CPB case report: Management of Antiphospholipid Syndrome with the HMS Plus system.

Fanny Lange DESS PEC UdM, CPC, B.Sc
Perfusionist in Montreal Sacre-Cœur Hospital
Educational Clinical Coordinator (MSCH)

Disclosure

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Medtronic

Financially supported my presence here

The reason why I'm a really good girl…

- I was raised by two medical parents, and by many "old timer" in the perfusion world
- Even after 10 years, every single day before a surgery, I still physically goand visit my patients… or I call the wonderfull nurse to get my bedtime story when I'm home!

But not everything is seen during school!

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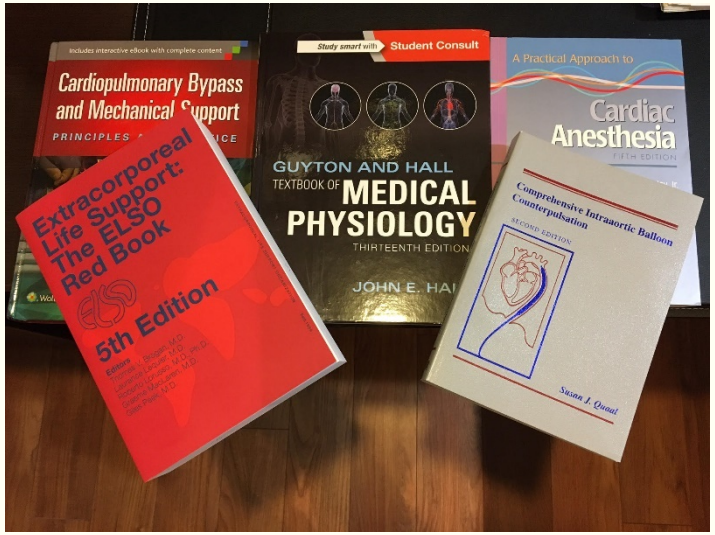

Université de Montréal
Faculté de médecine

Attendu que le Conseil de la Faculté atteste que

Fanny Lange

a terminé le programme d'études supérieures spécialisées en
perfusion extracorporelle

Nous, Recteur,
par décision du Conseil de l'Université et en vertu de Notre autorité, lui délivrons ce

Diplôme d'études supérieures spécialisées (D.É.S.S.)

à compter du 6 août 2009 avec tous les droits, honneurs et privilèges qui s'y rattachent.

En foi de quoi Nous signons ce document muni du grand sceau de l'Université
ainsi que de la signature de la secrétaire générale et de celles du doyen et de la secrétaire de la Faculté.
Fait à Montréal, le 8 septembre 2009

Le doyen
Le recteur
La secrétaire
La secrétaire générale

August 19th, 2017

- Eric caught the 1st "jackpot"…

Let's overlook the syndrome!

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IF YOU HAVE ONE MAJOR RESUME TO READ, THIS IS THE ONE…

Strategies for Managing Heparin Therapy in Patients with Antiphospholipid Antibody Syndrome

Trupti P. Mehta, Pharm.D., Maureen A. Smythe, Pharm.D., FCCP, and Joan C. Mattson, M.D.

(Pharmacotherapy 2011;31(12):1221–1231)

Let's overlook the syndrome!

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The diagnosis of definite antiphospholipid antibody syndrome requires the presence of one clinical and one laboratory criteria. No more than 5 years should separate the clinical events and a positive laboratory test.

Clinical criteria

1. Vascular thrombosis
   - One or more episodes of arterial, venous, or small-vessel thrombosis in any tissue or organ
2. Pregnancy morbidity
   - One or more instances of unexplained fetal death of a morphologically normal fetus at or beyond the 10th week of gestation
   - One or more instances of premature birth of a morphologically normal neonate before the 34th week of gestation related to eclampsia or severe preeclampsia or placental insufficiency
   - Three or more unexplained consecutive spontaneous abortions before the 10th week of gestation with exclusion of maternal anatomic or hormonal abnormalities and absence of chromosomal abnormalities in either parent

Other clinical features recognized by the 2006 consensus statement but not included in the criteria are cardiac valve disease, livedo reticularis, thrombocytopenia, nephropathy, and neurologic manifestations.

