

CASE STUDY

EVAR PROCEDURE IN AORTIC DISSECTION STANFORD TYPE B WITH END STAGE RENAL DISEASE ON HEMODIALYSIS: A RARE CASE REPORT

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Accepted 28th February 2019; Published Online 30th March 2019

ABSTRACT

Aortic dissection is emergency condition with various clinical presentation and high risk mortality within hours. Aortic dissection is related to renal ischemia accompanied by uncontrolled hypertension. Dissection on hemodialysis patient is a rare cases. Ounissi *et al* said that of 7128 hemodialysis patient, prevalence of aortic dissection is only 0,04%. Death is commonly happened because aortic dissection is not diagnosed earlier. Takeda *et al* show that of 896 death, 5,73% is sudden death. EVAR is promising treatment rather than surgery and medicine with better outcome and minimal invasive. Although incidence of aortic dissection in end stage renal disease on hemodialysis is very rare, mortality rate is still high. This high mortality is due to delayed diagnosis and disease characteristic which could threatened life. Identification of risk factor such as uncontrolled hypertension, history of previous heart disease, and specific sign symptoms related dissection is needed for early identification so delayed treatment could be prevented. Medicamentosa treatment aimed to lowering blood pressure and decrease pain with close hemodynamic monitoring. This case report showed recent EVAR therapy which had done to treat type B aortic dissection successfully and improved end stage renal failure outcome. Post EVAR procedure, chest pain was resolved, blood pressure was controlled with two drug antihypertension, and quality of life was improved qualitatively. Entry point of false lumen was closed by EVAR so all of blood enter through true lumen and dissection was resolved. EVAR is promising treatment with minimal complication and has better outcome rather than open surgery. Aortic Dissection type B is a rare cases among hemodialysis patient. Since mortality of aortic dissection complicated by renal disease is high, early diagnosis and treatment is needed with high index suspicion in patient who come with chest pain. This case report showed successful outcome of EVAR in aortic dissection with end stage renal failure. Decreasing cardiovascular complication, minimal invasive, and better outcome are important point of EVAR which recently still be excellent treatment rather than open surgery for type B aortic dissection.

Key words: Aortic dissection, EVAR, Hemodialysis, renal failure, surgery.

INTRODUCTION

Aortic dissection is emergency condition with various clinical manifestation and high mortality risk in hours (Mendonca *et al.*, 2015). It is due to intimal tear that comes from high pressure into aortic wall which will make new entry way for blood stream. It is called as false lumen which contained blood from entry tear and can compress true lumen. This matter will cause bad condition such as internal bleeding, ischemia or infarct miokard, visceral ischemia, and even death (Mendonca *et al.*, 2015; Brauwald *et al.*, 2015; Mehta *et al.*, 2002). Correlation between aortic dissection and renal ischemia are probably connected with existence of uncontrolled hypertension, which is the common risk factor of dissection aorta (Hiratzka *et al.*, 2010). Dissection aorta on hemodialysis patient is a rare cases. Ounissi *et al* revealed that of 7128 hemodialysis patient from 1992 until 2007, prevalence of dissection aorta is only 0, 04%. In this study, patient was diagnosed as aortic dissection after several months did hemo dialysis and have cardiovascular risk (such as hypertension, dyslipidemia, smoking, and vascular calcification). Death was commonly happened in hemodialysis patient because delayed diagnosis. Thus, clinical suspicious into aortic dissection was recommended especially if patient complained chest pain (Ounissi *et al.*, 2009). Study of Takeda *et al* showed from 896 death in hemodialysis patient, 5, 73% were having sudden death because of aortic dissection.

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This number was higher than aortic dissection incidence that reported in general population, 0, 59% (Takeda *et al.*, 1997). Understanding of mechanism dissection aorta as pathogenesis, how to establish diagnosis, and right treatment choice is what should we know. In this chance, we will present and discuss case report about aortic dissection in hemodialysis patient.

