Initial Outcomes of Simultaneous Pulmonary Thromboendartectomy and Hemiarch Replacement

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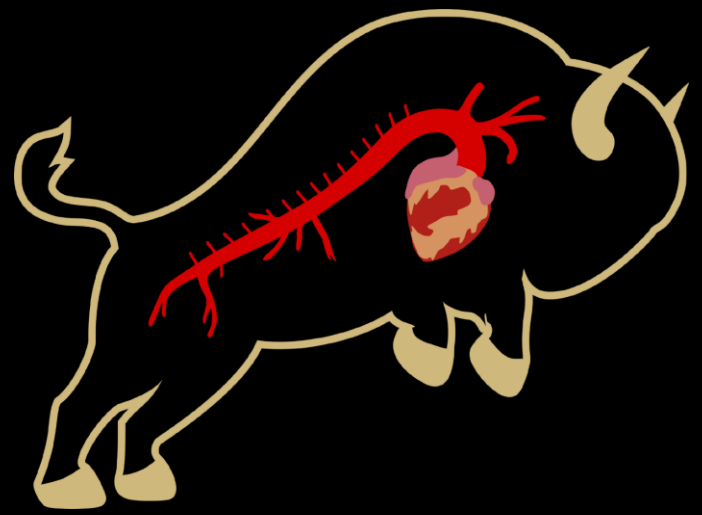
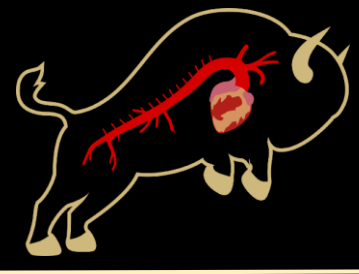
No disclosures



Introduction



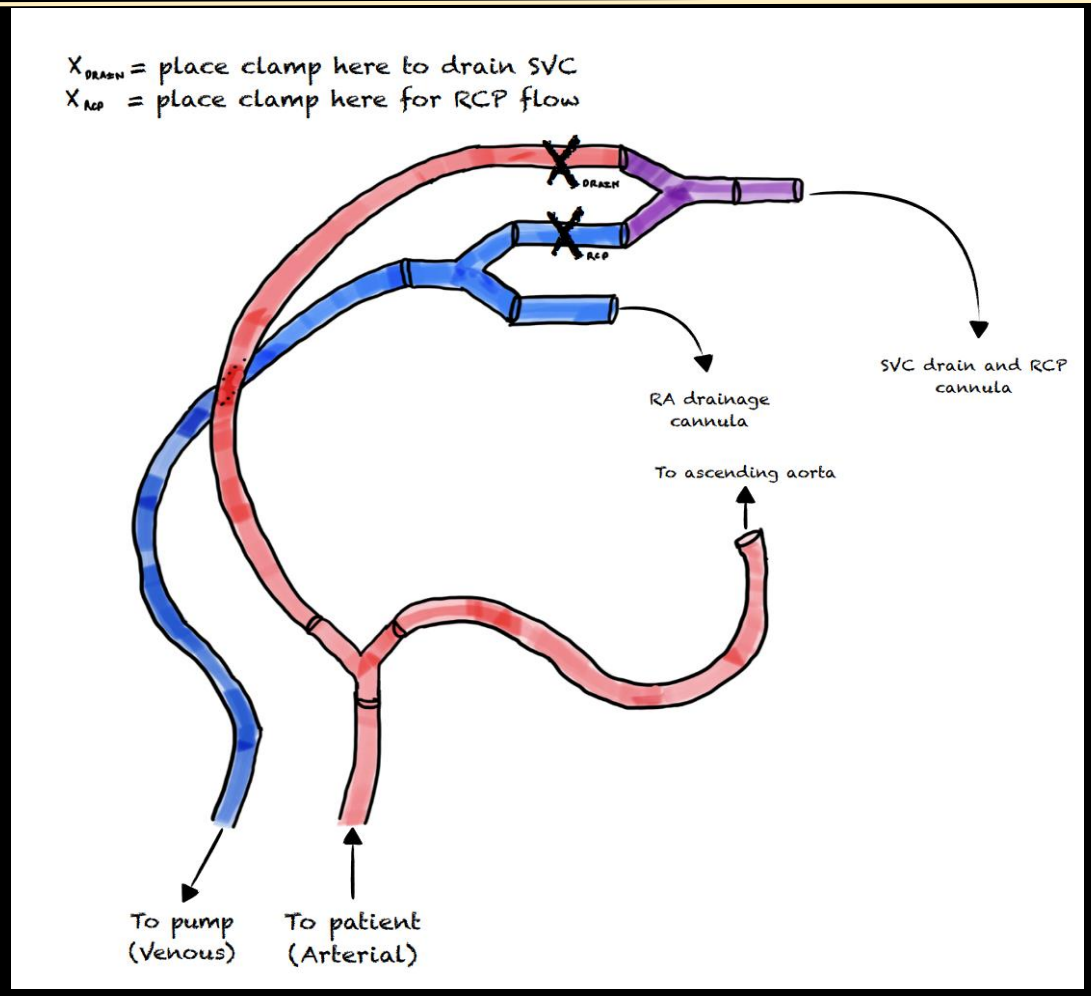
- Pulmonary thromboendartectomy (PTE) has provided a curative treatment option for chronic thromboembolic pulmonary hypertension (CTEPH)
- A subset of CTEPH patients present with concomitant aortic and cardiac pathology
- Deep hypothermic circulatory arrest (DHCA) typically used during PTE
- DHCA limits ability to address other pathology given coagulopathy risks and risk of reperfusion injury if significant volume resuscitation required

