Case report

Becoming post-angioplasty patients: experience of the Avicenne military hospital in Marrakech

Abstract

The management of acute coronary syndromes (ACS) has evolved considerably since the introduction of transluminal coronary angioplasty (PTCA) in 1977. This study analyzes acute coronary syndromes hospitalized in the cardiology department and who benefited from angioplasty as well as their outcome. This is a descriptive retrospective study, conducted over a three-year period from January 1, 2012 to December 1, 2014, with a total of 250 patients. In this study, angiographic success was obtained in the majority of cases, with satisfactory restoration of coronary flow. However, some per-procedural complications, such as rhythm disturbances (2.8%) and thromboembolic complications (1.4%), were observed. This study also revealed that 5% of patients experienced a recurrence of infarction within the first six months. Long-term results of primary angioplasty show improved survival and reduced hospitalizations for heart failure. Technological advances, including the use of drug-eluting stents, have significantly improved short-, medium-, and long-term outcomes, reducing complications such as restenosis and increasing overall survival. Patient education on secondary prevention measures, including appropriate lifestyle and regular monitoring, is crucial to reduce recurrences and improve patients' quality of life in the long term.

INTRODUCTION

Acute coronary syndrome (ACS) is a continuous entity grouping several diagnoses with different managements: unstable angina (UA), non-ST segment elevation myocardial infarction and ST segment elevation myocardial infarction.

Coronary angioplasty is considered the main mode of revascularization of the coronary patient, the first time was performed by Andreas Gruentzig in 1977, and has improved significantly in recent years with the miniaturization of the equipment, the technological contribution with the arrival of active stents and the preferential use of the radial route, the aim of which is to improve the outcome of patients in terms of survival and to relieve them of their symptoms as well as to reduce the rate of occurrence of complications after coronary angioplasty.

It is indicated if not controlled by medical treatment and in cases of proven ischemia for stable coronary disease and indicated urgently in acute coronary syndromes.

This technical act should not be isolated but should be accompanied by comprehensive patient care, not only medication but also in terms of lifestyle and physical exercise.

In light of this work, we will try to analyze acute coronary syndromes hospitalized in the cardiology department and who benefited from angioplasty as well as their outcome.

Keywords: Coronary angioplasty, Acute coronary syndrome, Active stents, In-stent restenosis, Secondary prevention, Cardiovascular risk factors

METHODOLOGY

1. Type of study

Descriptive retrospective study conducted over a three-year period from January 1, 2012 to December 1, 2014, with a total of 250 patients.

2. Place of study

The study is carried out in the cardiology department of the Avicenne military hospital in Marrakech

3. Study population

Our study population is represented by patients hospitalized in the department who underwent coronary angioplasty. During the study period, 250 patients with ACS meeting the inclusion and exclusion criteria were admitted to the cardiology department of the Avicenne military hospital.
Included in this study are all patients with acute coronary syndrome admitted to the cardiology department of the Avicenne military hospital who underwent angioplasty.
Excluded from this study were all patients with ACS not treated by coronary angioplasty and those with chest pain of other origins.

4. Data collection

The data is collected, on an operating sheet, from hospital records completed by treating physicians. Data collection focused on: Demographic data, cardiovascular risk factors, clinical profile on admission, paraclinical data, prognosis assessment, therapeutic strategy, intra-hospital developments and short, medium and long-term follow-up of patients after discharge.

RESULTS

1. Gender:

Our patients are characterized by a male predominance and are divided into 165 men, or 66% of cases, and 85 women, or 34% of cases. The M/F sex ratio is 1.94. (Figure 1)

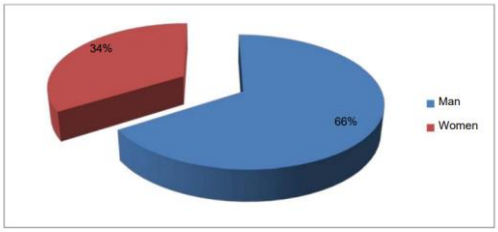


Figure 1: Distribution by gender

2. Age

The mean age of our patients was 55 years with extremes from 37 to 83 years.

