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Comparison between Complete and Incomplete Coronary Revascularization

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Abstract

Background: Coronary revascularization is the key of life today against the most leading cause of death allover the world today which is Coronary artery disease. Coronary revascularization is aiming to Improve blood flow and oxygen supply to the heart. For coronary revascularization there is two ways: complete and incomplete revascularization.

Aim of Study: Short-term follow-up for patients with coronary artery disease who were subjected to complete and incomplete revascularization due to certain conditions and comparison between the results in both groups to detect the best results for the patients.

Patients and Methods: A prospective comparative study conducted over two years at Departments of Cardiothorathic Surgery Ain Shams University Hospital and Minia University Hospital. 60 patients were subjected to CABG; at 30 patients complete Coronary revascularization was done and at the other 30 patients Incomplete Coronary revascularization was done.

Results: The study has shown that complete revascularization (CR) may improve short-term outcomes by reducing myocardial ischemia and preventing future revascularization, Patients with ICR had significantly lower number of coronary distal anastomosis than group of CR. However, More future multicentric studies and a large number of sample will be needed for more new results in this Feld.

Conclusion: In the light of the foregoing present study results, it can be concluded that, complete revascularization (CR) may improve short-term outcomes by reducing myocardial ischemia and preventing future revascularization, Patients with ICR had significantly lower number of coronary distal anastomosis than group of CR. However, More future multicentric studies and a large number of sample will be needed for more new results in this Feld.

Key Words: *Coronary artery disease — Complete revascularization.*

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Introduction

CORONARY artery disease (CAD) is the leading cause of morbidity and mortality worldwide, hence coronary revascularization by diversion of blood around narrowed or clogged parts of the coronary arteries either by PCI or CABG to improve blood follow and oxygen supply to the heart is one of the most important steps that has been taken in medicine history that clearly improved health of people and improved their expectancy of life. If there are multi-vessel lesions and the lesion is equal to or more than 60%; CABG is the Gold standard treatment for it, so in our study here we will make a comparison between complete and incomplete coronary revascularization. We will propose a reasonable, universal definition of complete and incomplete revascularization incorporating current evidence in two main Groups [1].

Complete anatomical revascularization which is defined as the treatment of all coronary segments >1 5mm in diameter and -60% diameter stenosis regardless of their functional significance. Incomplete revascularization which can be divided into two sub-groups: Anatomical but functionally adequate revascularization (reasonable incomplete revascularization) which is defined as the treatment of coronary segments with -60% diameter stenosis and an FFR <_0.8, or -70% diameter stenosis without FFR supplying viable myocardium. Incomplete anatomical and functional revascularization which is defined as the inability to treat all coronary segments that have -60 % to 70% diameter stenosis and an FFR <_0.8 or >70% without FFR that supplies a significant degree of viable myocardium, and this inability is due to multiple causes either preoperative or intraoperative as we will see in our study. Our study will depend on certain conditions through certain inclusion and exclusion criteria depending on age, sex, general condition, and the vessels state of the patient **[2].**

Then through follow-up the results of the two groups (complete and incomplete revascularization) post-operative through a certain program that includes clinical and investigation data we can highlight the comparison between complete and incomplete coronary revascularization **[3].**

Aim of the work:

Short-term follow-up for patients with coronary artery disease who were subjected to complete and incomplete revascularization due to certain conditions and comparison between the results in both groups to detect the best results for the patients.

Patients and Methods

Type of the study: Prospective study.

Study setting: Multicenter including Ain Shams University Hospital, Cardiothorathic Academy and Minia University Hospital Cardiothorathic Department From 2022 — 2023.

Study population:

Inclusion Criteria: Any adult patient mainly in the age group from 35 to 80 years old of both sex. Coronary artery disease patients.

Exclusion criteria: Age: Younger than 35 or older than 80 years old. Patients for CABG and valve replacement. Patients for CABG and valve repair. Patients refuse to give consent for follow-up. Uncooperative patients during the study e.g: Patients who are not compliant on treatment or the medical recommendations.

Study design:

This analysis includes 60 consecutive patients subjected to CABG due to IHD; those patients were subdivided into 2 groups:

The first group (complete revascularization): In this group, all intended vessels which are occluded with a lesion equal to or more than 60% according to coronary angiography was grafted whether by LIMA, veins, or Radial artery.

