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# Comparison of sternal pain and narcotic requirement after cardiac surgery between new rigid closure and conventional wire closure: follow-up results of 50 randomizations.

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# Comparison of sternal pain and narcotic usage after cardiac surgery between new rigid closure and conventional wire closure

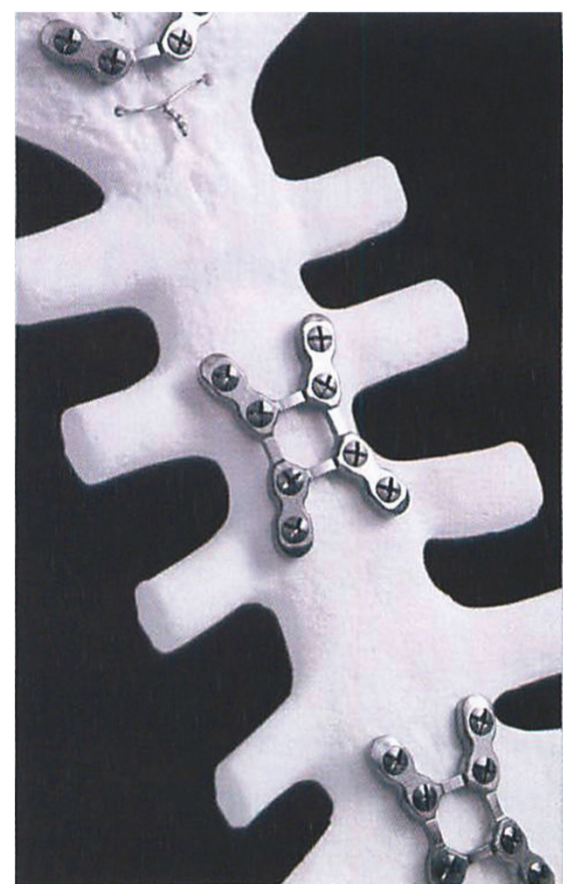
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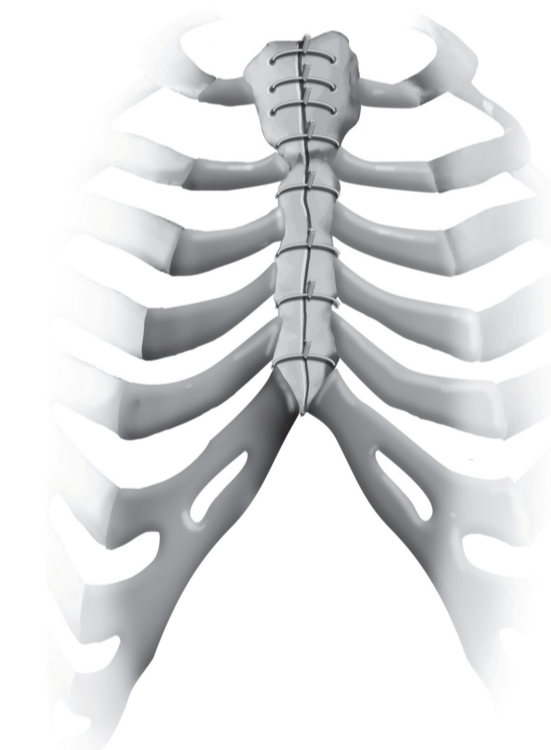
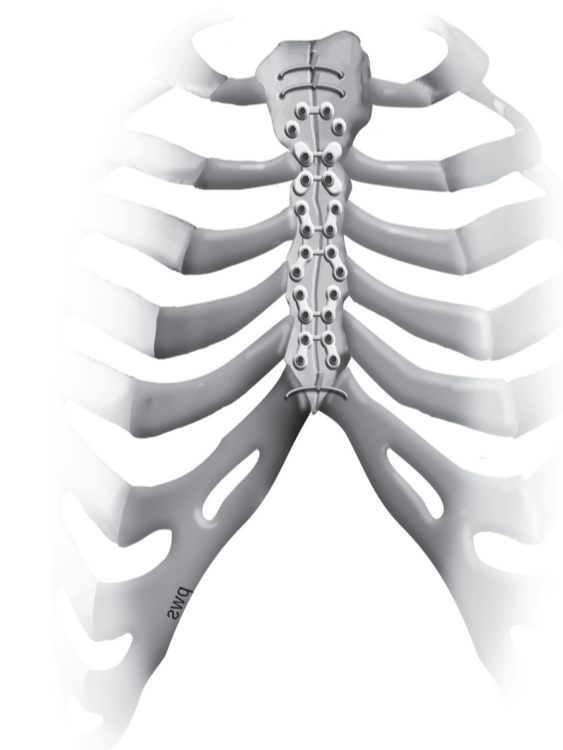
## Objective

