Penetrating Atherosclerotic Ulcer of Aorta: A Giant Lurking in the Dark

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ABSTRACT

Penetrating atherosclerotic ulcer is one of the acute aortic conditions, associated with high morbidity and mortality. Management option is often debated between conservative vs. surgical, with different data supporting each of the option. Here we present two case reports, managed conservatively.

INTRODUCTION

Penetrating Atheroschlerotic Ulcer (PAU) was initially described by Shennan[1] in 1934; however, PAU was defined as a clinicopathologic entity distinct from classic aortic dissection by Stanson and colleagues in 1986.[2] Defined histologically by ulceration of an atheromatous plaque deep into the internal elastic lamina and a variable distance into the aortic media.[3]

PAU typically occurs in elderly patients with systemic hypertension and extensive atherosclerotic disease. Intramural hematoma (IMH) is frequently but not invariably present.[4,5,6] This condition is being increasingly diagnosed because of availability of CT angio, magnetic resonance imaging (MRI), and transesophageal echocardiography.

The main symptom is acute, severe chest pain radiating to the interscapular area, similar to classical acute aortic dissection of the thoracic aorta. Frequently, PAU is asymptomatic and is diagnosed rather incidentally. Pseudo-aneurysm, frank rupture, and aortic dissection also may complicate PAU.

The rate of rupture in PAU is 42%, higher than in IMH (35%) or in aortic dissection (3.6-7%).[7]

Case Report No.1

75 yrs old female presented to emergency on Nov 2010 with the history of severe epigastric pain, radiating to back along with sweating. She felt like having a brief period of loss of consciousness. Her pulse rate on arrival was 90/min, Blood Pressure 240/130 mmHg. She was somewhat restless due to pain. She was a smoker and a known hypertensive not taking

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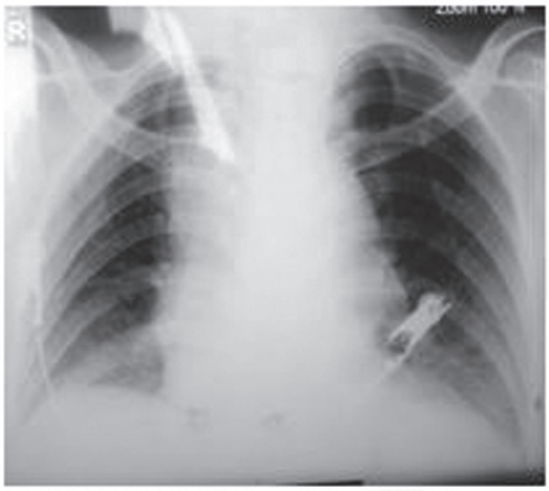
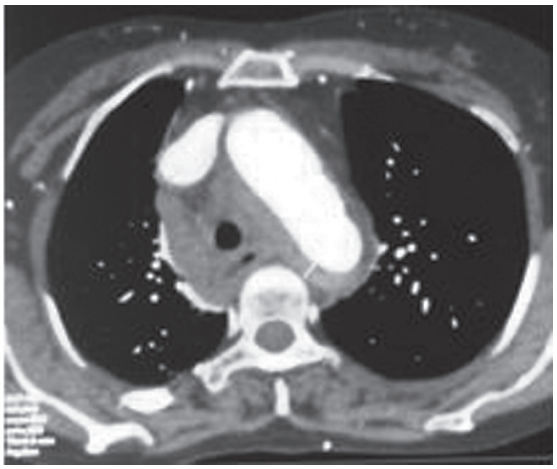


Chest X-ray showed widened mediastinum during initial presentation

medicines. She had tender epigastium. cardiac enzymes were normal. Her electrocardiogram (ECG) revealed left ventricular hypertrophy.



CT chest showed mediastinal hematoma

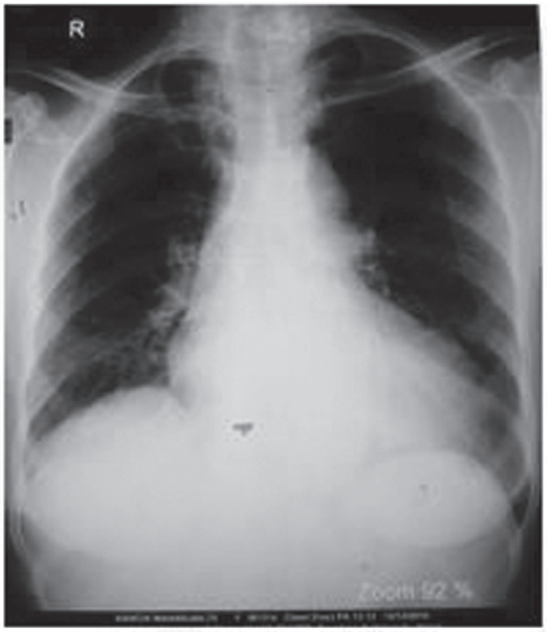
Her chest X-ray revealed widened mediastinum. She underwent CT angiography of chest which showed, mediastinal hematoma along with small penetrating atheroschlerotic ulcer in aortic arch just distal to the origin of left subclavian artery.