The second group (incomplete revascularization): Any vessel had a lesion equal to or more than 60% and intended to be grafted but the decision was omitted preoperative or intraoperative for no revascularization due to one or more of the following reasons: Severe Calcification. Very small vessel. Inadequate or poor vessel. Two adjacent vessels supplying the same area of the heart.

Study procedures:

Pre-operative: Demographic (Age, Sex, BMI). A complete history is taken from the patient including: Past medical history of any of the following risk factors: Smoking, diabetes mellitus, hypertension, chronic lung disease as COPD, hypercholesterolemia and positive family history. Past history of cardiac surgery. General examination including vital signs. Full chest examination. Imaging. Preoperative echocardiography. Preoperative coronary angiography. Carotid duplex and venous mapping. Routine lab Investigations include: Complete blood picture, RFTs, LFTs, PT, INR, HbAlc.

Operative data: Includes the surgical technique and decisions to correct the underlying lesions. All operations were performed by expert surgeons, the procedures are carried out through median sternotomy; cardiopulmonary bypass, perfusion data, and events like bleeding are registered, also Cardiopulmonary bypass time and cross clamp time are calculated.

Post-operative: Post-operative follow-up in both groups by: Clinical data including clinical picture, ICU and hospital stay. Echocardiography to detect wall motion abnormalities at the intended area, Ejection Fraction and left ventricular dimensions.

Statistical analysis:

The statistical analysis was performed using the SPSS program. The numeric data was expressed as mean and standard deviation (SD) and compared by the t-student test. The categorical data were expressed as numbers and percentages and compared by the Chi-square test. p-value <0.05 was considered significant.

Ethical considerations: The Study was considered the ethical principles of the Helsinki Declaration. Approval from a research ethics committee and informed consent was obtained from October 2022 to October 2023, with a sample size of 60 patients. This study was Approved of ethical committee, approval number No. FIVA00017585.

Results

Comparing demographic characteristics between both groups revealed statistically non-significant differences (Table 1).

Comparing preoperative clinical risk factors and comorbid conditions between both groups revealed statistically non-significant differences (Table 2).

Comparing preoperative dyspnea status (functional NYHA class) between both groups revealed statistically non-significant differences (Table 3).

Comparing preoperative left ventricular function and dimensions on transthoracic echocardiography between both groups revealed statistically non-significant differences (Table 4).

Comparing preoperative angiographic extent of coronary artery disease (CAD) between both groups revealed higher proportions of patients with multi vessels disease in group of ICR (Table 5).

Table (1): Demographic characteristics.

Variables	CR (n=30)	ICR (n=30)
Age (years)	52.76±8.72	55.16±7.43
Gender:		
Male	21 (70%)	19 (63.3%)
Female	9 (30%)	11 (36.7%)
Obesity (BMI >25)	16 (53.3%)	20 (66.7%)

CR : Complete revascularization.
ICR: Incomplete revascularization.
Data are expressed as mean ± standard deviation or number (percent).

Table (2): Preoperative clinical risk factors and comorbid conditions.

Variables	CR (n=30)	ICR (n=30)
Smoking	16 (53.3%)	18 (60%)
Diabetes mellitus	15 (50%)	19 (63.3%)
Hypertension	14 (46.7%)	13 (43.3%)
Dyslipidemia	13 (43.3%)	15 (50%)
COPD	1 (3.3%)	2 (6.7%)

CR : Complete revascularization.
ICR: Incomplete revascularization.
COPD: Chronic obstructive pulmonary disease.
Data are expressed as number (percent).

Table (3): Preoperative dyspnea status (functional NYHA class)

NYHA class	CR (n=30)	ICR (n=30)
I	6 (20%)	4 (13.3%)
II	9 (30%)	8 (26.7%)
III	10 (33.3%)	16 (53.3%)
IV	5 (16.7%)	2 (6.7%)

CR : Complete revascularization.
ICR: Incomplete revascularization.
NYHA: New York Heart Association.
Data are expressed as number (percent).

Table (4): Preoperative left ventricular function and dimensions on transthoracic echocardiography.

Variables	CR (n=30)	ICR (n=30)
LVEF (%)	57.16±7.94	54.96±7.37
LVEDD (mm)	51±5.2	49.9±5
LVESD (mm)	33.3±4.73	32±3.86

CR : Complete revascularization.
ICR : Incomplete revascularization.
LVEF: Left ventricular ejection fraction.
LVEDD: Left ventricular end-diastolic diameter.
LVESD : Left ventricular end-systolic diameter.
Data are expressed as mean±standard deviation.