Laboratory criteria

1. Lupus anticoagulant present in plasma on two or more occasions at least 12 weeks apart, detected according to the guidelines of the International Society on Thrombosis and Haemostasis Scientific Subcommittee on Lupus Anticoagulant/Phospholipid-Dependent Antibodies[5]
2. Anticardiolipin antibody of immunoglobulin G or M isotype present at greater than 40 GPL or MPL on at least two occasions more than 12 weeks apart detected by standardized ELISA
3. Anti–β_2-glycoprotein I antibody of immunoglobulin G or M isotype in a titer greater than the 99th percentile on at least two occasions 12 weeks apart as measured by standardized ELISA

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Let's overlook the syndrome!

In 2009, these guidelines were updated, and recommendations were made for reducing the variability in laboratory testing with respect to choice of assay, type of phospholipid and activator, plasma preparation, expression of results, and cutoff values.[12] Most important, the new guidelines emphasize the need for use of two phospholipid-dependent coagulation tests based on different principles to optimize detection of lupus anticoagulant: the dilute Russell viper venom time and a lupus anticoagulant–sensitive aPTT (with low phospholipids and silica as activator).

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Antiphospholipid syndrome (APS) is a rare disease in which patients display prolonged coagulation test results *in vitro*, but usually develop thrombotic symptoms *in vivo*. Patients with APS are at increased risk of valvular heart disease or coronary vascular disease, conditions that often necessitate cardiac surgery via bypass. The management of anticoagulation during cardiopulmonary bypass (CPB) is particularly challenging in these patients because of the unique features of APS. Patients with APS are constantly at risk of arterial and venous thrombotic events. Therefore it is very important to maintain proper anticoagulation perioperatively, especially during CPB. In this paper, we present three successful cases of APS patients who underwent cardiac surgery with CPB. (Korean J Anesthesiol 2014; 66: 164-168)

