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Early ambulatory discharge is safe and feasible after transradial coronary interventions

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ABSTRACT

Background: At present, there are no definite criteria for selecting patients eligible for same-day discharge after percutaneous coronary interventions (PCI). With rapid ambulation and reduced vascular complication rates, transradial PCI have many features that favorably reduce costs and hospital stay. This study aimed to demonstrate the possibility of early ambulatory discharge following transradial percutaneous coronary interventions.
Methods: 254 consecutive patients undergoing transradial PCI (elective, urgent, and emergent) at our center was observed during hospital stay. Patient demographics, angiographic characteristics, post-procedural complications, and timing of these post-procedural events were recorded.
Results: A total of 336 lesions were treated among 299 vessels with 277 stents. One hundred fifty-two (45.2%) lesions were Type C. There were 26 chronic total occlusions (CTO). One hundred fifty-five (61%) patients were discharged on the same day after the procedure. 24 complications (12.6%) occurred and were divided into three groups according to occurrence time. 13 (54.2%) occurred within the first 2 h and 11 (45.8%) occurred after the 24-hour period. No complications were observed between the 2nd and 24th hours.
Conclusions: Same-day discharge with a 2-hour observation period is safe and feasible after successful transradial PCI in appropriate patients. Although a minor number of complications occurred, these did not occur between the 2nd and 24th hours. Same-day discharge after successful transradial PCI could be an alternative for better utilization of resources.

1. Introduction

Hospitalization is one of the major causes of rising costs in health care. Despite the increasing cost, overnight hospitalization is still usually required after therapeutic coronary interventions. Major reasons for hospitalization are surveillance for access site complications and peri-procedural events in the first 24 h. The frequency of access site complications, in particular, is further increased by aggressive antiplatelet or antithrombotic therapy as in patients with stent implantation [1], which is an additional factor for the increased need for hospitalization in recent years.

With the increasing number of patients who needs coronary interventions, hospital resources must be used cost effectively. The transradial route has some advantages over the transfemoral route, with lower rate of access site complications and earlier ambulation of patients [2–5]. The need for hospitalization following the transradial approach still has to be explored.

In this study, we aimed to demonstrate the post-procedural clinical course in the first 24 h following transradial PCI in order to determine the possibility of early ambulatory discharge.

2. Methods

This observational study was conducted in our center in which all diagnostic and PCI procedures are routinely performed via the transradial route. The study group consisted of 254 consecutive patients who underwent transradial intervention. Patient demographics, angiographic characteristics, post-procedural complications, and timing of these post-procedural events were recorded. The study was approved by the local ethics committee and an informed consent form was obtained from all patients.

2.1. Radial PCI technique

Following local anesthesia with 0.3 cm^3 verapamil and 0.7 cm^3 prilocaine 2% mixture, sheath insertion into the radial artery was performed using the standard Seldinger technique with a 21-gauge needle and a 0.018-inch guidewire. Short and hydrophilic 5- and 6-Fr sheath

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introducers were used. The left radial approach was used for the saphenous vein graft (SVG) ($n = 23$) and left internal mammary artery (LIMA) ($n = 2$) interventions. After sheath insertion, 1 mg verapamil was administered intra-arterially against radial artery spasm.

2.2. Anticoagulation

Unfractionated heparin (5000 IU) was administered intra-arterially after sheath insertion. All patients were pretreated with aspirin and clopidogrel 75 mg/day and 600 mg loading dose of clopidogrel was given if the patient was not on clopidogrel therapy. GP IIb/IIIa inhibitors were used upon operator's choice. The radial sheath was removed immediately after the procedure and compression was applied by sterile gauze bandage with the help of adhesive medical tape. The bandage was released gradually.

2.3. After the procedure

Patients were transferred either to a specially designed room with expandable comfort chairs (radial lounge) or to a normal ward (operator's choice). The cardiologist who performed the procedure decided on hospitalization. If the patient was discharged within 24 h, a telephone call was made the following day by a fellow to learn about minor and major complications including bleeding, chest pain, palpitation, or any complaints, which needed admission to an emergency unit.

2.4. Definitions of complications

Local vascular complications were defined as local hematoma, bleeding, regional ischemia, arteriovenous fistula, and pseudo-aneurysm. Major bleeding was defined as a decrease in hemoglobin level >5 g/dl or hematocrit ≥15%, or whole blood or packed red cell transfusions. Post-procedural myocardial infarction (MI) was defined as new pathological Q waves or elevation of creatinine kinase MB (CKMB) fraction greater than twice the normal upper limit.