Table (5): Preoperative angiographic extent of coronary artery disease (CAD).

Extent of CAD	CR (n=30)	ICR (n=30)
3-vessels	23 (76.7%)	12 (40%)
4-vessels	6 (20%)	13 (43.3%)
5-vessels	1 (3.3%)	5 (16.7%)
LMS disease	4 (13.3%)	6 (20%)

CR : Complete revascularization.
ICR : Incomplete revascularization.
LMS: Left main stem.
CAD: Coronary artery disease.
Data are expressed as number (percent).
*Significant difference.

Comparing operative times between both groups revealed non-significant differences in bypass time and cross-clamp time while these times were higher in group of CR (Fig. 1).

Patients with ICR had significantly lower number of coronary distal anastomosis than group of CR (Fig. 2).

Patients with ICR had higher incidence of postoperative low cardiac output than group of CR but with statistically non-significant differences regarding treatment of this entity (Fig. 3).

Postoperative complications did not significantly differ between both groups (Fig. 4).

The mortality rate was 6.7% in ICR group and 3.3% in CR group with non-significant difference between both groups (Fig. 5).

Survival plot during postoperative hospital stay in the studied groups. Test of equality of the survival distributions for the different levels of groups (Log-rank test) revealed non-significant differences between both groups (Chi-Square = 0.108, p-value = 0.74).

Comparing postoperative durations of mechanical ventilation, ICU, and hospital stay revealed statistically non-significant differences (Fig. 6).

During postoperative follow-up period, there was non-significant difference in postoperative functional NYHA class between survivors of both groups. NYHA class was significantly improved from preoperative baseline class in both group (Fig. 7).

During postoperative follow-up for 3 months, there were non-significant differences in postoperative left ventricular function and dimensions between survivors of both groups (Fig. 8).

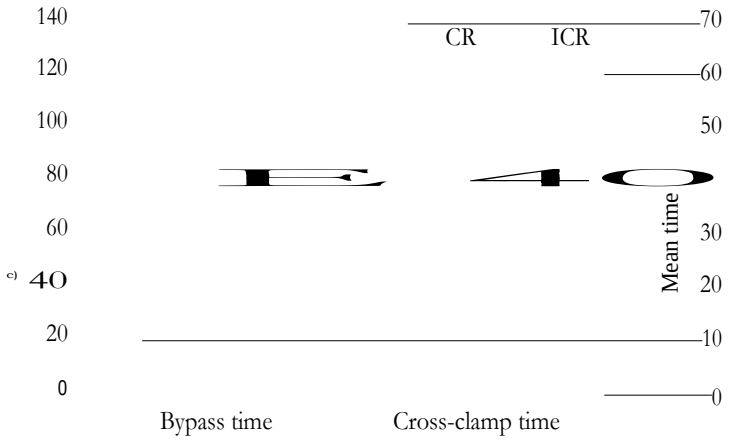

Fig. (1): Mean of bypass and cross-clamp times in the studied groups.

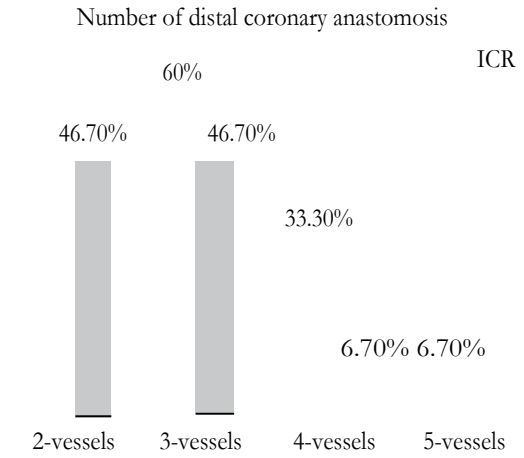

Fig. (2): Percentage of distal coronary anastomosis in the studied groups.

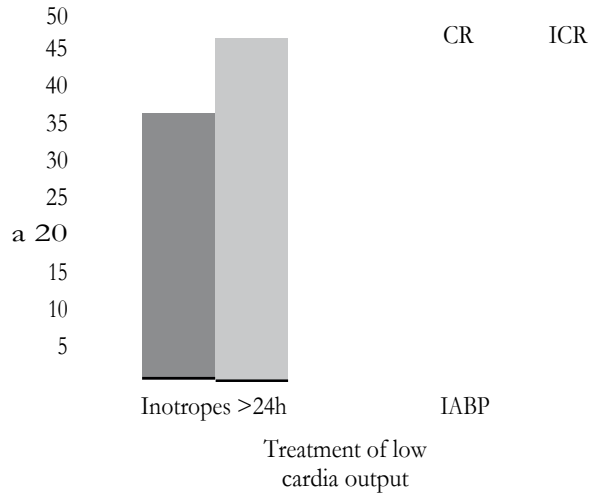

Fig. (3): Distribuation of the treatment methods of postoperative low cardiac output in the studied groups.

