Case Report: Vaginal Delivery and A Tale of Two Ventricles (Transposition of the Great Arteries, d-TGA), Simply Baffling!

Ishan Garg, D.O.
Anesthesia Resident, PGY-3
HJ Huffnagle DO, DJ Katz DO, SL Huffnagle DO, JT Wenzel MD,
CR Hoffman DO, E Sims MD
Thomas Jefferson University Hospital
Philadelphia, PA, USA

VAPOR
September 25-28, 2021

Disclosures

I have NO financial disclosure or conflict of interest with the presented material in this presentation

Background - dTGA

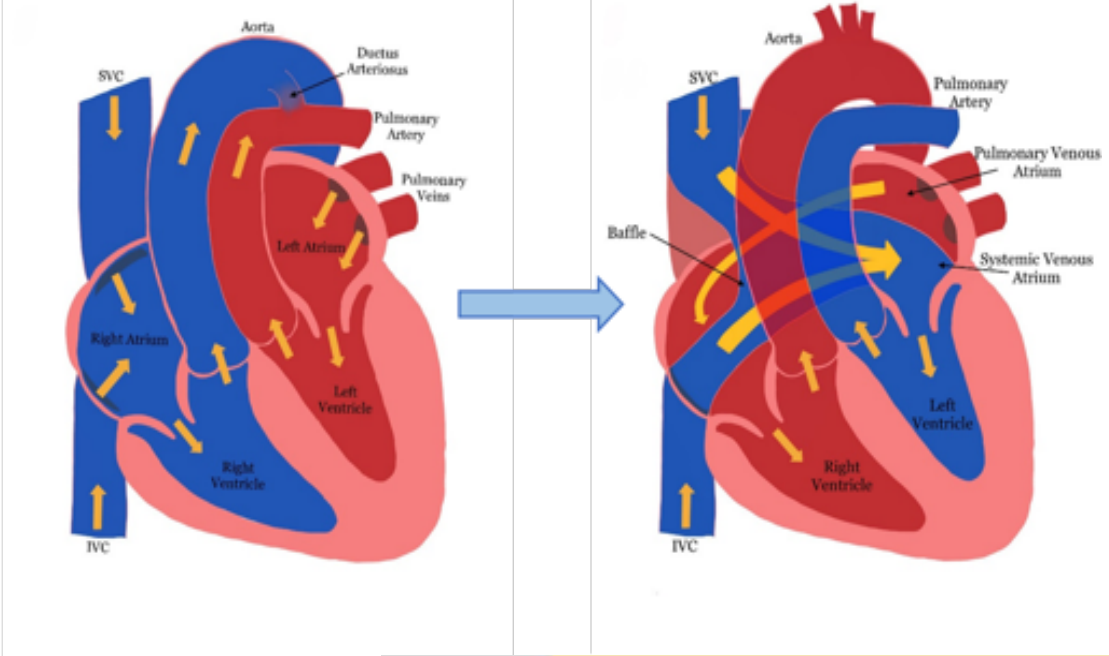
Characterized by:
- Atrioventricular concordance
- Ventriculoarterial discordance

Results in circuit in parallel, leading to cyanosis

Surgical interventions (e.g. Mustard procedure) correct parallel circuit to series circuit

Patients now able to reach child-bearing age

Fig 1. Diagram depicting d-TGA circulation before and after Mustard procedure



Case Report

35 y/o, G2P0 at 39 5/7 for induction of labor

PMx: d-TGA, ADHD, tobacco use disorder
PSx: Mustard repair (age 6)

TTE @ 34 weeks: mod/severe RV dilation with hypokinesis, bi-directional baffle flow, and TAPSE 1.4 cm.

NYHA class 1

Anesthetic Plan and outcomes:

- Multidisciplinary collaboration with MFM, OB anesthesia, cardiology
- Arterial and PA catheters placed to monitor baffle pressures/volume
- Early epidural initiated to avoid catecholamine surges
- Slow incremental dosing without boluses achieved optimal analgesia
- Patient progressed rapidly. Had an uncomplicated SVD
- TTE performed on PPD 2 was unchanged.

Discussion

CV changes during pregnancy include an increase in blood volume and CO (40–50%)

During labor, CO increases further, putting strain on the RV, and may lead to CHF, arrhythmias (A-fib/flutter), baffle leak, stroke, deterioration of NYHA functional class, or death

GOALS: Must avoid increases in afterload and catecholamine release! Optimize O2 delivery, maintain euvolemia, treat any arrhythmias

HOW?

