here we report an interesting case of proximal anastomotic leak after ascending aorta replacement which manifested with a huge acute pseudoaneurysm. This patient required emergency repair of the anastomotic leak to tackle the issue.

**Keywords:** Aortic anastomotic leak; Pseudoaneurysm post repair; aTAAD repair complication

### Introduction

Ascending aorta replacement is a common surgical procedure while dealing with acute Type A Aortic Dissection (aTAAD) [1,2,11,16,18]. Patients are mandatory to have meticulous follow up with Computed Tomography Angiography (CTA) postoperatively to assess if presence of periaortic haematoma, anastomotic leak or development of pseudoaneurysm [3,4,25]. The anastomotic leak usually occurs during the peri-operative period but it may also diagnose later during the follow up CTA. The incidence was reported as 4.3% in a study [3]. Here we present a case of late proximal anastomotic leak after ascending aorta replacement in a patient who had aTAAD.

### Case Report

A 47-year-old lady with hypertension presented to our hospital 3 months ago with acute Type A Aortic Dissection (aTAAD). She had undergone emergency ascending aorta replacement with Hemashield graft and resuspension of aortic valve. During peri-operative period, she also developed acute right Middle Cerebral Artery (MCA) infarction with left hemiparesis which she recovered without any residual deficit and discharged home well. She was planned for a surveillance CTA at third month. However, she presented to emergency department with three days history of cough, worsening of breathlessness and chest pain a week prior her CTA appointment. Her initial physical examination was normal. Her vital signs remained normal with systolic blood pressure ranging 110-130mmHg. Her blood investigations showed stable haemoglobin but raised white blood count, 18x10<sup>9</sup>/L. Her Chest Roentgenogram (CXR) showed widened mediastinum (**Figure 1b**). However, she was treated for presumed community acquired pneumonia. Upon worsening of her symptoms, she was then referred to cardiothoracic surgical team for further management. On further clinical examination, we noted that the patient had an episode of forceful

cough followed by worsening of breathlessness and changed in voice. She appeared diaphoresis, tachypneic on high flow oxygen mask, saturation maintained at 97-100%. Patient had difficulty to talk with hoarseness of voice. Air entry was reduced on the right lung. Her haemoglobin levels were static. Blood gas showed Type 1 respiratory failure. She was promptly sent for urgent CTA which later showed huge mediastinal haematoma, measuring 8.8cm x 10.8cm (AP x W) which exerting mass effect onto the pulmonary trunk, right pulmonary artery and superior vena cava (SVC) with contrast extravasation at the supravalvular region, which suspecting an anastomotic leak from the proximal anastomotic site (**Figure 2**). There were bilateral pleural effusions, worse on the right side. She was transferred to Cardiac intensive care unit (CICU) where a right chest tube was inserted. It drained 800ml of straw colour pleural fluid which temporarily improved her breathing. Bed-side echocardiography (ECHO) was performed which showed mild aortic regurgitation and moderate tricuspid regurgitation without pericardial effusion.

The CTA and ECHO findings were supporting our clinical finding. However, her condition took a wrong turn and becoming more breathless. which required intubation. She was planned for emergency re-exploration after a high-risk consent. Anticipating a difficult redo-sternotomy, left groin femoro-femoral cardiopulmonary bypass (fem-fem CPB) was initiated before opening of chest. There were dense adhesions around the surrounding tissues with huge hematoma. There was an anastomotic leak at the proximal anastomosis, size approximating 10mm. The surrounding tissues appeared friable. Direct repair of the leak was performed with single pledgetted Prolene 6/0 suture. It was then reinforced with autologous pericardium. Patient was then weaned off from CPB with minimal inotropes support. Her chest was closed by using sternal wires. She was transferred back to CICU for close monitoring.