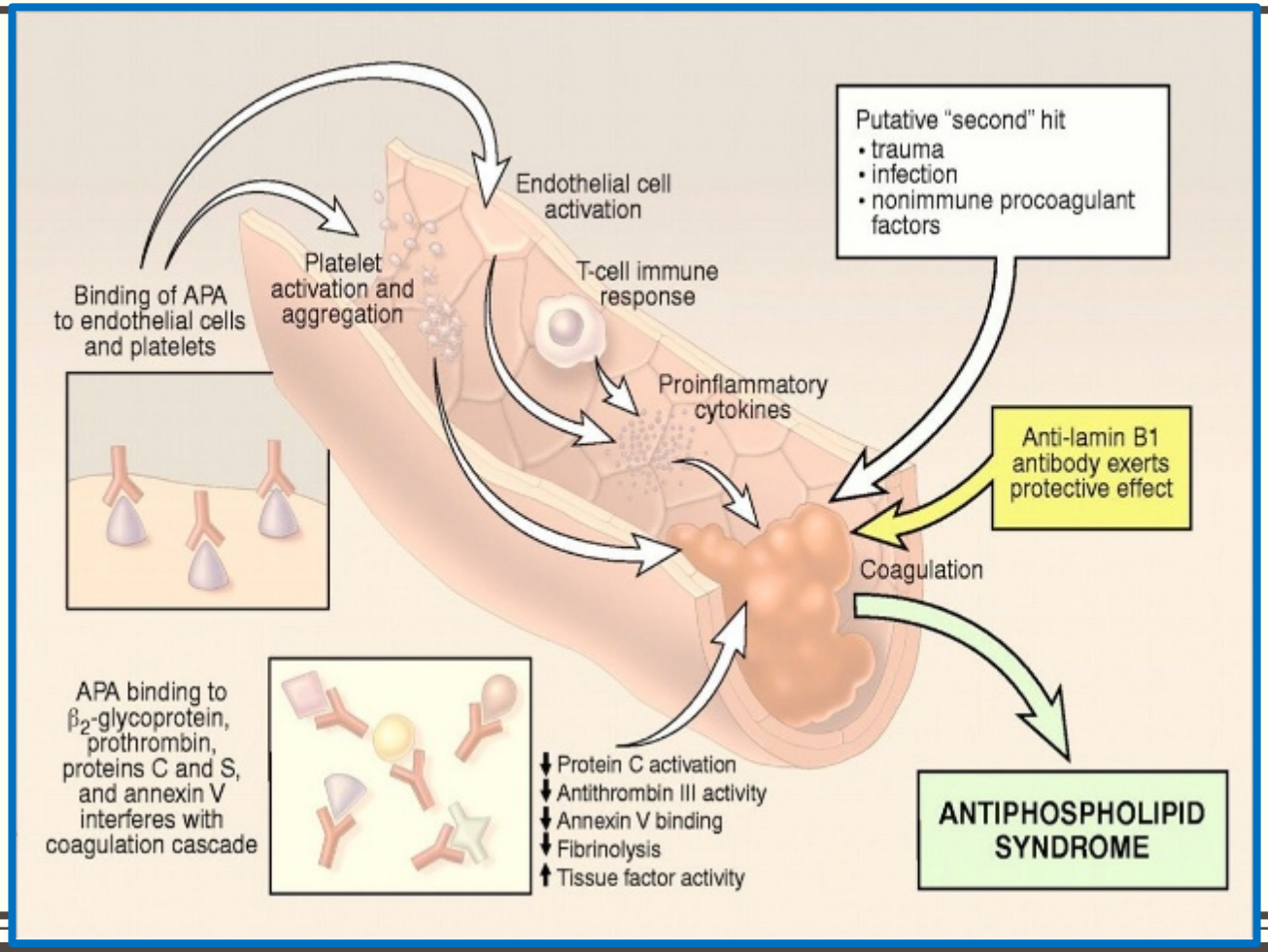
Case Report

Korean J Anesthesiol 2014 February 66(2): 164-168
http://dx.doi.org/10.4097/kjae.2014.66.2.164

Anesthetic management of antiphospholipid syndrome patients who underwent cardiac surgery
-three cases report-

Hyunwook Cho, Yunseok Jeon, Deok Man Hong, Hyun Joo Kim, and Jeong Jin Min

What a big mess!



https://image.slidesharecdn.com/antiphospholipidsyndrome-141014120624-conversion-gate01/95/antiphospholipid-syndrome-19-638.jpg?cb=1413290258

How do we translate this to CPB:

- ❑ Ideally maintain normothermia
- ❑ Omit antifibrinolytic use during cardiac surgery… At least without the ROTEM system
- ❑ Use cell-saver before and after the cpb period
- ❑ Be prepared to transfuse anykind blood products
- ❑ Pre and post membrane monitoring in CPB circuit
- ❑ No retro-autologous priming of the CPB circuit
- ❑ Early given and secured level of antico

Severe antiphospholipid syndrome and cardiac surgery: Perioperative management

Pankaj Kumar Mishra[1], Fayaz Mohammed Khazi[2], Patrick Yiu[1] and John Stephen Billing[1]

Asian Cardiovascular & Thoracic Annals
2016, Vol. 24(5) 473–476

DOI: 10.1177/0218492315577879
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Management of a Patient With Antiphospholipid Syndrome Undergoing Aortic Valve Replacement Using the Hepcon Hemostasis Management System Plus and Rotational Thromboelastometry: A Case Report

Yuriko Samejima, MD, Mitsuharu Kodaka, MD, Junko Ichikawa, MD, Tetsu Mori, MD, Kazuyoshi Ando, MD, Keiko Nishiyama, MD, and Makiko Komori, MD

(A&A Case Reports. 2017;8:100–4.)

Many techniques for the "safe" anticoagulation level

- Use an excess of heparin (≈ 5 mg/kg) and run your ACT ≥ 999sec (Kaolin = ok/Celite= less affected)

OR

- Run Anti-Xa around ≥ 4u/ml during the cpb period (… possible lab issues…)

OR

- **Run HMS Plus – heparin concentration tests ≥ 3-4 u/ml (2,2-3mg/kg)**

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(A&A Case Reports. 2017;8:100–4.)

October 5th, 2017

What a chance: Alex caught the 2nd one!

I was SO ready that time!

Welcome aboard!

