

RIGHT VENTRICULAR STRAIN AS A PREDICTOR OF VASCULAR FILLING RESPONSIVENESS IN CARDIAC SURGERY

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BACKGROUND AND GOAL OF STUDY

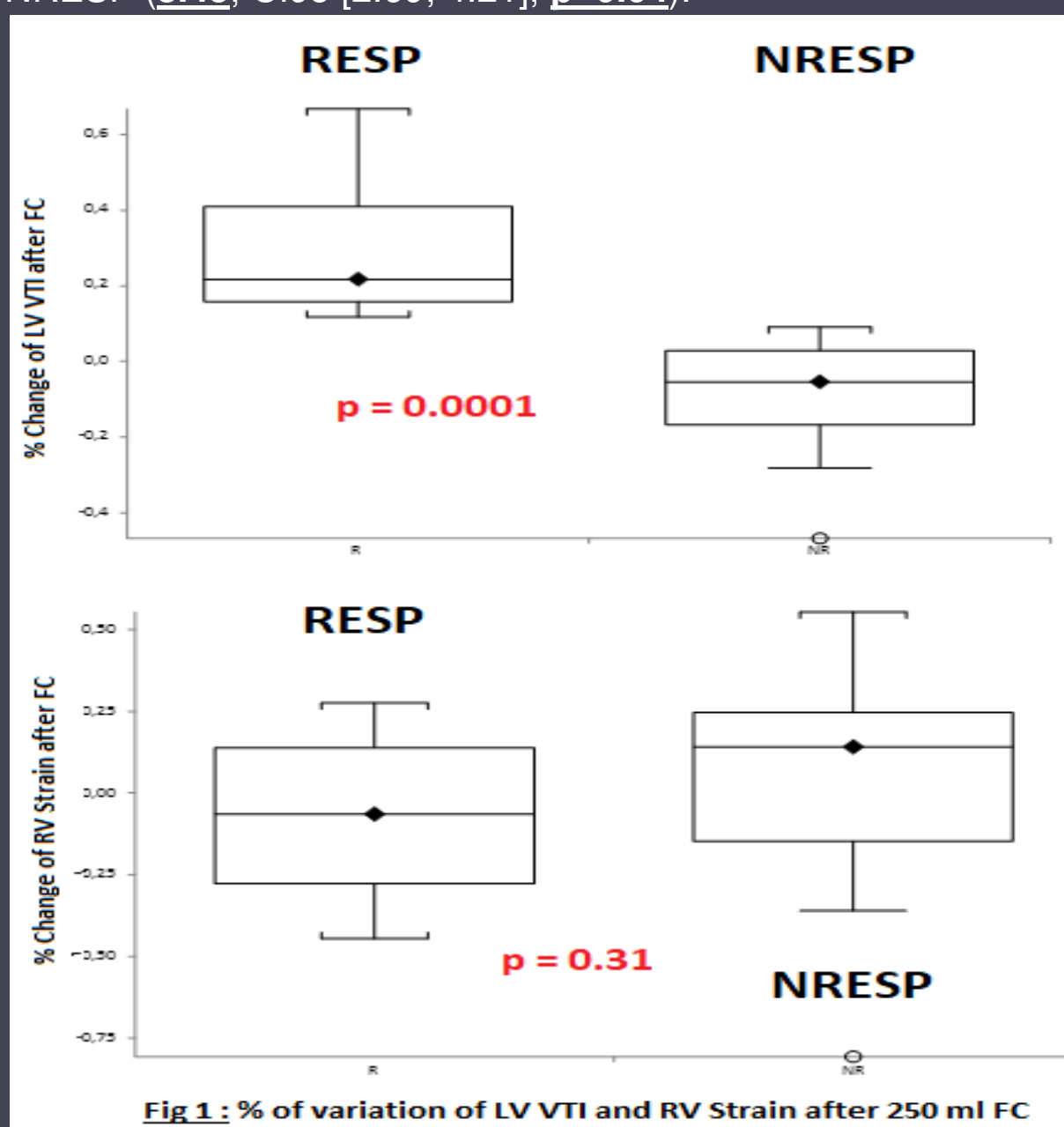
Fluid infusion to optimize cardiac output (CO) is a challenge during cardiac surgery (CS). There are no accurate indices to determine fluid responsiveness in this setting (1). No study has examined the accuracy of intra-operative right ventricular longitudinal strain (RVLS) (2, 3) in determining preload dependence during a fluid challenge (FC). We hypothesized that changes in RVLS could predict preload dependence during a FC in CS patients.

MATERIALS AND METHODS

- **Design** : observational, prospective study in CS patients.
- **Materials** : TEE after general anesthesia and before sternotomy
- **Measurements** : LVEF, RV indices and VTI ; performed before and after a 250ml FC.
- **Responders** (RESP) → increase of 10% in VTI
- **Statistics** : RESP and nonresponders (NRESP) compared by Student-t and Chi² tests (p<0.05 significant).

RESULTS

- 26 patients (74,3%) NRESP
- Mean **RVLS** before FC : **-18.12** +/- 2.31% (CI95 [- 20.05; -16.19]) in RESP vs **-18.5** +/- 4.92% [CI95 -20.58; -16.42] in NRESP (**p=0.38**)
- Mean **RVLS** after FC : **-16.37** +/- 4.9% (CI95 [-12.26; -20.48]) in RESP vs **-17.7** +/- 4.02% (CI95 [-16; -19]) in NRESP (**p=0.22**)
- No difference in **S' values** in RESP (**8.47**, CI95 [6.98; 9.97]) vs NRESP (**8.05**, CI95 [7.18; 8.93], **p=0.29**).
- Significant difference in **IVA values** in RESP (**2.68** CI95 [2.1; 3.27]) vs NRESP (**3.45**, CI95 [2.69; 4.21], **p=0.04**).



