Thoracic Aortic Disease

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**Background:** incidence of thoracic aortic aneurysm (TAA) ≥25 new cases per year in 400,000 persons; prevalence 3% to 4% of autopsied patients age >65 yr; spectrum of disease includes simple aneurysm, dissection and hematoma, and penetrating ulcer

**Anatomic landmarks of thoracoabdominal aorta:** sinus of Valsalva (aortic sinus), sinotubular junction, and mid–ascending aorta can all generally be seen clearly on transthoracic echocardiography (TTE); proximal and mid aortic arch; proximal descending aorta (site of coarctation); mid–descending aorta

**Evaluation of patients**

- Echocardiography (TTE); proximal and mid aortic arch; proximal descending aorta (site of coarctation); mid–descending aorta

**Pathologies of TAA:** atherosclerosis; noninflammatory — ≈55% of cases; acquired (HTN) or congenital (bicuspid aortic valve disease); genetic — 13% to 15% of cases; include Marfan syndrome (MFS), Ehlers-Danlos syndrome (EDS), and Loeys-Dietz syndrome (LDS); autosomal dominant mutation of transforming growth factor-β; presentation similar to MFS, but with aneurysm of visceral vessels; inflammatory — rare; include Takayasu arteritis, giant cell arteritis, and syphilitic and bacterial (myotic) disease

**Risk factors for development of thoracic aortic dissection:** increased stress of aortic wall — HTN (particularly if uncontrolled); pheochromocytoma; cocaine or other stimulant use; weight lifting (or other Valsalva maneuver); trauma; deceleration or torsional injury; coarctation of aorta; aortic media abnormalities — genetic (eg, MFS, EDS, Turner syndrome [TS], LDS; bicuspid aortic valve); familial, nongenetic TAD; inflammatory vasculitides; other — pregnancy; polycystic kidney disease; long-term administration of corticosteroids; infections involving aortic wall from bacteria

**Evaluation of patients**

- Suspected TAA and dissection (TAAD); clinical assessment of risk; chest x-ray helpful to identify increased aortic tortuosity or mediastinal widening; anterior ST elevation myocardial infarction (STEMI) pattern can be seen in type A dissection on electrocardiography; additional imaging — echocardiography; computed tomography (CT); magnetic resonance imaging (MRI)

*Educational Objectives*

1. **Identify patients with risk factors for thoracic aortic disease (TAD) and the development of aortic dissection.**
2. **Evaluate a patient with suspected TAA and dissection.**
3. **Appropriately treat an asymptomatic patient with an ascending aortic aneurysm.**
4. **Recognize the common features of infective endocarditis (IE).**
5. **Consider the possibility of IE in older patients with a history of chronic anorexia and fatigue.**

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event (at 2 yr, rate for type A dissections only slightly higher; patients with type B dissections tend to do worse over time because of recurrent symptoms or rupture); patients who survive to discharge from hospital tend to do fairly well

Incidence of acute aortic dissection: data from Howard et al show incidence typically higher in men at younger age, but rates similar in both sexes at age >55 yr

Immediate death vs survival to hospital admission in patients with type A dissection: main differences in data from Howard study seen in mean SBP in past 5 yr (≈151 mm Hg in patients who died immediately vs ≈138 mm Hg in those who survive to hospital admission) and in mean percentage of patients with BP ≥140/90 mm Hg in past 5 yr (=72% in immediate death group vs ≈39% in survival group); results suggest patients with refractory HTN require close monitoring and should be made aware of symptoms of TAAD, as well as those of stroke and coronary artery disease

Treatmenet of TAD: control of BP (goal <130/80 mm Hg; primarily β-blockers); smoking cessation; control of lipid levels

Management of asymptomatic patients with ascending aortic aneurysm: ascending aorta or aortic sinus with diameter >5.5 cm — surgery required; MFS or other genetic disorders — elective surgical repair at smaller diameters (4.0-5.0 cm); growth rate >0.5 cm/yr with diameter <5.5 cm — surgery required; patients with aortic valve replacement and sinus or aortic diameter >4.5 cm — surgical repair (composite graft [prosthetic valve and ascending root repair])

