TUESDAY, FEBRUARY 20, 2018	
7:00 AM	**Registration**
7:30 AM	**Breakfast and Visit Exhibits**
POTPOURRI Moderator: *S. Little*	
8:00 AM	**Cardio-Oncology: 2018** *J. Hung*
8:20 AM	**Sonographer's Guide to Evaluation of Right Ventricule in Pulmonary Hypertension** *S. Roemer*
8:40 AM	**Case Studies: Endocarditis** *S. Little*
9:00 AM	**Case Studies: Disease of Aorta: Marfan, Dissection, Aortic Atheroma** *M. Saric*
9:20 AM	**Refreshment Break and Visit Exhibits**
9:50 AM	**Case Studies: LVAD** *C. Kramer*
10:10 AM	**Case Studies: LVNC** *M. Umland*
10:30 AM	**Closing Remarks** *B. Khandheria, W. Zoghbi*
11:00 AM	**Adjourn**

31st Annual State of the Art Echocardiography | San Diego, CA

February 20, 2018 | 9:00 – 9:20 AM | 20 min

Diseases of Aorta: Marfan, Dissection, Atheroma

Muhamed Sarić MD, PhD, MPA
Director of Noninvasive Cardiology | Echo Lab
Associate Professor of Medicine

NYU Langone MEDICAL CENTER

Disclosures

Speakers Bureau (Philips, Medtronic)
Advisory Board (Siemens)

ARNOLD SCHWARZENEGGER SAYS: **'IT'S NOT A TUMOR!'**

KID: 'What's the matter?'

ARNOLD: 'I have a headache'

KID: 'It might be a tumor.'

ARNOLD: 'It's not a tumor. Not a tumor. At all!'

CASE PRESENTATION

80-year-old man presents with
severe **headache** and **nonexertional chest pain**
in the setting of severe hypertension
(BP 210/90 mm Hg)

PAST MEDICAL HISTORY

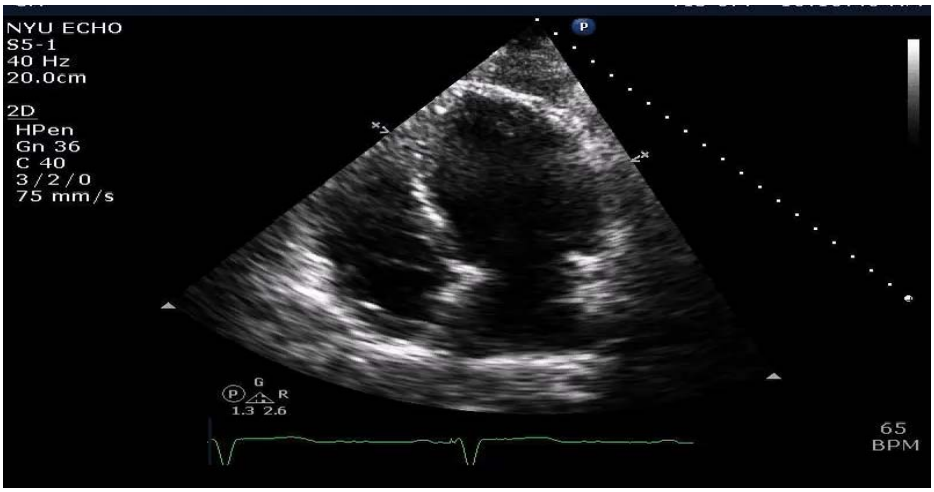
- Hypertension
- Coronary artery disease
  (s/p CABG & PCIs)
- Abdominal aortic aneurysm
- Bradycardia
  (s/p Permanent pacemaker placement)

WORKING DIAGNOSES

- Hypertensive urgency
- Acute coronary syndrome

Transthoracic echocardiogram was ordered...

TRANSTHORACIC ECHOCARDIOGRAM



Hypertensive heart disease with paced rhythm.
Otherwise, no wall motion abnormalities; no valvular disease.