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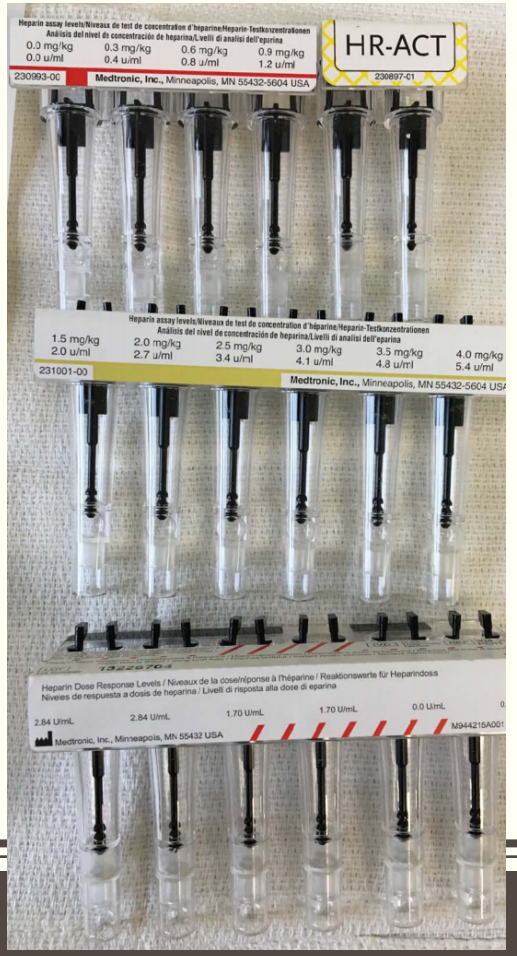
- We purchased the HMS Plus system a year ago
- We learned through time to use it
- Because of the two APS we had to get on board!



HMS Plus in action: Clinical cases Presentation

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Case no.	1	2
Sex/Age	F/50	M/50
Presentation and lab results	**Known primary APS 2003** DB, HTN, Psychiatric history, Anemia, Pulmonary Vasculitis, Pneumonia x 3, Ascites requiring peritoneal drainage, sepsis prior to 1st surgery	**Known secondary APS 2005 (SLE)** 2016: Pericarditis PCIs: 2007x2+2015+2017x2 DB, IVC mesh filter,
Pre-CPB blood work	HB 89, PLT 123, Creat 302, INR 1.2, PTT 78	HB 146, PLT 161, Creat 59, INR 0.93, PTT 174
APS Manifestations	DVT, multiples TIA, CAPS 2014+2017, HS, **ACA + (IgG/IgM)** **DRVVT ↑**	2005: PE+ DVT **ACA + (IgG)** **Anti-B_2-Glycoprotein-1 +** **DRVVT ↑**
Echo/coronaro findings	Libman-Sacks endocarditis, Cardiomyopathy, MR, MS, TR	CAD (LAD 70-50%, RC: 60%, Cx: 70%)
Pre-CPB medication	Lovenox, Humulin R, Lasix	Eliquis, ASA, Brilinta, Plaquenil

APS: Antiphospholipid Syndrome, ACA: Anticardiolipin antibody, HS: Hepatic steatosis, DVT: Deep vein thrombosis, TIA : Transient ischemic attack, CAPS : Catastrophic APS, AKI: Acute kidney injury, HTN: hypertension, MR: Mitral regurgitation, MS: Mitral stenosis, TR: Tricuspid regurgitation, DRVVT: Dilute Russel Viper Venom time, SLE: Systemic Lupus Erythematosus, MPE: Pulmonary embolism, PCI: Percutaneous coronary intervention, CAD: coronary artery disease.

HMS Plus in action: Clinical cases Presentation

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Case no.	1	2
Surgery	MVR, TR	CABG x 4
CPB data	CPB Time: 165min (36°C) Crossclamp: 123min Initial warm induction with Del Nido followed by cold maintenance (21-7°C)	CPB Time: 69min (36°C) Crossclamp : 38min Warm CPG HighK (22°C)
Postoperative events	Extubated 24h Discharged ICU: POD 8 Passed away: POD16 (CPR-Tamponade)	Extubated 4h Discharged ICU: POD2 DC Home: POD5

MVR: Mitral Valve Replacement, TR: Tricuspid Repair, POD: Post op day, DC: discharged, CPR: Cardio-Pulmonary resuscitation

