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# Aortic Dissection - The Great Masquerader


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# Acknowledgments

**Prof Christoph Nienaber**, Consultant Cardiologist, Royal Brompton Hospital & Imperial College London, UK

**Dr Mike Rubens**, Consultant Radiologist, Royal Brompton Hospital, UK

**Mr Niteen Limbachia**, WL Gore and Associates (UK) Ltd

# Disclosure of Interest

I do not have any potential conflict of interest

# Medical History

- 75 male
- Sudden onset severe central chest pain, whilst playing base guitar in a gig. Carried on playing for 40min to finish the show. Drove home.
- Next morning, attended Emergency Department (ED).

**Past medical history**

- Systemic hypertension
- Atrial fibrillation
- Stroke 4yr ago (mild residual weakness)
- Ex-smoker
- Crt 117umol/L, est GFR 54 ml/min
- Renal carcinoma → R nephrectomy 4yr ago, last f/u 6mo - well
- Giant cell arteritis
- Lumbar spine decompression

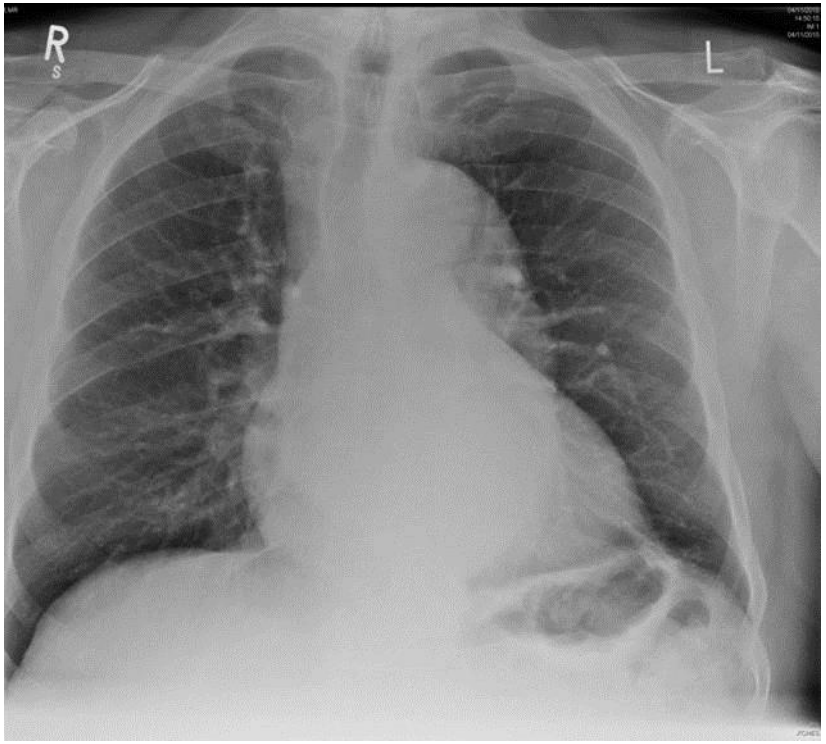
**Medications**

- Bendroflumethiazide, Warfarin, Digoxin, Paracetamol, Zopiclone

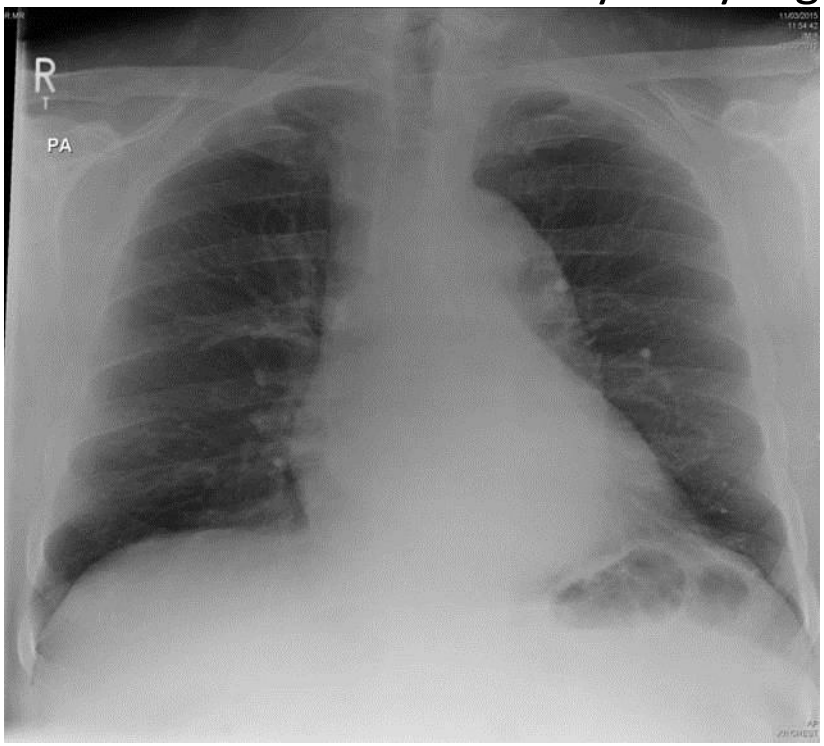
# Chest X-ray

`...rule out infection or widened mediastinum‘

ED with chest pain




6 months previous
(unfolded aorta noted as early as 2yr ago)




Diagnosis: musculoskeletal chest pain → discharged home

# Progress

Intermittent chest pain for 2 weeks

→ Family doctor (week 2)

- Left upper quadrant/epigastric discomfort
- 10 Kg weight loss over 6 months (was on diet to loose weight)
- Hb 128↓, MCV 96.9, ferritin 745↑, ESR 77↑, CRP 29↑
- **Gastrointestinal disease, tumour recurrence (prev renal cancer)?**

→ Gastroenterology review (week 4)

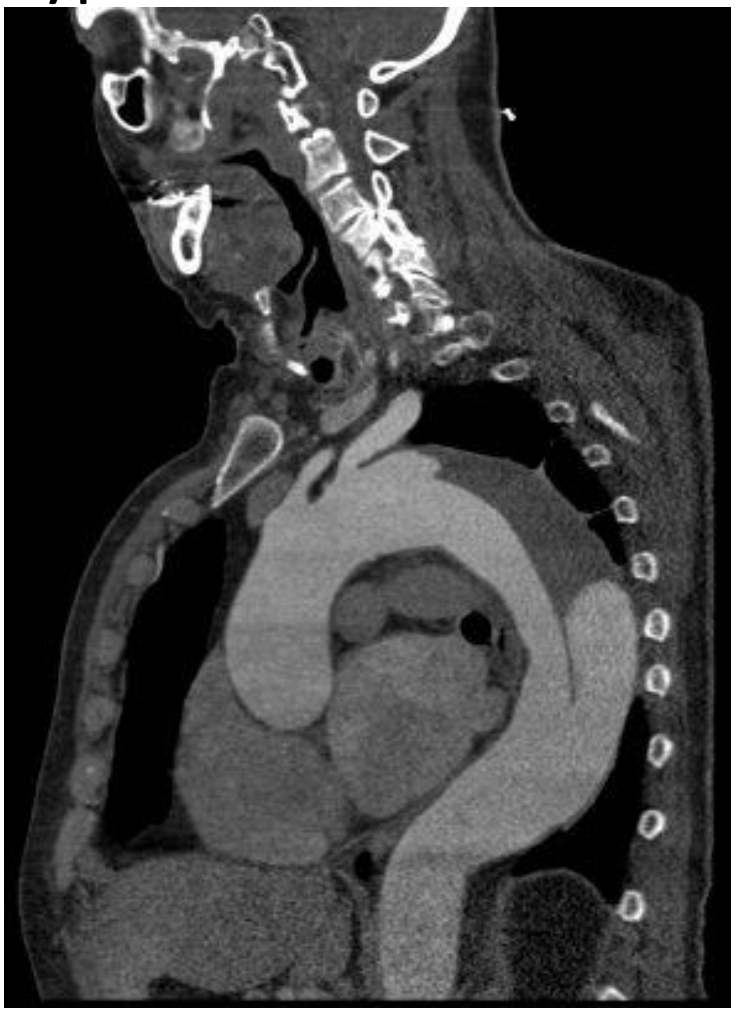
- **Gastrointestinal disease, tumour recurrence?**
  → gastroscopy + CT chest-abdo-pelvis, to be performed within 2 weeks