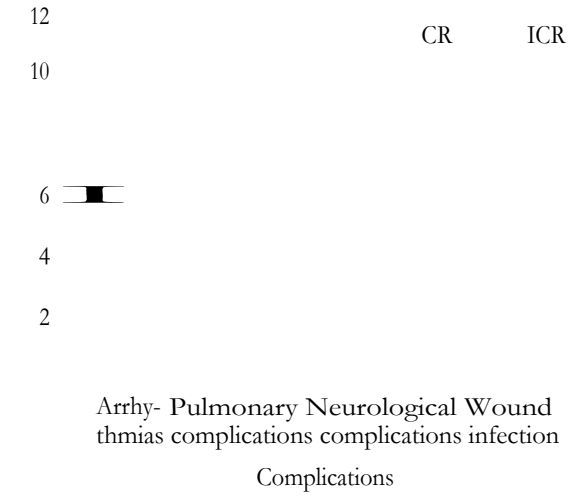

Fig. (4): Distribution of postoperative complications in the studied groups.

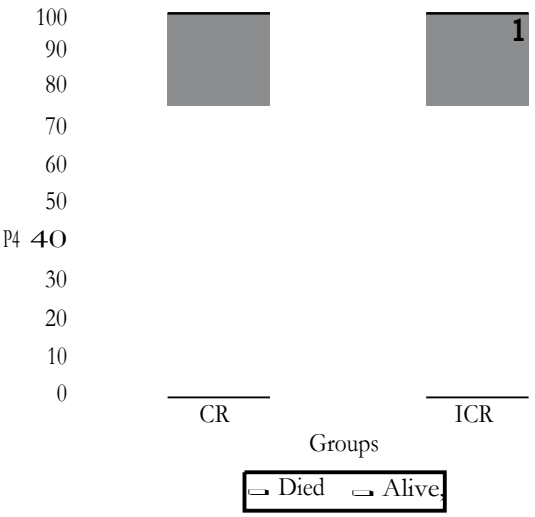

Fig. (5): Survival and mortality proportions in the studied groups.

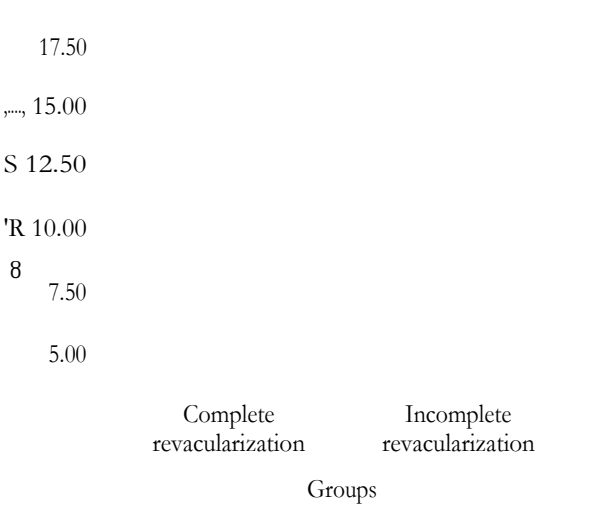

Fig. (6): Boxplots showing range and quartiles of postoperative hospital stay in the studied groups.