3. Cardiovascular risk factors

3.1. Smoking:

In our study, patients who had quit smoking for five years were considered non-smokers. We found that 46% of patients with ACS were not exposed to tobacco, while 54% were active smokers, all male.

3.2. Dyslipidemia:

In our study 16% of our patients are known to be dyslipidemic.

3.3. Obesity :

In our study population, 26.4% of patients are obese (BMI>30kg/m²). (Figure 2)

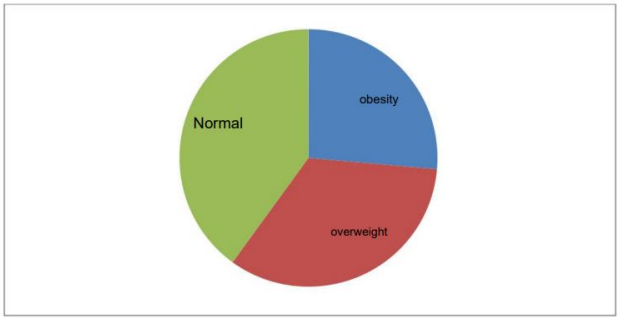


Fig 2- distribution according to BMI

3.4. Diabetes :

Diabetes is type 2, and present in 34% of cases. The average duration of diabetes is 8 ± 4 years (2 months-25 years)

3.5. High blood pressure:

In our population, 88% of our patients are known to be hypertensive.

4. Background

Sixteen percent of cases, or 40 patients, had already had an MI, 6% of whom were revascularized by transluminal angioplasty. 2% had PAD. 4% had renal failure. Two patients had a history of stroke. (Figure 2)

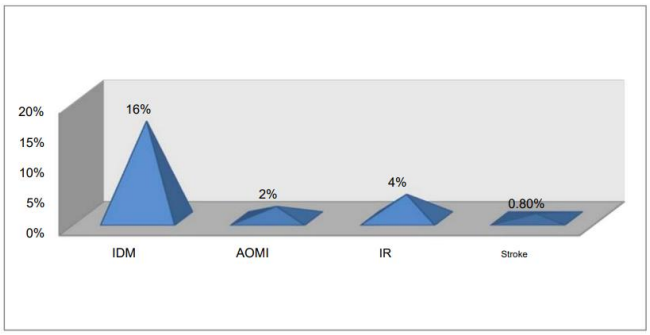


Figure.2: Prevalence of antecedents

5. Clinical data

5.1. Functional signs:

infarctoid pain , i.e. 66% of cases, 65 patients had atypical pain, i.e. 26% of cases, and 20 patients had anginal pain that subsided at rest, i.e. 8% of cases.

5.2. Clinical examination:

Signs of IVG in 20 patients or 8% of cases, two patients were admitted in cardiogenic shock or 0.8% of cases.

6. Paraclinical data

6.1. Electrocardiogram results

140 patients had acute coronary syndrome with ST segment elevation (56%), 90 had acute coronary syndrome without ST segment elevation (36%) and 20 patients had a normal ECG (8%). (Figure 4)

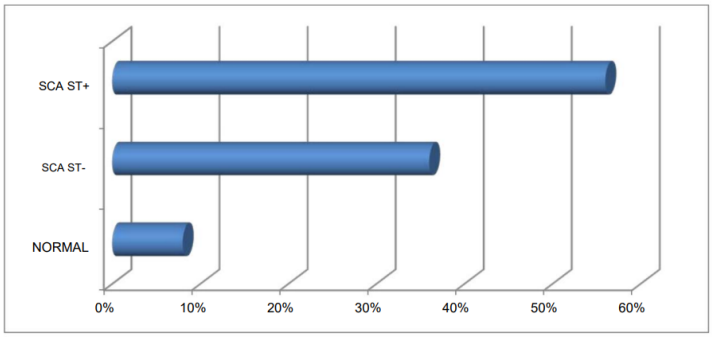


Figure.4: ECG abnormalities

6.2. Biological profile

6.2.1.Cardiac enzymes: Troponin

Troponin assay at admission was positive in all patients with ST+ ACS, 50% in patients with ST- ACS. The mean value is 0.4 ng /ml. (Figure 5).