Continued to travel to play music

# Elective CT Scan (week 6)

## (looking for tumour recurrence)

Type B aortic dissection



**Recalled from home to ED**

- Pain free, HR 70 AF, BP 130/70

→ added Bisoprolol + ACEI

→ referral aortic centre

**'Complicated' type B dissection (↑risk of aortic rupture)**

- Dissected aorta max diameter 6.1cm (ie >4cm)
- Partial thrombosis of false lumen
- Intermittent pain despite reasonable BP

→**agreed for TEVAR**

**Coronary angio** (TEVAR workup): no flow limiting disease

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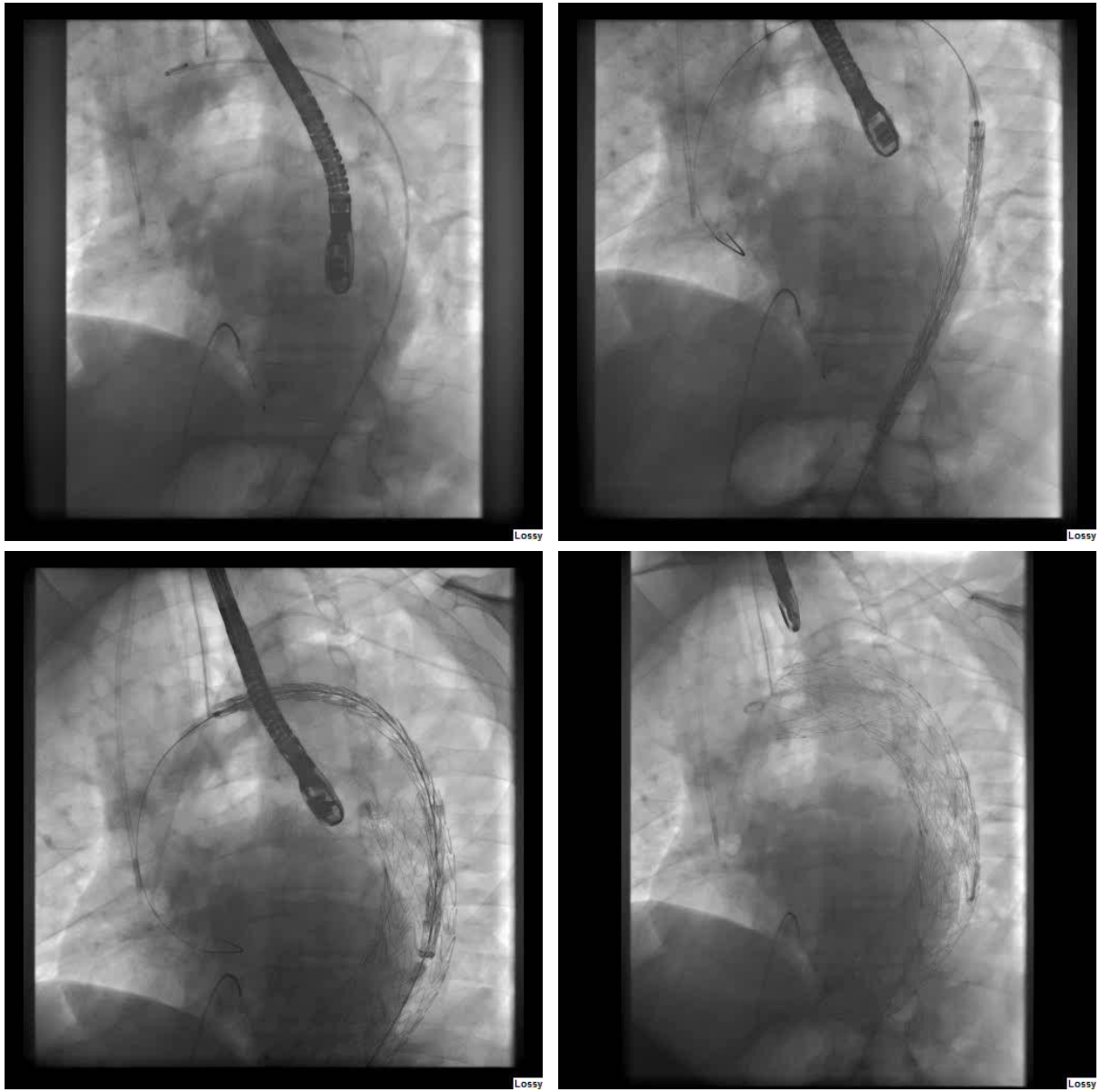
# TEVAR Procedure

