Repair of Blunt Traumatic Thoracic Aortic Tears: Stents are the First Line Therapy for Appropriate Patients

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Conflicts of Interest

- None

Traumatic Thoracic Aortic Tears: Three Groups

- I 75% of patients die at the scene
- II 5% of survivors will be unstable and die within hrs
- III 25% of the remaining will die mostly due to associated injuries

Background

- The majority of tears are at the aortic isthmus
- Traditional approach has been emergent open repair
  - Paraplegia 2-19%, Mortality 15-35%
- Current trend is appropriately timed urgent repair with an evolving role for aortic stents
  - Paraplegia 0%, Mortality 0-17%

UC Davis Approach to Traumatic Thoracic Aortic Tears (TTAT)

- All suspected aortic injuries receive CT scan of chest with reconstructions
- CT Surgeon is primary coordinator of treatment for pathologies of the aorta
- If patient has significant concomitant injuries, especially lung, bias is to stent
- If anatomy favorable, bias is to stent
- If stent is considered, team with Cardiology and/or Vascular Surgery

Methods

- Retrospective review of prospective database
- Comparison of open repair vs. stent for TTAT from January 2003 to June 2009 (78 months)
- First thoracic aortic stent was October 2005
- Last 2 years all repairs for TTAT by stent
- Wilcoxon rank sum test