To investigate if rigid closure reduces sternal pain

### Rigid



### Wire



## Methods

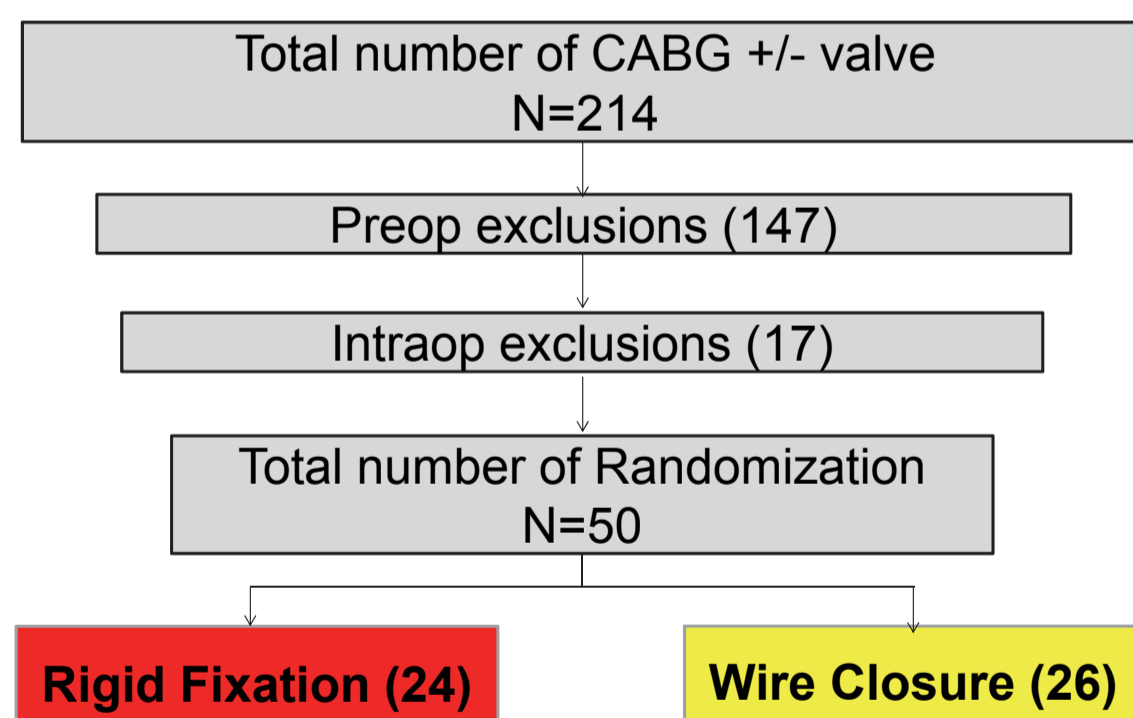
Prospective randomized CABG +/- valve  
Study period: 07/2011 – 1/2013  
Rigid fixation: n=24  
Wire closure: n=26

### Pre-Op and Intra-Op Exclusions

Preop exclusions (147)	Intraop exclusions (17)
Age >80 (26)	Unexpected aortic surgery (3)
Emergency (12)	Osteoporosis (6)
Redo sternum (20)	Bleeding (8)
Hemodialysis (15)	
Hx of Osteoporosis (11)	
Radiation hx (2)	
Malignancy (11)	
Immunosuppression (4)	
Known coagulopathy (4)	
Infections, IE (7)	
Metal allergy (2)	
BMI above 40 (6)	

Compliance (8)  
Refusal (19)