CLINICAL COURSE

Headache resolved after normalization of blood pressure
He was ruled out for acute coronary syndrome

YET…

Severe nonexertional chest pain continued…

MAYBE IT'S AORTIC DISSECTION

Let's order a **chest CT**…

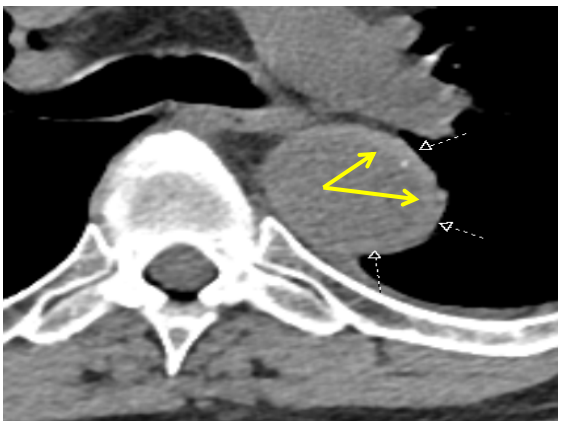
CHEST CT

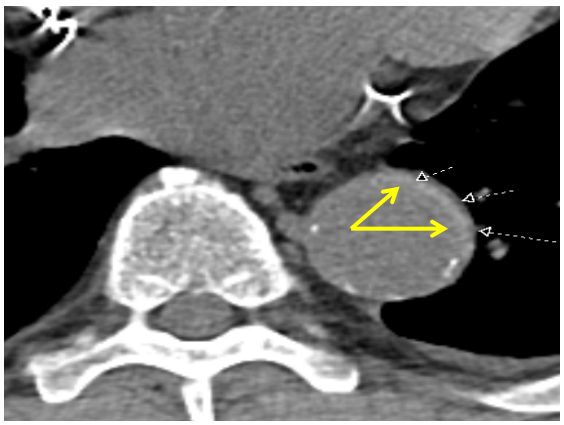
The good news is there is no aortic dissection...

...but, there is something very concerning on **noncontrast** portion of CT.

NONCONTRAST CHEST CT

Crescentic hyperdense lesion involving distal arch & descending aorta





CT DIAGNOSIS

Acute **intramural hematoma (IMH)**
of distal aortic arch and descending thoracic aorta

First described on autopsy in **1760** of king George II of England

CLASSIC AORTIC DISSECTION

ACUTE AORTIC SYNDROME

King George II of England
(1683-1760)

INTRAMURAL HEMATOMA (IMH)

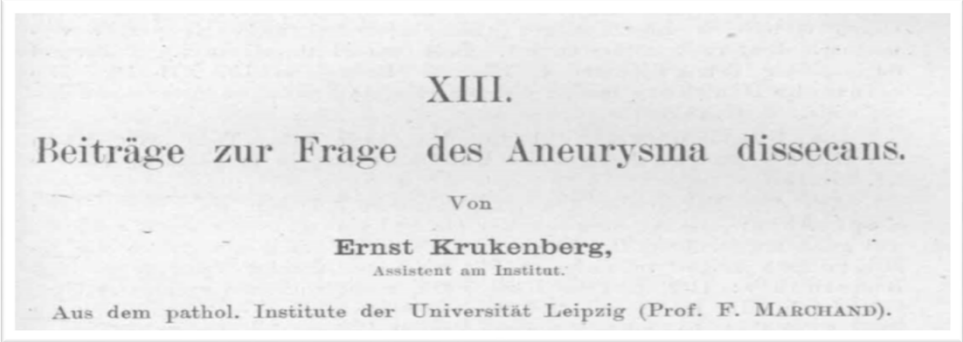
First described in **1920**
in Germany on autopsy.

PENETRATING ATHEROSCLEROTIC ULCER (PAU)

First described in **1986**
on aortography & CT
at Mayo Clinic.

INTRAMURAL HEMATOMA | FIRST DESCRIPTION

Krukenberg E. Beiträge zur Frage des Aneurysma dissecans
[Contributions to the question of dissecting aneurysm].
Beitr Pathol Anat Allg Pathol. **1920**;67:329-351.



XIII.

Beiträge zur Frage des Aneurysma dissecans.

Von

Ernst Krukenberg,
Assistent am Institut.

Aus dem pathol. Institute der Universität Leipzig (Prof. F. MARCHAND).

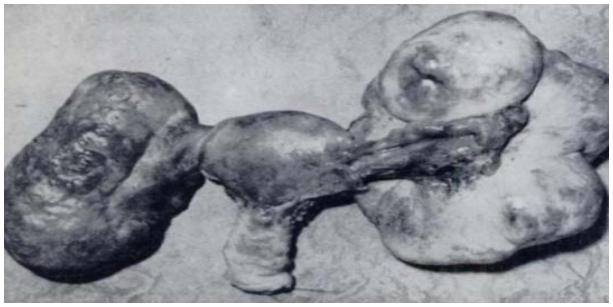
Krukenberg correctly deduced that **IMH** results from **rupture of vasa vasorum**.

