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Case Report

Aortic dissection in Indonesia male: 3 case report

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ABSTRACT

Background: Aortic dissection (AD) is a life-threatening rare condition caused by a tear in the aortic wall which requires urgent surgery.
Case presentation: 3 Indonesian males obtained a CT angiography (CTA) showing a picture of AD which was confirmed using the Stanford and De Bakey classification. The patient was successful in undergoing TEVAR and open-heart surgery which 2 patients survived and 1 patient died.
Discussion: The speed of handling in AD is the key to successful management of AD supported by an understanding of the signs and symptoms and results of thoracoabdominal CTA.
Conclusion: The ability to interpret CTA results and understand AD sign symptoms is very helpful in minimizing mortality.

1. Introduction

Chest pain is one of the complaints found in the emergency department. Some cases of life-threatening chest pain include acute myocardial infarction, pulmonary embolism, visceral perforation, and aortic dissection (AD) [1]. AD is a life-threatening rare condition caused by a tear in the aortic wall. The cause is often unknown but is associated with hypertension (72%) and atherosclerosis (30%). Diagnosis is often difficult and delays in treatment can be life-threatening for the patient [2]. AD is estimated to occur at a rate of 3–4 cases per 100,000 persons per year and is associated with high mortality [3]. We are interested in reporting 3 cases of AD in Indonesian males that we have treated. We have reported based on the surgery case report (SCARE) 2020 guideline [4].

2. Case presentation

We report case of three patients with AD that performed thoracoabdominal CT angiography (CTA). Details of the comparison of each patient can be seen in Table 1.

3. Case 1

A 57-year-old male patient with a history of untreated high blood pressure was admitted to the hospital due to severe chest pain, shortness of breath, and abdominal pain accompanied by vomiting for 7 days. He visited a regional hospital and was treated with antihypertensive therapy. Due to the persistent symptoms, he was referred to a secondary hospital and underwent a thoracoabdominal CTA with the result suspected of AD. He was referred to the hospital and the cardiovascular thoracic surgeon requested for thoracoabdominal CTA to confirm the diagnosis. A thoracoabdominal CTA on a 128-slice scanner revealed AD of the entire aorta, starting from the descending aorta and extending into the left common iliac artery, confirming the diagnosis of Stanford type B AD and type III AD according to De Bakey Classification [5,6]. There is a rupture of the false lumen on the superior site of the descending aorta which causes left hematothorax with adjacent compressive atelectasis (Fig. 1). He underwent a TEVAR (Thoracic Endovascular Repair of the aorta) procedure.

4. Case 2

A 49-year-old male patient with complaints of chest pain and progressive shortness of breath for a week. He underwent echocardiography with the result suspected of AD. He was referred to the hospital and the cardiologist requested for thoracoabdominal CTA to confirm the diagnosis. A thoracoabdominal CTA shows AD starting from the aortic root, left brachiocephalic artery until left subclavian artery until the left iliac

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Table 1
Comparison of aortic distention in each patient.

Variable	Case 1	Case 2	Case 3
Complaint	Chest pain, breathless, and abdominal pain	Chest pain and tachypnea	Breathless
Onset	7 days	7 days	5 days
Past medical history	Uncontrolled hypertension	Uncontrolled hypertension	–
CTA	Aortic distention	Aortic distention	Aortic distention
Clarification			
Stanford	B	A	B
Debakey	III	I	III
Surgical	TEVAR	Open Surgery	–
Prognosis	survive	dead	survive

Note: TEVAR = Thoracic Endovascular Repair of the aorta.

externa, confirming the diagnosis of Stanford type A AD and type I AD according to De Bakey Classification (Fig. 2) [5,6]. The patient died 3 days after open-heart surgery.

5. Case 3

A 49-year-old male patient complains of progressive dyspnea for 5 days. Thoracoabdominal CTA shows AD starting from arcus aorta, descending aorta until abdominal aorta confirming the diagnosis of Stanford type B AD and type III AD according to De Bakey Classification (Fig. 3) [5,6].

