

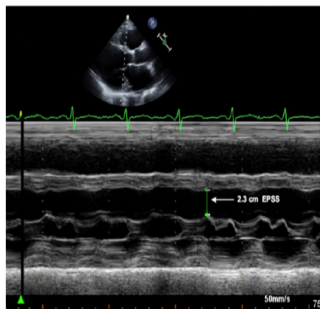
JOURNAL READING

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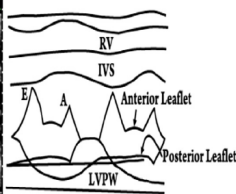
Original Contribution

E-point septal separation: a bedside tool for emergency physician assessment of left ventricular ejection fraction

Conor J. McKaigney, MD^{a,b,*}, Mori J. Krantz, MD^{c,d}, Cherie L. La Rocque, MSc^e, Nicole D. Hurst, MD^{b,f}, Matthew S. Buchanan, MD^{b,g}, John L. Kendall, MD^{b,h} American Journal of Emergency Medicine 32 (2014) 493–497



EPSS < 6mm: normal EF
 6 < EPSS < 12mm: low normal EF
 EPSS > 12mm: low EF



Goal:

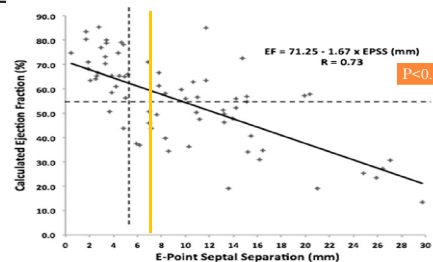
- 在急診為了快速診斷HF，會使用超音波，目測心臟動的好不好，即global cardiac function(GCF)。
- 然而GCF會因不同的人而改變，目前並沒有研究顯示GCF與最終心臟科醫師做的LVEF的相關性。
- 目前有人提出EPSS與LVEF成高度負相關，而測量EPSS一樣很簡單易上手，此研究希望用EPSS(定量分析)取代急診常做的GCF，讓診斷更準確

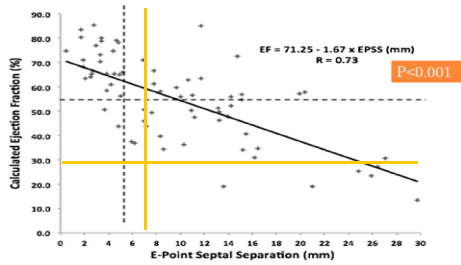
Method:

- Prospective observational study
- 2012/02~2012/04, 加拿大一級醫院,共80位pt
- Inclusion: 只要急診醫師有排心超(TEE)
- Exclusion: Age < 18y/o, pregnancy
- 隨機選擇23pt(30%)做第二次bedside echo, 來比較 interrater reliability
- 計算EPSS與LVEF的相關性
- 計算GCF與LVEF的吻合度
- GCF: 用subxiphoid, parasternal long, parasternal short, apical views
- EPSS: parasternal long-axis view where M-mode

Table
 Demographic and physical examination variables

	Mean	SD	Range
Age (y)	58.0	15.1	22-100
Heart rate (beats/min)	81.0	14.9	12-126
Respiratory rate (breaths/min)	16.9	2.7	12-26
Systolic blood pressure (mm Hg)	127.1	21.2	93-189
Diastolic blood pressure (mm Hg)	73.2	14.1	23-117
Weight (kg)	84.9	24.9	43-115
Study interval time (min)	360	474	11-1620





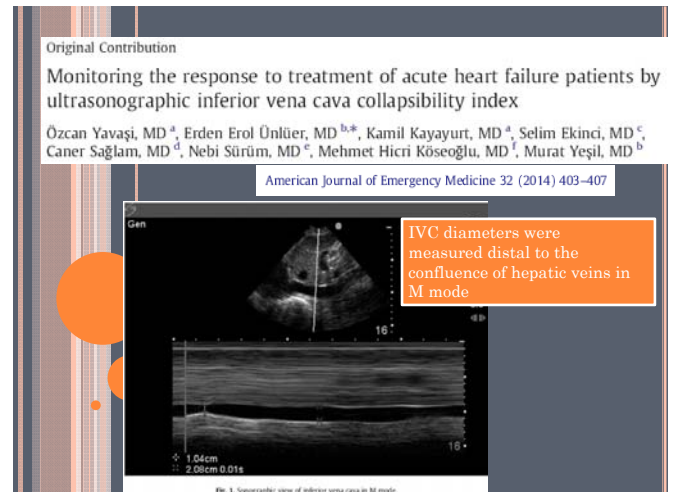
- EPSS>7mm, LVEF ≤30%的sensitivity為100.0% (95% CI, 62.9-100.0) ; specificity為 51.6% (95% CI, 38.6-64.5)
- LR+: 2.07(Weak evidence to rule in disease)
- LR-: 0.00(Strong evidence to rule out disease)

	Normal (>55%EF)	Moderate reduced (30~55%EF)	Severe reduced (<30%EF)
LVEF	57.7%	32%	11.3%
GCF	51.9%	24.7%	23.4%
agreement	75.6%	x	100%