Instructive Cases

Case 1

- 76 YO female, MVC
- Multiple injuries

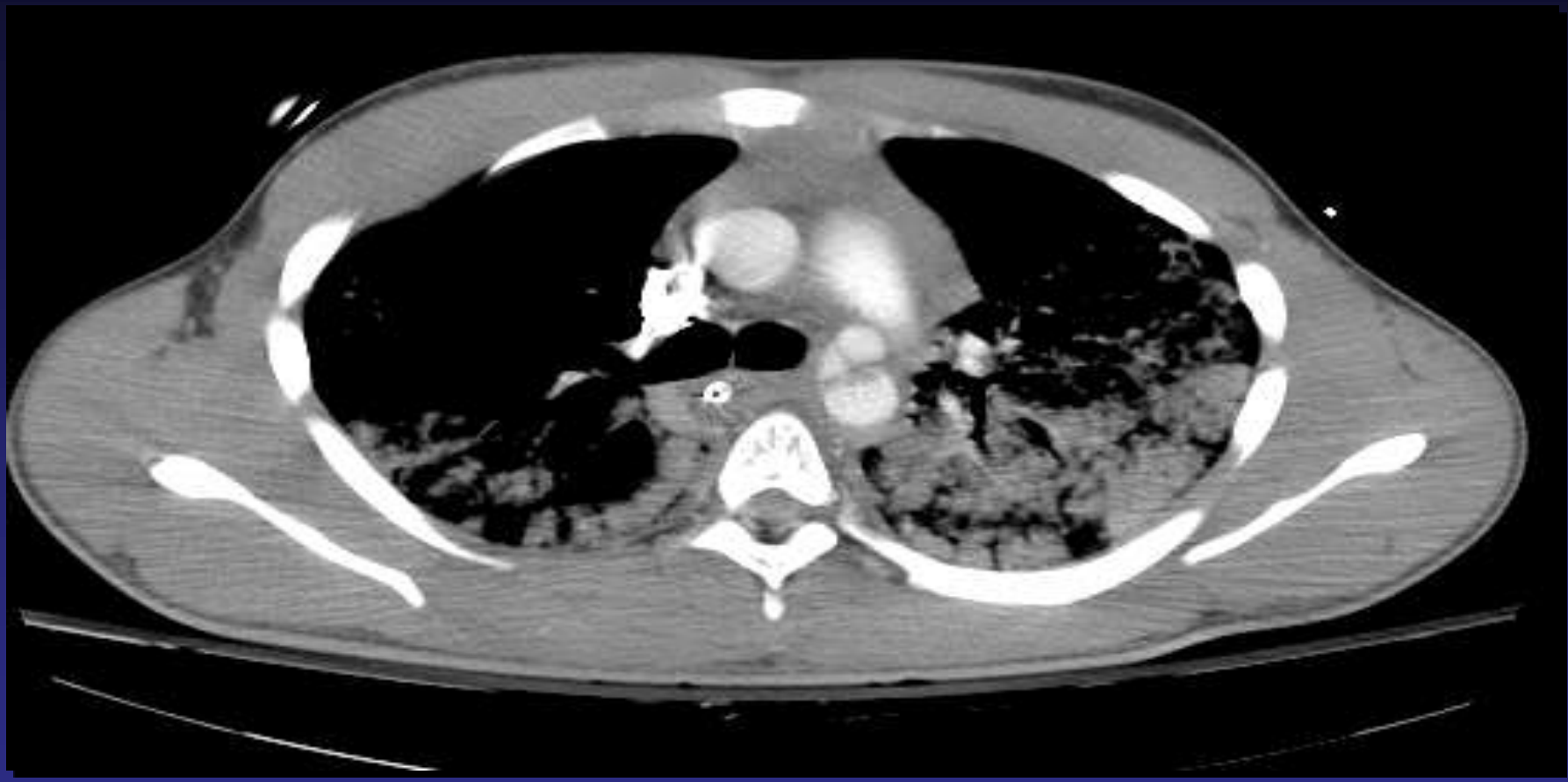

20:36:43 0000
Thrombus mid dissection
50 MM


INTRAVASCULAR AORTIC S


[redacted]
UC DAVIS HEALTH SYSTEM
10/25/2005
9:53:02 PM
163392
FINAL
R
87 kVp
17.44 mA
22
55
64
OEC

Case 2

- 17 YO male, ejected from car
- Intracranial bleed, multiple orthopedic injuries, splenic and liver lacerations
- Bilateral severe pulmonary contusions
- pO_2 55 on 100% FIO_2 with 20 PEEP
- Comminuted aortic tear