She was managed with morphine, nitrates, amlodipine, metoprolol and ACE inhibitor. She became pain free over next 24 hrs. Her blood pressure normalized. Surgical option of replacement of involved portion of aorta was discussed with the patient and family, which they denied. So she was managed conservatively. She was discharged home 6 days after admission as her symptoms improved.

On follow-up after one month, her chest X-ray

CT angiography showed penetring atherosclerotic ulcer

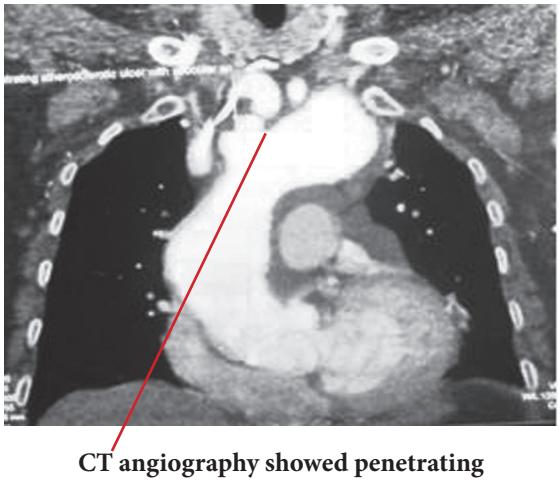
showed normal mediastinal widening. She has been asymptomatic till date, nearly 3 years after her initial presentation. She continues to follow-up being compliant on medications.



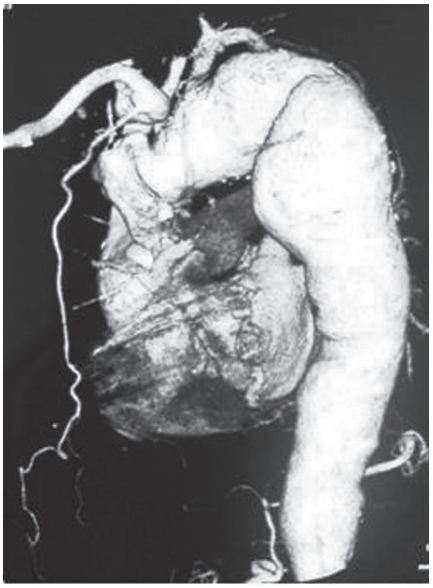
Chest X-ray one month after initial presentation showed normal mediastinal widening

Case Report No. 2:

66 years old female being referred from other hospital for arch and descending thoracic aortic aneurysm, presented to our out patient clinic. She is asymptomatic with controlled blood pressure, on antihypertensive medications. Her CT angiography showed PAU on arch of aorta along with aneurysmal dilatation of arch and descending aorta. She was managed conservatively.



CT angiography showed penetrating atherosclerotic ulcer with saccular aneurysm on the arch of aorta



CT angio showed aneurysm of arch and descending thoracic aorta

DISCUSSION

The management of PAU, particularly those symptomatic at presentation and those associated with IMH, dissection, or pseudoaneurysm, has been controversial. The initial reports by Stanson and colleagues and Cooke and colleagues suggested that medical therapy alone failed to prevent the recurrence of symptoms.[2,8] Both reports advocated immediate surgical intervention in all symptomatic patients. Also stressed was the importance of distinguishing between classic type B (DeBakey III) aortic dissection and PAU complicated by dissection because the latter appeared to be more likely to rupture. In some cases, a penetrating ulcer is a recognized precursor to dissection.[9,10] Coady and colleagues argued for aggressive operative intervention in patients with PAU, particularly when associated dissection is present, because this combination of findings is associated with a particularly unstable clinical course.[11] This group recently reported midterm follow-up of this entity, supporting their argument for surgical management.[12] Other investigators have advocated expectant therapy. In 1989, Hussain and colleagues reported a series of five patients with PAU in whom medical management with anti-impulse therapy led to resolution of symptoms and the IMH.[13] In none of the patients did the PAU progress to rupture, leading the authors to suggest that not all patients with PAU require surgical intervention. In 1992, Kazerooni and colleagues reported that the IMH resolved in four of eight patients with PAU who received conservative medical therapy.[14] Yucel and colleagues reported similar results.[15] Kazerooni and colleagues suggested that the clinical course of the patient was the primary determinant for surgical intervention.[16] The authors reserved surgical intervention for patients at risk of imminent cardiovascular collapse from hemorrhage, patients with recurrent chest pain, and patients with the initial development of a pseudoaneurysm. Similar results were reported recently from the Mayo Clinic.[17] Given the substantial morbidity associated with conventional surgery, endovascular repair is an attractive and challenging alternative method in these high-risk patients.[18,19,20]