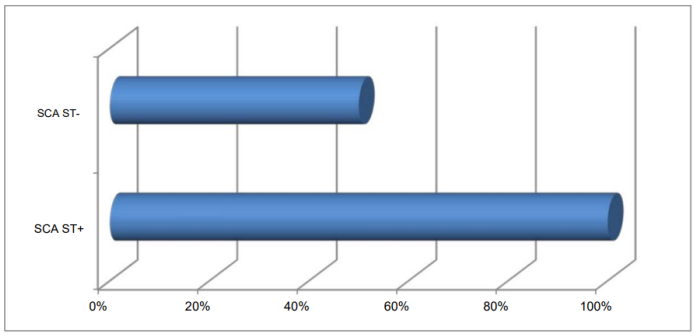


Figure 5: Troponin positivity as a function of coronary artery disease

6.2.2.Kidney function

Renal function was adequate in 70% of cases, 2% had severe renal impairment, and 28% of patients had a creatinine clearance between 30 and 60 ml/min. (Figure 6)

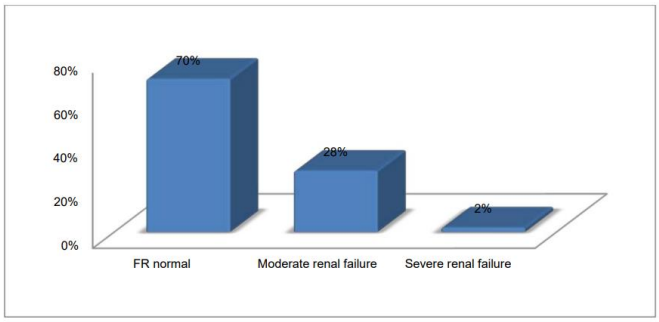


Figure.6: Renal function

6.2.3.Glycemic profile

Sixty percent of our patients had an admission blood glucose level greater than 1.26 g/l and 40% of patients in this group had an admission blood glucose level less than 1.26 g/l (figure 7)

6.2.4.Lipid balance

In our series, 37% of patients have LDL cholesterol greater than 1g/l, and triglycerides are normal in the majority of cases (figure 8).

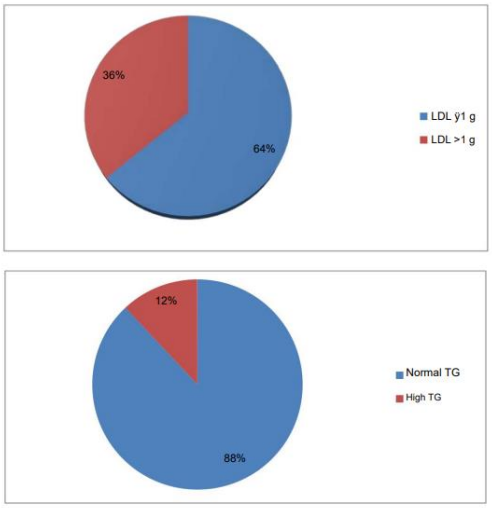


Figure 8: Lipid balance

6.3. Echocardiography

All our patients had undergone cardiac echo-Doppler , of which 140 patients had a preserved left ventricular ejection fraction (EF) (greater than 50%) or 56% of cases. Seventy-five patients had a moderately impaired EF (between 30 and 50%) or 30% of cases, and severely impaired EF (less than 30%) in 35 patients or 14% of cases. (Figure 9)

