Case Report: Extracorporeal Membrane Oxygenation to Facilitate Cytolytic Therapy in a Patient with Sensitive Metastatic Nonseminomatous Germ Cell Tumor

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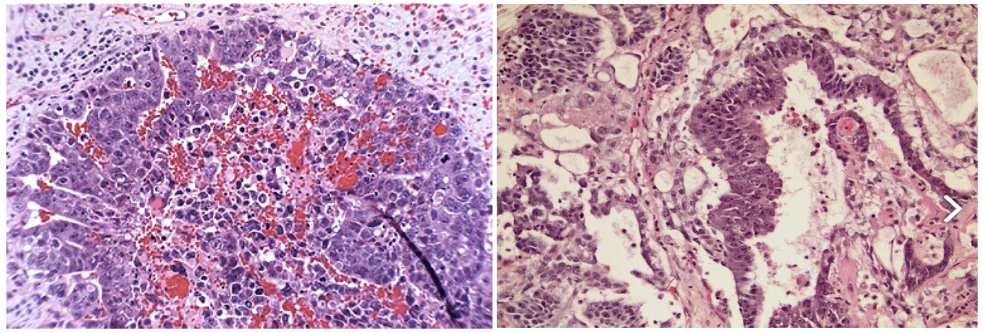
Introduction

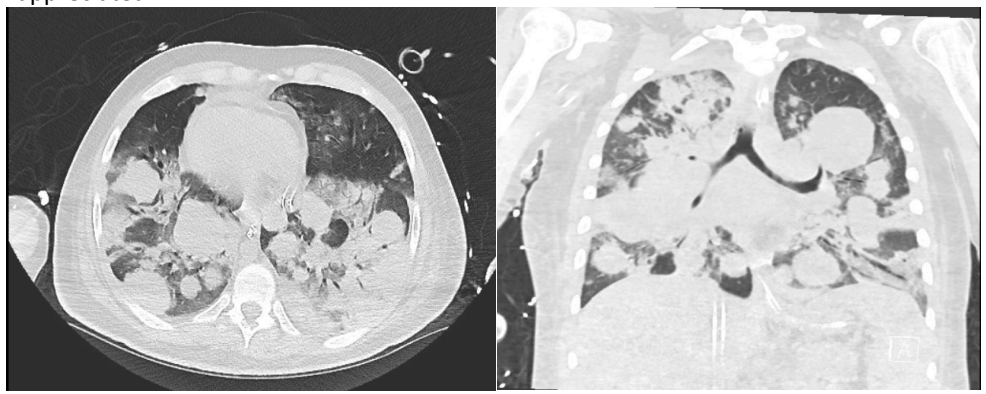
- Extracorporeal membrane oxygenation (ECMO) has several indications in the management of severe cardiopulmonary failure.
- The use of ECMO has extended beyond these traditional indications and may help support patients with uncommon problems that are potentially reversible.
- Metastatic malignancy has been considered a contraindication to ECMO support.

Case Presentation

26 year old male presented to hospital with testicular discomfort and shortness of breath. Evaluation identified metastatic testicular nonseminomatous germ cell tumor with pulmonary, hepatic and renal metastasis. He underwent right orchiectomy but required prolonged intubation due to persistent hypoxic respiratory failure. It was decided through a multimodality team approach that this patient would benefit from chemotherapy if he were to be bridged with ECMO. Patient was placed on V-A-V ECMO with arterial limb due to acute heart failure and additional venous return limb in place to deliver oxygenated blood to lungs along with chemotherapeutic agents. He completed cycle 1 of VIP treatment, receiving 5 days of Cisplatin and Etoposide and 4 of 5 days of ifosfamide due to concern for toxicity. Unfortunately, patient developed severe complications including persistent cardiopulmonary failure, renal failure, limb ischemia, pancytopenia, coagulopathy and septic shock. After discussion with family and palliative medicine, decision was made for withdrawal of life sustaining treatment, and patient expired soon thereafter.



Light microscopy of testicular NSGCT embryonal carcinoma. Glandular elements are seen with cells showing large pleomorphic vesicular nuclei. Areas of necrosis are also appreciated.

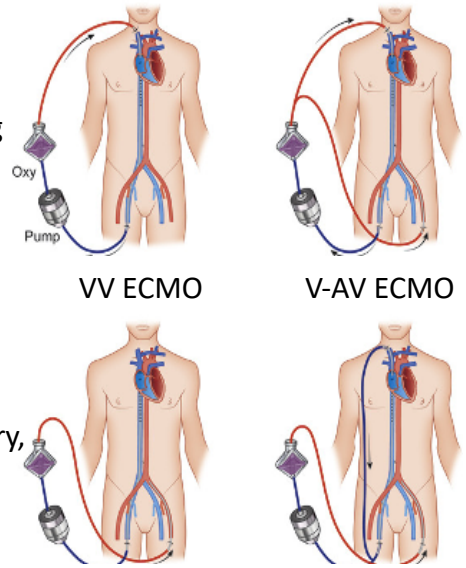


Axial and coronal CT imaging showing widespread pulmonary metastasis from testicular NSGCT.

References:
- Carro SE, Essex DW, Alsammak M, Bains A, Toyoda Y, Keshavamurthy S. Mediastinal Lymphoma Presenting in Cardiogenic Shock with Superior Vena Cava Syndrome in a Primigravida at Full Term: Salvage Resection after Prolonged Extracorporeal Life Support. Case Rep Oncol. 2019 Jun 4;12(2):401-410. doi: 10.1159/000499195.
- Mangukia C, Brann S, Patel S, Jaffe F, Stewart J, Sunagawa G, Toyoda Y. Veno-arterial extracorporeal membrane oxygenation as a bridge to cytolytic therapy. Indian J Thorac Cardiovasc Surg. 2020 Jul 21;36(6):1-3. doi: 10.1007/s12055-020-00992-3.

Discussion

This case demonstrates a proof of concept that ECMO can be used to support patients with critical illness and metastatic cancer through cytolytic therapy. Contraindications to ECMO have traditionally included end stage malignancy as the pre-existing condition is incompatible with recovery. However, aggressive cancers causing acute cardiopulmonary failure but are highly sensitive to chemotherapeutic agents may be managed by bridging patients with ECMO while receiving treatment. These decisions should be made in a multimodality team approach, including cardiothoracic surgery, intensivists, and medical oncologist.



Conclusion

- ECMO as a bridge to recovery and delivery of cytolytic therapy in patients with highly sensitive metastatic malignancies should be considered
- Multimodality team approach should be used in decision to use ECMO as bridge to treating metastatic malignancy