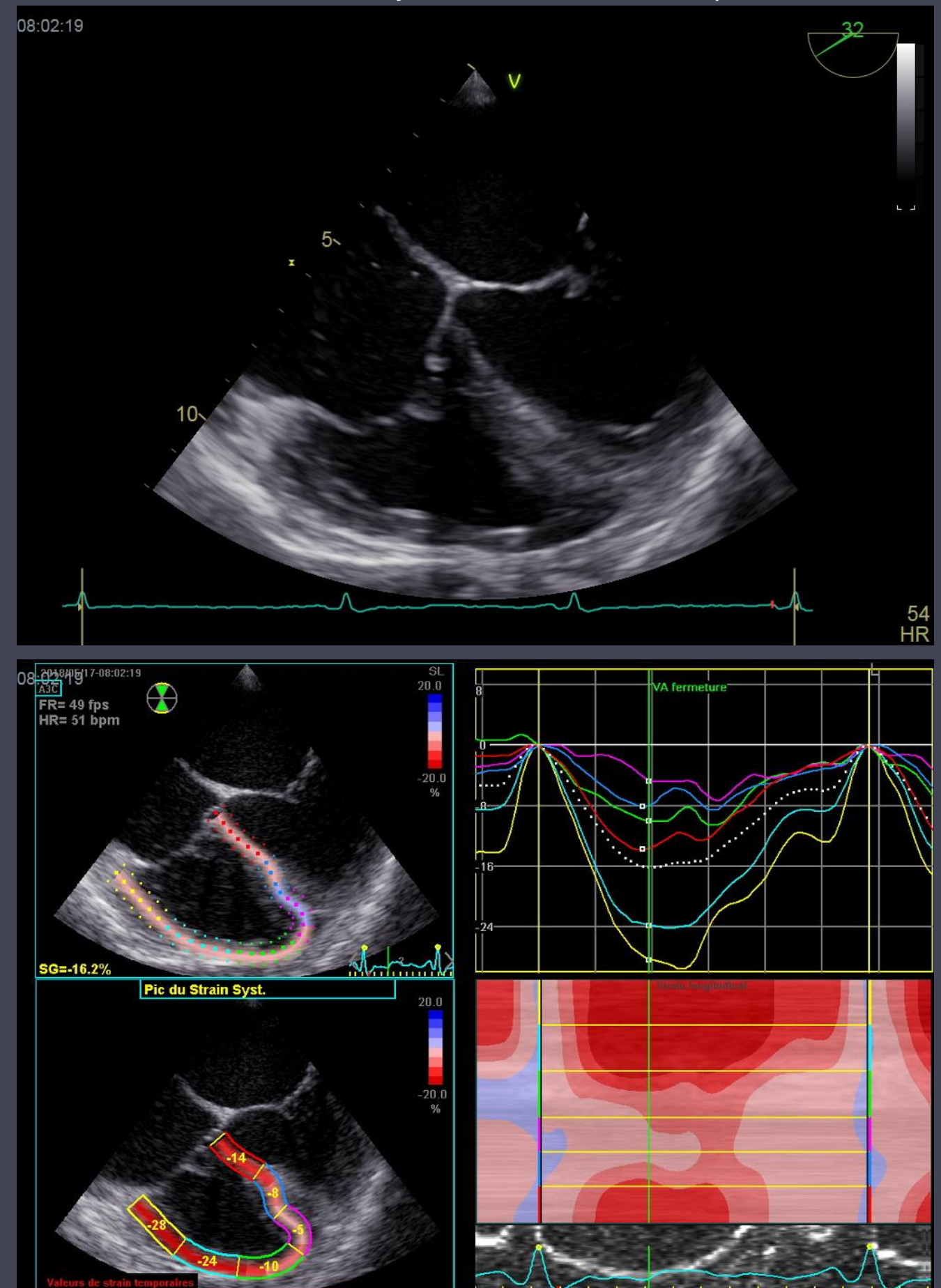
PATIENT CHARACTERISTICS					
	n	Mean	SD	Median	IC 95%
Age (years)	37	66	9,6	67	62,8 - 69,2
Height (cm)	37	170	8,1	171	167,6 - 175
Weight (kg)	37	83,9	17,2	80	78,15 - 89,6
body Surface	37	1,92	0,22	1,96	1,9 - 2,05
Haemoglobin (g/dL)	35	13,5	1,65	13,5	12,9 - 14
GFR (ml/min)	37	71,5	21,2	71	64,8 - 78,8
LVEF (%)	37	61,6	10,8	60	57,5 - 64,7
SannT	36	8,23	2,1	7,85	7,52 - 8,94
IVA	36	3,23	1,66	3	2,66 - 3,79
PASP (mmHg)	25	25,6	12,62	25	20,4 - 30,7

DISCUSSION

This study is the first to examine strain values as a dynamic index using a FC. Increasing preload using a 250ml FC did not modify RVLS in cardiac surgery patients under general anesthesia and mechanical ventilation. However, we observed a non-significant increase (deterioration) of RVLS in NRESP (Fig 1).

CONCLUSION

RVLS cannot be used as a dynamic index of fluid responsiveness.



1. Clin Physiol Funct Imaging.2017
2. Anesth Analg.2017;125(5):1475-8
3. Anesth Analg.2014;118(3):525-44