HMS Plus in action: Clinical cases Presentation

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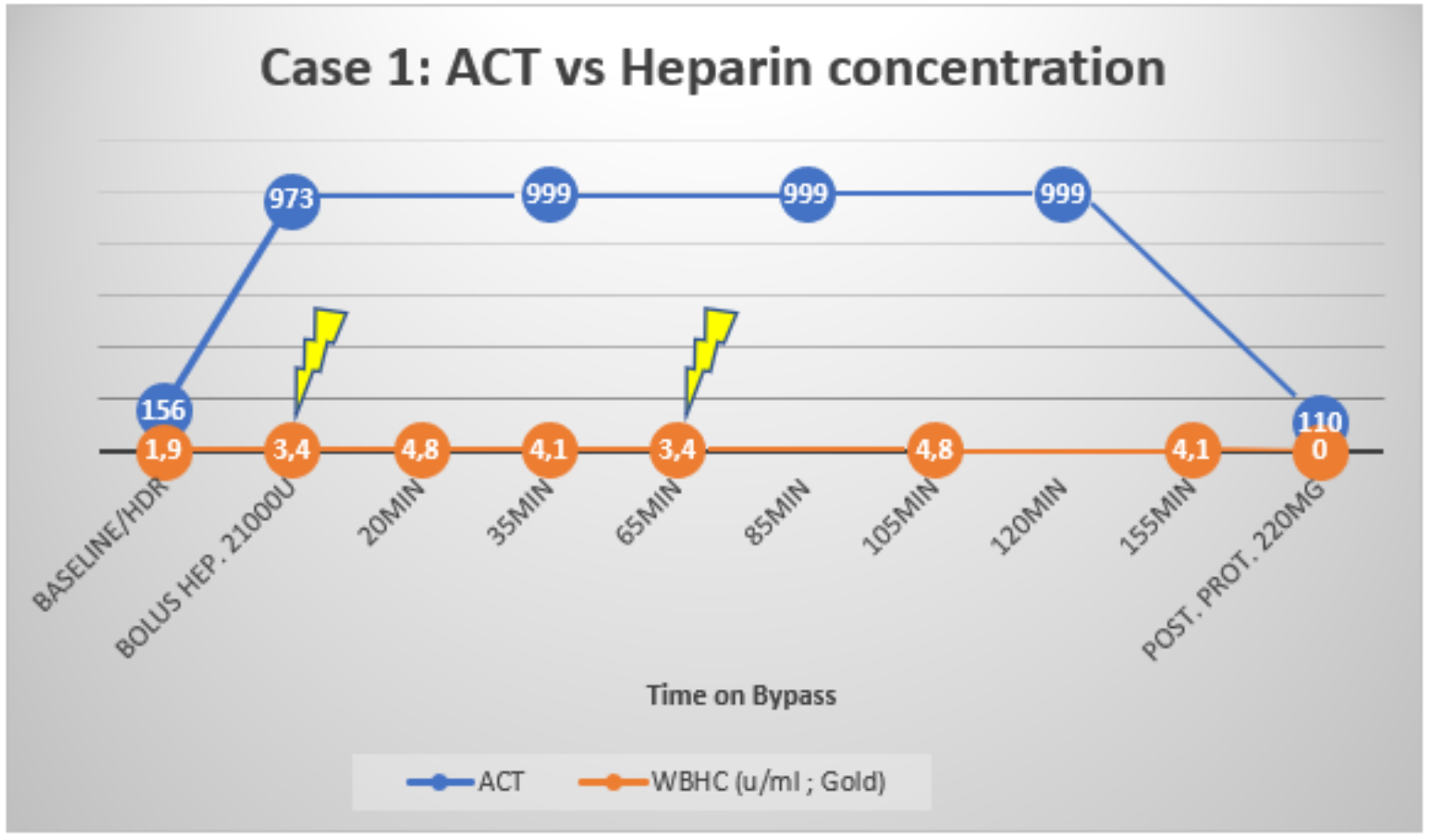