INTRAMURAL HEMATOMA | FIRST DESCRIPTION

ERNST KRUKENBERG
(1871-1946)
German pathologist

Although he was first to describe **intramural hematoma (IMH)** of the aorta....

...he is actually better known for describing **'Krukenberg tumors'** – transperitoneal ovarian metastases from stomach and colon cancers.

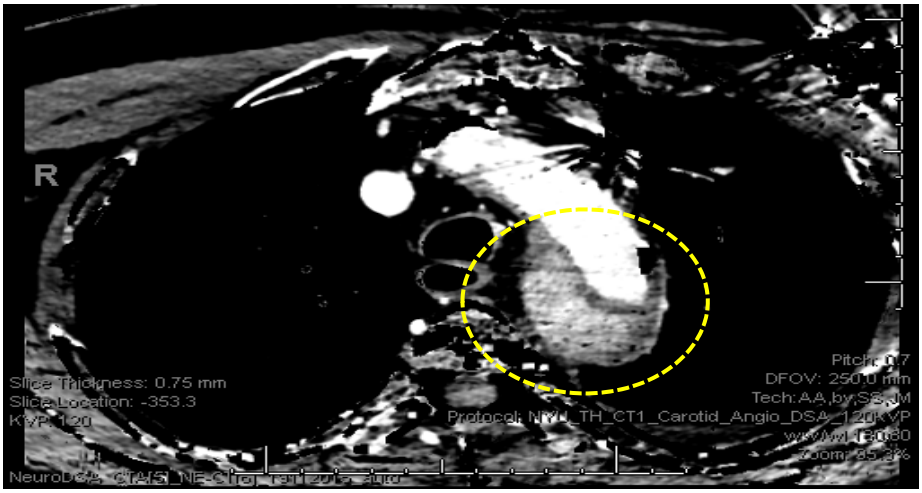


BACK TO OUR PATIENT

Six weeks later, severe chest pain recurred...
...and repeat chest CT was ordered

CHEST CT #2 | 6 WEEKS AFTER INITIAL CT

Increase in the thickness of IMH with appearance of contrast inside IMH.



CHEST CT #2 | 6 WEEKS AFTER INITIAL CT

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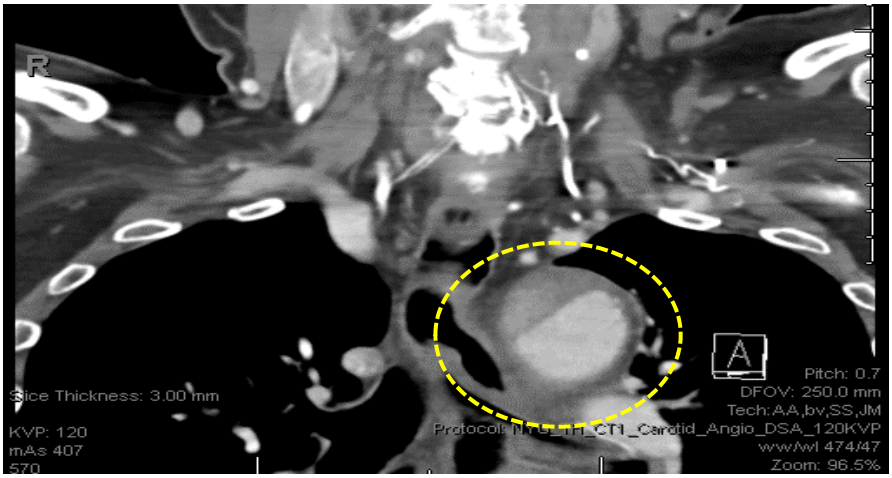
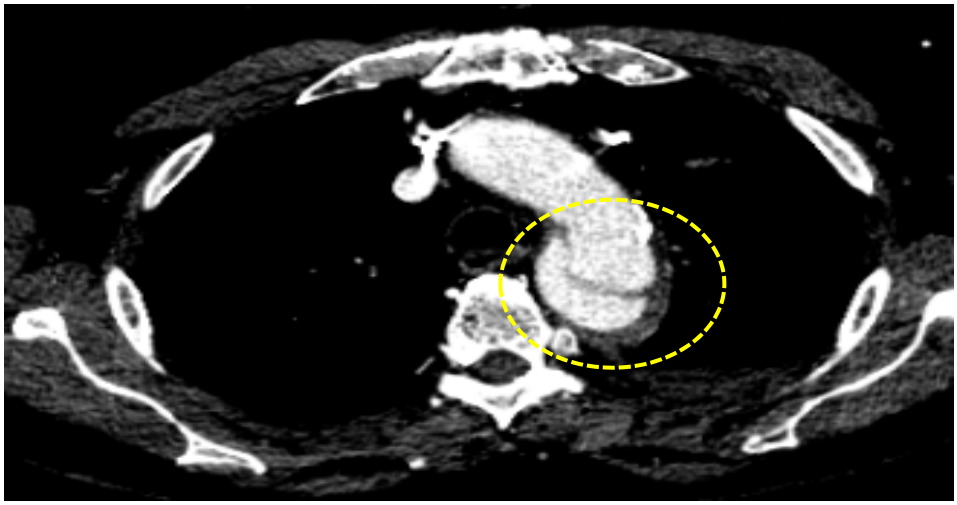