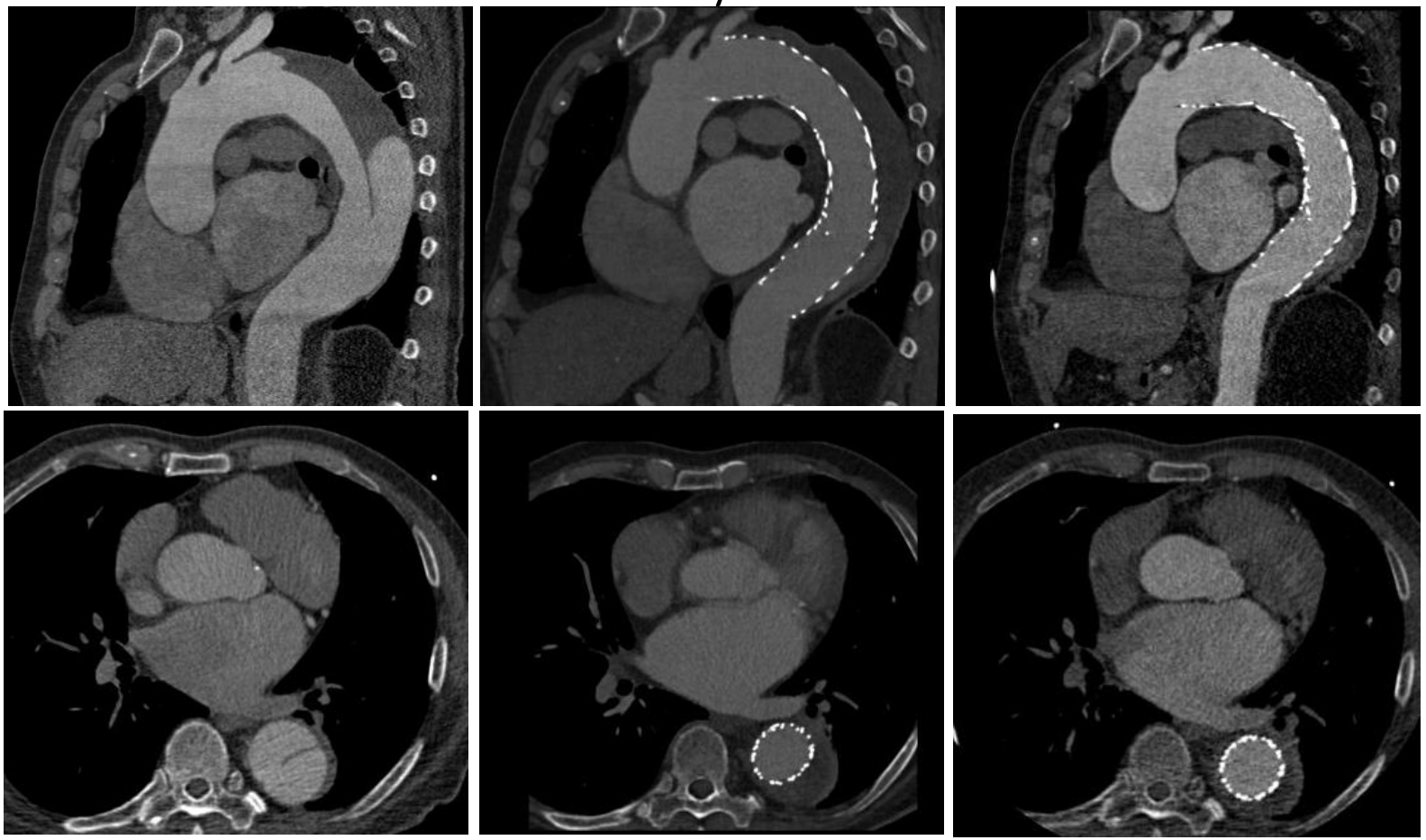


# Serial CT Aortogram

Pre-TEVAR

Post-TEVAR
Day 3

Post-TEVAR
5 months



# Aortic Dissection

## Disorders presenting with acute chest/back pain (or both) seen in ED

| | Per 1000 |
|---|---|
| Acute coronary syndrome | 253 |
| Neuro-radicular | 170 |
| Pulmonary diseases | 157 |
| Arrythmia | 65 |
| Heart failure | 50 |
| Hyperventilation | 33 |
| Hypertensive crisis | 22 |
| Chest wall syndrome | 18 |
| Gastrointestinal disorders | 12 |
| Pulmonary embolism | 4 |
| Aortic dissection | 3 |
| Pericarditis | 1 |
| No definitive diagnosis | 6 |
| Other | 61 |

Adapted from von Kodolitsch Y et al, 2000[5]

**1.** Roberts CS et al, Ann Surg 1991. **2.** Bickerstaff LK et al, Surgery 1982. **3.** American Heart Association 1998. **4.** Spittell PC et al, Mayo Clin Proc 1993. **5.** von Kodolitsch Y et al, Arch Intern Med 2000. **6.** Hagan PG et al, JAMA 2000.

# Aortic Dissection: symptoms & signs

**Table 2.** Presenting Symptoms and Physical Examination of Patients With Acute Aortic Dissection (N = 464)*

| Category | Present, No. Reported (%) | Type A, No. (%) | Type B, No. (%) | *P* Value, Type A vs B |
|---|---|---|---|---|
| Presenting symptoms | | | | |
| Any pain reported | 443/464 (95.5) | 271 (93.8) | 172 (98.3) | .02 |
| Abrupt onset | 379/447 (84.8) | 234 (85.4) | 145 (83.8) | .65 |
| Chest pain | 331/455 (72.7) | 221 (78.9) | 110 (62.9) | <.001 |
| Anterior chest pain | 262/430 (60.9) | 191 (71.0) | 71 (44.1) | <.001 |
| Posterior chest pain | 149/415 (35.9) | 85 (32.8) | 64 (41) | .09 |