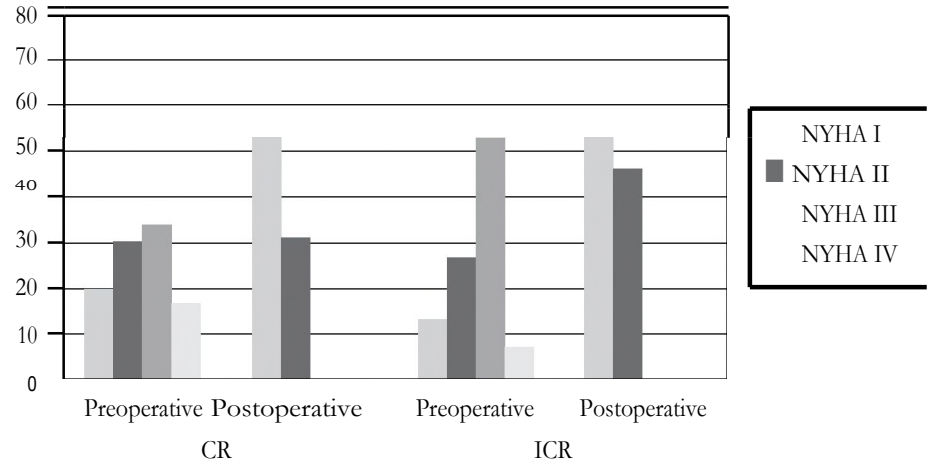

Fig. (7): Distribution of preoperative and postoperative NYHA class (dyspnea status) in the studied groups.

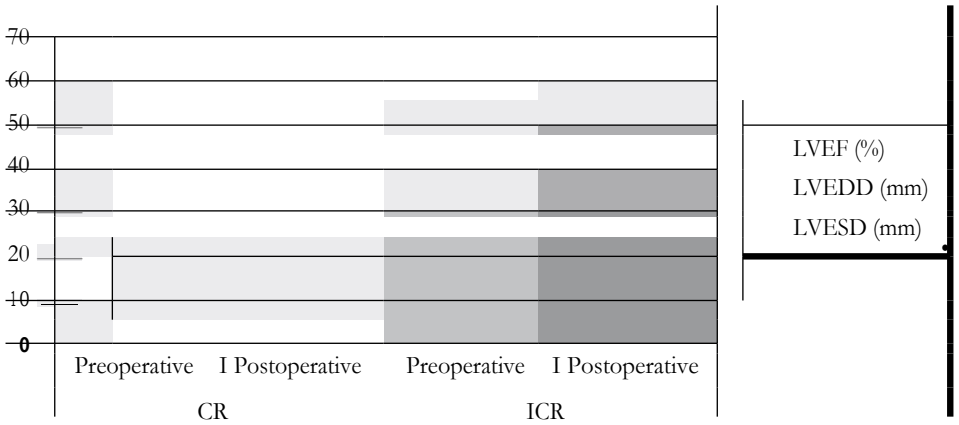

Fig. (8): Mean of preoperative and postoperative left ventricular ejection fraction (LVEF), Left ventricular end-diastolic diameter (LVEDD), and Left ventricular end-systolic diameter (LVESD) in the studied groups.

Discussion

In this study we discuss through the Short-term follow-up for patients with coronary artery disease who were subjected to complete and incomplete revascularization due to certain conditions the comparison between complete and incomplete coronary revascularization: Group I: 30 patients had complete coronary revascularization (CR). Group II: 30 patients had in complete coronary revascularization (ICR).

In the current thesis demographic characteristics of the studied patients showed that, Group I included 21 (70%) male and 9 (30%) female patients with an average age of 52.76±8.72 years. While, Group II included 19 (63.3%) male and 11 (36.7%) female patients with an average age of 55.16±7.43 years. there was no statistically significant between the two studied groups as regard age, sex, and Obesity (p-value >0.05).

In agreement Schaefer et al. **[4]** reported that, Of 1859 patients enrolled in the study, 1550 patients (83.4%) received CR and 309 patients (16.6%) ICR. When comparing baseline demographics of patients with CR and ICR, no significant differences were found regarding age, gender distribution or surgical risk stratification utilizing the logistic European System for Cardiac Operative Risk Evaluation.

Also, another study titled "Complete versus incomplete revascularization for treatment of multivessel coronary artery disease" by Song et al. **[5]** A total of 873 patients were included in this analysis: 427 (48.9%) in the CR group and 446 (51.1%) in the ICR group. CR group included 311 (72.8%) male and 161 (27.2%) female patients with an average age of 63.7±10.6 years. While, ICR group included 303 (67.9%) male and 143 (32.1%) female patients with an average age of 65.5±10.6 years.

Our results showed that, there was no statistically significant between the two studied groups as regard preoperative clinical risk factors and comorbid conditions or preoperative dyspnea status (functional NYHA class) (p-value >0.05).

In agreement Saia et al. **[6]** observed that, no significant differences noted between CR group and

ICR group as regard preoperative clinical risk factors (Diabetes mellitus, Hypertension, Dyslipidemia and COPD) p-values were 0.36, 0.24, 0.66 and 0.75 respectively.

