Simultaneous Transradial Coronary and Renal in Stent Restenosis Treatment in Diabetic Patient with NSTE MI Complicated by Hypertensive Emergency

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The elderly diabetic patients are increasingly referred for percutaneous coronary interventions during acute coronary syndromes. A nonegligible proportion of this population includes the in stent restenosis as a possible cause of ischemic syndrome. This population accounts an higher risk of ischemic, bleeding and vascular complications affecting the periprocedural management, the length of hospital stay and also the prognosis. The improvement of strategies concerning site of access choice, antithrombotic drug and timing of interventional treatment have significantly reduced the incidence of complications. This paper reports the case of a 76 years-old diabetic female with a high bleeding risk, referred to our hospital because of NSTEMI complicated by pulmonary edema during hypertensive emergency. The patient had a simultaneous in stent restenosis both in left descending coronary artery and left renal artery, undergoing percutaneous transradial treatment during bivalirudin infusion. The clinical, technical, pharmacological and prognostic implications are discussed. Key words: Acute Coronary Syndromes; bivalirudin; in stent restenosis; drug eluting balloon.

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1. INTRODUCTION

The acute coronary syndromes (ACS) represent a significant burden on healthcare systems. Different Registries have demonstrated a dramatic improvement in ACS outcomes over the last years. In the last decade the paradigm that adding different anti-thrombotic regimens can improve the outcome was consolidated especially in high risk diabetic patient undergoing percutaneous coronary intervention (PCI).

However in the real world unselected populations this strategy is associated with an excess of bleeding that affects the prognosis. Nowadays, a number of data address the target of the treating strategies in balancing the avoidance of the event with the avoidance of an excess of bleedings.

During PCI, transradial approach dramatically reduces site-access bleeding complications then its use has increased particularly in ACS high risk patients (1, 2). At the same time nonaccess site bleeding is common after PCI, also after transradial approach, especially during ACS treated with optimal antithrombotic therapy (3). Diabetes is an independent marker of restenosis after percutaneous coronary intervention (PCI) especially when a bare metal stent was implanted. Despite the considerable advances in percutaneous interventions, long-term outcome after stent implantation remains an unresolved issue and restenosis has been referred to as the “Achilles heel” of percutaneous intervention. Among novel strategies developed to overcome this problem the paclitaxel-eluting balloon seems to be an effective therapeutic option both in coronary and peripheral artery restenosis. (4, 5, 6).
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pertension and hypercholesterolemia, referred to our hospital because of NSTEMI (ST-segment shift in anterolateral leads-CK-MB=12 ng/dl, TnI=2 ng/ml at admission).

At admission the patient had a pulmonary edema complicated by chest pain and very high systolic (190 mmHg) and diastolic (110 mmHg) arterial pressure.

Six months before the patient underwent percutaneous coronary bare metal stent implantation on mid left descending artery, for stable coronary artery disease (Canadian Class Study II). Afterwards, in consideration of severe hypertensive status despite extensive medical treatment, a renal PTA with stent implantation was performed for a tight stenosis on left renal artery. The clinical follow-up was uneventful until the next admission.

Before planning the treatment strategy a clinical and hemorrhagic risk stratification was provided: the GRACE risk score was 240 (30% in Hospital composite death or MI) and the CRUSADE Bleeding Score was 66 (risk of in Hospital major bleeding 19.7%).

The patient was pretreated with aspirin and a loading dose of 600 mg of Clopidogrel and undergoes early invasive strategy. According to the strategy used in our Cath Lab, the procedure was performed with left transradial approach during Bivalirudin infusion. The coronary angiography showed a normal right coronary artery (Figure 1 A) and the presence of sub-occlusive in stent diffuse restenosis (Figure 1 B) in middle segment of the left descending artery.

After a 0.014” (BMW, Abbott) guide-wire insertion in the first diagonal branch, a lesion predilation was performed with 2.0 x 12 mm (Quantum NC, Boston) non compliant balloon expanded up to 10 atmospheres, followed by Paclitaxel Eluted Balloon Angioplasty (PEBA) with 3.0 x 15 mm (Dior, Eurocor) expanded up to 12 atmospheres for 60 seconds (Figure 2 A) with good final angiographic result (Figure 2 B) in middle segment of the left descending artery.

In consideration of the small amount of contrast media used for coronary intervention (95 ml), we decide to treat the renal restenosis. A prolonged inflation of a 5.0 x 15 mm non compliant balloon (Quantum, Boston) up to 18 atmospheres was performed with a good final angiographic result (Figure 3 B-3C). At the end of procedure the total contrast medium amount was 130 ml.