Management of TAD in pregnancy: prepregnancy counseling of women at risk indicated for those with MFS or another genetic risk factor, known aortic dilatation, or family history of TAD; strict control of BP (ie, recommendations for stage 2 HTN) should include monthly or bimonthly echocardiography to monitor for change in aortic diameter, and MRI or transesophageal echocardiography (TEE) for advanced imaging; delivery only in medical center where cardiothoracic surgery available

Bacterial Endocarditis

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Introductory remarks: infective endocarditis (IE) uncommon but considered frequently in inpatient setting, usually in younger patients (often with history of intravenous drug use); still deadly condition that affects increasingly older population; early clinical presentation can be extremely subtle and challenging to diagnose (seat of disease in vital organ, while manifestation almost entirely elsewhere)

Case example: previously healthy, highly functioning 83-yr-old woman experienced lack of appetite at dinner; on following day, patient unwilling to get out of bed and felt unwell; anorexia and lack of energy continued, but remained only symptoms; after ≈2 wk, she visited physician (not her regular provider) for evaluation; she had no history of fever, chills, myalgia, headache, or other constitutional symptoms; medical records showed patient lost >5% of body weight in past 6 mo; past medical history included HTN, some mild symptomatic osteoarthropathies, and repair of broken hip; previous colonoscopy showed normal findings; no current episodes or history of depression; medication list fairly straightforward (no new drugs or signs of possible iatrogenic problem; patient extremely conscientious in adhering to current medical therapy)

PE: patient described at first office visit as alert and in good mood; vital signs included normal heart rate; low body weight; thorough examination documented small lymph node, but nothing else; no record of examining conjunctiva, fundi, or nail beds (at that time, rheumatologic diseases and malignancies [but not infectious diseases] discussed with patient); blood count essentially normal (unchanged from 6 mo prior); complete metabolic panel and thyrotropin (TSH) test also obtained and normal

Patient’s personal physician subsequently called patient and family: family members reported patient continued to have prominent anorexia and severe fatigue, but no fever, chills, myalgias, headache, or localizing symptoms; physician arranged for patient to come in for additional evaluation ≈30 days after initial office visit; vital signs again normal; careful PE again performed and included fundoscopic, conjunctival, and meticulous heart examinations; again, no abnormalities detected; at this time, physician ordered blood work and expanded differential diagnosis to include rheumatologic diseases (possibly polymyalgia rheumatica [PMR]); laboratory tests showed that anemia starting to develop and albumin starting to decline (suggesting possible inflammatory condition; TSH elevated); CT of chest, abdomen, and pelvis and serologic tests ordered and all normal; when physician called to report laboratory results, patient had not been out of bed for 1 wk

Patient admitted to hospital: physical findings of personal physician confirmed; patient spiked fever first day of admission (38.1°C) but no chills; blood cultures obtained and positive for Streptococcus bovis; echocardiography showed vegetation on aortic valve; diagnosis of IE established

Prevalence of IE: 5 to 10 in 100,000 individuals (similar to giant cell arteritis); continued older individuals increasingly making up percentage of population contracting IE

Presentation of older vs younger adults: results of prospective, multicenter studies

Study (2008): >2700 consecutive patients; older adults defined as age >65 yr, and younger adults as age ≤65 yr; results showed older patients had higher rates of hospitalization, procedures, diabetes, gastrointestinal (GI) and genitourinary (GU) pathology (particularly cancers), and mortality; diagnostic gain from TEE appeared significantly better than TTE; study concluded distinct difference between older and younger adult population with IE; in speaker’s opinion, differences between age groups may not be striking clinically (incidence of fever similar); younger adults tended to have more emboli than older patients; clear epidemiologic differences (more S bovis and Enterococcus and less Staphylococcus aureus in older compared to younger adults) may not change how presentation of disease viewed and managed