In the same line Song et al. [5] showed that there was no statistically significant between Complete and Incomplete revascularization Patients as regard Hypertension (237 (55.5%) vs 275 (61.7%) pr,:l.07) and Dyslipidemia (124 (29.0%) vs 118 (26.5%) p=0.39). But Diabetes mellitus were significantly higher and Smoking was significantly lower in CR group p-values were 0.04 and 0.01 respectively.

Also, Schaefer et al. [4] reported that there was no statistically significant between the two CR and ICR groups as regard Smoking 860 (55.4%) vs 168 (54.4%) p=0.37, and Diabetes mellitus 551 (35.5%) vs 117 (37.9%) 0.59.

In the current study, comparing preoperative left ventricular function and dimensions on transthoracic echocardiography between both groups revealed statistically non-significant differences.

In the same line Schaefer et al. [4] reported that, there was no significant difference between Complete revascularization (CR) group and Incomplete revascularization (ICR) group in preoperative transthoracic echocardiography as regard left ventricular ejection fraction LVEF (56.5±12.4 vs 56.5±11.8; p-value.98).

Contrary Song et al. [5] reported that, Patients with Incomplete revascularization (ICR) had a significantly lower left ventricular ejection fraction (LVEF) with mean 57.6±10.9 than Complete revascularization (CR) group 59.2±10.5 p-value=0.02.

Comparing preoperative angiographic extent of coronary artery disease (CAD) between both groups revealed higher proportions of patients with 4 or 5-vessel CAD in group of ICR.

In agreement Gao et al. m noted that, When comparing preoperative angiographic IR to CR, the extent of CAD was significantly higher in the angiographic ICR group (2.55% vs. 1.13%, p=0.016).

Contrary, in a previous study Schaefer et al. [4] reported that, no differences had been noted between patients with CR or CR regarding degree of CAD as seen in coronary angiography.

Patients with ICR had significantly lower number of coronary distal anastomosis and higher incidence of postoperative low cardiac output than group of CR but with statistically non-significant differences regarding treatment of this entity.

In the same line Gaba et al. [1] showed that, postoperative low cardiac output was higher in patients with ICR than in those without ICR (33.5% versus 23.8%; p<0.001).

Also, Kim et al., 2023 reported that, number of coronary distal anastomosis was significantly lower in ICR patients group when compared with CR group p=0.001.

In the current study there was no statistically significant difference between the two studied groups as regard postoperative complications (p-value >0.05).

In agreement Saia et al. [6] observed that, no statistically significant differences between both groups CR and ICR group in postoperative complications p43.89.

Along with our study Schaefer et al. [4] showed that no significant differences between CR and ICR were found regarding postoperative complications as Pulmonary hypertension 46 (3.0%) 6 (1.9%) *p*= 0.32 and Chronic kidney disease 107 (6.9%) 24 (7.8%) p=0.59.

According to Postoperative survival outcome our results showed that, mortality rate was 6.7% in ICR group and 3.3% in CR group with on significant differences between both groups.

In agreement Saia et al. [6] reported that, Mortality was without significant difference between groups (2.9% CR vs. 4.6% IR, p=.45) Similarly, there was no significant difference in any of the in-hospital outcomes between CR and IR groups; p>0.05.

Also, Lehmann et al. [8] demonstrated that CR was associated with a survival benefit of ::=50% over IR. However, there was no longer a statistically significant difference between the two studied group p-value >0.05.

On the other hand there are several studies that suggest a survival benefit of CR over IR in patients with severe multivessel CAD. A large study by Jones et al. [9] showed that survival at 5 years was significantly greater in patients with CR (88.5%) than in those with IR (83.5%).

Similarly, Kleisli et al. [io] demonstrated that CR was associated with better survival (5-year unadjusted survival rate 82.4% versus 52.6%), only limited by major baseline differences between the 2 groups favoring patients who underwent CR, and a lack of adjustment in the survival analysis.

Another large series from the Cleveland Clinic done by Scott et al. [ill showed that CR compared with IR with ungrafted high-grade left circumflex or right CAD was associated with a substantially increased 10- and 20-year survival (91.1% CR versus 81% IR at 10 years and 70% versus 53% at 20 years).

In a another trial by Mohr et al. [12] including registry and randomized data demonstrated, after

multivariate analysis, that IR and not the complexity of the coronary anatomy to be an independent predictor of adverse 2-year outcomes (p=0.002).

Comparing postoperative durations of mechanical ventilation, ICU, and hospital stay revealed statistically non-significant differences.