| Back pain | 240/451 (53.2) | 129 (46.6) | 111 (63.8) | <.001 |
| Abdominal pain | 133/449 (29.6) | 60 (21.6) | 73 (42.7) | <.001 |
| Severity of pain: severe or worst ever | 346/382 (90.6) | 211 (90.1) | 135 (90) | NA |
| Quality of pain: sharp | 174/270 (64.4) | 103 (62) | 71 (68.3) | NA |
| Quality of pain: tearing or ripping | 135/267 (50.6) | 78 (49.4) | 57 (52.3) | NA |
| Radiating | 127/449 (28.3) | 75 (27.2) | 52 (30.1) | .51 |
| Migrating | 74/446 (16.6) | 41 (14.9) | 33 (19.3) | .22 |
| Syncope | 42/447 (9.4) | 35 (12.7) | 7 (4.1) | .002 |
| Physical examination findings | | | | |
| Hemodynamics (n = 451)† | | | | |
| Hypertensive (SBP ≥150 mm Hg) | 221 (49.0) | 99 (35.7) | 122 (70.1) | <.001 |
| Normotensive (SBP 100-149 mm Hg) | 156 (34.6) | 110 (39.7) | 46 (26.4) | |
| Hypotensive (SBP <100 mm Hg) | 36 (8.0) | 32 (11.6) | 4 (2.3) | |
| Shock or tamponade (SBP ≤80 mm Hg) | 38 (8.4) | 36 (13.0) | 2 (1.5) | |
| Auscultated murmur of aortic insufficiency | 137/434 (31.6) | 117 (44) | 20 (12) | <.001 |
| Pulse deficit | 69/457 (15.1) | 53 (18.7) | 16 (9.2) | .006 |
| Cerebrovascular accident | 21/447 (4.7) | 17 (6.1) | 4 (2.3) | .07 |
| Congestive heart failure | 29/440 (6.6) | 24 (8.8) | 5 (3.0) | .02 |

*SBP indicates systolic blood pressure; NA, not applicable. For definitions of type A and B dissections, see footnote to Table 1.
†Systolic blood pressure is reported for 277 patients with type A and 174 patients with type B acute aortic dissection, respectively.