Aim

- Present a series of PTE patients who simultaneously underwent hemiarch replacement
- Discuss usage of moderate hypothermia and adjunctive retrograde cerebral perfusion (RCP) in these patients

Methods

- Retrospective review of a single institution aortic database for patients who underwent PTE at the time of hemiarch replacement
  - Four patients identified
- Discuss patient presentation, operative, post-operative course



Cardiopulmonary bypass set-up for PTE & aortic intervention with RCP

Patient 1

- 65M with dyspnea limiting activity with CTEPH, multivessel CAD, dilated ascending aorta, PFO
  - Plan for BL PTE, CABG x2, PFO closure, ascending/hemiarch
- Additional History
  - Prior liver transplant
  - CKD (Cr 1.7)
  - DM2 (not on insulin)
  - Previously very active hiker

Dilated ascending aorta

Bilateral pulmonary embolus

Patient 2

- 62M with severe pulmonary hypertension due to CTEPH (PASP 88mmHg, on 5L), atrial fibrillation (on multiple antiarrhythmics)
  - Plan for BL PTE, ascending/hemiarch, MAZE, left atrial appendage ligation (LAAL)

Massive right sided PE, extends further distally (also with contralateral disease)

Patient 3

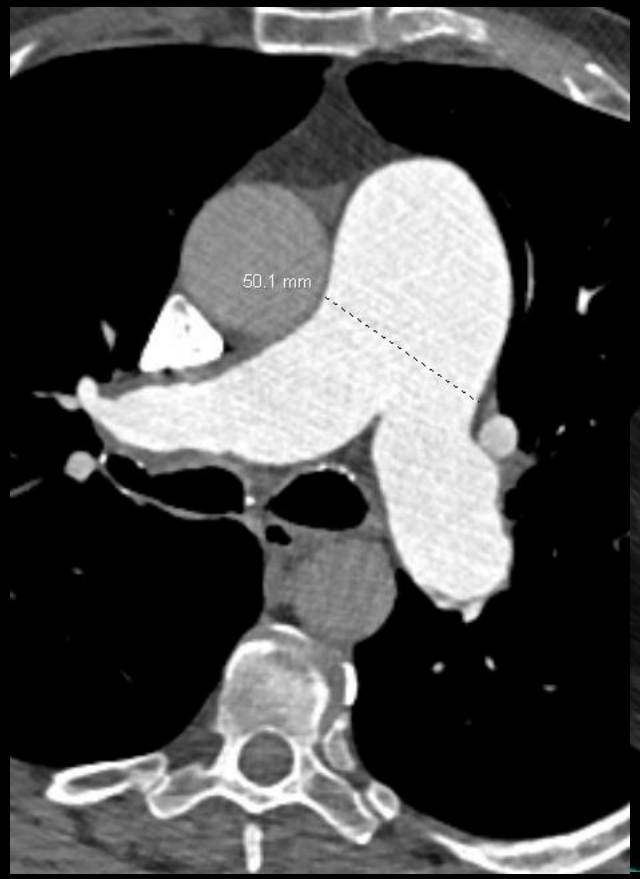
- 63M with dyspnea limiting activity (CTEPH, PA pressures 2/3 systemic), aneurysmal ascending aorta
  - Plan for BL PTE, ascending/hemiarch
- Additional History
  - Previously very active skier, mountain biker
  - Family history of alveolar capillary dysplasia

