Different sternal closure techniques after J-shaped ministernotomy

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Introduction

✓Systematic reviews of minimally invasive aortic valve surgery showed certain advantages over conventional surgery
✓New trends were introduced in aortic root surgery
✓The growth in the number of minimally invasive procedures creates new problems that require the solution

Background

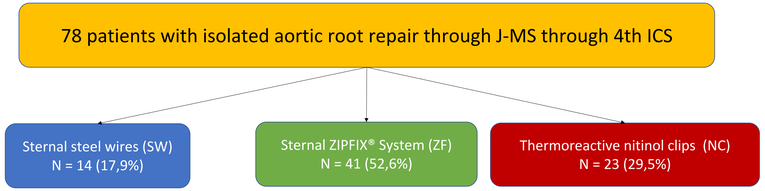
✓Aim of our study to compare the results of different sternal closure techniques after J-shaped ministernotomy (J-MS) through 4th intercostal space (ICS)

Patients

✓In last 7 years, a total of 881 patients undergoing aortic root surgery of them 216 patients (24.5%) with minimally invasive approach
✓Study period: from 2019 to 2021 Study design: prospective, single center
✓Inclusion criteria: minimally invasive aortic root repair
✓Exclusion criteria: previous surgery

Groups, n(%) Mean±SD; Median(IQR)	SW (n = 14)	ZF (n = 41)	NC (n = 23)	p
Age	43.5(30)	56(18)	49(33.5)	0.621
Male	12(87.5)	33(80.5)	22(95.7)	0.274
BMI, kg/m2	26.4(6.58)	28.3(6.5)	27.1(5.19)	0.083
Diabetes mellitus	0	3(7.3)	0	0.245
Obesity	2(14.3)	15(36.6)	6(26.1)	0.262
COPD	1(7.1)	5(12.2)	3(13)	0.846
CKD	2(14.3)	1(2.4)	4(17.4)	0.099
CHF	4(28.6)	5(12.2)	8(34.8)	0.088
Procedures				
David aortic root repair	9(64.3)	14(34.1)	11(47.8)	0.129
Bentall - DeBono procedure	5(35.7)	27(65.9)	12(52.2)	0.129

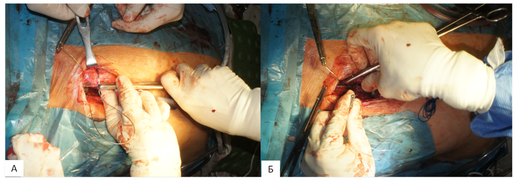
Methods



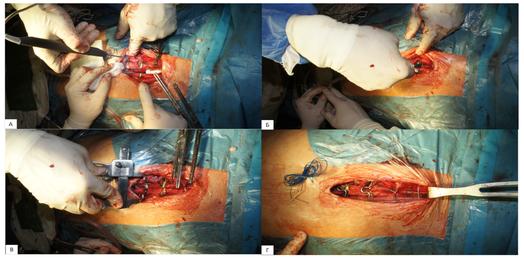
✓Endpoints were intraoperative time, complications, pain syndrome, CT scan control of sternal healing

Surgical technique

✓Minimally invasive surgical approach included J-ministernotomy via 4th intercostal space and peripheral or central cannulation (Fig.1) with limited 6-cm skin incision



Sternal steel wires (SW)



Thermoreactive nitinol clips (NC)



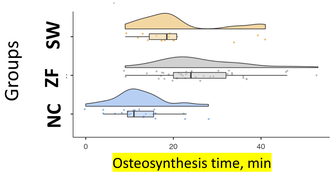
Sternal healing with NC (1 year after)

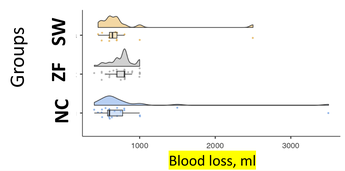
Data are expressed as mean ± standard deviation (SD), or as median with IQR. The ANOVA analysis was used to compare continuous values. For categorical variables, the two sided χ2-test or Fisher's exact test were used to assess differences between two groups. The threshold of significance was set at P < 0.05

Results

The need for opioid analgesics was higher in the ZF and SW groups
V Cramer = 0,269; OR (95% CI) = 0,169; 0,00913-3,14)

N (%), mean SD	SW (n = 14)	ZF (n = 41)	NC (n = 23)	p
Osteosynthesis time, min	18,5(6.25)	24(12)	11,5(6)*	< 0,001
Blood loss, ml	640(100)	800(100)	600(200)	0.032
Drainage loss (2 days), ml	400(223)	350(170)	390(265)	0,832
Superficial wound infection	0(0)	2(4,9)	1(4,3)	0.707
Deep wound infection	1(7,1)	1(2,4)	3(13)	0.249
Re-exploration for bleeding	0(0)	0(0)	2(8.7)	0.08
Pain intensity, 5-point scale	1,57(1)	1,39(1)	1,32(0,5)	0,734
Opioid analgesia	3(21.4)	3(7.3)	0(0)*	0.059
Ventilation time, h	4,75(4.5)	5(2)	5,5(4)	0,536
ICU stay, days	1(0)	1(0)	1(0)	0,638
Hospital stay, days	9(2.5)	7(2)	9(4)	0.014
Sternal healing (CT data)	14(100)	40(97.7)	22(100)	1.000





Conclusions

Thermoreactive NC has certain advantages over alternative methods:

- technical simplicity of the technique,
- decreasing the time of sternal osteosynthesis (p <0.001),
- decreasing blood loss (p = 0.032)
- decreasing in the intensity of pain (OR (95% CI) = 0.169; 0.009-3.14)

The authors declare no relevant conflict of interests regarding this poster