6. Discussion

AD is the most common life-threatening disorder affecting the aorta [2,7,8]. It is found in approximately 80–90% of the acute aortic syndromes [9]. The incidence of acute aortic dissection in the general western population is estimated to range from 2.6 to 3.5 per 100,000 person/year. Twenty percent of patients with AD die before reaching the hospital and 30% of patients die during hospital admission [3]. CTA was performed to diagnose AD. It is the most often used diagnostic modality to diagnose AD because of its high specificity and sensitivity, and also its availability [10]. On CTA, a flap in the intima separates the true lumen from the false lumen, the so-called "cobweb sign", and "beak sign". If it involves the entire intima, a circular intimal fold is present, the so-called "windsock" appearance, the true lumen is narrow filiform with intimointimal intussusception. Calcified false lumen with mural calcification of the false lumen can be seen in chronic dissection. If the secondary dissection occurs in one of the channels, the three-channel dissection of the "Mercedes-Benz sign" can be seen with the resulting intima flap [11]. The other modalities for definitive diagnoses such as magnetic resonance imaging (MRI), transesophageal echocardiography (TTE), or aortography [11,12].

Based on anatomical location, AD can be classified to Stanford and DeBakey classification. Stanford AD type A involves the ascending aorta and type B dissection occurs distal to the subclavian artery. In the De Bakey classification, type I dissection begins in the ascending aorta and extends to the descending aorta, type II dissection involves only the ascending aorta, and type III dissection begins in the descending aorta distal to the left subclavian artery [5,6]. Concerning the time from the onset of the symptoms, AD are divided into acute (presentation within <2 weeks), subacute (from 1 week to 1 month), and chronic (more than 1 month) [10,13]. The highest mortality rate is in the first 7 days. Patients with chronic AD (>2 weeks) have a better prognosis. TEVAR is the recommended surgery in both type A and B AD cases. The success of TEVAR in AD type A is about 95–100% and post-surgery mortality is