Dilation of main PA

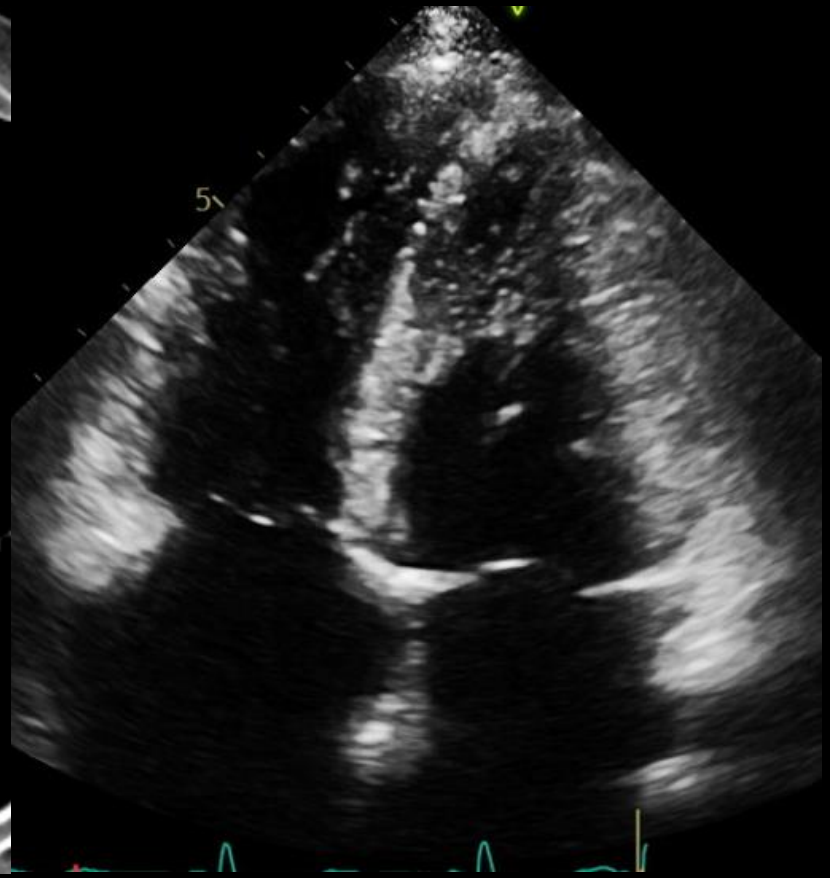
Multiple filling defects seen on lung perfusion

Patient 4

- 67M with severe pulmonary hypertension due to CTEPH (RVSP 77mmHg), atrial fibrillation, severe AI, multivessel CAD, ascending aortic aneurysm, PFO
  - Plan for BL PTE, CABG x2, AVR, PFO closure, ascending/hemiarch
- Additional History
  - Chronic osteomyelitis (shoulder), on suppressive antibiotics
  - Prior small bowel obstruction requiring surgery

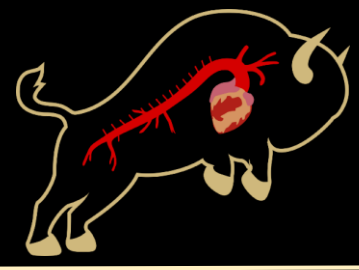


Significantly dilated main PA due to CTEPH



Right sided dilation on TTE

Results



- All patients received RCP via SVC
  - 3 moderate hypothermia
- Three patients extubated within 24 hours
- Patients started on low dose heparin infusion within 6 hours of surgery
- One re-admission to ICU after colonic perforation due to diverticulitis
- All patients doing well at three-month follow-up

#	Adjunctive Procedures Performed	Nadir Bladder Temperature (*C)	CPB (min)	Cross-Clamp (min)	R Lung CA (min)	L Lung CA (min)	Additional Aortic CA (min)	CA tot (min)	PRBC (units)	FFP (units)	Plt (units)	Other coagulation products (units)	Time to extubation (hr)	ICU LOS (days)	Additional Comments
1	CABG x2, PFO closure, LAAL	22.4	259	89	19	15	0 (during R Lung CA)	34	1	2	1	3	17	4	None
2	MAZE, LAAL	23.7	201	86	21	11	6	38	0	0	1	0	92	6	Mechanical Ventilation >24 hours
3	R PA plasty	28.2	172	88	19	14	6	39	0	0	0	3	22	6	Colonic Perforation (POD#12)
4	R PA plasty, CABG x2, AVR, PFO closure, LAAL	19.1	248	125	21	19	6	46	4	0	3	2	17	7	None

Table 1. Operative variables and post-operative outcomes of patients who underwent concomitant Pulmonary Thromboendartectomy (PTE) and hemiarch replacement with retrograde cerebral perfusion. CPB (Cardiopulmonary Bypass), R (Right), L (Left), CA(circulatory arrest) PRBC (packed red blood cells), FFP (fresh frozen plasma), Plt (Platelets), POD (Post-operative day)

Conclusion

- Simultaneous PTE and aortic arch surgery can be safely performed
  - Performing aortic repair has additional benefit of improving operative view, especially of the right PA
- RCP with moderate hypothermia provides adequate cerebral protection
  - Additional benefit of blood-less field
- Post-operatively, need to balance risk of resuscitation and reperfusion injury, as well as risk of baseline coagulopathy and bleeding

Questions???