**Comparison of MIDCAB and Full Sternotomy in Multi-Vessel Disease**

In this study, we investigated the postoperative outcomes of 70 patients who underwent either MIDCAB or full Sternotomy procedures, we divided the patients into two groups: MIDCAB group (n=35) and full sternotomy CABG group (n=35). **Table 1** summarizes the demographic and preoperative characteristics of the groups, there were no significant difference between the groups in terms of Age, gender, BMI, and Ejection fraction. Although The prevalence of urgent operations was higher in the full sternotomy CABG group, this difference was not significant statistically. serum creatinine and blood urea levels varied between the groups but didn’t show statistically significant differences. Regarding Complete blood count (CBC) results, and preoperative chronic condition (shown in **table 2**) there were no significant difference between the groups.

**Table 1:** presenting demographic and preoperative characteristics.

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **No sternotomy (n=35)** | **sternotomy (n=35)** | **P value** |
| **Age (year)** | 61.94 ± 8.72 | 62.14 ± 9.50 | 0.927 |
| **Gender (Male)** | 30 | 30 | 1.000 |
| **BMI (Kg/m2)** | 28.58 ± 3.11 | 29.07 ± 4.14 | 0.579 |
| **EF (%)** | 53.17 “ 9.42 | 52.66 “ 10.91 | 0.832 |
| **Urgency of the operation (urgent patients)** | 2 | 6 | 0.259 |
| **Renal function test** |  |  |  |
| S. Creatinine (mg/dL) | 0.96 ± 0.26 | 1.01 ± 0.22 | 0.229 |
| B. Urea (mg/dL) | 39.02 ± 19.50 | 36.24 ± 14.76 | 0.495 |
| **CBC** |  |  |  |
| Hb (g/dL) | 13.24 ± 1.74 | 13.11 ± 1.86 | 0.953 |
| WBC (x103/ µL) | 7.35 “ 1.56 | 9.36 “ 6.98 | 0.110 |

|  |  |  |  |
| --- | --- | --- | --- |
| PLT (x103/ µL) | 233.71 “ 77.29 | 234.51 “ 82.52 | 0.879 |

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Values are shown as mean± (standard deviation).** | | | |

BMI: body mass index, EF: ejection fraction, CBC: Complete blood count, WBC: white blood cell, HB: hemoglobin, PLT: platelet count.

**Table 2: Distribution of Chronic Diseases by Surgical Group.**

| **Chronic Disease** | **MIDCAB (n=35)** | **Sternotomy (n=35)** | **Total** |
| --- | --- | --- | --- |
| **Diabetes Mellitus** | **16** | **13** | **29** |
| **Diabetes mellitus and Chronic Kidney Disease** | **1** | **2** | **3** |
| **Diabetes mellitus and Liver Disease** | **0** | **1** | **1** |
| **Hypertension** | **3** | **5** | **8** |
| **hypertension and chronic kidney disease** | **1** | **0** | **1** |
| **Hypertension and diabetes mellitus** | **5** | **4** | **9** |
| **p-value** | **-** | **-** | **0.608** |

**Table 3** presents the preoperative stenosis findings of the coronary arteries of patients in both groups, the prevalence of the first obtuse marginal branch stenosis was higher in the full sternotomy group compared to MIDCAB group (23 vs 20, p-value = 0.013), the difference being significant statistically. While a Higher rate of stenosis in the Left main coronary artery (p-value = 0.272), right coronary artery (p-value = 0.078), circumflex artery (p-value = 0.415), second obtuse marginal branch (p-value = 0.337) and posterior descending artery (p-value = 0.536) was also observed in the full sternotomy CABG group, none of these differences reached significant statistically.

**Table 3: Summary of Stenosis Findings in arteries.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Artery** | **MIDCAB (n=35)** | **Sternotomy (n=35)** | **p-value** |
| **Left Main Coronary Artery** | **8** | **13** | **0.272** |
| **Right Coronary Artery** | **17** | **29** | **0.078** |
| **First Obtuse Marginal Branch** | **20** | **23** | **0.013** |
| **Left Anterior Descending Artery** | **27** | **27** | **0.296** |
| **Circumflex Artery** | **25** | **27** | **0.415** |
| **First Diagonal Branch** | **11** | **9** | **0.460** |
| **Second Obtuse Marginal Branch** | **1** | **4** | **0.337** |
| **Posterior Descending Artery** | **18** | **21** | **0.536** |

As shown in **table 4,** intraoperatively surgery duration (p-value = 0.749) was longer in the full sternotomy CABG compared to MIDCAB group, while total hospital stay (p-value = 0.459) and ICU stay (p-value = 0.332) was favoring full sternotomy CABG group, by being longer in the MIDCAB group. Intra operative arterial blood gas parameters (ABG) indicated that PO2 (p-value = 0.030) and lactate (p-value = 0.048) were significantly higher in the full sternotomy CABG group compared to the MIDCAB group. Postoperatively serum creatinine (p-value = 0.045) levels were significantly higher in the full sternotomy CABG group, and blood urea (p-value = 0.215) levels also were higher but wasn’t significant. Regarding postoperative ABG parameters, PH (p-value = 0.002), PCO2 (p-value = 0.003) and lactate (p-value = 0.002) showed statistically significant difference between the groups. Specifically, PCO2 and lactate levels were higher in the full sternotomy CABG group, whereas PH levels were higher in the MIDCAB group. Postoperative white blood cell count (p-value = 0.021) was significantly higher in the full sternotomy CABG group while the platelet count (p-value = 0.002) in the other hand showed significant rise in the MIDCAB compared to full sternotomy CABG group.