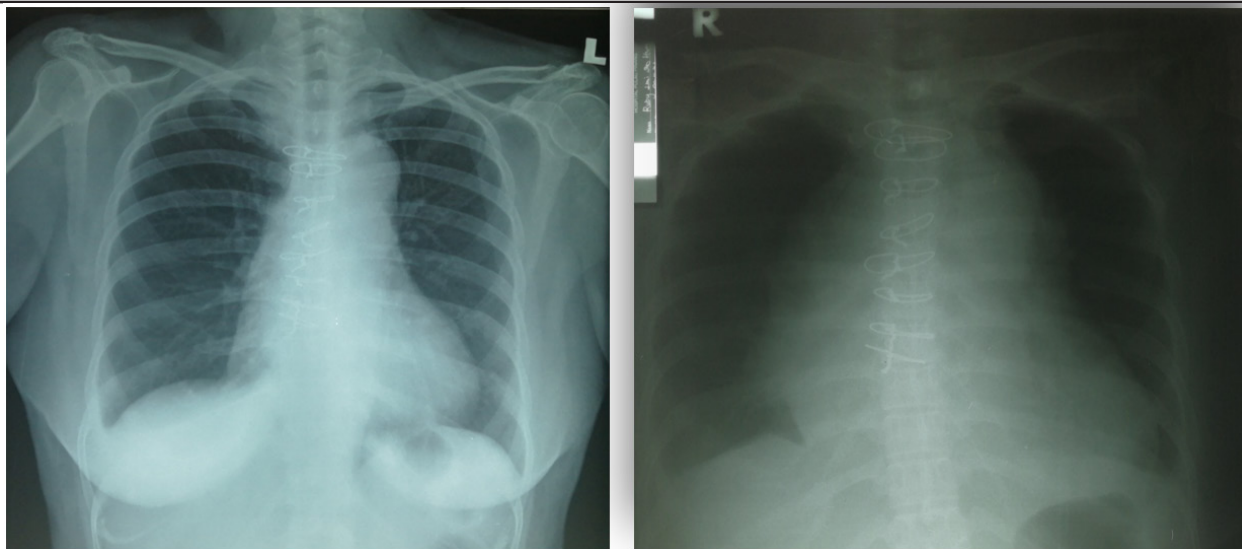


Figure 1: a. Chest Xray post Stanford A dissection repair; b. Chest Xray showed widened mediastinum upon admission.

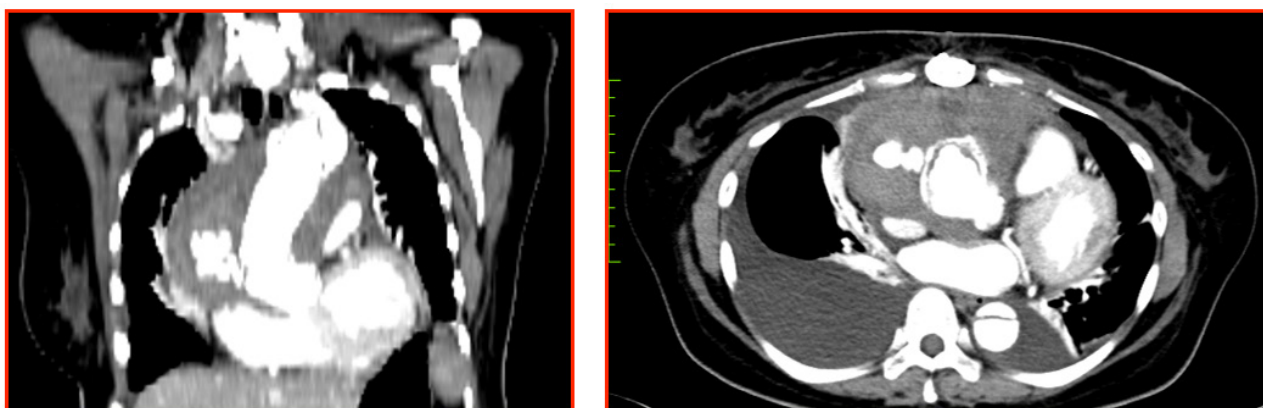


Figure 2: Coronal reconstruction(left) and axial view (right) of CT angiogram aorta which showed contrast extravasation.

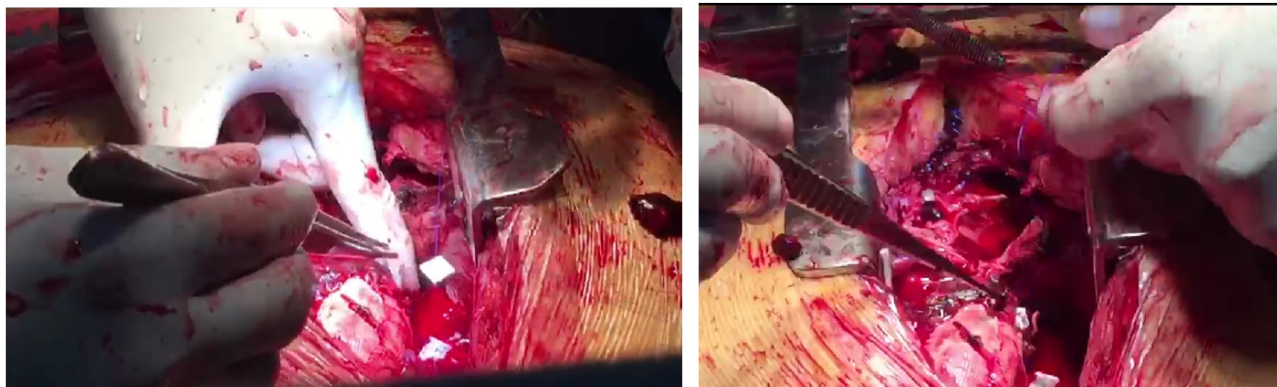


Figure 3: Anastomotic leak at the proximal anastomosis.