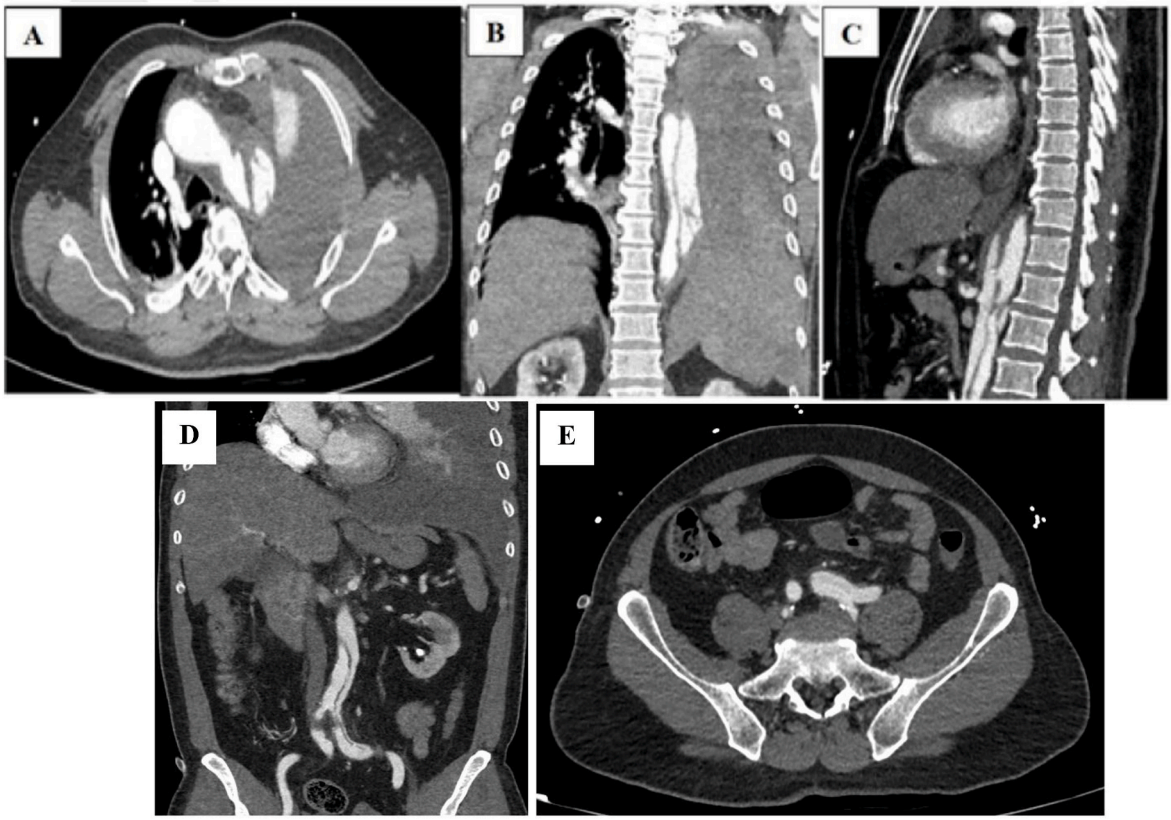

Fig. 1. Stanford type B aortic dissection and type III aortic dissection according to De Bakey Classification. (A, B) Axial & coronal image shows dissection flap involvement of the aortic arc and descending aorta with ruptured of the false lumen on the superior site of the descending aorta which causes left hematothorax with adjacent compressive atelectasis. (C) Sagittal image shows aortic dissection in abdominal aorta. (D, E) extending until the left common iliac artery.