CASE REPORT

Male, 38 y.o come to hospital due to prolong left chest pain, sudden onset, when hemodialysis, described as "tearing", radiating from chest to the back and centre of abdomen since two months ago. There were dispneu at rest due to volume overload, paroxysmal nocturnal dyspnea, and orthopnoe. Patient had end stage renal failure and was doing hemodialysis two until three times a week routinely. Physical examination showed blood pressure 210/110 mmHg with heart rate 90 times per minutes, regular, equal, and respiratory rate 30 times per minutes. There were palpebra oedema and JVP was increasing. Cardiovascular examination revealed cardiomegaly and was found diastolic murmur suggestive aortic regurgitation. Lung examination showed rales in basal lung bilateral. Aortic abdominal diameter was palpate widden, shifting dullness confirmed, and had bilateral pretibial edema. Laboratory examination revealed hemoglobin 9,1 g/dL, blood urea 203 mg/dL, serum creatinine 12,0 mg/dL, D-dimer >5000 ng/mL, prothrombin time 32,6 seconds (control 11,1), and activated partial thromboplastin time 73,7 seconds (control 34,6).



Fig 1. Chest X-Ray: Mediastinum Enlargement

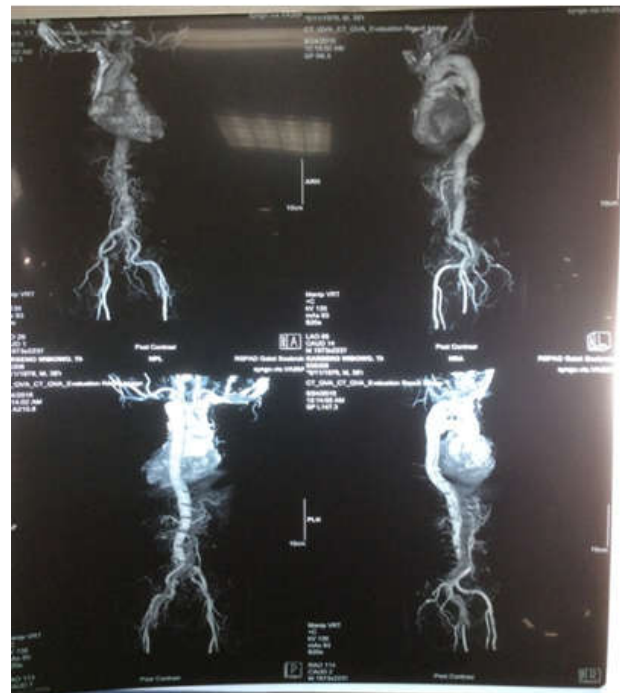