CHEST CT #3

Done 1 day after chest CT #2

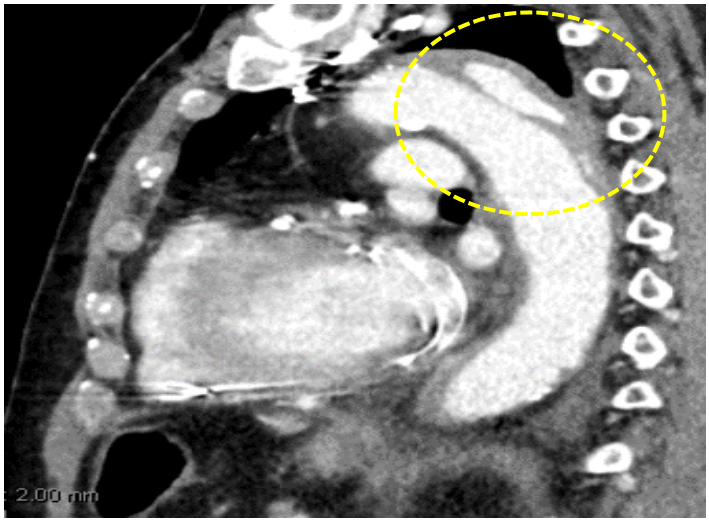
CHEST CT #3 | ONE DAY AFTER CT #2

Conversion of IMH into aortic dissection



CHEST CT #3 | ONE DAY AFTER CT #2

Conversion of IMH into aortic dissection



CHEST CT #3 | ONE DAY AFTER CT #2

Conversion of IMH into aortic dissection

TEACHING POINTS

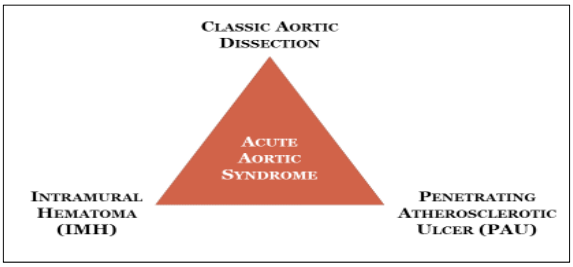
- Intramural hematoma (IMH) was first described by Ernst **Krukenberg** of Germany in **1920**
- IMH is likely the result of **vasa vasorum rupture** in the aortic media
- IMH is visualized as **crescentic thickening** of the aortic wall
- IMH may be a **precursor** to aortic dissection

INTRAMURAL HEMATOMA | ONE OF CAUSES OF ACUTE AORTIC SYNDROME

The term
ACUTE AORTIC SYNDROME
was first proposed in **2001**
by Vilacosta & San Román of Spain

