

LONG-TERM OUTCOME OF CORONARY BALLOON ANGIOPLASTY IN UNSTABLE ANGINA PECTORIS

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Anstabil angina pektorisli hastalar (USAP) stabil angina pektoris (SAP) göre daha yüksek akut koroner sendrom riski ile birlikte dir. Eylül 1998'den Aralık 2001 tarihleri arasında balon anjiyoplasti ile revaskülarize edilen 325 hasta (182'si stabil 143'ü anstabil angina pektorisli) 5 yıl takip edildi. Anstabil angina pektorisli hastalarda klinik başarı SAP'lılara göre çok düşük, işlem sırasında görülen komplikasyonlar ise çok yüksekti ($p < 0.05$). Beş yıllık takipte restenoz, revaskülarizasyon hızı ve miyokard infarktüsü sıklığı USAP'lı hastalarda SAP'lılara göre çok yüksekti ($p < 0.05$). SAP'lılara benzerdi.

Sonuçta, balon anjiyoplasti ile revaskülarize edilen USAP'lı hastalar çok daha yüksek işlemel komplikasyon, restenoz ve yeniden girişim hızına sahipti. Buna rağmen, USAP ve SAP'lı hastalarda benzer idi.

Anahtar kelimeler: Anstabil angina pektoris, Perkütan koroner anjiyoplasti uzun süreli sonuçlar

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GİRİŞ

Unstable angina pectoris (UAP) is a clinical syndrome characterized by new recurrent episodes of ischaemic pain at rest or on mild effort in the absence of evidence for myocardial infarction. Patients with UAP have high mortality varies from 7 to 10% after 1 year[1,2]. Unstable angina is related to fissuring or erosion of coronary atheromatous plaque with local platelet aggregation and thrombus formation. Previous studies have showed that the increased coagulation system activity during the acute phase of UAP might persist over 6 months despite an uneventful clinical course[3]. Percutaneous transluminal coronary angioplasty (PTCA) is a method of revascularization in UAP[4,5]. PTCA has a lower success rate and worse short-term results in patients with UAP compared with stable angina pectoris (SAP)[6,7]. However, the long-term results after successfully angioplasty in patients with UAP are not well known. So, the aim in our study to examine the

long-term (5 years) outcome in patients with UAP treated by balloon angioplasty and compared the results with those of patients undergoing angioplasty for SAP during the same period.

METHOD

Patient group

Between September 1998 and December 2001, PTCA was attempted in 352 consecutive patients at Sani Konukoğlu Medical Center. Of those patients, 193 (%54.8) had stable and 159 (%45.2) had unstable angina pectoris. The lesion could not be crossed by the angioplasty wire or balloon catheter in 11 patients (%5.7) in the stable and 16 patients (%10.1) in the unstable group, so that dilation was actually performed in 325 patients (182 with stable and 143 with unstable angina).

Angioplasty procedure

Selective coronary angiography was carried out according to the Judkins technique. Angioplasty was performed using standard techniques and pharmacotherapy as applicable at the time. Pharmacotherapy included aspirin 100-325 mg daily, intravenous heparin (10 000-15 000 U) during procedure and in selected patients for 12-24 h following angioplasty. After angioplasty patients were

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Table 1 Baseline Clinical Characteristics of Patients

	Stable angina (n= 182)	Unstable angina (n= 143)	p value
Age (years)	54.8 ± 10.1	56.9 ± 11.4	NS
Male (%)	76.3	80.0	NS
Prior infarction (%)	51.6	45.4	NS
Hypertension (%)	44.5	43.3	NS
Diabetes mellitus (%)	22.0	19.6	NS
Obesity (%)	37.4	36.4	NS
Current Smokers (%)	41.8	39.9	NS

treated with aspirin and long-acting nitrates for at least 3 to 6 months, unless contraindicated. Other drugs before, during, as well as after the procedure were administered according to the clinical situation and accompanying disorders.