The blood test performed 24 hours after the procedure showed stable values of hemoglobin. No GFR worsening neither access site and non access site bleeding complications was recorded during hospitalization and at 1 month follow-up. The patient was discharged asymptomatic on the fourth day after the procedure. Six months after the discharge the clinical follow-up was excellent, no MACE’s occurred, the arterial pressure values was normal on single antihypertensive drug treatment (Ramipril 10 mg/daily).

3. DISCUSSION

Bleeding complications occur in 2-5% of ACS patients with prognostic and pharmacoeconomic consequences related to length and cost of hospital stay.

During ACS, we can classify the predictors of bleeding in: patient related: older age, female gender, weight, previous bleeding, impaired renal function, comorbidities (i.e. diabetes), metabolic pathways genetically determined (i.e. cytochrome P4502C1917 polymorphism); drug related: type and regimen of antithrombotic association, excess
Figure 3 A. In stent restenosis of left renal stent; Figure 3 B. Non compliant balloon angioplasty; Figure 3 C. Final angio result.

Although the systematic use of bivalirudin in peripheral percutaneous scenario is a not approved labeling with lack of literature data, this case clearly demonstrates the safety and efficacy of bivalirudin in widespread percutaneous interventions also in high clinical and bleeding risk patients.

In the past, in-stent restenosis (ISR) after bare-metal stent (BMS) implantation is thought to be clinically benign. Recently this notion remains controversial and several studies show a correlation between ISR of BMS, repeated ACS, ischemic relapses and worse long-term clinical outcomes. (10, 11, 12).

The metabolic abnormalities associated with diabetes increase stent restenosis by promoting intimal hyperplasia even if a tight glicemic control was achieved with insulin administration (13). When in stent restenosis occur the rates of MACE and ACS were significantly higher confirming that ISR with BMS was significantly associated with long-term adverse clinical outcomes. Nevertheless recent studies, confirms that diabetes remains an important predictor for restenosis also in the DES era, in ACS diabetic patient DES implantation must be the first choice treatment in order to achieve improved angiographic and clinical outcomes. In this case the BMS previously implanted, as expected, develop restenosis confirming that in a diabetic patient DES, especially for large prognostic vessel, represent the first choice treatment even in a clinically stable coronary setting.

Significant renal artery stenosis is a well-accepted cause of arterial hypertension and renal insufficiency. Despite technical improvements of diagnostic and interventional endovascular tools has lead to widespread use of percutaneous renal artery revascularization, during the past two decades the indications for renal artery stenting have been still a matter of debate due to a considered unproven benefit compared with best medical therapy.

However when the revascularization was performed in the early phase of renal impairment the clinical results are achieved more efficaciously than the medical therapy alone.

Although the renal vascular bed is different, some pathophysiological findings are similar to that with coronary tree. The persistence in plaque vulnerability and platelet activation with subsequent atherothrombosis as well as the neointimal hyperplasia and restenosis can be an important common findings. In this case the renal stent was probably underexpanded increasing the probability of restenosis.

After balloon angioplasty alone, the introduction of stents proved to be a significant advance in reducing the elastic recoil and negative remodeling at the treatment site but stimulated proliferation, migration of smooth muscle cells, and neointimal hyperplasia, thereby generating a new type of restenosis, in-stent restenosis. Numerous attempts to increase vessel patency after percutaneous intervention have included systemic medications, endovascular brachytherapy and drug-eluting stents but these techniques have not met our expectations in preventing completely restenosis. Although the number of published trials and patients treated is still limited, available data seem to prove that non-stent based local drug delivery and interventional endovascular tools are achieved more efficaciously than the bare-metal stent restenosis as well as for treatment of drug-eluting stent restenosis compared with uncoated balloon angioplasty alone (6).

Our case shows that the use of paclitaxel-eluting balloons is safe, effec-
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tive and easy to use in case of coronary restenosis and potentially can be used during renal stent restenosis.

Although during acute coronary syndrome the interventional treatment must be limited to “culprit lesion” in our case the renal restenosis was responsible for a worsening in clinical conditions affecting the prognosis in consideration of the basal VFG (Cockcroft-Gault Creatinin Clearance=71.5 ml/min) we decide to treat. The post-procedural nephroprotection treatment with sodium bicarbonates was effective avoiding the contrast induced nephropathy as confirmed during the hospital stay and in the follow-up.

The potential to improve outcomes in ACS high risk diabetic patients is hence related to a multistep approach starting from a case-by-case early and mid-term clinical and bleeding risk assessment.

REFERENCES