- Early epidural placement without bolus dosing. Deviations in SVR, preload, and HR are treated by titrating fluids and vasopressors. Alternately, a continuous spinal will allow slow titration of reliable analgesia
- Noninvasive monitors (NIBP, SpO2, ECG), are reasonable when RV function is adequate BUT an arterial catheter and TTE allow rapid assessment/intervention with changing hemodynamics
- A shortened, forceps-assisted 2nd stage avoids increases in RV afterload with pushing

CAUTION: Oxytocin causes vasodilation and pulmonary HTN if given quickly; Ergot alkaloids may increase SVR and PVR.

Monitor carefully postpartum – significant risk for heart failure as caval compression is gone, uterine autotransfusion occurs, and accumulated fluid is mobilized

Plasmapheresis with human donor plasma in COVID-19 pneumonia

with significant clinical, laboratory and imaging improvement during 96-hour treatment

Authors / Credentials:

Dr. Maria Campos Yatzkan, MD

Dr. Michael A. Talalaev, DO

LARKIN COMMUNITY HOSPITAL

In Covid-19 cases...

- Respiratory distress appears to include a crucial vascular insult that mandates a different treatment approach
- Attenuating circulating cytokines and other mediators by blood purification techniques, and removal of bioactive molecules can be a useful adjunct to standard treatment in patients with SARS-CoV-2 pneumonia

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A 57-year-old female with confirmed COVID-19 infection, and history of hypertension was admitted with moderate respiratory distress.

- Bodyweight: 208 lbs
- Height: 62 inches
- BMI: 30.7
- CrCl: 81.55

Patient reported moderate to severe shortness of breath and dry cough over the preceding 48 hours

*Not an acutal patient

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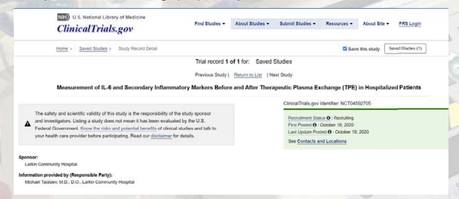
Patient Enrolled in Clinical Study:

Measurement of IL-6 and Secondary Inflammatory Markers Before and After Therapeutic Plasma Exchange (TPE) in Hospitalized Patients



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Plasma Exchange Treatment

- Within 12 hours after obtaining consent underwent plasmapheresis of 1.5 plasma volume with 4.5L of human donor plasma
- Based on the rounded up calculation of [1.25 x 0.07 x weight in kg x (1-hematocrit)]
- Followed by infusion of 1 unit of convalescent plasma

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Plasma exchange with human donor plasma was repeated in approximately 48 hours, followed by administration of an additional unit of convalescent donor plasma.

- C-reactive protein levels dropped from 10.9 mg/L prior to treatment to normal levels
- 4-fold reduction in the first 24 hours after first exchange
- Similar improvement was observed in the levels of ferritin
- Levels of Interlukin-6, D-dimer and LDH decreased from significantly above normal to near normal range.

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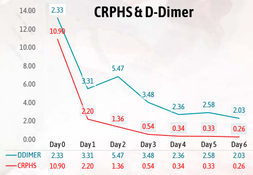
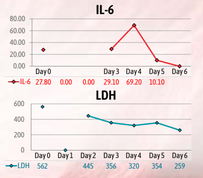
During the 96-hour course of her treatment patient demonstrated significant and consistent clinical as well as laboratory improvement:





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Chest Radiograms

- Prior to treatment
- 24 hours
- 48 hours
- 96 hours

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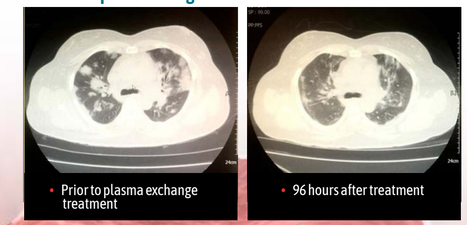
Chest Computer Tomogram



- Prior to plasma exchange treatment
- 96 hours after treatment

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Subjective and objective clinical improvement corresponded

- Remarkable improvement of daily chest radiograms and computer tomography of the lungs performed before and after treatment
- Patient was maintained on oxygen via non-rebreather mask, followed by O2 via nasal cannula after standard treatment protocol was completed.
- Downgraded to telemetry observation after plasmapheresis treatments
- Discharged home with self-care within 48 hours after the second plasma exchange

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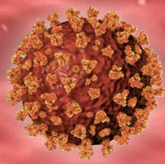
This case illustrates that plasmapheresis treatment combined with transfusion of convalescent plasma may be a viable treatment modality for COVID-19 patients



- This is one of the few successful treatment examples, and further research is indicated to obtain statistically significant outcomes.
- Plasma exchange treatment presents minimal risks with a potential for substantial reduction of morbidity and mortality in COVID-19 patients.