CONCLUSION

PAU affects elderly, who usually have co-morbidities. Patients with PAU involving the descending aorta can initially be treated conservatively by aggressive medical therapy. However, PAU and IMH are more serious and lethal conditions than classic descending aortic dissection. Ultimately surgical intervention may be required in selected cases. The best treatment option would be to treat conservatively initially with close follow-up, so that they can get appropriate surgical treatment when required. Alternatively, endovascular treatment is an attractive option.

REFERENCES

1. Shennan T. Dissecting aneurysms. Medical Research Council Special Report Series 1934;193:1-143.
2. Stanson AW, Kazmier FJ, Hollier LH, et al. Penetrating atherosclerotic ulcers of the thoracic aorta: natural history and clinicopathologic correlations. Ann Vasc Surg 1986;1:15-23.
3. Kazmier FJ. Penetrating aortic ulcer. Cardiovasc Clin 1992;22:201-7.
4. Coady MA, Rizzo JA, Elefteriades JA. Pathologic variants of thoracic aortic dissections. Penetrating atherosclerotic ulcers and intramural hematomas. Cardiol Clin 1999;17:637-57.
5. Robbins RC, McManus RP, Mitchell RS, et al. Management of patients with intramural hematoma of the thoracic aorta. Circulation 1993;88:II1-10.
6. Muluk SC, Kaufman JA, Torchiana DF, et al. Diagnosis and treatment of thoracic aortic intramural hematoma. J Vasc Surg 1996;24:1022-9
7. Coady MA, Rizzo JA, Elefteriades JA. Pathologic variants of thoracic aortic dissections. Penetrating therosclerotic ulcers and intramural hematomas. Cardiol Clin. 1999; 17: 637-657.
8. Cooke JP, Kazmier FJ, Orszulak TA. The penetrating aortic ulcer: pathologic manifestations, diagnosis and management. Mayo Clin Proc 1988;63:718-25.
9. Tisnado J, Cho SR, Beachley MC, Vines FS. Ulcer like projections: a precursor angiographic sign to thoracic aortic dissection. AJR Am J Roentgenol 1980;135:719-22.
10. Gore I, Hirst AE Jr. Dissecting aneurysm of the aorta. Cardiovasc Clin 1973;5:239-60.
11. Coady MA, Rizzo JA, Hammond GL, et al. Penetrating ulcer of the thoracic aorta. What is it? How do we recognize it? How do we manage it? J Vasc Surg 1998;27:1006-16.
12. Tittle SL, Lynch RJ, Cole PE, et al. Midterm follow-up of penetrating ulcer and intramural hematoma of the aorta. J Thorac Cardiovasc Surg 2002;123:1051-9.
13. Hussain S, Glover JL, Bree R, Bendick PJ. Penetrating atherosclerotic ulcers of the thoracic aorta. J Vasc Surg 1989;9:710-7.
14. Kazerooni EA, Bree RL, Williams DM. Penetrating atherosclerotic ulcers of the descending thoracic aorta: evaluation with CT and distinction from aortic dissection. Radiology 1992;183:759-65.
15. Yucel EK, Steinberg FL, Egglin TK, et al. Penetrating aortic ulcers: diagnosis with MR imaging. Radiology 1990;177:779-81
16. Kazerooni EA, Bree RL, Williams DM. Penetrating atherosclerotic ulcers of the descending thoracic aorta: evaluation with CT and distinction from aortic dissection. Radiology 1992;183:759-65.
17. Cho KR, Stanson AW, Potter DD, et al. Penetrating atherosclerotic ulcer of the descending thoracic aorta and arch. J Thorac Cardiovasc Surg 2004;127:1393-9.
18. Baikoussis NG, Apostolakis EE, Kalogeropoulou C. et al. Endovascular stent-grafting in penetrating atherosclerotic ulcer of the thoracic aorta. J Card Surg. 2009; 24: 725-726.
19. Baikoussis NG, Apostolakis EE, Siminelakis SN, Papadopoulos GS, Goudevenos J. Intramural haematoma of the thoracic aorta: who's to be alerted the cardiologist or the cardiac surgeon? J Cardiothorac Surg 2009;4: 54.
20. Brittenden J, McBride K, McInnes G, Gillespie IN, Bradbury AW. The use of endovascular stents in the treatment of penetrating ulcers of the thoracic aorta. J Vasc Surg. 1999; 30: 946-949.