November 2012

Sternal pain after rigid fixation: a pilot study of randomization rigid vs conventional wire closure.

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Recommended Citation
Kong HM, Tabata S, Yamane K, Lusardi, M, Bogar L, Guerraty A, Diehl JT, Hirose H. Sternal pain after rigid fixation: a pilot study of randomization rigid vs conventional wire closure. Presented at Chest 2012, Atlanta GA, October 20-25.

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Sternal pain after rigid fixation: a pilot study of randomization rigid vs conventional wire closure.

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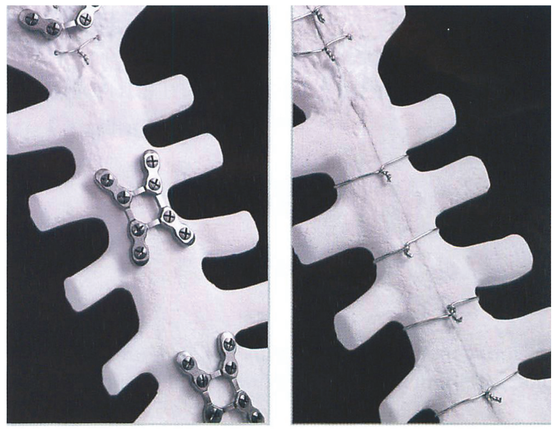
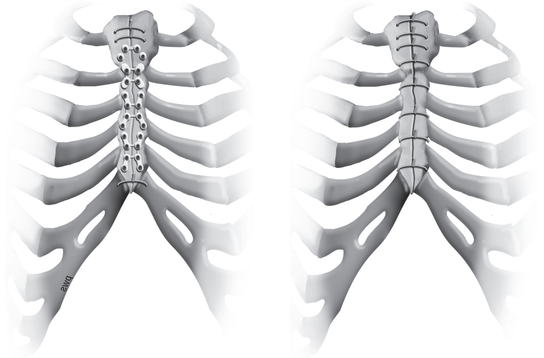
Objective

To investigate if rigid closure reduces sternal pain

Rigid **Wire**





Methods

Prospective randomized CABG +/- valve
Study period: 07/2011 – 1/2012
Rigid fixation: n=11
Wire closure: n=15

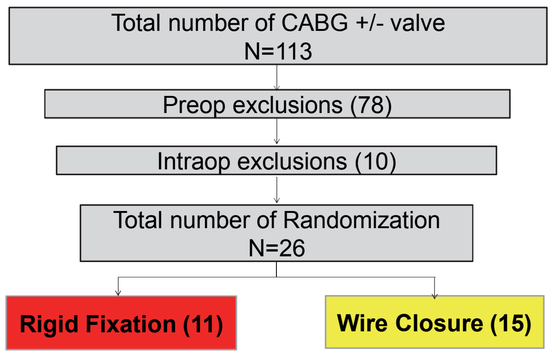
Pre-Op and Intra-Op Exclusions

Preop exclusions (78)
Age >80 (14)
Emergency (6)
Redo sternum (11)
Hemodialysis (8)
Hx of Osteoporosis (5)
Radiation hx (1)
Malignancy (5)
Immunosuppression (2)
Known coagulopathy (2)
Infections, IE (5)
Metal allergy (1)
BMI above 40 (4)

Compliance (4)
Refusal (10)

Intraop exclusions (10)
Unexpected aortic surgery (1)
Osteoporosis (4)
Bleeding (5)

Randomization



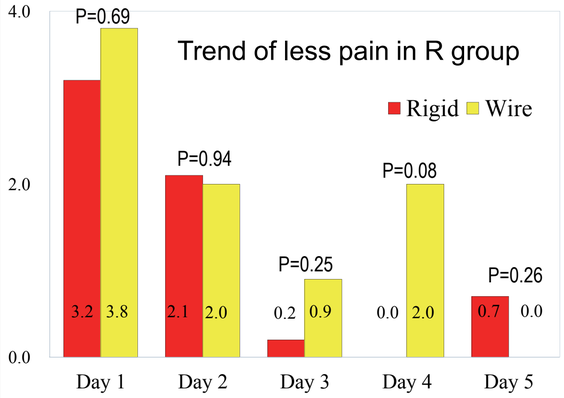
Patient Risk Factors

	Rigid	Wire	P
Age	67 ± 8	66 ± 10	0.78
Male	10 (91%)	13 (87%)	0.74
BMI	30 ± 6	28 ± 5	0.30
Poor EF(<40%)	1 (9.1%)	0	0.23
Diabetes	6 (55%)	5 (33%)	0.28
Insulin user	2 (18%)	4 (27%)	0.61
Smoking	5 (46%)	6 (40%)	0.78
PVD	1 (9.1%)	0	0.23
Cr above 1.5	1 (9.1%)	0	0.23
CABG	8 (73%)	13(87%)	0.37
Valve	5 (46%)	4 (27%)	0.32
CABG + Valve	2 (18%)	2 (13%)	0.74

Postop Outcomes

	Rigid	Wire	P
Intubation hours	7.3 ± 3.1	9.2 ± 7.2	0.37
Intubation >24 h	0	1 (6.7%)	0.38
ICU stay hours	55 ± 34	41 ± 24	0.26
ICU stay > 48h	5 (46%)	5 (33%)	0.53
Postop stay days	5.9 ± 2.0	6.3 ± 4.4	0.76
Postop stay >7d	1 (9%)	3 (20%)	0.45
Postop CVA	1 (9%)	0	0.23
Atrial Fibrillation	4 (36%)	6 (40%)	0.85
Superf sternal infection	0	1 (7%)	0.38
Deep sternal infection	1 (9%)	0	0.23
Pneumonia	0	0	0.99

Pain Score



Narcotic Requirement Dosage Calculation

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

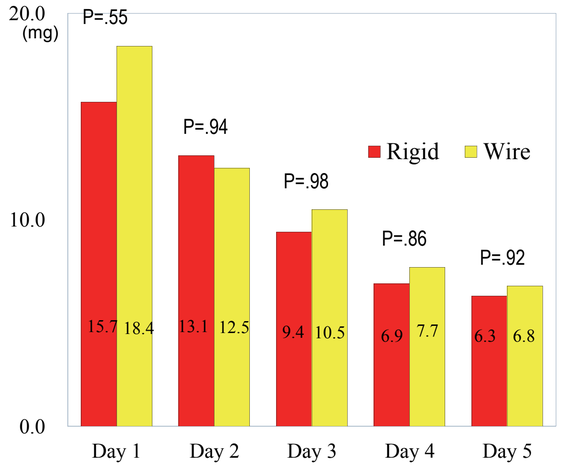
	IV	PO
Morphine	1mg	3mg
Hydromorphone	0.15mg	0.75mg
Percocet	N/A	3mg
Fentanyl	0.01mg (10mcg)	N/A

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 Palliabive 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.

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