2.5. Statistical methods

Data are expressed either as frequencies or medians (range). Data regarding occurrence of post-procedural MI and timing of events between groups were compared by Mann–Whitney *U* test. SPSS 15.0 (SPSS Inc., Chicago, IL, USA) statistical software package was used for all calculations.

3. Results

A total of 254 patients were included in the study. The demographics of the patients are given in Table 1.

A total of 336 lesions were treated among 299 vessels with 277 stents (95 bare metal stents (BMS), 102 cobalt-chromium, 72 drug eluting stents (DES), 2 graft-covered stents, and 6 polymer-coated stents). Those lesions were on the left main coronary artery (LMCA) in one, left anterior descending artery (LAD) in 132, circumflex artery (Cx) in 83, right coronary artery (RCA) in 107, LIMA in 2, and SVG in 11 interventions. One hundred fifty-two (45.2%) lesions were Type C. There were 26 CTO. Mean procedure time was 41.7 ± 21.1 min. In 53 patients, angiogram was performed via the left radial route (due to prior bypass surgery in 51 patients and a failure in the right radial artery cannulation in 2 patients). Seven (2.8%) patients received GP IIb/IIIa inhibitors. One hundred fifty-five (61%) patients were discharged on the same day after the procedure. Ninety-nine (39%) patients required prolonged hospitalization (>24 h).

Table 1
Demographics.

Male	196 (76.8%)
Age	62 ± 10
Weight	80.9 ± 14.2
BMI	28.35 ± 4.6
Diabetes mellitus	79 (31.1%)
Hypertension	173 (68.1%)
Hyperlipidemia	139 (54.7%)
Smoking	134 (52.8%)
Family history for CAD	123 (48.4%)
Previous myocardial infarction	87 (34.3%)
Previous CABG	51 (20.1%)
Renal failure	13 (5.1%)
Previous stroke	4 (1.6%)
Peripheral artery disease	12 (4.7%)
PCI indication	
Stable angina	157 (61.8%)
Unstable angina	88 (34.6%)
NSTEMI	8 (3.1%)
STEMI	1 (0.4%)
GP IIb/IIIa inhibitors	7 (2.8%)
Type A/B1 lesion	75 (22.3%)
Type B2 lesion	109 (32.4%)
Type C lesion	152 (45.2%)
CTO	26 (10.2%)
Single vessel PTCA	207 (81.5%)
Multi vessel PTCA	47 (18.5%)

CAD: coronary artery disease, NSTEMI: non ST elevation MI, STEMI: ST elevation MI.

3.1. Summary of complications

Twenty-four complications (12.6%) occurred and were divided into three groups according to occurrence time (0–2 h, 2–24 h, and >24 h) (Table 2). Of these, 13 (54.2%) occurred within the first 2 h and 11 (45.8%) occurred after the 24-hour period. No complications were observed between the 2nd and 24th hours.

There were no major bleedings. All minor bleeding events (8 patients) were observed during the first 2-hour period and were treated with manual compression and reapplying gauze bandage. Six of them were discharged on the same day after 4 h of surveillance. The other two were hospitalized because of the diagnosis of non-ST segment elevation MI.

There were eight post-procedural MI events. Four of them happened in the first 2 h. Two of these patients had chest pain and ST segment elevation in ECG as well as repeat catheterization during the 0–2 hour period. One of them had LMCA thrombosis after successful stent implantation to the Cx osteal region and this patient had post-procedural MI, VF, and was the only patient who required urgent coronary artery bypass graft surgery (CABG) during the 0–2 hour period. This patient also had stroke one day after CABG surgery. The other patient had LAD thrombosis after successful balloon dilatation only to LAD (because of small vessel size) and was treated with stent implantation. The other

Table 2
Complications.

	0–2 h	2–24 h	>24 h
Minor bleeding	6	None	2
Major bleeding	None	None	None
Post procedural MI	2	None	6
VT-VF	1	None	None
CABG	1	None	None
rePCI	2	None	2
Death	None	None	None
Atrial fibrillation	1	None	None
Stroke	None	None	1

VT: ventricular tachycardia, VF: ventricular fibrillation, AF: atrial fibrillation.