[redacted]
UC DAVIS HEALTH SYSTEM
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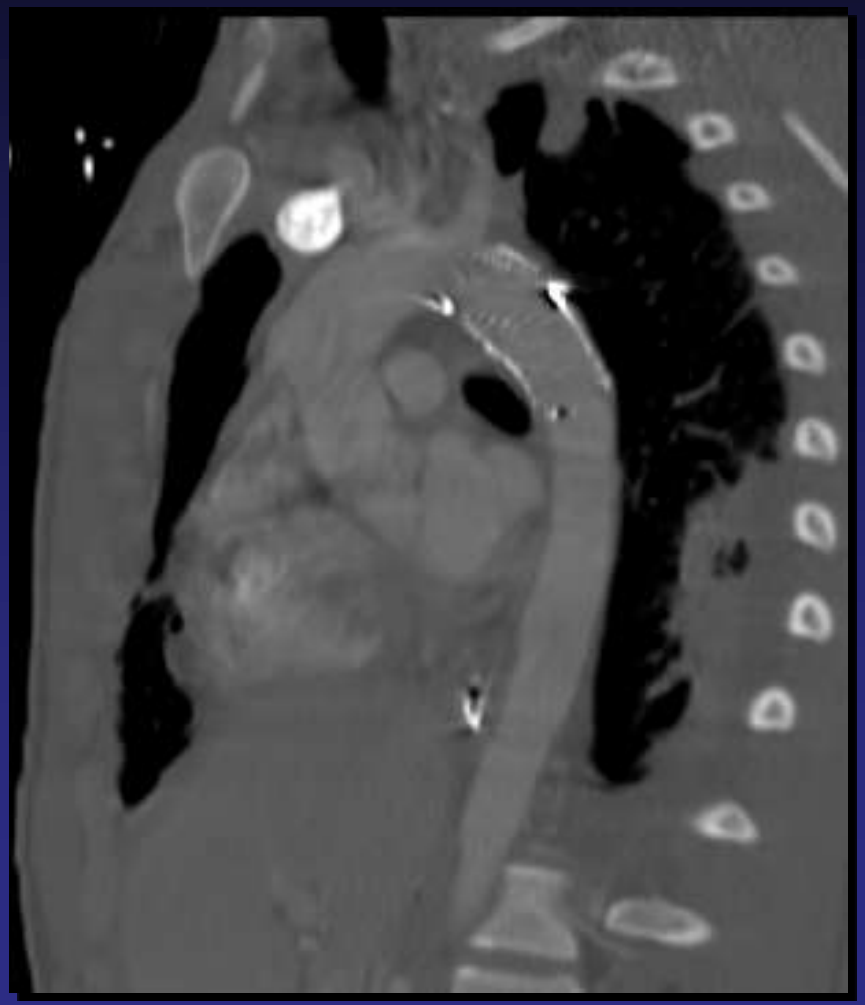
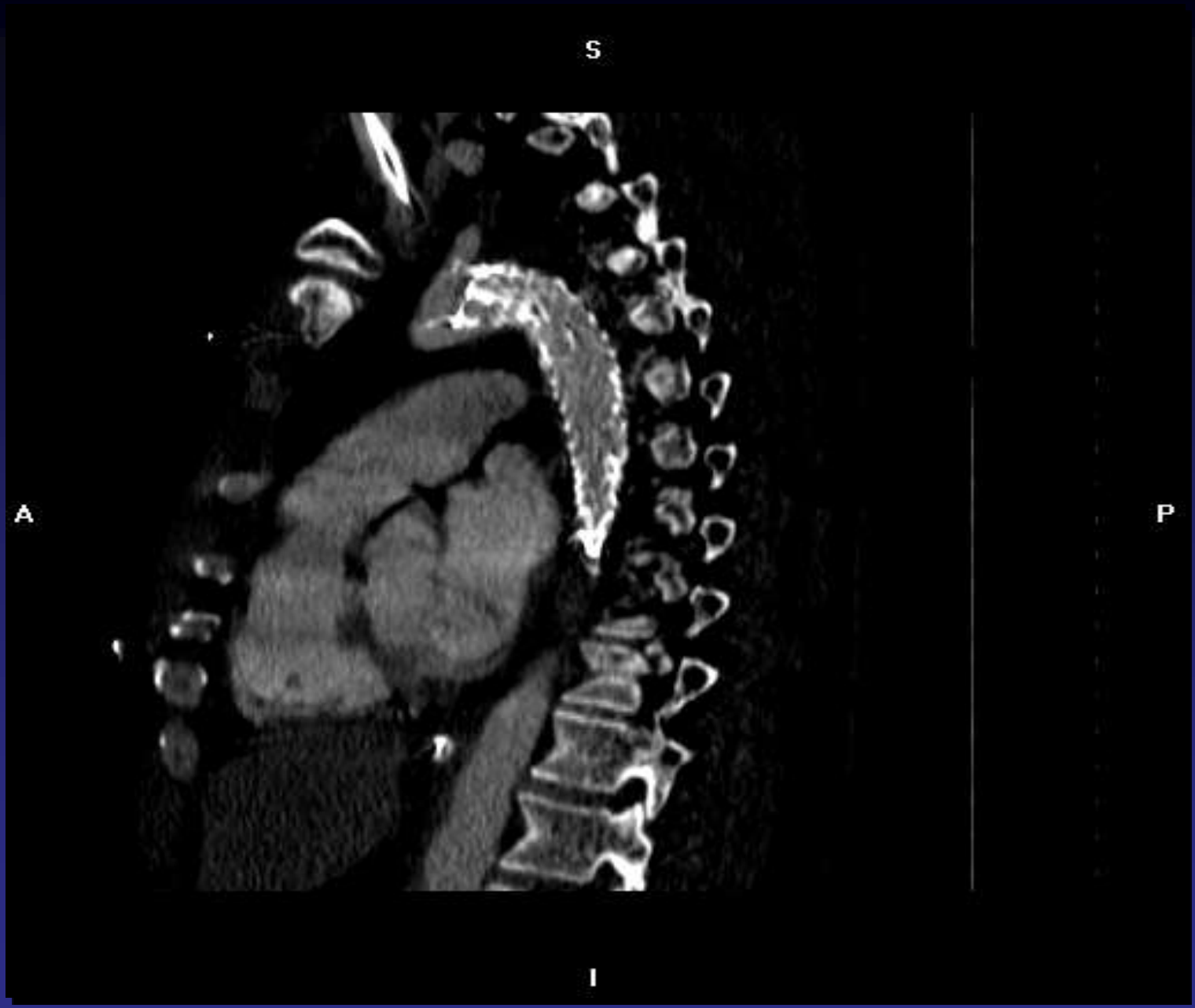
VASCULAR REPAIR
81 kVp
13.28 mA
2
55
64
OEC