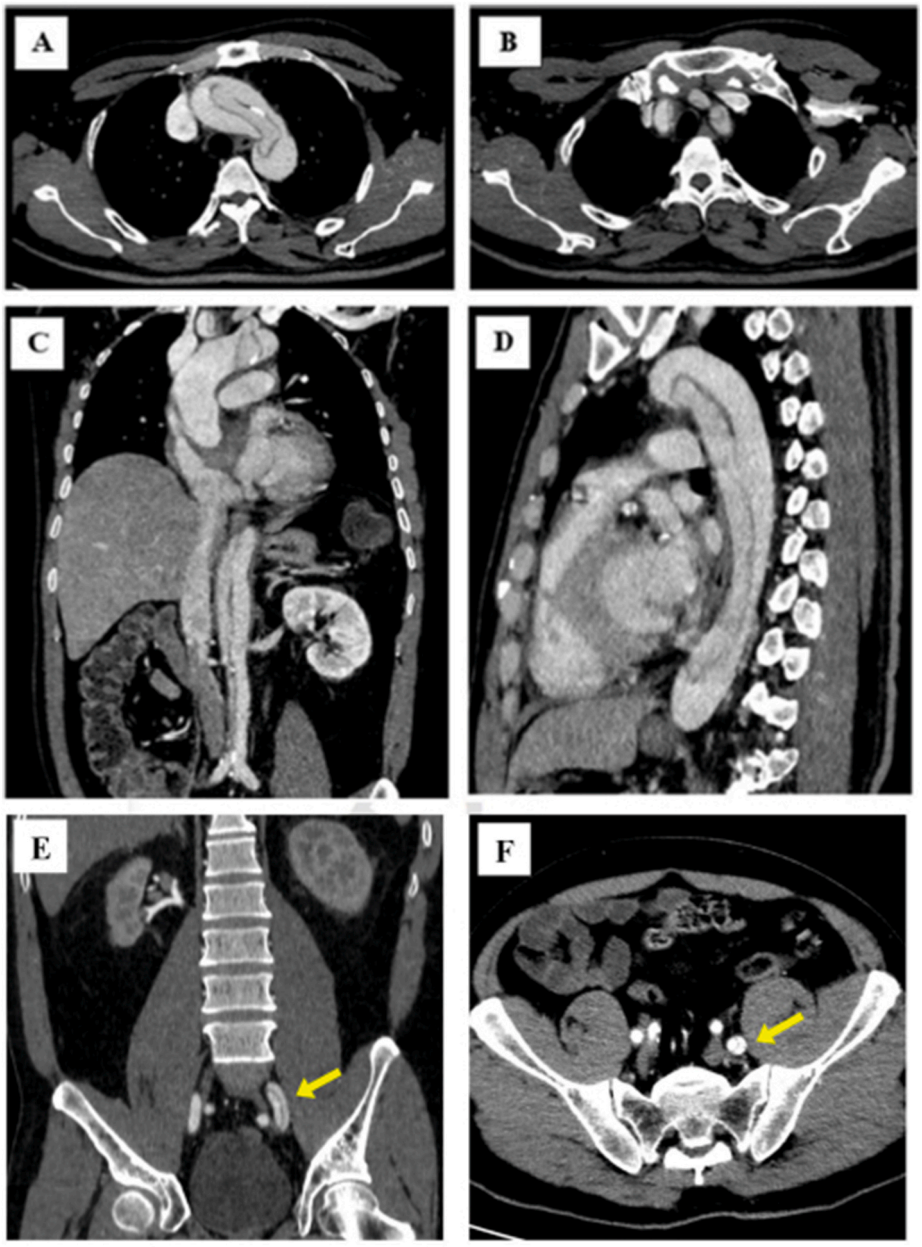

Fig. 2. Stanford type A aortic dissection. (A, B) The axial image shows dissection flap involvement of the aortic root, left brachiocephalic artery, and left subclavian artery. (C, D) Coronal and sagittal images obtained at different levels that involve descending aorta until the left iliac externa. (E, F) Extending until the left common iliac artery (yellow arrow).

about 5–6%. But in acute AD type A does not exceed open-heart surgery and is merely regarded as a rescue procedure for high-risk cases [14,15].

The classical teaching is emergency surgery by the cardiovascular surgeon is the preferred treatment for acute type A dissection [16]. For acute type B dissection if uncomplicated conservative management with blood pressure and pain control is the standard of care [17]. For complicated acute type B intervention is required by TEVAR if suitable of open surgery if not suitable [14]. Early diagnosis and prompt appropriate treatment are important factors affecting prognosis [18].

7. Conclusion

3 Indonesian males obtained a thoracoabdominal CTA showing a picture of AD which was confirmed using the Stanford and DeBakey classification. The patient was successful in undergoing TEVAR and open-heart surgery which 2 patients survived and 1 patient died. AD is commonly found in patients with hypertension who have complications. TEVAR is the treatment of choice that does not apply to all cases as illustrated in your case some of your patients had open-heart surgery. The ability to interpret thoracoabdominal CTA results and understand AD sign symptoms is very helpful in minimizing mortality.

Ethical approval

Not applicable.