HMS Plus in action: Clinical cases Presentation

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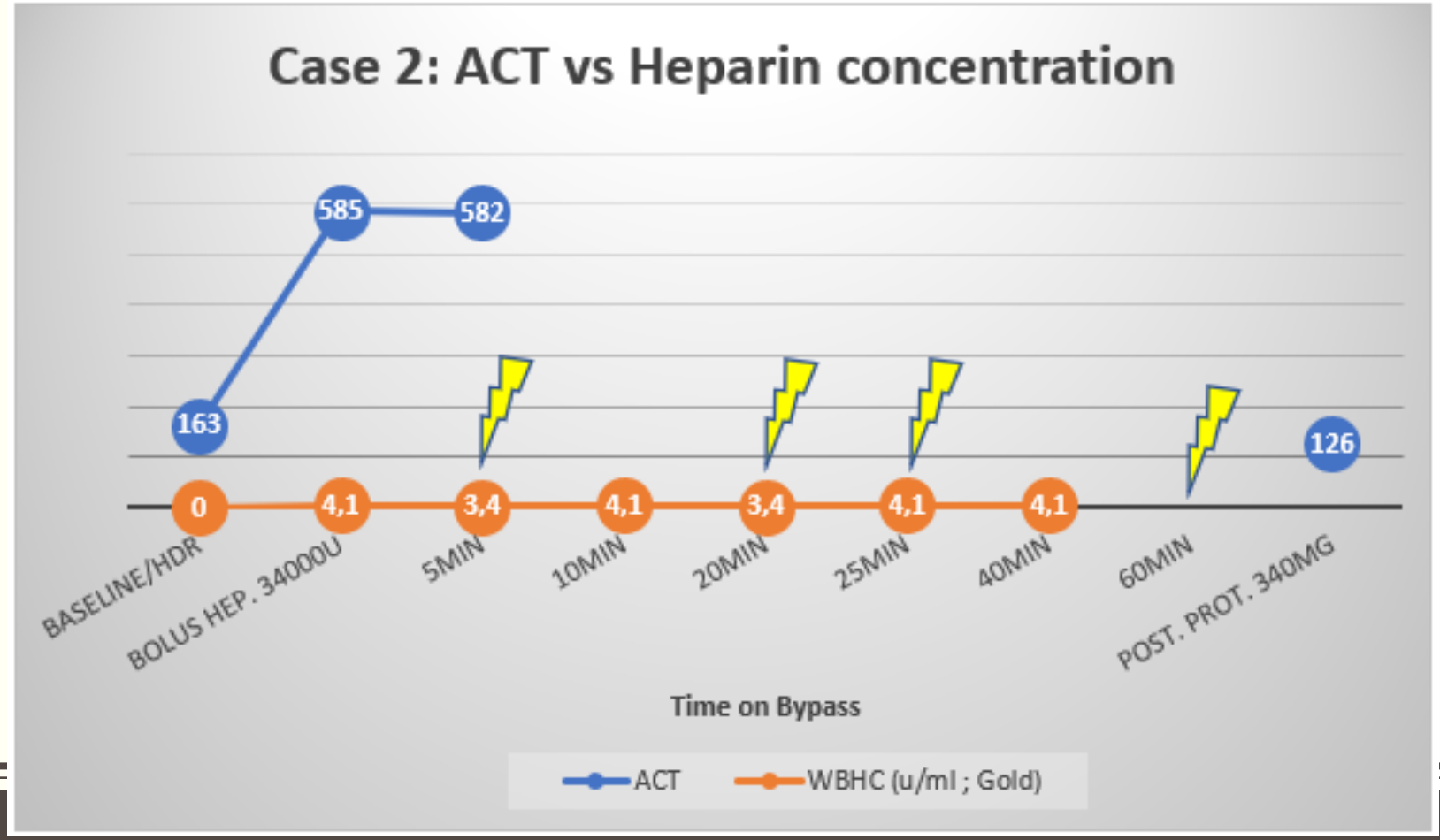

Conclusion:

- Young expertise in our center
- Evidence based approach definitly helped
- **HMS Plus was used** with the Heparin concentration test in both cas
- No significant events during both CPB periods
- Sufficient anticoagulation maintained
- NO OBSERVED CLOT IN BOTH CIRCUITS
- GOOD LUCK to all of you now!

Acknowledgments:

- The CSCP organizers

AND