Fig 2. MSCT pre-EVAR

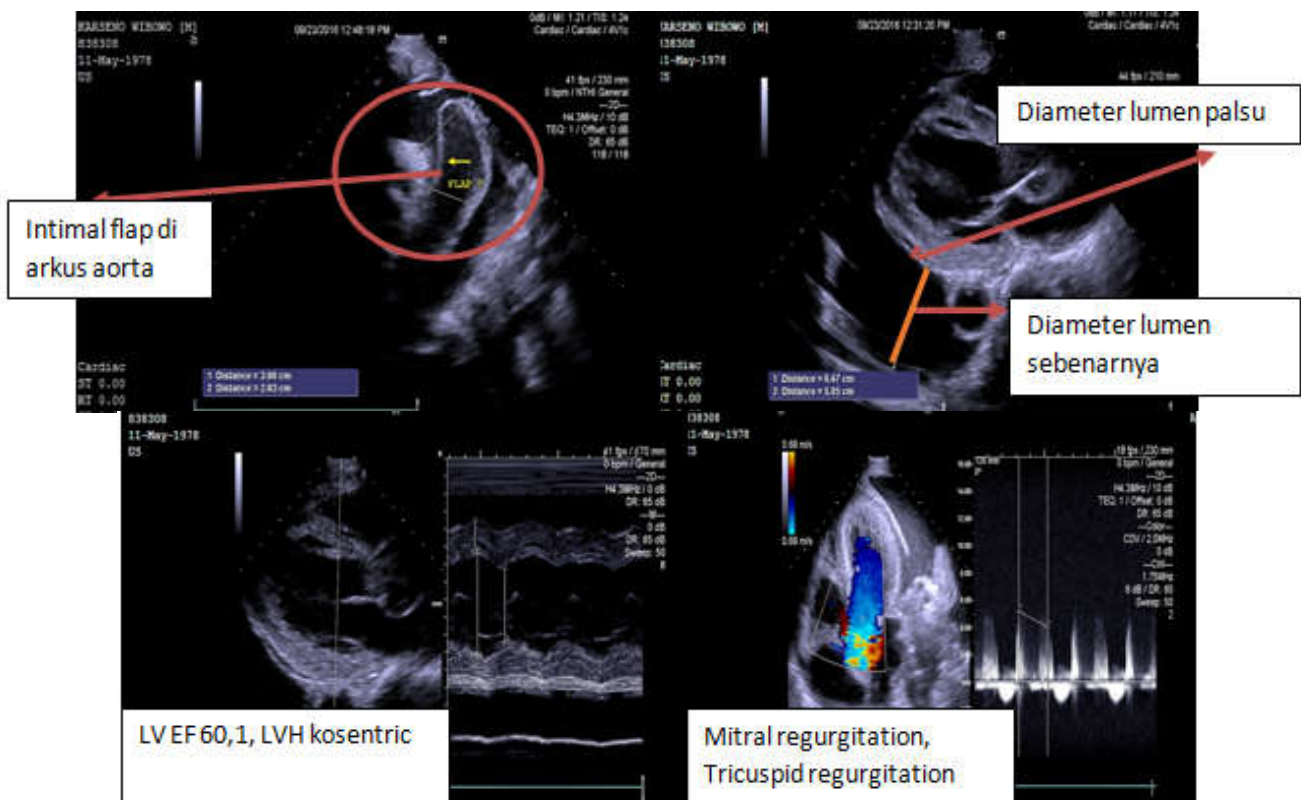


Fig 3. Echocardiography showed intimal flap, true lumen, and false lumen (red circle and arrow)

Chest X-ray showed *cardiothoracic ratio* more than 70 percent with mediastinum enlargement, widening of aortic silhouette and prominent, and bilateral pleural effusion. Echocardiography showed intimal flap from arcus aorta up to descendent aorta and accompanied by mild aortic regurgitation, mitral regurgitation, and tricuspid regurgitation. CT angiography revealed aortic dissection in thoracoabdominal as long as 40 centimetres from proximal border in

arcus aorta (after left subclavia artery) until aortic bifurcation thus stanford type B aortic dissection was confirmed. Patient had been given intravenous therapy peridipine, start 0, 1 $\mu\text{g}/\text{kgBB}/\text{minutes}$ titration every 15 minutes with MAP goal 90-70 and morfin 10mg/hours. Patient also consumed drug per oral such as valsartan 2x160mg, amlodipine 1x10mg, hytrin 1x1mg, bisoprolol 1x5mg, ISDN 3x5mg, atorvastatin 1x20mg, lactulac 3x10ml, bicnat 3x500mg, vitamin B12 3x500mg, and

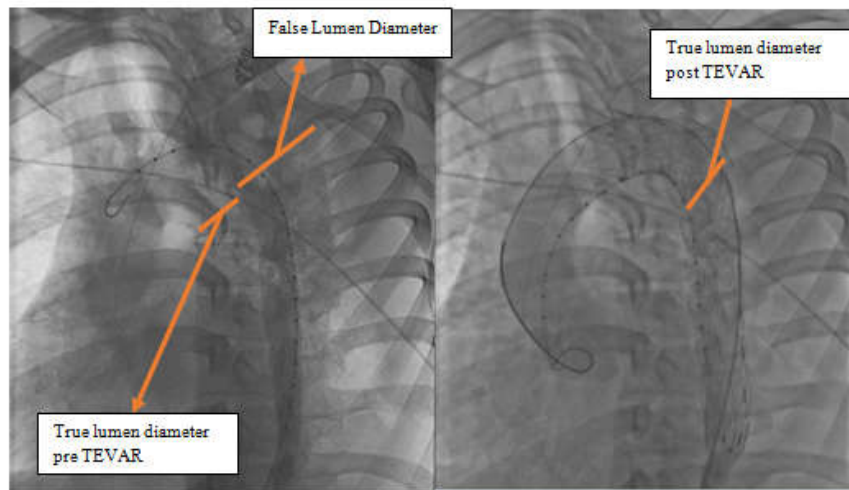


Fig 4. Angiography pre TEVAR (right) and post TEVAR (left)