ISIDRE VILACOSTA
Spanish Physician

JOSÉ ALBERTO SAN ROMÁN
Spanish Physician



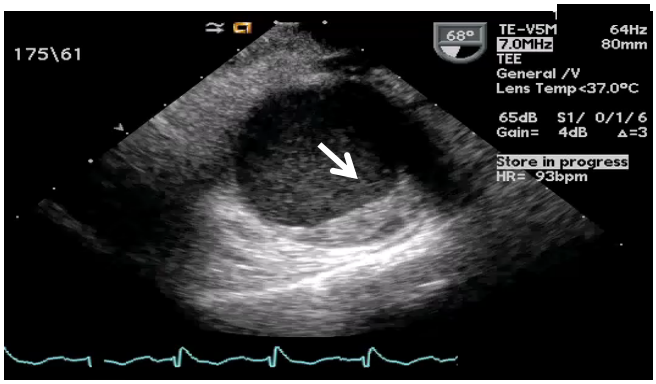
Editorial

Heart 2001;**85**:365–368

Acute aortic syndrome

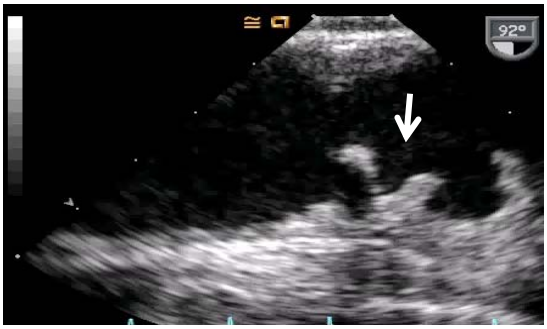
Although the chest pain of acute aortic dissection is widely recognised, less consideration has been given to pain associated with other aortic pathologies. In light of contemporary concepts in aortic pathology we would like to present the pathology of a new cardiovascular syndrome—acute aortic syndrome (AAS).[1]