## Discussion

Anastomotic leak after ascending aorta replacement in aTAAD is rare yet potentially life-threatening complication. It can be divided into two groups: tissue-prosthesis anastomosis leak or prosthesis-prosthesis anastomosis leak [3]. It can also further subgroup into proximal or distal anastomosis leak. Infection undeniably is one of the major causes of anastomotic leak. Other factors could be due to the degeneration of aortic wall, surgical techniques, connective tissue diseases (i.e: Marfan syndrome, Takayasu arteritis) and the false lumen [3,14,16,21].

According to Ghazy et al [3], surgical intervention is granted if the periaortic haematoma compresses on the surrounding structures. Otherwise, patients with asymptomatic anastomotic leak can be managed conservatively with surveillance CTA. Undoubtedly, re-operation is challenging yet an effective defi-

nite treatment but with higher morbidity and mortality during peri-operative period [10]. In this minimally invasive surgery era, there were studies showed managing anastomotic leak successfully via endovascular approach such as via coiling or transcatheter closure [5-7].

Our patient in this case who presented with vague symptoms making the preliminary diagnosis challenging. Her symptoms were likely due to the mass effect causing by the huge mediastinal haematoma. The mediastinal dense adhesion confined the bleeding and formed huge haematoma, which likely delayed the presentation of anastomotic leak [3]. The elevated WBC suggested an infectious causing the pathology. We opted her for emergency operation in view of her critically ill condition. We studied the CTA and identified the leaking at the proximal anastomotic suturing site. Redo-sternotomy always pose a risk of hazardous re-entry [22-24,26].

Therefore, fem-fem CPB was preferred in this case after considering these factors, such as risks of injury to mediastinal structures, mediastinal adhesion from the recent surgery, and huge haematoma which compressing the vascular structures [23,26]. We explored the left groin to expose the femoral artery and vein. We initiated fem-fem CPB with two-thirds of flow (2.53L/min) to decompress the heart volume. Patient was cooled down to 28°C prior redo-sternotomy. Redo-sternotomy was performed without catastrophic bleeding. Adhesiolysis and removal of the haematoma were performed cautiously. Without excessive mobilisation of the heart, we examined the bleeding point. There was no obvious signs of infection observed except the surrounding tissues appeared friable. We performed direct closure of the bleeding point by using single pledgetted Prolene 6/0 suture with CPB flow manipulation, maintaining it between quarter flow (3.17L/min) and two third flow (2.52L/min) intermittently with a close monitoring of cerebral oximetry. Total bypass time was 94 min without circulatory arrest. We opined that infection could have been the leading cause of anastomotic dehiscence in this case [25]. Hence, there was no haemostatic sealant or glue used during this operation [27]. Transoesophageal ECHO (TOE) was performed which showed an optimal repair [12,13]. The aortic valve function was satisfactory. CPB was weaned off with minimal inotropic support. Her chest was closed after achieving good haemostasis. Her immediate postoperative recovery was rather smooth without major adverse event.

Early re-operation for ascending aorta replacement undeniably sets a very high risk of mortality and morbidity. Studies have reported that mortality and morbidity of early re-operation for ascending aorta replacement are as high as 6-19% [8,9,17,19,20]. Nevertheless, the risk and benefit of early intervention should be given adequate consideration. In this patient early intervention was done in view of active contrast leakage, mediastinal haematoma causing pressure symptoms as well as recurrent laryngeal nerve palsy [25]. Surgery has not only allowed a definitive repair, but also relieved the mediastinal compression symptoms by evacuation haematoma which expedited her recovery.

### Conclusion

A high index of clinical suspicion of potential complications after ascending aorta replacement is of paramount importance. CTA is a gold standard tool to evaluate aortic diseases and its complications. Choice and timing of intervention in anastomosis leak is very crucial since it determines the clinical outcome as well as recovery without adverse events. However, re-intervention is always decided on individual case presentations. In our case, the early re-intervention has benefited the patient avoiding catastrophic postoperative complications and prompt recovery.

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