Sources of funding

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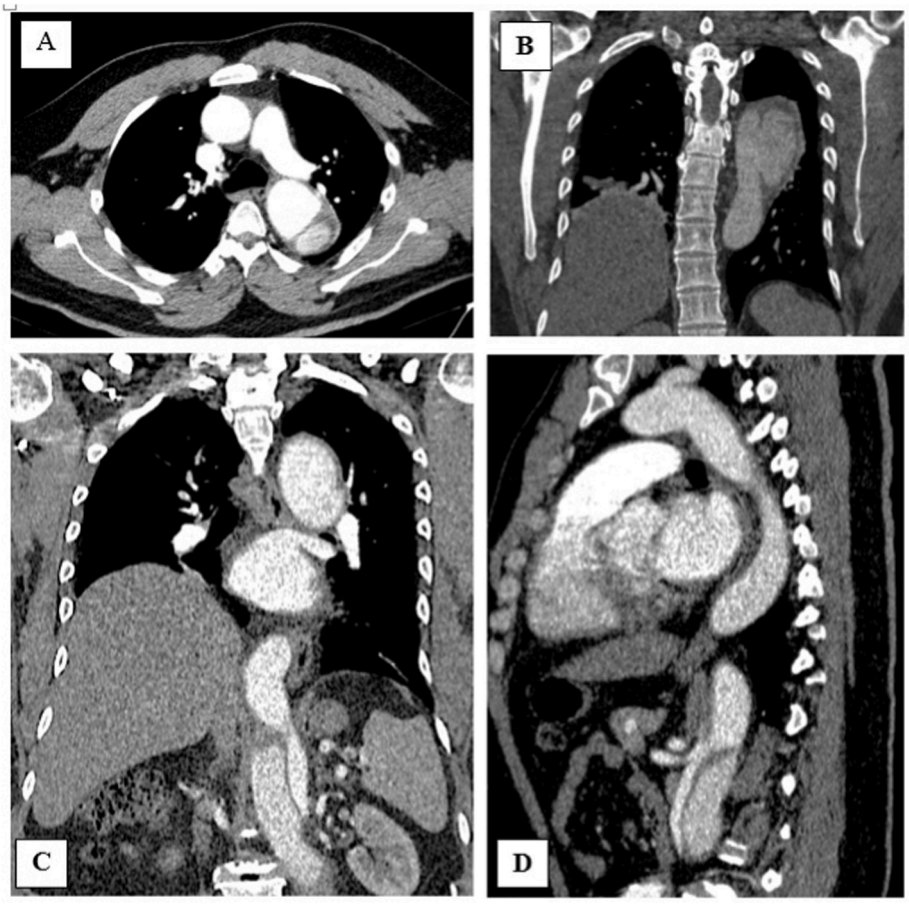

Fig. 3. Stanford type B aortic dissection and type III aortic dissection according to De Bakey Classification. (A, B) Axial and coronal image shows dissection flap involvement of the aortic arch and descending aorta. (C, D) Coronal and sagittal image shows aortic dissection that involves abdominal aorta.

Author contribution

Mustika Cakti Anggraini: collecting data, supervision, visualization, investigation, and drafting; **Anita Widyoningroem:** Conceptualization, methodology, drafting, editing, revising, and reviewing.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Registration of research studies

1. Name of the registry: .
2. Unique Identifying number or registration ID: .
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): .

Guarantor

Anita Widyoningroem is the person in charge of the publication of our manuscript.

Provenance and peer review

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Declaration of competing interest

Mustika Cakti Anggraini and Anita Widyoningroem declare that they have no conflict of interest.

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References

[1] C.H. Chen, K.T. Liu, A case report of painless type A aortic dissection with intermittent convulsive syncope as initial presentation, Medicine (Baltim.) 96 (17) (2017), e6762, https://doi.org/10.1097/md.0000000000006762.
[2] R. Ohle, H.K. Kareemi, G. Wells, J.J. Perry, Clinical examination for acute aortic dissection: a systematic review and meta-analysis, Acad. Emerg. Med. 25 (4) (2018) 397–412, https://doi.org/10.1111/acem.13360.
[3] S.A. LeMaire, L. Russell, Epidemiology of thoracic aortic dissection, Nat. Rev. Cardiol. 8 (2) (2011) 103–113, https://doi.org/10.1038/nrcardio.2010.187.
[4] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230, https://doi.org/10.1016/j.ijsu.2020.10.034.
[5] L.P. Kohl, E.M. Isselbacher, N. Majahalme, A. Evangelista, M.J. Russo, S. Hutchison, et al., Comparison of outcomes in DeBakey type AI versus AII aortic dissection, Am. J. Cardiol. 122 (4) (2018) 689–695, https://doi.org/10.1016/j.amjcard.2018.04.042.
[6] R.A. Nugraha, M. Amshar, E.A.D. Batubara, T. Siddiq, S. Indriani, S. Adiarto, Descending aorta diameters as predictor of late adverse outcomes in patients with uncomplicated type B aortic dissection: a systematic review and meta-analysis, Ann. Vasc. Surg. (2021), https://doi.org/10.1016/j.avsg.2021.10.033.
[7] H.F. Wong, P. Bevis, Acute aortic dissection: a missed diagnosis, BMJ Case Rep. 2018 (2018), https://doi.org/10.1136/bcr-2018-226616.
[8] A. Silverio, C. Prota, M. Di Maio, M.V. Polito, F.M. Cogliani, R. Citro, et al., Aortic dissection in patients with autosomal dominant polycystic kidney disease: a series