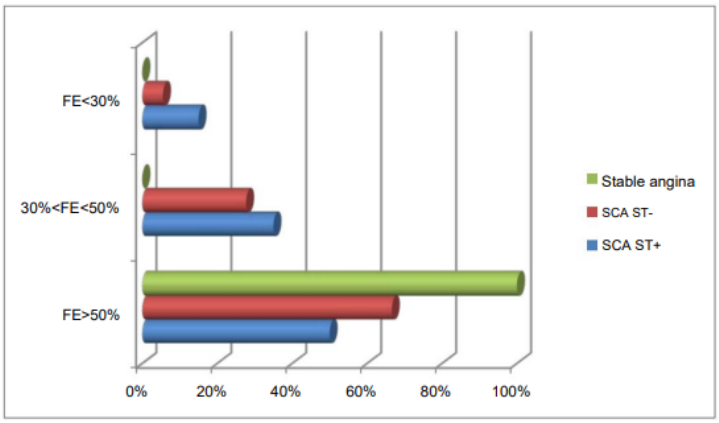


Figure 9: Analysis of ejection fraction

6.4. Coronary angiography

Coronary angiography was abnormal in all our patients: For patients with ST+ ACS, the results showed single-vessel involvement in 86 patients, or 61.42% of cases, bi-vessel involvement in 24 patients, or 17.14% of cases, and tri-vessel involvement in 30 patients, or 21.42% of cases.
The affected arteries were distributed as follows. (Figure 10)

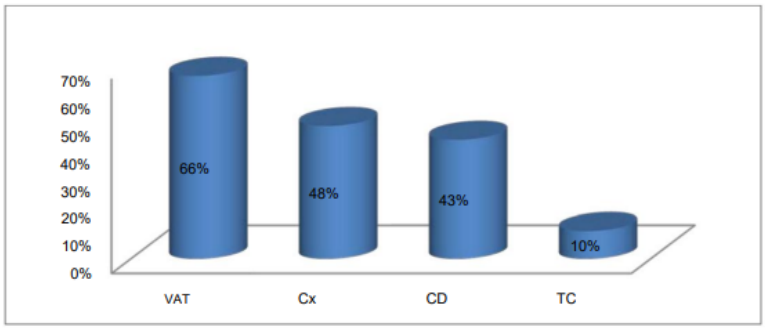


Figure 10: Frequency according to the affected arterial trunk in ST+ ACS

For patients with ST-ACS, the results showed single-vessel involvement in 36 patients or 40% of cases, bi-vessel involvement in 18 patients or 20% of cases and tri-vessel involvement in 36 patients or 40% of cases.
The affected arteries were distributed as follows. (Figure 11)

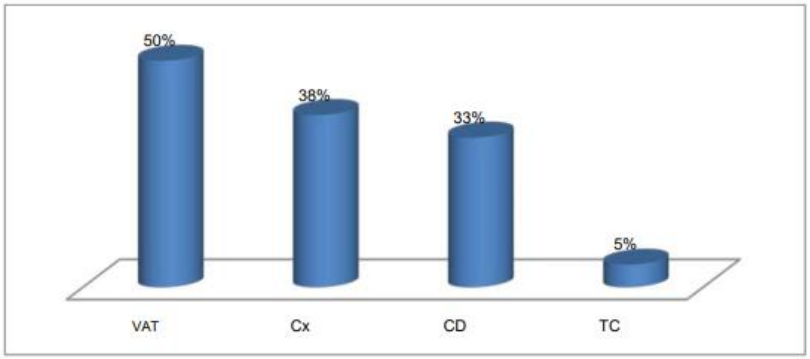


Figure 11: Frequency according to the arterial trunk affected in ST-SCA

For patients with chronic stable angina, the results showed single-vessel involvement in 10 patients or 50% of cases, bi-vessel involvement in 6 patients or 30% of cases and tri-vessel involvement in 4 patients or 20% of cases. The anterior interventricular artery (IVA) is the artery responsible for the infarction in 80% of cases, followed by the circumflex in 20% of cases, the right coronary (RC) in 10% of cases and the left common trunk in 1% of cases.

7. Therapeutic support

Angioplasty was performed in all our patients: It was with balloon + stent in 230 cases and only with direct stent in 20 patients. Active stents were used in 59.2% of cases, i.e. 148 of our stented patients.