These results were closed to results obtained by several previous studies Gao et al. **[7];** Chang et al. **[13];** Song et al. **[5]** who showed no significant differences between CR group and ICR group as regard hospital stay and durations of mechanical ventilation p>0.05 .

During postoperative follow-up period, there was non-significant difference in postoperative functional NYHA class between survivors of both groups. NYHA class was significantly improved from preoperative baseline class in both group.

In a recent similar study Schaefer et al. **[4]** there were no significant differences in NYHA between Complete revascularization 437 (28.2%) and in Complete revascularization group 80 (25.9%) *p-value=0.41.*

In the same line Saia et al. **[6]** study showed that, there was non-significant difference in postoperative functional NYHA class between survivors of CR groups 89 (64.5%) and ICR group 94 (61.4%) p-value.59.

During postoperative follow-up period, there were non-significant differences in postoperative left ventricular function and dimensions between survivors of both groups.

In agreement was a recent study done by Saia et al. **[6]** reported that, there were significant differences between survivors in CR group 57.1±13.1 and ICR group 54.5±13.7 in postoperative left ventricular function p-value=0.11.

Also, Schaefer et al. **[4]** showed that, no differences were found between patients with CR or CR regarding left ventricular function as assessed by left ventricular ejection fraction in follow-up period p>0.05.

Conclusion:

In the light of the foregoing present study results, it can be concluded that, complete revascularization (CR) may improve short-term outcomes by reducing myocardial ischemia and preventing future revascularization, Patients with ICR had significantly lower number of coronary distal anastomosis than group of CR. However, More future multicentric studies and a large number of sample will be needed for more new results in this Feld.

References

1- GABA P., GERSH B.J., ALI ZA., MOSES J.W. and STONE G.W.: Complete versus incomplete coronary revascularization: Definitions, assessment and outcomes. Nature Reviews Cardiology, 18 (3): 155-168, 2021.

2- BUDA AJ., MACDONALD IL., ANDERSON MJ., STRAUSS HD., DAVID T.E. and BERMAN ND.: Long-term results following coronary bypass operation. Importance of preoperative actors and complete revascularization. J. Thorac. Cardiovasc. Surg., 82: 383-390, 2003.

3- American Heart Association: What is coronary bypass surgery?. https://wwwheartorg/en/health-topics/consumer-healthcare/answers-by-heart-fact-sheets/answers-by-heart-fact-sheets-treatments-and-tests . Accessed Oct. 14, 2020.

4- SCHAEFER A., CONRADI L., SCHNEEBERGER Y., REICHENSPURNER H., SANDNER S., TEBBE U., NOWAK B., STRITZKE J., KASTRATI A. and SCHUNKERT H.: Clinical outcomes of complete versus incomplete revascularization in patients treated with coronary artery bypass grafting: insights from the TiCAB trial. European Journal of Cardio-Thoracic Surgery, 59 (2): 417-425, 2021.

5- SONG YB., LEE S Y., HAHN J.Y., CHOI S.H., CHOI J.H., LEE S H and GWON H.C.: Complete versus incomplete revascularization for treatment of multivessel coronary artery disease in the drug-eluting stent era. Heart and Vessels, 27: 433-442, 2012.

6- SAIA F., PALMERINI T., COMPAGNONE M., BATTISTINT P., MORETTI C., TAGLIERI N. and RAPEZZI C • Coronary artery disease and reasonably incomplete coronary revascularization in high-risk patients undergoing transcatheter aortic valve implantation. Catheterization and Cardiovascular Interventions, 95 (1): 19-27, 2020.

7- GAO Z., XU B., YANG YJ., YUAN J.Q., CHEN J., CHEN J.L. and GAO R.L.: Long-term outcomes of complete versus incomplete revascularization after drug-eluting stent implantation in patients with multivessel coronary disease. Catheterization and Cardiovascular Interventions, 82 (3): 343-349, 2013

8- LEHMANN R., FICHTLSCHERER S., SCHACHINGER V., HELD L., HOBLER C., BALER G. and SPYRIDOPOULOS I.: Complete revascularization in patients undergoing multivessel PCI is an independent predictor of improved long-term survival. Journal of Interventional Cardiology, 23 (3): 256-263, 2010.

9- JONES E.L., CRAVER J.M., GUYTON RA., BONE D K., HATCHER JR, C.R. and RIECHWALD N.: Importance of complete revascularization in performance of the coronary bypass operation. The American Journal of Cardiology, 51 (1): 7-12, 1983.