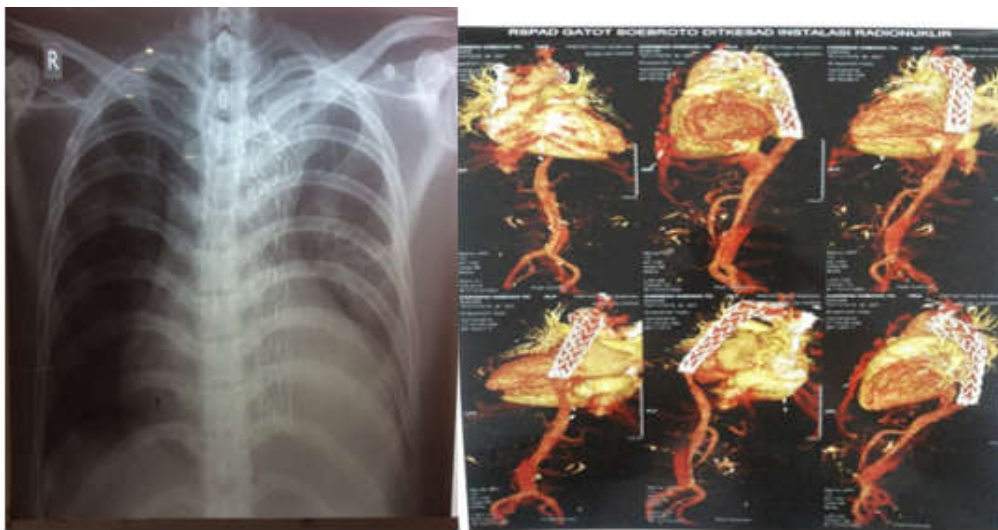


Fig 5. Chest X-Ray post TEVAR (right) MRI post TEVAR (left)

folic acid 1x15mg. On 20 days admission, TEVAR/EVAR had done because prolong chest pain with uncontrolled hypertension with blood pressure 150/90mmhg. Post TEVAR, chest pain was resolved, blood pressure was controlled in 130/90 mmhg with only two drug hypertension, and general status was normal.

DISCUSSION

Although incidence of aortic dissection in end stage renal disease on hemodialysis is very rare, mortality rate is still high.³This high mortality is due to delayed diagnosis and disease characteristic which could threatened life. Identification of risk factor such as uncontrolled hypertension, history of previous heart disease, and specific sign symptoms related dissection is needed for early identification so delayed treatment could be prevented. Medicamentosa treatment aimed to lowering blood pressure and decrease pain with close hemodynamic monitoring. Chest pain during hemodialysis is one of complication that could be happened, especially in patients who have cardiovascular risk. When doing hemodialysis, heparin intravena was given and make aortic become vulnerable with trauma. Beside that, renal failure adversely affects endothelial function, decreasing the bioavailability of nitric oxide and, vascular distensibility

subsequently. Uncontrolled hypertension in renal failure patient produced high stress to aortic wall and together with previous factor produced high chance of dissection (Levy Jeremy and Morgan July, 2004; Beckman *et al.*, 2004). This is probably could be the pathogenesis aortic dissection in hemodialysis patient. This case report showed recent EVAR therapy which had done to treat type B aortic dissection successfully and improved end stage renal failure outcome. Post EVAR procedure, chest pain was resolved, blood pressure was controlled with two drug antihypertension, and quality of life was improved qualitatively. Entry point of false lumen was closed by EVAR so all of blood enter through true lumen and dissection was resolved. EVAR is promising treatment with minimal complication and has better outcome rather than open surgery (Alsac *et al.*, 2014; Wilkinson *et al.*, 2013). Nienaber dkk and INSTEAD trial revealed that TEVAR could improve life expectancy up to 5 years and prevented worsening of aortic dissection type B outcome (Nienaber *et al.*, 2009). Fattori *et al.* (2013) showed mortality (33, 9%) and complication (40%) of open surgery is higher than mortality (10, 6%) and complication (20%) of TEVAR (Fattori *et al.*, 2008). Hogendoorn *et al* revealed that 30-day mortality in open surgery is 7, 3% higher rather than TEVAR for management of aortic dissection type B. (Hogendoorn *et al.*, 2014). Long term monitoring is needed after TEVAR application.

It is because there is some complication such as graft stent collapse, graft stent migration, graft stent torsion, thrombus on stent, and late rupture that must be concerned. Clinical monitoring accompanied by imaging are best option for patient outcome post TEVAR (Swee, 2008).