141 of our patients had benefited from the placement of a single stent, i.e. 56.4% of cases, 89 had benefited from the placement of two stents, i.e. 35.6% of cases, and 20 of our patients had benefited from the placement of three stents, i.e. 8% of cases. (Figure 13)

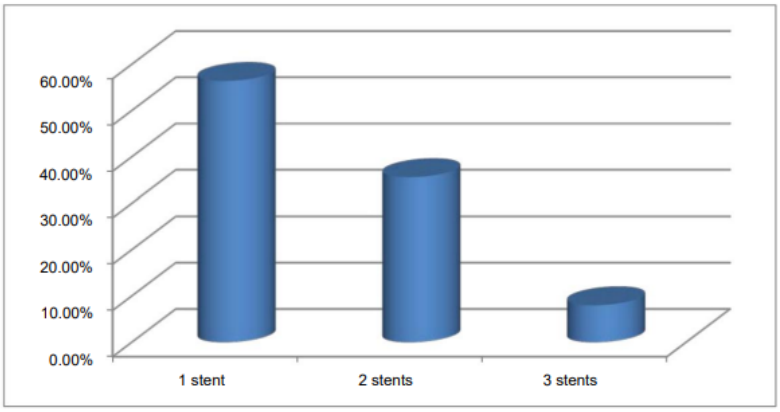


Figure 13: Frequency according to the number of stents used

8. Evolution

The evolution was marked by short, medium and long term complications:

8.1. Intra-hospital complications:

8.1.1. SCA ST+: (Figure 14)

- 10 of our patients, or 7.1% of cases, had presented complications:
- 4 cases of 2nd degree BAV or 2.8%.
- 4 cases of ESV or 2.8%.
- 2 cases of TV or 1.4%.
- 1 patient had a thromboembolic complication such as a stroke, i.e. 0.70% of cases

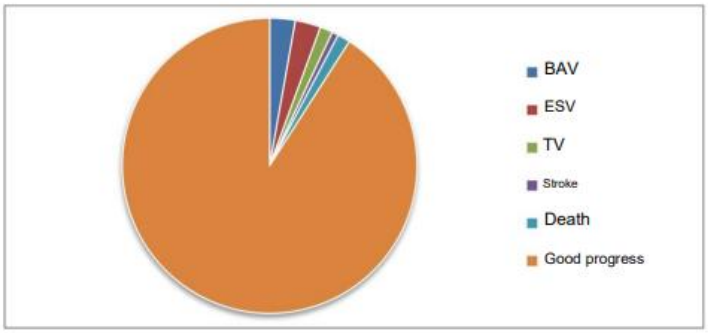


Figure 14: Short-term evolution (SCA ST+)

8.1.2. SCA ST- (Figure 15)

6 of our patients, or 6.6% of cases, had presented complications:

- 1 case had presented a hemorrhagic complication such as a cerebrovascular accident, i.e. 1.1% of cases.
- 2 cases of 2nd degree BAV or 2.2% of cases
- 2 cases of ESV or 2.2% of cases.
- 1 case of left ventricular failure was observed two days post-angioplasty, i.e. 1.1% of cases: This is a 62-year-old woman, diabetic, on chronic hemodialysis, whose coronary angiography revealed a tri-trunk lesion and who had benefited from the placement of two active stents at the level of the IVA, the evolution was favorable

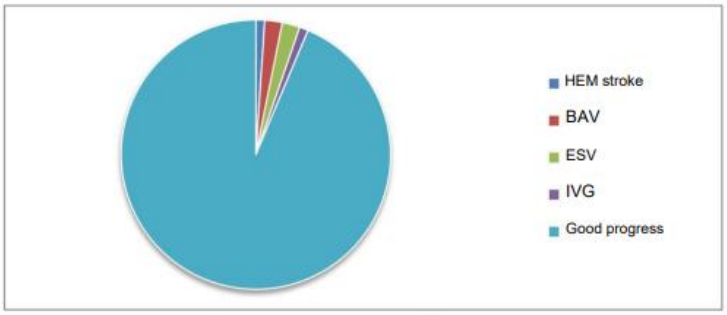


Figure.15: Short-term evolution (SCA ST-)

8.1.3.Stable angina:

Favorable evolution during the intra-hospital period with an average hospital stay of two days.

8.2. For medium and long term monitoring

235 of our patients attended regularly, on average every 3 months for consultation, i.e. 94% of cases; while 10 of our patients had irregular follow-up, i.e. 4% of cases, and 5 patients were lost to follow-up, i.e. 2% of cases.

8.2.1.SCA ST+: (Figure 17)

A recurrence of infarction was observed in 7 patients or 5% of cases with a mean age of 65 years, three of whom were diabetic; the MI was extensive anterior in 4 cases, inferior in 2 cases and lateral in one case.