Second prospective study: 315 consecutive cases of IE; included significant number of participants age >70 yr (mean age 77 yr; >25 patients >80 yr of age); other age groups defined as age 50 to 70 yr and age <50 yr; results found larger numbers of pacemakers, increased GI and GU pathology, and more frequent infection with S bovis in older group; however, clinical and echocardiographic findings similar between groups

Common features of IE: malaise and fatigue extraordinarily common and profound (absence in elderly raises question of whether IE correct diagnosis); anorexia and weight loss also extremely common (not so common with PMR; insufficient data on giant cell arteritis); fever (some early studies suggest fever occurs in ≈70% of patients, but unlikely that older adult with IE would not have fever if temperature measured several times daily over few days)

Lessons learned from case example: increasing proportion of cases of IE seen in elderly because people with acquired valvular disease living longer; invasive procedures (particularly of GI or GU system) predispose to IE; clinical features of IE in elderly very similar to those in young patients; bacterial epidemiology different (reflecting GI and GU pathologies); infected prosthetic valves and other hardware (eg, pacemakers) risk factor; fever occurs often; presence of weight loss, anorexia, and fatigue common; immunologic and embolic events present
only in minority of patients; incidence of embolic events and stroke lower in older adults (role of anticoagulants and antiplatelets in prevention has not been tested and still not recommended); TEE often needed in elderly due to technical limitations of TTE and wider anteroposterior diameter in older adults; presentation of IE “treacherously deceptive” and can be nonspecific; if patient reports weight loss or fever, order appropriate laboratory or radiologic tests and consider having patient measure temperature daily for several days.

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Estimated time to complete the educational process:

- Review Educational Objectives on page 1: 5 minutes
- Take pretest: 10 minutes
- Listen to audio program: 60 minutes
- Review written summary and suggested readings: 35 minutes
- Take posttest: 10 minutes
1. Risk factors for thoracic aortic aneurysm (TAA) include all the following, except:
   (A) Age >60 yr  (C) Black race
   (B) Male sex    (D) Tobacco use

2. Which of the following pathologies of TAA accounts for approximately half of all cases?
   (A) Atherosclerosis     (C) Inflammatory disease
   (B) Genetic syndrome    (D) Noninflammatory disease

3. In the evaluation of a patient with suspected TAA and dissection, which of the following imaging modalities is most helpful to identify aortic tortuosity or mediastinal widening?
   (A) Chest x-ray       (C) Echocardiography
   (B) Magnetic resonance imaging (MRI) (D) Computed tomography

4. Annual imaging from head to pelvis with MRI is recommended for all patients with:
   (A) Ehlers-Danlos syndrome  (C) Marfan syndrome
   (B) Loeys-Dietz syndrome    (D) Turner syndrome

5. Which class of aortic dissection requires primary surgical treatment?
   (A) Stanford type A       (C) A and B
   (B) Stanford type B       (D) Neither A nor B

6. Aortic dissection accounts for an estimated _______ deaths per year in the United States.
   (A) 100,000     (B) 50,000     (C) 20,000     (D) 10,000

7. Surgery is required for the asymptomatic patient with an ascending aortic aneurysm and:
   (A) Growth rate >0.5 cm/yr with diameter <5.5 cm
   (B) Aortic valve replacement and sinus or aortic diameter >4.5 cm
   (C) Ascending aorta or aortic sinus with diameter >5.5 cm
   (D) All the above

8. Older individuals are increasingly making up the percentage of population contracting infective endocarditis (IE).
   (A) True          (B) False

9. Which of the following is not a common feature of IE?
   (A) Anorexia     (B) Fatigue    (C) Embolic events   (D) Malaise

10. Anticoagulant and antiplatelet therapy for prevention of IE is not recommended.
    (A) True          (B) False

Answers to Audio-Digest Internal Medicine Volume 61, Issue 30: 1-A, 2-C, 3-D, 4-B, 5-D, 6-C, 7-A, 8-D, 9-A, 10-A