Hagan PG et al, JAMA 2000.

# Aortic Dissection: CxR, ECG, Imaging

**Table 3.** Chest Radiography, Electrocardiography, and Initial Diagnositic Imaging Results for Patients With Acute Aortic Dissection*

| Category | Present, No. Reported (%) | Type A, No. (%) | Type B, No. (%) | *P* Value, Type A vs B |
|---|---|---|---|---|
| Radiography findings (n = 427) | 427 (100) | 256 (88.6) | 171 (97.7) | |
| No abnormalities noted | 53 (12.4) | 26 (11.3) | 27 (15.8) | .08 |
| Absence of widened mediastinum or abnormal aortic contour | 91 (21.3) | 44 (17.2) | 47 (27.5) | .01 |
| Widened mediastinum | 263 (61.6) | 169 (62.6) | 94 (56) | .17 |
| Abnormal aortic contour | 212 (49.6) | 124 (46.6) | 88 (53) | .20 |
| Abnormal cardiac contour | 110 (25.8) | 69 (26.9) | 41 (24.0) | .49 |
| Displacement/calcification of aorta | 60 (14.1) | 29 (11.3) | 31 (18.1) | .05 |
| Pleural effusion | 82 (19.2) | 46 (17.3) | 36 (21.8) | .24 |
| Electrocardiogram findings (n = 444) | | | | |
| No abnormalities noted | 139 (31.3) | 85 (30.8) | 54 (32.1) | .76 |
| Nonspecific ST-segment or T-wave changes | 184 (41.4) | 116 (42.6) | 68 (42.8) | .98 |
| Left ventricular hypertrophy | 116 (26.1) | 67 (25) | 498 (32.2) | .11 |
| Ischemia | 67 (15.1) | 47 (17.3) | 20 (13.2) | .27 |
| Myocardial infarction, old Q waves | 34 (7.7) | 19 (7.1) | 15 (9.9) | .30 |
| Myocardial infarction, new Q waves or ST segments | 14 (3.2) | 13 (4.8) | 1 (0.7) | .02 |
| Initial modality (n = 453) | | | | |
| Computed tomography | 277 (61.1) | 145 (50.2) | 132 (75.4) | <.001 |
| Echocardiogram (TEE and/or TTE) | 148 (32.7) | 122 (42.2) | 26 (14.9) | <.001 |
| Aortography | 20 (4.4) | 12 (4.2) | 8 (4.6) | .92 |
| Magnetic resonance imaging | 8 (1.8) | 2 (0.7) | 6 (3.4) | .36 |
| Images performed per patient, mean (SD) | 1.83 (0.82) | 1.64 (0.69) | 2.15 (0.91) | <.001 |

*TEE indicates transesophageal echocardiography; TTE, transthoracic echocardiography. For definitions of type A and B dissections, see footnote to Table 1.

Hagan PG et al, JAMA 2000.

# Conclusion

1. Aortic dissection may mimick more common conditions, eg, acute coronary syndrome, gastrointestinal disease, musculoskeletal pain

2. Presented
   - 75 y/o male, acute severe pain, history of hypertension (a typical patient for aortic dissection)
   - Diagnosis missed on 3 consultations. Contributing factors:
     - absence of acute changes on chest X-ray
     - symptoms/signs suggestive of other diagnosis
     - past history of tumour
   - Subsequent CT (looking for tumour recurrence) revealed a complicated type B aortic dissection → TEVAR

3. Swift diagnosis of aortic dissection requires a high index of suspicion and judicious use of appropriate imaging (eg CT) early

4. Early transfer to an aortic centre for expert management is recommended for optimal outcome