The culprit artery was the IVA in 5 cases, the CD in 1 case and the CX in 1 case.

Angiographic control showed intra-stent restenosis in three cases, or 2.1% of cases, and stent thrombosis in 4 cases, or 2.8% of cases.

Anginal recurrence was observed in 2 patients whose coronary angiographic control did not reveal any pathological modification in the vascular bed.

Re-hospitalization for left ventricular failure was observed in 12 patients, or 8.5% of cases, with a mean age of 63 years. These were 8 men and 4 women, 6 patients were diabetic.

The mean time to rehospitalization for heart failure was 8 months post-infarction, the MI was anterior in 10 cases, inferior in 2 cases, the culprit artery was the IVA in 7 cases, the CX in 3 cases and the CD in 2 cases, the mean LVEF was 40%, the evolution was favorable with regression of signs of heart failure.

Three patients had an ischemic stroke and one patient had a hemorrhagic complication such as a hemorrhagic stroke.

One patient died within an average of 8 months after SCAST +. He was a 65-year-old diabetic, hypertensive man. The cause of death was cardiogenic shock refractory to treatment.

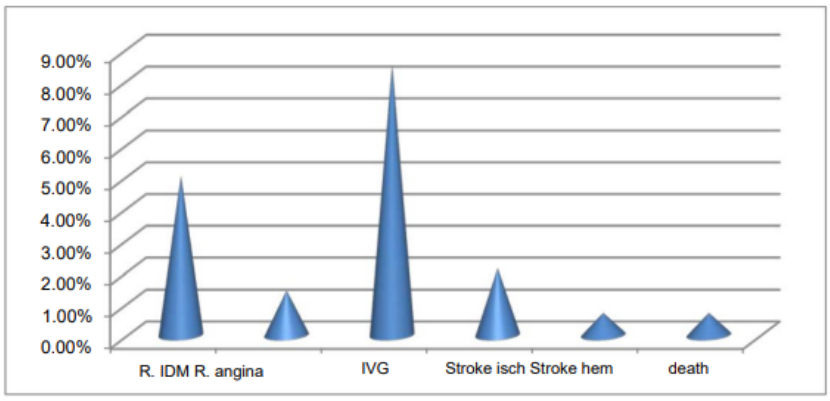


Figure.17 Medium and long-term evolution of patients with ST+ ACS

8.2.2.SCA ST-: (Figure 18)

Angina recurrence was observed in 4 patients whose coronary angiographic control revealed intra-stent restenosis in one patient.

Re-hospitalization for left ventricular failure was observed in 6 patients or 6.66% of cases with an average age of 60 years. These were 4 men and 2 women, the 6 patients were diabetic, the average time to re-hospitalization for heart failure was 8 months post-angioplasty, the evolution was favorable with regression of signs of heart failure.

One patient had a thromboembolic complication such as an ischemic stroke.

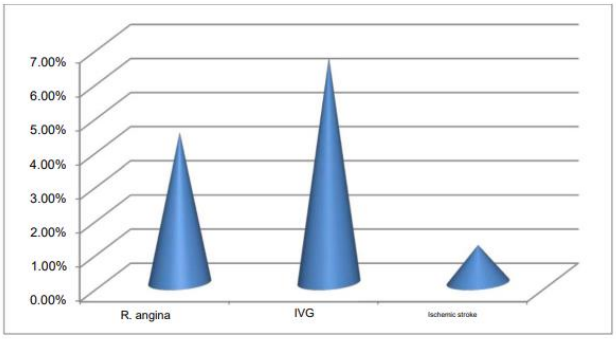


Figure.18 Medium and long-term evolution of patients with ST-ACS.

8.2.3.Stable angina:

Anginal recurrence was observed in three patients whose coronary angiographic control did not reveal any abnormality.

DISCUSSION

The management of acute coronary syndromes (ACS) has evolved considerably since the introduction of transluminal coronary angioplasty (PTCA) in 1977. This technique, initially limited by complications such as restenosis and failed revascularization, has benefited from numerous technological advances, including the introduction of metallic and then active stents, which has improved short- and long-term results [1, 4].