Clinical and angiographic follow-up

In-hospital outcome was determined by means of a discharge form filled out on all patients at the time of discharge. All patients were evaluated clinically by outpatient visits or telephone interviews at regular intervals after PTCA. Coronary angiographic restudy was performed during follow-up if clinically indicated. Clinical events including death, recurrences of angina, myocardial infarction, or the need for repeat revascularizations of the target lesion (either by angioplasty or by surgery) during the follow-up period were evaluated. Clinical follow-up (mean: 60.8 ± 16.5 months) was available in 80.9% of cases.

Definitions

UAP was defined as chest pain at rest, of new onset, or increasing in frequency and severity. SAP was defined as pain on exertion relieved by rest or medication.

Significant stenosis (lesion) defined as stenosis causing >50% reduction of the lumen diameter in the main coronary branches were considered significant and assigned for angioplasty.

Multivessel disease was defined as the presence of significant narrowing in at least two different major coronary arteries.

Coronary lesions were characterised according to the modified ACC AHA classification[8].

Restenosis was defined as a recurrence of luminal narrowing to >50% in the previously dilated coronary segment.

Procedural success was defined as partial or total angiographic success without death, myocardial infarction, or need for emergency coronary artery bypass grafting.

Angiographic success was defined as a reduction in the diameter stenosis of all lesions dilated to <50% and a decrease in the stenosis diameter by >20%.

Statistical analysis

All data are expressed as proportion or mean ± SD. Categorical variables were compared by using the chi-square test and continuous variables by using the

Student t test. Survival and event-free survival were assessed by life-table analysis using the Kaplan-Meier method, and survival curves were compared using the log-rank test. A p value <0.05 was considered statistically significant. All statistical analysis was performed on computer using SPSS 8.0 software.

RESULTS

The baseline clinical characteristics of patients with SAP and UAP are given in Table 1. There was no difference between the two groups with regard to baseline clinical characteristics of patients.

Baseline angiographic characteristics and procedural data are shown in Table 2. Baseline angiographic characteristics were similar in SAP and UAP groups. Clinically successful procedure after PTCA was higher in SAP group (p<0.05). However, complete revascularization rate was similar in patients with SAP and UAP. In-hospital incidence of major complications were significantly higher in UAP group (p<0.0001).

Follow-up data are shown in Table 3. Mean follow-up duration was comparable in both groups. Repeat angiography, restenosis, repeat PTCA and CABG rate and, incidence of myocardial infarction during follow up were significantly higher in UAP group (p<0.05). The overall death and cardiac death rates showed no significant difference between two groups (Table 3 and Figure 1). Therefore, event-free survival during 5-year follow-up was significantly lower in patients with UAP (Table 3 and Figure 2). Year to year analysis showed that restenosis, repeat PTCA and CABG rates were significantly higher during first year of follow up (p<0.05). However, restenosis, repeat PTCA and CABG rates were not significantly different during second, third, fourth or fifth year.

DISCUSSION

We found a lower clinical success and higher complications rate in UAP patients undergoing angioplasty. These results are in accordance with previous reports[9, 10]. The lower clinical success and increased risk of complications during PTCA procedure in UAP patients was due to increased incidence of thrombus and instability of the injured plaque[11].

Tablo 2. Angiographic and Procedural variables

	Stable angina (n = 182)	Unstable angina (n = 143)	p value
Multivessel disease (%)	62.7	60.1	NS
No. significant lesions per patient	1.8 ± 0.5	1.7 ± 0.4	NS
No. dilated lesions per patient	1.2 ± 0.3	1.2 ± 0.3	NS
Dilated vessels	n = 218	n = 172	
LAD	55.8	56.9	NS
Cx	32.4	30.4	NS
RCA	30.2	32.8	NS
Dilated lesion typen	= 241 lesionn	= 177 lesion	
A	38.2	35.0	NS
B1	46.9	48.6	NS
B2	22.0	24.6	NS
C	10.8	9.0	NS
Successful procedure	93.4	86.0	0.021
Complete revascularization	58.2	60.8	NS
Periprocedural major complications	2.2	12.6	<0.0001
Death	0	0	NS
Myocardial infarction	1.1	3.5	NS
Emergency CABG	1.1	9.1	0.011