Conclusion

Aortic Dissection type B is a rare cases among hemodialysis patient. Since mortality of aortic dissection complicated by renal disease is high, early diagnosis and treatment is needed with high index suspicion in patient who come with chest pain. This case report showed successful outcome of EVAR in aortic dissection with end stage renal failure. Decreasing cardiovascular complication, minimal invasive, and better outcome are important point of EVAR which recently still be excellent treatment rather than open surgery for type B aortic dissection.

REFERENCES

- Alsac, JM., Girault, A., El Batti, S., Abou Rjelli, M., Alomran, F., Achouh, P. and Julia, P FJ. 2014. Experience of The Zenith Dissection Endovascular System in emergency setting of malperfusion in acute type B dissection. *J Vasc Surg.*, 2014; 59:645-650.
- Beckman, JA., Mehta, RH., Isselbacher, EM., *et al.*, 2004. Branch vessel complications are increased in aortic dissection patients with renal insufficiency, 267-270.
- Brauwald, E., *et al.*, 2015. Aortic Dissection: definition into cause and pathogenesis. In: Braunwald, Eugene, Mann, Douglass L, Zipes, Douglas P, Peter, Libby BRO, ed. Braunwald Heart Disease. 10th ed. *Elsevier Inc.*, 1288-1292.
- Fattori, R., *et al.*, 2008. Complicated acute type B dissection: is surgery still the best options? A report from the International Registry of Acute Aortic Dissection. *J Am Coll Cardiol Interv.*, 1(4):395-402. doi:10.1016/j.jcin.2008.04.009.
- Hiratzka, LF., Bakris, GL., Beckman, JA., *et al.*, 2010. ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM Guidelines for the Diagnosis and Management of Patients With Thoracic Aortic Disease. *Circulation*, 121(13):e266-e369. doi:10.1161/CIR.0b013e3181d4739e.
- Hogendoorn, W., Hunink, Mg., Schlosser, FJ., Moll, FL. and Sumpio, BE MB. 2014. Endovascular vs open repair of complicated acute type B Aortic Dissections. *J Endovasc Ther.*, 21:503-514.
- Levy Jeremy and Morgan July BE. 2004. Complications during dialysis: others. In: Levy Jeremy, ed. *Oxford Handbook of Dialysis*. 2nd editon. Oxford University Press; 2.
- Mehta, RH., O'Gara, PT., Bossone, E., *et al.*, 2002. Acute type A aortic dissection in the elderly: clinical characteristics, management, and outcomes in the current era. *J Am Coll Cardiol.*, 40(4):685-692. doi:S0735109702020053 [pii].
- Mendonca, S., Chengappa, ANM., Gupta, D., Singh, S., Gupta, P. and Shanker, VR. 2015. Catastrophic aortic dissection in a patient of end stage renal disease. *Edorium J Cardiothorac Vasc Surg.*, 2:25-29. doi:10.5348/C04-2015-6-CR-5.
- Nienaber, CA *et al.*, 2009. Randomized comparison of strategies for type B aortic dissection: the Investigation of Stent grafts in Aortic Dissection (INSTEAD) trial. *Circulation*, 120: 2519-2528.
- Nienaber, CA KS., *et al.*, 2013. Endovascular repair of type B aortic dissection: long term results of the randomized investigation of stent grafts in aortic dissections trial. *Circulation*, 6:407-416.
- Ounissi, M., Goucha, R., Hedri, H., *et al.*, 2009. Dissecting Aortic Aneurysm in Maintenance Hemodialysis Patients. *Saudi J Kidney Dis Transpl.*, 20(6):1053-1056.
- Swee, W DM. 2008. Endovascular management of thoracic dissections. *Circulation*, 117:1460-1473.
- Takeda, K., Harada, A., Okuda, Fujimi, S, Hattori, F, Motomura, K, Hirakata, H. and Fujishima, M. 1997. Sudden Death in Chronic Dialysis Patients. *Nephrol Dial Transpl.*, 12:952-955.
- Wilkinson, DA., Patel, HJ., Williams, DM. and Dasika, NL DG. 2013. Early open and endovascular thoracic aortic repair for complicated type B aortic dissection. *Ann Thorac Surg.*, 96:23-30.