**Table 4: Intraoperative and postoperative outcomes between MIDCAB and Sternotomy patients**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variables** | **MIDCAB (n=35)** | **sternotomy (n=35)** | **P value** |
| **intraoperative** |  |  |  |
| **Surgery duration (hours)** | 4.96 “ 0.89 | 5.04 “ 1.24 | 0.749 |
| **Total hospital stays (days)** | 5 “ 2.18 | 5 “ 1.41 | 0.459 |
| **ICU stay (hours)** | 19.2 “ 10.04 | 17.52 “ 7.25 | 0.332 |
| **ABG** |  |  |  |
| PH | 7.33 “0.64 | 7.33 “ 1.32 | 0.681 |
| PO2 | 142.16 “ 85.53 | 224 “ 153.7 | 0.030 |
| PCO2 | 41.29 “ 7.72 | 40.68 “ 7.63 | 0.743 |
| HCO3 | 20.87 “ 1.51 | 21.54 “ 7.44 | 0.626 |
| Lactate | 2.4 “ 2.76 | 3.42 “ 2.81 | 0.048 |
| Worst blood glucose among the ABGs | 212 “ 57.96 | 220.86 “ 63.2 | 0.814 |
| **Postoperative** |  |  |  |
| **EF (%)** | 51.40 “ 9.06 | 54.57 “ 6.23 | 0.163 |
| **Renal function test** |  |  |  |
| S.creatinine (mg/dL) | 1.05 “ 0.37 | 1.27 “ 0.54 | 0.045 |
| B.urea (mg/dL) | 45.26 “ 22.17 | 49.86 “ 20.85 | 0.215 |
| **ABG** |  |  |  |
| PH | 7.39 “ 0.08 | 7.31 “ 0.10 | 0.002 |
| PO2 | 125.16 “ 114.42 | 132.73 “ 93.51 | 0.166 |
| PCO2 | 38.61 “ 6.53 | 44.91 “ 9.32 | 0.003 |
| HCO3 | 22.24 “ 5.37 | 21.62 “ 3.01 | 0.282 |
| Lactate | 2.73 “ 1.61 | 4.86 “ 3.25 | 0.002 |
| Worst blood glucose among the ABGs | 223.91 “ 64.95 | 235.17 “ 62.52 | 0.541 |
| **CBC** |  |  |  |
| HB (g/dl) | 10.11 “ 1.63 | 9.76 “ 1.51 | 0.411 |
| WBC (x103/ µL) | 13.5 “ 3.54 | 17.14 “ 7.32 | 0.021 |
| PLT (x103/ µL) | 187.66 “ 52.85 | 150.69 “ 47.67 | 0.002 |
| **Values are shown as mean± (standard deviation).** | | | |

ABG, arterial blood gas; PH, potential of hydrogen; PO2, partial pressure of oxygen; PCO2, partial pressure of carbon dioxide; HCO3, bicarbonate ion; EF, ejection fraction; S. Creatinine, Serum Creatinine; B. Urea, Blood Urea; CBC, Complete blood count; PLT, platelet count; WBC, white blood cell.

**table 5** presents postoperative complications, where no significant differences were observed between the groups, although the prevalence of blood loss was higher in the full sternotomy CABG group, this difference was not statistically significant (p-value = 0.112).

**Table 5**: Postoperative complications between diabetic and non-diabetic patients.

|  |  |  |  |
| --- | --- | --- | --- |
| **Complications** | **MIDCAB (n=35)** | **sternotomy (n=35)** | **P value** |
| Blood Loss > 1000 ml Without Reoperation. | 7 | 13 | 0.112 |
| Readmission to ICU | 1 | 2 | 1.000 |
| Shock | 1 | 0 | 1.000 |
| Acute Kidney Injury | 5 | 6 | 0.743 |
| Respiratory Failure | 13 | 12 | 0.803 |
| Reoperation |  |  |  |
| Stroke | 2 | 1 | 1.000 |
| Liver Failure | 1 | 0 | 1.000 |
| Prolonged ICU Stay (>72 Hours) | 1 | 0 | 1.000 |
| Myocardial Infraction | 1 | 1 | 1.000 |
| ICU, Intensive Care Unit; | | | |