10- KLEISLI T., CHENG W., JACOBS M.J., MIROCHA J., DEROBERTIS MA., KASS R.M. and TRENTO A.: In the current era, complete revascularization improves survival after coronary artery bypass surgery. The Journal of thoracic and cardiovascular surgery, 129 (6): 1283-1291, 2005.

11- SCOTT R., BLACKSTONE E.H., MCCARTHY P.M., LYTLE B.W., LOOP FD., WHITE JA. and COSGROVE D. M.: Isolated bypass grafting of the left internal thoracic artery to the left anterior descending coronary artery: Late consequences of incomplete revascularization. The Journal of thoracic and Cardiovascular Surgery, 120 (1): 173-184, 2000.

12- MOHR F.W., RASTAN A.J., SERRUYS P.W., KAPPETEIN AP., HOLMES DR., POMAR J.L. and MACK M.J.: Complex coronary anatomy in coronary artery bypass graft surgery: Impact of complex coronary anatomy in modern bypass surgery? Lessons learned from the SYNTAX trial after two years. The Journal of thoracic and cardiovascular surgery, 141 (1): 130-140, 2011.

13- CHANG M., AHN J.M., KIM N., LEE P.H., ROH J.H., YOON S.H. and PARK S.J.: Complete versus incomplete revascularization in patients with multivessel coronary artery disease treated with drug-eluting stents. American Heart Journal, 179: 157-165, 2016 .

مقارنة بين ترقيع الشرايين التاجية بالطريقة المكتملة والغير المكتملة

إن مرض إحتشاء وقصور الشرايين التاجية من أكثر الأمراض خطورة فى عالمنا اليوم كما أنه من أكثرها انتشاراً وتسبباً فى الوفاة فى مختلف بلدان العالم.

ولذلك كانت إعادة توعية الشرايين التاجية من أهم إنجازات الطب على مدار تاريخه، وإعادة التوعية هذه تتم من خلال القسطرة علي الشرايين التاجية، أو من خلال ترقيع الشرايين التاجية بواسطة جراحة القلب سواء كان ذلك بالطريقة المكتملة أو الجزئية حسب الظروف التى لدينا فى كل مريض.

ولذلك دراستنا هنا ترتكز على دراسة مقارنة بين إعادة توعية الشرايين التاجية بالطريقة المكتملة والجزئية، والظروف التى تقود إلى كل منهما سواء قبل أو أثناء أو بعد العملية الجراحية، وذلك من أجل تقديم أفضل ما يمكن لحياة المريض ودفع عنه المعاناة الشديدة.

وهذه الدراسة تقوم بتسليط الضوء على الظروف التى تقودنا إلى إجراء إعادة توعية الشرايين التاجية بالطريقة المكتملة تارة وبالطريقة الجزئية تارة أخرى، تلك الظروف التى تتعلق بحالة المريض الصحية من ناحية القلب خاصة، وحالة الشرايين التاجية لديه الممكن ترقيعها، وحالة الأوعية التى سيتم الترقيع بواسطتها والظروف التى تحدث لاسيما أثناء إجراء الجراحة فى وجود الفريق الطبى الخبير والمتميز.

ثم تسليط الضوء على النتائج فى كلا من الطريقتين، من خلال دراسة حالة المريض بعد العملية أثناء الإقامة فى المستشفى وبعد خروجه ومدى سرعة تعافيه، ودراسة حالة القلب لديه بالأشعة التليفزيونية على القلب لإظهار كفاءة القلب وأبعادة وحركات أجزاءه وضرباته.

ومن خلال دراستنا هنا تم الوصول إلي أن المقارنة بين إعادة توعية الشرايين التاجية سواء بالطريقة المكتملة أو الجزئية كل له مميزات وكذلك كل فيه بعض القصور حيث أن الطريقة المكتملة تقدم نتائج أفضل فى حالة القلب لدى المريض بعد العملية من خلال نتائج الأشعة التلفزيونونية وسرعة تعافى المريض ولكن على الجانب الآخر فإنها لا تكون ممكنة فى كل الظروف، بينما الطريقة الجزئية فهى خيار الظروف الصعبة التى تكون حينها مفتاح الأمل لإنقاذ حياة ولكن على الجانب الآخر فإن حالة القلب بعد العملية وتعافى المريض لا يكون بالشكل الأسرع أو الأمثل فى العادة.