Case 3

- 55 YO male, motorcycle on deer
- Multiple orthopedic fractures, liver laceration
- Pulmonary contusions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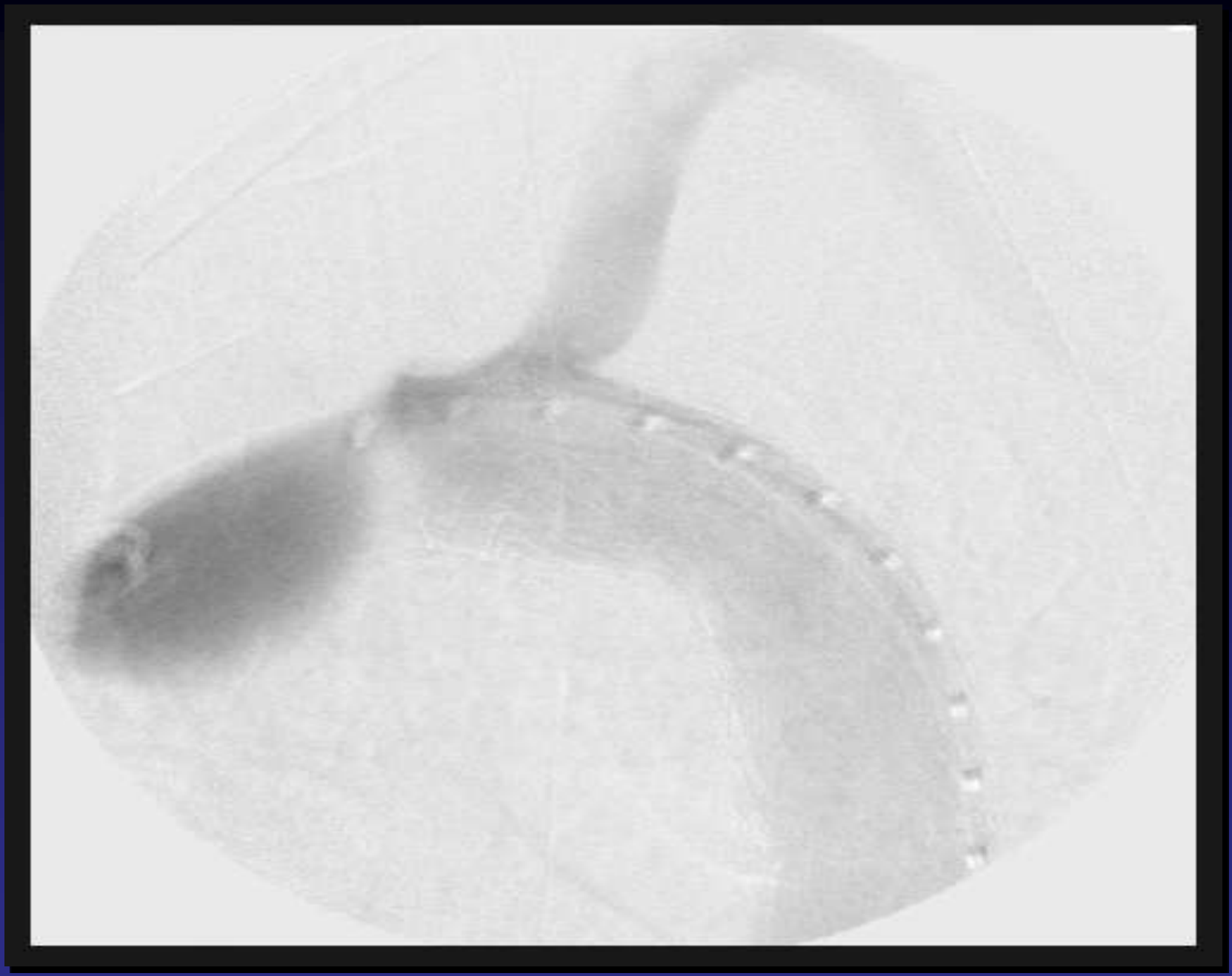
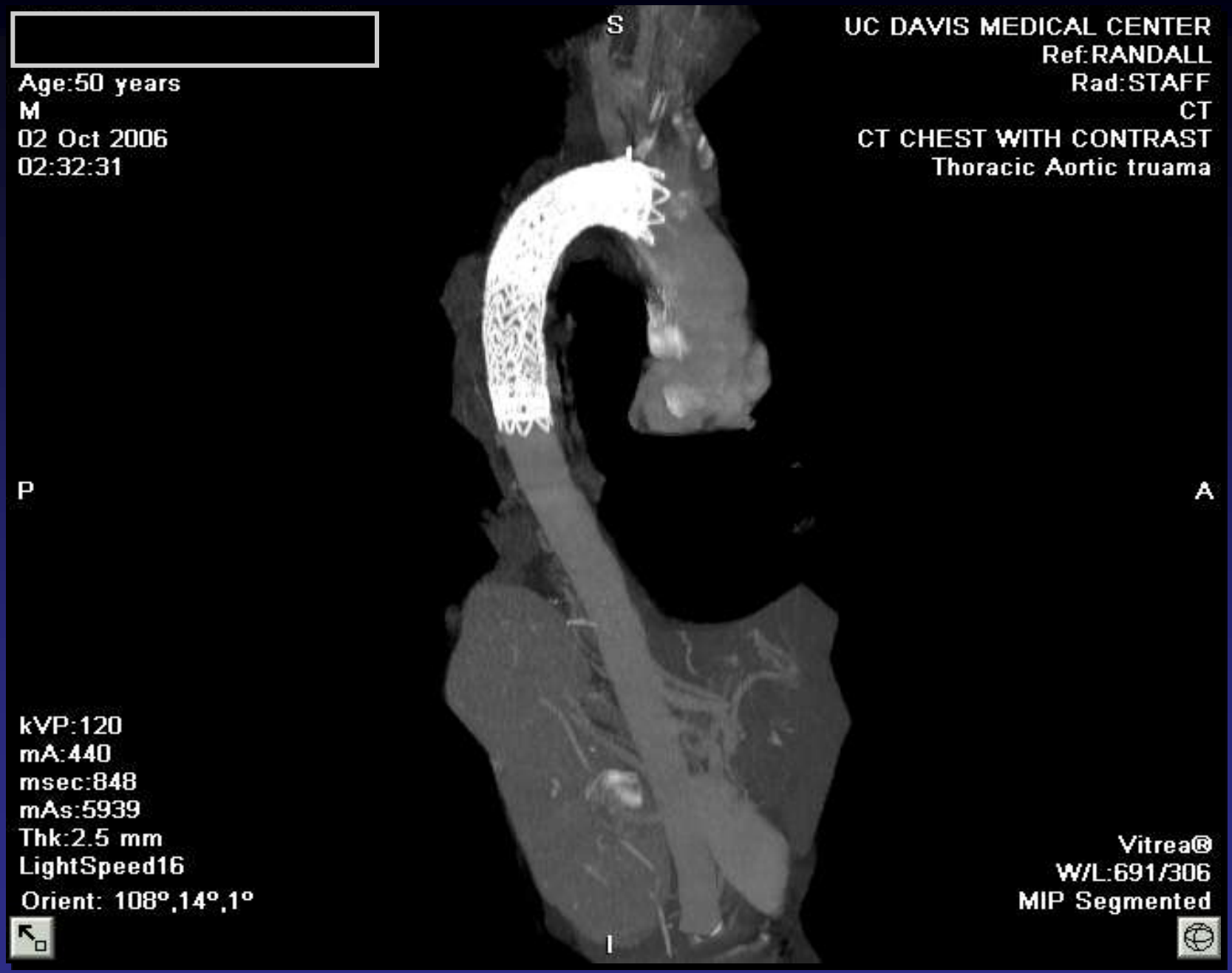
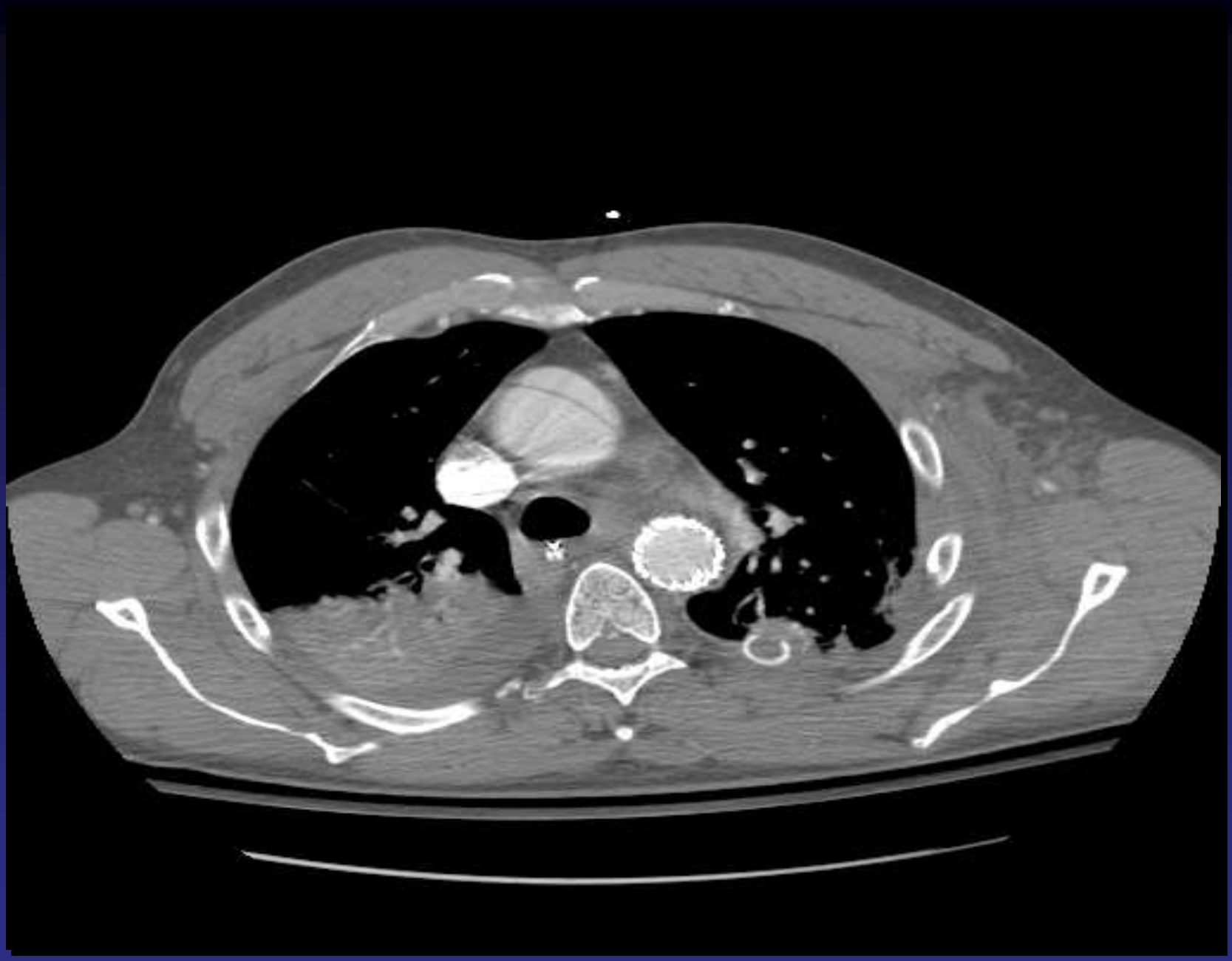