ACUTE AORTIC SYNDROME | INTRAMURAL HEMATOMA



Crescentic thickening
of the aortic arch wall

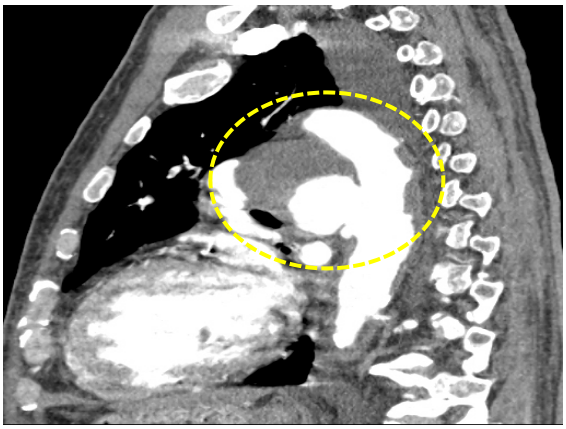
ACUTE AORTIC SYNDROME | **PENETRATING ATHEROSCLEROTIC ULCER (PAU)**

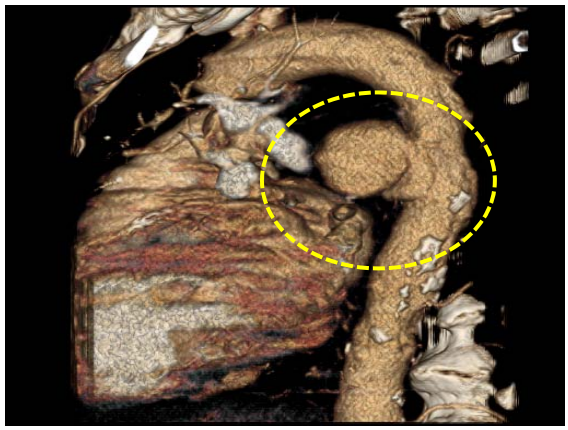


PAU = Erosion of atherosclerotic plaque into the media

Note the intramural hematoma underneath the PAU

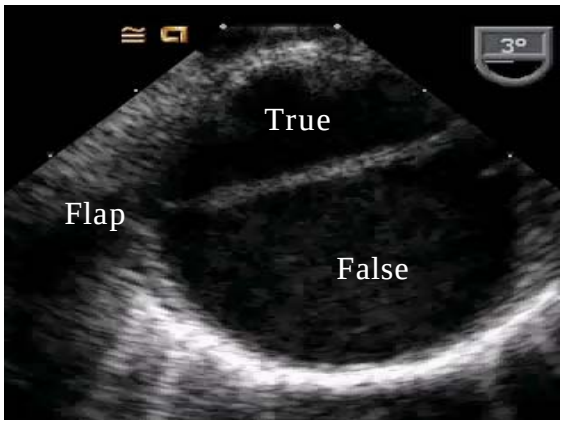
ACUTE AORTIC SYNDROME | **PAU LEADING TO PSEUDOANEURYSM**



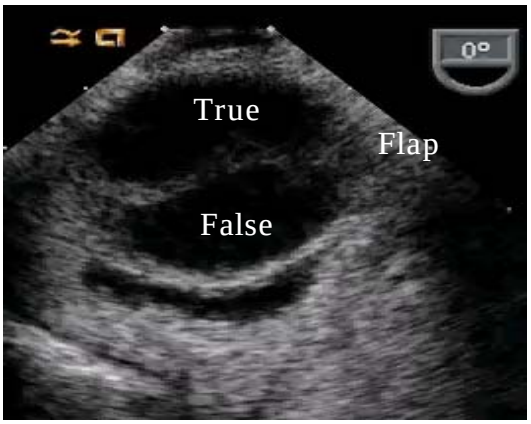


PAU >> **Pseudoaneurysm (Focal aortic rupture)**

ACUTE AORTIC SYNDROME ON TEE| **CLASSIC AORTIC DISSECTION**

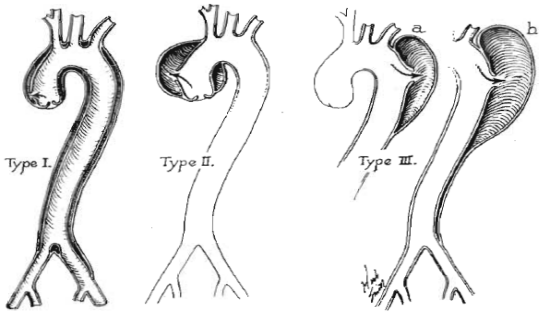


Noncontrast TEE



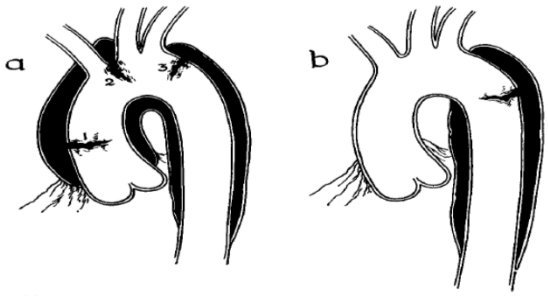
TEE with Microbubble Contrast

Michael Ellis DeBakey
(originally ديبغي : Dabaghi)
1908-2008
Lebanese-American surgeon



J. Thorac. Cardiovasc. Surg. **1965**;49:130-149.

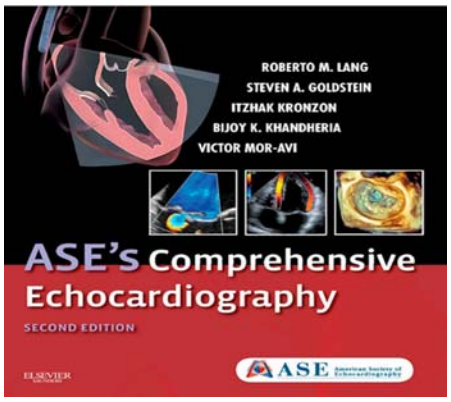
STANFORD
SCHOOL OF MEDICINE
Stanford University Medical Center



Ann Thorac Surg. **1970** Sep;10(3):237-47.

Stanford Type A & B classification
is now used for **IMH**, **PAU** & **dissection**.

FURTHER READING



ASE's Comprehensive Echocardiography
2nd Edition
Elsevier (April 29, 2015)

Chapter 159: Acute aortic syndrome
Pages 671-679

159 Acute Aortic Syndrome

Muhamed Saric, MD, PhD
Itzhak Kronzon, MD

Acute aortic syndrome (AAS) encompasses several life-threatening clinical entities with overlapping features including acute onset of chest pain, disruption of the aortic wall media, and a need for urgent medical care (Fig. 159.1). The term "acute aortic syndrome" was first proposed in 2001 by the Spanish physicians Vilacosta and San Román.[1] The following three entities were originally included in the spectrum of acute aortic syndrome: aortic dissection, intramural hematoma (IMH), and penetrating atherosclerotic ulcer (PAU). Traumatic aortic rupture (TAR; transection) due to blunt deceleration trauma as well as aortic aneurysm leak and rupture may also be included the spectrum of AAS.[2]

Thank You!

New York University Langone Medical Center