## Randomization



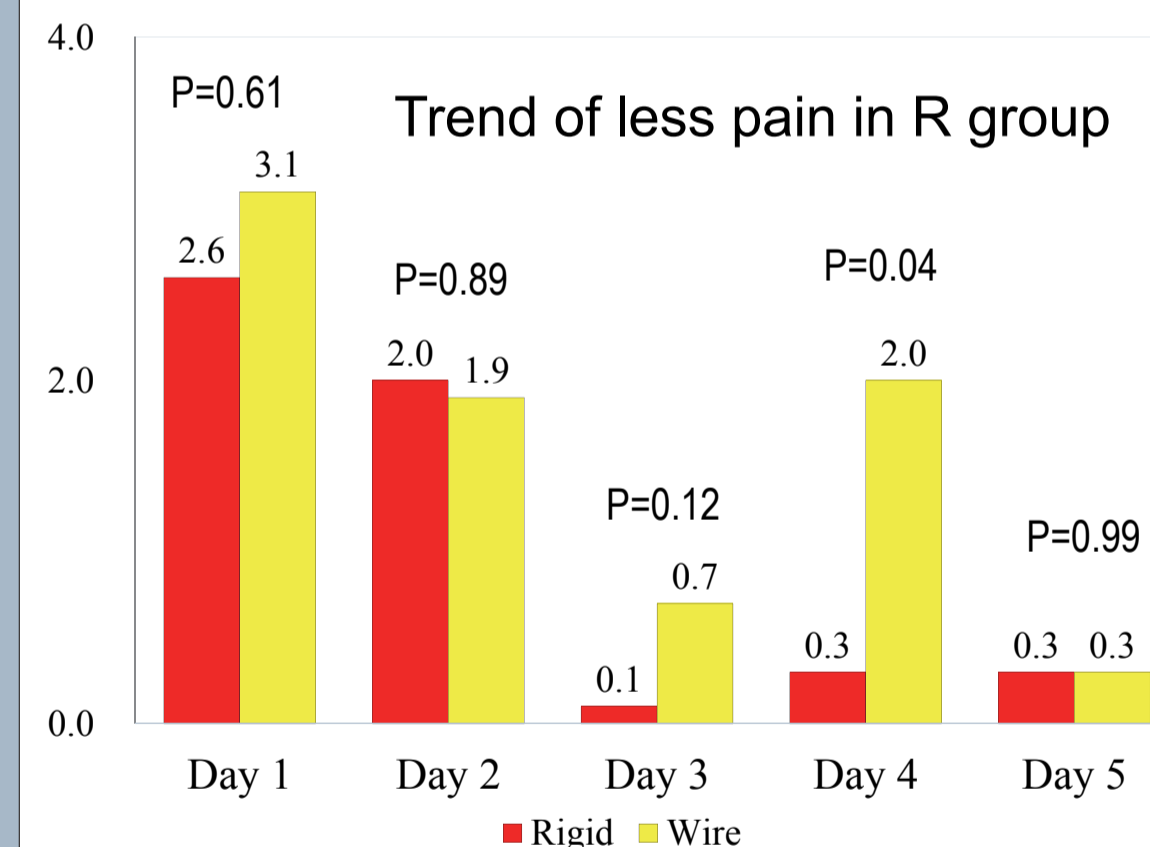
## Patient Risk Factors

	Rigid	Wire	P
Age	65 ± 9	65 ± 9	0.91
Male	20 (83%)	21 (81%)	0.81
BMI	31 ± 5	29 ± 5	0.39
Poor EF(<40%)	4 (16.7%)	3 (11.5%)	0.60
Diabetes	12 (50%)	11 (42.3%)	0.59
Insulin user	6 (25%)	9 (34.6%)	0.46
Smoking	6 (25%)	11 (42.3%)	0.19
PVD	2 (8.3%)	2 (7.7%)	0.93
Cr above 1.5	1 (4.2%)	0	0.29
CABG	15 (62.5%)	20 (76.9%)	0.27
Valve	7 (29.2%)	4 (15.4%)	0.24
CABG + Valve	2 (8.3%)	2 (7.7%)	0.93

## Postop Outcomes

	Rigid	Wire	P
Intubation hours	7.6 ± 5.0	10.5 ± 10.5	0.21
Intubation >24 h	0	2 (7.7%)	0.17
ICU stay hours	51.5 ± 26	49 ± 41.7	0.79
ICU stay > 48h	10 (42%)	10 (39%)	0.82
Postop stay days	6.6 ± 2.9	7.1 ± 4.6	0.65
Postop stay >7d	7 (29.2%)	8 (30.8%)	0.90
Postop CVA	1 (4.2%)	0	0.29
Atrial Fibrillation	6 (25%)	8 (31%)	0.65
Superf sternal infection	1 (4.2%)	2 (7.7%)	0.60
Deep sternal infection	1 (4.2%)	0	0.29
Pneumonia	0	1 (3.8%)	0.33

## Pain Score



## Narcotic Requirement Dosage Calculation

24 hours narcotic requirement was calculated using the following formula and expressed in IV morphine equivalent

