



Blood Volume Analysis (BVA) Clinical Case Study

Congestive Heart Failure (Diastolic) With Marked Elevation of BNP

History:

This eighty-three year old male, 64" height and 169lbs complains of shortness of breath with minimal exertion. His past medical history includes CAD and aortic valve disease diagnosed and followed in clinic monthly for 24 months following an episode of endocarditis. Patient still refused surgery following antibiotic therapy. Patient admitted for surgical repair of the aortic valve after an episode of congestive heart failure.

BVA Results:

Blood Vol.	4562cc	Ideal Blood Vol.	5097cc	Deficit	536cc	Devtn.	-10.5%
Red Cell Vol.	1171cc	Ideal Red Cell Vol.	2067cc	Deficit	895cc	Devtn.	-43.3%
Plasma Vol.	3990cc	Ideal Plasma Vol.	3031cc	Excess	360cc	Devtn.	11.9%

Normal
0 to 8%

Mild
8 to 16%

Moderate
16 to 24%

Severe
24 to 32%

Extreme
>32%

Hematocrit: 29%

BNP: 2350 (NYHA Class IV)

Clinical Analysis:

This patient has mild hypovolemia due entirely to reduced red blood cell mass (-43.3%). Although this patient has a markedly elevated BNP measurement, he is hypovolemic. This is left ventricular dysfunction without volume overload. Plasma volume shows mild incomplete compensatory expansion for anemia. Diuretic therapy in this patient might increase the potential for pre-renal azotemia and less than favorable hemodynamics. The patient may benefit from transfusion and correction of plasma volume expansion, post transfusion.

Conclusion:

The results are consistent with left ventricular dysfunction without volume overload in spite of the BNP measurement.

Technical Analysis:

Technical analysis consists of an evaluation of five separate blood volume collection points with mathematical evaluation of consistency. Technical evaluation is reported as acceptable or unacceptable. All five individual sampling points, tested in duplicate, were internally consistent with no significant deviations. This result is technically acceptable.