Short term results

Short-term results of primary coronary angioplasties show a high rate of technical success, exceeding 90% in experienced centers [3]. In our series, angiographic success was obtained in the majority of cases, with satisfactory restoration of coronary flow. However, some per-procedural complications, such as rhythm disturbances (2.8%) and thromboembolic complications (1.4%), were observed, confirming data from the international literature [2].

The management of post-angioplasty patients has been optimized by the use of active stents (59% of cases in our series), which reduce the risk of short-term restenosis [4]. These results are consistent with those of large studies, such as CADILLAC, demonstrating a significant improvement in clinical outcomes with these devices [2].

Complications and medium-term results

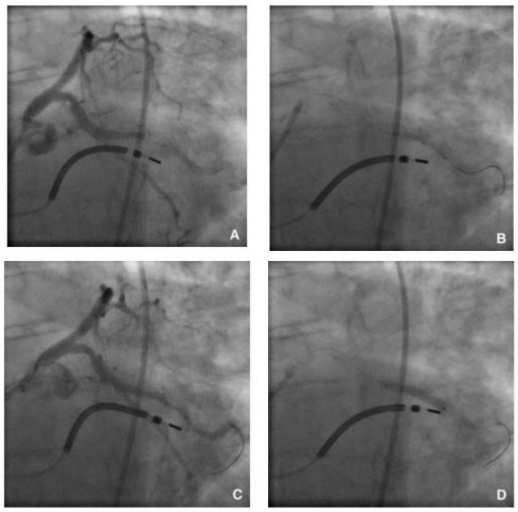
Medium-term follow-up of our population demonstrated a low complication rate, with an incidence of in-stent restenosis of 2.1%, comparable to results reported in other similar series [5]. Prolonged use of dual antiplatelet therapy probably contributed to reducing these complications, in line with current recommendations [6].

Recurrences of coronary events nevertheless remain a challenge. In our series, 5% of patients experienced a recurrence of infarction within the first six months. These results highlight the

importance of strict management of cardiovascular risk factors such as diabetes, hypertension, and dyslipidemia, which significantly influence prognosis [7].

Long term results

Long-term results of primary angioplasty show improved survival and reduced hospitalizations for heart failure. However, some patients require reinterventions due to progression of coronary lesions or late complications such as stent thrombosis [8].
Our study is consistent with the GRACE registry data, demonstrating that patients receiving optimal care had better survival and fewer long-term complications [9]. However, the presence of comorbidities such as renal failure or diabetes remains a major limiting factor.



A. *Acute stent thrombosis of the left anterior descending artery in the acute phase of a previous MI (myocardial infarction).*
B. *Guide downstream of the distal IVA (anterior descending artery), absence of antegrade flow (TIMI 0).*
C. *Guide downstream of the left retroventricular artery, thromboaspiration by Export® system. Figure .28: A. Acute stent thrombosis of the left anterior descending artery in the acute phase of a previous MI (myocardial infarction). Becoming coronary patients who have benefited from coronary angioplasty*
D. *Result after thromboaspiration by Export® system, recovery of normal coronary flow (TIMI 3), persistence of an intrastent thrombotic image*

Perspectives and recommendations

The results of our study highlight the importance of multidisciplinary management and rigorous follow-up of patients after coronary angioplasty. Technological advances, such as new generation active stents and intravascular imaging, offer promising prospects for improving clinical outcomes [10].
Finally, patient education on secondary prevention measures, including appropriate lifestyle and regular monitoring, is crucial to reduce recurrences and improve patients' quality of life in the long term.

CONCLUSION :

Coronary angioplasty has marked a major turning point in the management of acute coronary syndromes by providing rapid and effective revascularization. Technological advances, including the use of drug-eluting stents, have significantly improved short-, medium-, and long-term outcomes, reducing complications such as restenosis and increasing overall survival.
However, challenges persist, including the management of recurrent cardiovascular events and the prevention of late complications. Particular attention should be paid to the overall management of patients, including risk factor management, regular follow-up and adequate therapeutic education. Future perspectives include the integration of advanced technologies and the development of secondary prevention strategies to further improve the prognosis and quality of life of coronary patients.

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