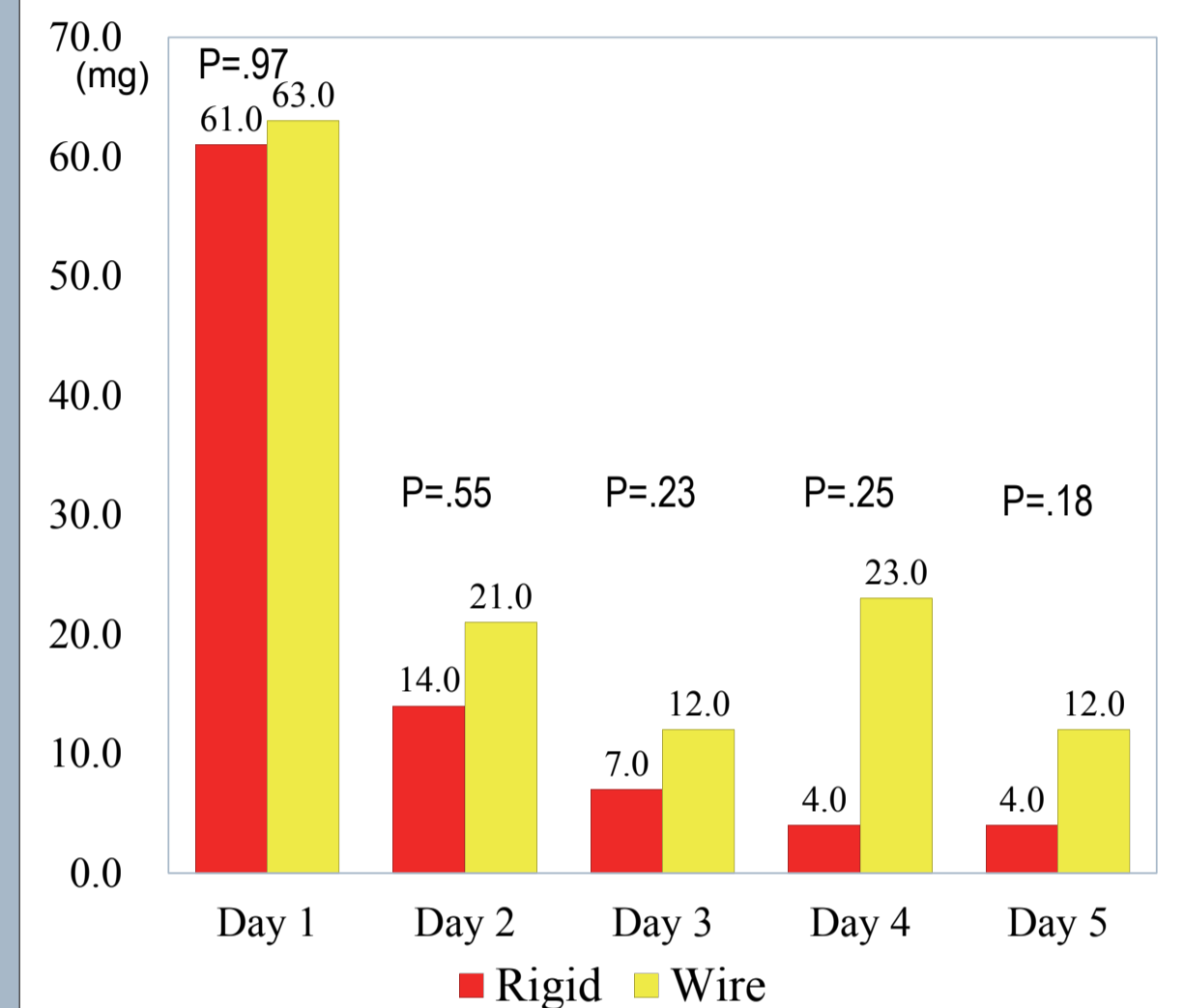
	IV	PO
Morphine	1mg	3mg
Hydromorphone	0.15mg	0.75mg
Percocet	N/A	3mg
Fentanyl	0.01mg (10mcg)	N/A

e.g.  
5 mg PO morphine is equianalgesic to 1.33mg IV morphine.  
2 mg PO hydromorphone is equianalgesic to 2.67mg IV morphine

Adapted from: Debria B. et al. Opioid equianalgesic calculations. J Palliative Med. 1999; 2: 209-218.

## Total Narcotic Requirement

There was a trend of less narcotic requirement in group R



## Conclusion

Randomized data showed a trend of fewer narcotic requirement in rigid fixation than in conventional wire closure.

## Implications

Rigid fixation may potentially improve immediate sternal pain after open heart surgery.

Less narcotic requirement potentially facilitate early return to the normal activity. Larger population is required to justify study.

## Contact information

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