S
UC DAVIS MEDICAL CENTER
Ref:RANDALL
Rad:STAFF
CT
CT CHEST WITH CONTRAST
Thoracic Aortic truama
Age:50 years
M
02 Oct 2006
02:32:31
P
A
kVP:120
mA:440
msec:848
mAs:5939
Thk:2.5 mm
LightSpeed16
Orient: 108°,14°,1°
Vitrea®
W/L:691/306
MIP Segmented
I



Results

Open Approach

- n=22
- Thoracotomy, L groin 21
- Partial bypass 17
- Full bypass 4
- DHCA 2
- Thoracotomy, Gott shunt 1

Stent Access

- n=28
- Femoral (cut down) 21
- Iliac (RP with graft) 2
- Infrarenal Aorta (4 RP, 1 Lap) 5

Stents Used

- TAG 7
- AneuRx Cuffs 4
- Excluder Cuffs 13
- Talent 3

	Stent	Open	p
# Pts	28	22	
Age	39	42	0.55
ISS	39	43	0.20
*Time to OR (hrs)	57	28	<0.01
*Procedure time (hrs)	4	6.3	<0.01

	Stent	Open	p
*Transfusions	1.8	7.6	<0.01
ICU (days)	10.5	12.5	0.29
Ventilator (median days)	5	7	0.10
LOS (days)	29.5	30.1	0.95
F/U (mos)	11	17	0.19

Major Adverse Events

	Stent n=28	Open n=22
Death	2	4
Paraplegia	0	0
CVA	0	0
Renal Failure requiring dialysis	1	4
Vascular	2*	0
Re-intervention/re-op	5	0

Stent Graft Results

- 25/28 immediate technical success
- 27/28 technical success after reinterventions
- Complete coverage of traumatic tear with no stent migration or endoleaks at most recent follow-up

Conclusions

- Endovascular stents for TTAT can be performed safely with good short term results
- Stents may be associated with less morbidity and mortality relative to open repair
- Routine IVUS preferred as first diagnostic in OR
- Mid and long-term follow-up with stents is unknown

Conclusions

- Endovascular stents have become our preferred approach for TTAT
- High Risk Gore Trial will hopefully provide us with a better suited stent for TTAT
- There remains a role for expectant management with control of dp/dt and serial imaging prior to any intervention
- There is still a role for open operation in patients not deemed suitable for stent