of two cases and a review of the literature, Nephrology 20 (4) (2015) 229–235, https://doi.org/10.1111/nep.12373.
[9] F.F. Mussa, J.D. Horton, R. Moridzadeh, J. Nicholson, S. Trimarchi, K.A. Eagle, Acute aortic dissection and intramural hematoma: a systematic review, JAMA 316 (7) (2016) 754–763, https://doi.org/10.1001/jama.2016.10026.
[10] J. Gawinecka, F. Schönrath, A. von Eckardstein, Acute aortic dissection: pathogenesis, risk factors and diagnosis, Swiss Med. Wkly. 147 (2017) w14489, https://doi.org/10.4414/smw.2017.14489.
[11] C.Y. Lu, Y.K. Diao, Y.Q. Guo, X.H. Zhang, H.L. Bai, Z.L. Li, Can multiphase dynamic CT angiography provide a better assessment of aortic dissection compared with the standard triphasic protocol? Acta Radiol 59 (1) (2018) 58–64, https://doi.org/10.1177/0284185117704236.
[12] J.P. Ko, J.M. Goldstein, L.A. Latson Jr., L. Azour, E.K. Gozansky, W. Moore, et al., Chest CT angiography for acute aortic pathologic conditions: pearls and pitfalls, Radiographics 41 (2) (2021) 399–424, https://doi.org/10.1148/rg.2021200055.
[13] H.H. Sievers, B. Rylski, M. Czerny, A.L.M. Baier, M. Kreibich, M. Siepe, et al., Aortic dissection reconsidered: type, entry site, malperfusion classification adding clarity and enabling outcome prediction, Interact. Cardiovasc. Thorac. Surg. 30 (3) (2020) 451–457, https://doi.org/10.1093/icvts/ivz281.
[14] T. Uchida, M. Sadahiro, Thoracic endovascular aortic repair for acute aortic dissection, Ann Vasc Dis 11 (4) (2018) 464–472, https://doi.org/10.3400/avd.ra.18-00127.
[15] M.E. Stelzmueller, R. Nolz, S. Mahr, D. Beitzke, F. Wolf, M. Funovics, et al., Thoracic endovascular repair for acute complicated type B aortic dissections, J. Vasc. Surg. 69 (2) (2019) 318–326, https://doi.org/10.1016/j.jvs.2018.05.234.
[16] M.N. Gionis, G. Kaimasidis, E. Tavlas, N. Kontopodis, M. Plataki, A. Kafetzakis, et al., Medical management of acute type a aortic dissection in association with early open repair of acute limb ischemia may prevent aortic surgery, Am J Case Rep 14 (2013) 52–57, https://doi.org/10.12659/ajcr.883793.
[17] T. Suzuki, K.A. Eagle, E. Bossone, A. Ballotta, J.B. Froehlich, E.M. Isselbacher, Medical management in type B aortic dissection, Ann. Cardiothorac. Surg. 3 (4) (2014) 413–417, https://doi.org/10.3978/j.issn.2225-319X.2014.07.01.
[18] V. Vardhanabhuti, E. Nicol, G. Morgan-Hughes, C.A. Roobottom, G. Roditi, M. C. Hamilton, et al., Recommendations for accurate CT diagnosis of suspected acute aortic syndrome (AAS)–on behalf of the British Society of Cardiovascular Imaging (BSCI)/British Society of Cardiovascular CT (BSCCT), Br. J. Radiol. 89 (1061) (2016) 20150705, https://doi.org/10.1259/bjr.20150705.