- GCF與LVEF吻合度 $\kappa=0.58$ (moderate)
- Interobserver GCF吻合度 $\kappa=0.49$ (moderate)
- Interobserver EPSS(Spearman $r = 0.87$; $P<0.01$)(高度相關)

○ 結論: EPSS好用又上手, EPSS比GCF更好的代表LVEF, 且EPSS若>7mm, 則判斷病人有EF<30%的Sensitivity到100%

- Limitation:
- 未排除MS, valvular disease, BBB, Af
- 大部分病人都是normal function, 只有少數病人位於severe reduced function(EF<30%)
- TEE和做bedside echo的期間拉得太長



○ Goal:

- 目前在急診無好的指標來顯示AHF的病人治療有效, 目前都是用臨床symptom/signs來判斷治療效果及預後.
- 此篇研究想測量NT-proBNP在治療前後是否有變化
- 想測量IVC diameter及IVC-CI(collapsibility index)在AHF治療前後的變化, 是否顯著到可用以判斷治療有效

Method:

- Prospective cohort study, 2009/01~2010/01, 一家土耳其醫學中心
- 50名健康志願者的IVC diameter當作control
- 總共47名AHF pt, 心臟科醫師決定要出院或住院時, 再抽一次BNP及測IVC
- Inclusion: 所有大於18y/o來ED的診斷為AHF
- Exclusion:
 - <18y/o, pregnancy, liver transplantation,
 - mechanical ventilation, acute abdomen, renal failure,
 - patients who were transferred from other hospitals after the administration of diuretics, bronchodilators, or vasoactive medicines,
 - inability to consent for the study

入ED30min內請心臟科醫師做快速心超來確認AHF的診斷(Blinded)

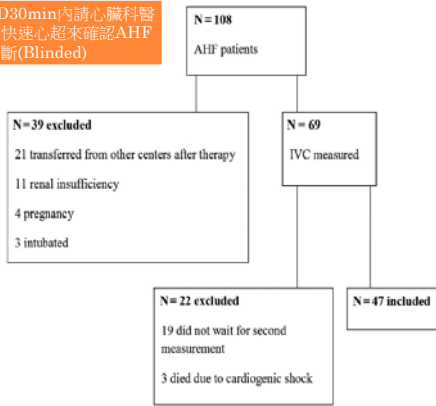


Fig. 2. Patient flow diagram.

Table 1
Patient demographics

	Patients	Controls
Total no. of patients	47	50
Mean age	70.89 ± 10.64	62.92 ± 8.76
Sex		
Women	27 (57.4%)	22 (44%)
Men	20 (42.6%)	28 (56%)
Hypertension	26 (55.3%)	-
Diabetes	16 (34.0%)	-
COPD or asthma	14 (29.8%)	-
Coronary artery disease	20 (42.6%)	-
Atrial fibrillation	20 (42.6%)	-
History of HF	41 (87.2%)	-

Acute HF patients were divided into 6 groups according to the guidelines of the European Society of Cardiology:

- (1) worsening or decompensated chronic HF (24/47)
- (2) pulmonary edema (3/47)
- (3) hypertensive HF (9/47)
- (4) cardiogenic shock (0/47)
- (5) isolated right HF (8/47)
- (6) acute coronary syndrome and HF (3/47)

Table 2
The IVC parameters of the control and patient groups before and after treatment

	IVCexp	IVCins	IVC-CI
Before treatment	2.10 ± 0.37	1.63 ± 0.40	22.80 ± 10.97
Control group	1.57 ± 0.24	0.90 ± 0.26	43.09 ± 13.63
P	<.001	<.001	<.001
After treatment	1.85 ± 0.41	1.14 ± 0.42	39.75 ± 14.48
Control group	1.85 ± 0.41	1.14 ± 0.42	39.75 ± 14.48
P	<.001	<.001	<.001
After treatment	1.85 ± 0.41	1.14 ± 0.42	39.75 ± 14.48
Control group	1.57 ± 0.24	0.90 ± 0.26	43.09 ± 13.63
P	<.001	<.001	.246

Table 3
The laboratory test results of patients before and after treatment

	Before treatment	After treatment	P
BUN	25.78	25.19	.201
Creatinine	1.01	1.01	.904
Sodium	136.82	139.61	.287
Potassium	4.22	3.74	.001
Troponin	0.27	0.53	.024
CK-MB mass	3.00	3.20	.362
NT-proBNP	12058.49	12587.00	.560

Abbreviations: BUN, blood urea nitrogen; CK-MB, creatine kinase-MB.

- 根據文獻, IVC-CI 15%~50% are diagnostic for HF
- 根據文獻, IVC-CI <15% is highly sensitive and specific for diagnosing congestive HF
- 根據文獻, 若出院時BNP很高, 為strong, independent的預測死亡與再入院的因子
- 根據文獻, BNP於治療後七天測量最好, 不建議天天測

- Conclusion:
 - IVC-CI可用於監測AHF的治療是否有效, 建議AHF的pt都要量IVC-CI
 - NT-proBNP不建議在急診F/u
- Limitation:
 - Single center, small pt number
 - No objective scale of symptoms
 - Valvular heart disease 未排除(TR)
 - 量IVC的位置差異導致diameter差異