Tablo 3. Long-Term Outcome after successful PTCA

	Stable angina (n = 139)	Unstable angina (n = 124)	p value
Mean follow-up (months)	61.4 ± 24.7	60.1 ± 22.3	NS
Repeat angiography	48.2	63.7	0.008
Restenosis	28.4	50.6	0.005
Repeat PTCA	26.9	46.8	0.001
CABG in follow up	13.4	24.0	0.03
Myocardial infarction	3.0	7.6	0.045
Death	2.9	4.8	NS
Cardiac death	2.2	3.2	NS
Event-free survival	56.8	29.0	<0.0001

The results from our analysis showed that patients who undergo PTCA for UAP continue to be at higher risk for adverse clinical outcomes for up to 1 year compared with those who present with SAP. Previous reports have showed that 1 year follow up results of PTCA are better in patients with SAP than in patients with UAP[7,12]. Some investigators have not found any advantage in the early intervention in UAP[13,14]. Indeed Boden et al. have reported a worse results in early invasive therapy than the initially conservative strategy[15].

Many investigators have showed that patients with UAP had higher restenosis rate, but similar atherosclerosis progression rate compared with SAP after PTCA[9,10,16]. In accordance with those studies, we found a higher reintervention rate, especially during first year following PTCA in patients with UAP compared with patients SAP, resulting from restenosis.

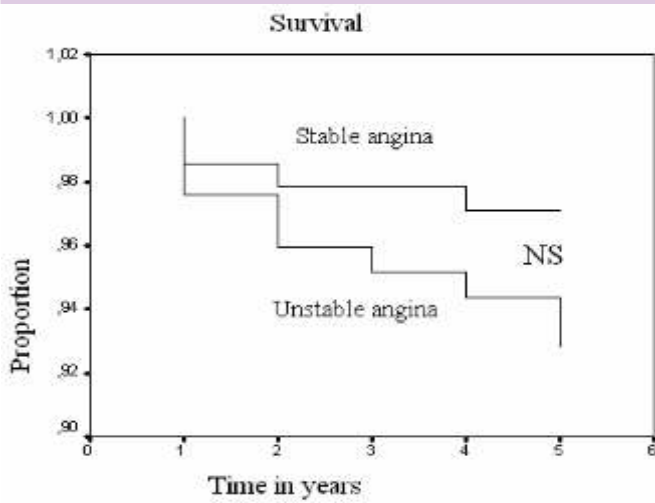
In UAP, local lesion characteristics may influence the acute response to angioplasty and short term

complication rate[17,18]. Bauters et al. and Violaris et al. have reported that thrombus containing lesions which was frequently occurred in UAP patients, caused restenosis development more frequently after angioplasty[19,20]. Our results, together with previous reports, connote that UAP was a short-lasting process limited to one or more particular coronary lesions which followed by vascular healing and plaque restabilization after PTCA[21]. On the other hand some investigators have reported that markers of acute systemic inflammation, increased coagulation tendency and infectious agents might have some role in the aetiology of restenosis[22,23].

In our study, we observed a significantly higher incidence of myocardial infarction in UAP patients during the follow-up period, mainly throughout the first year following PTCA. We suppose that myocardial infarction was due to higher rate of restenosis during the first year after PTCA.

In accordance with previous reports, we did not find significant difference in the overall mortality and

Figure 1. Kaplan-Meier curves of survival in patient with stable and unstable angina pectoris.



cardiac mortality between patients with UAP and SAP during long-term follow up[9,10]. It seems that, instability is a short-term disorder and, when successfully treated, does not influence patient's long-term survival.

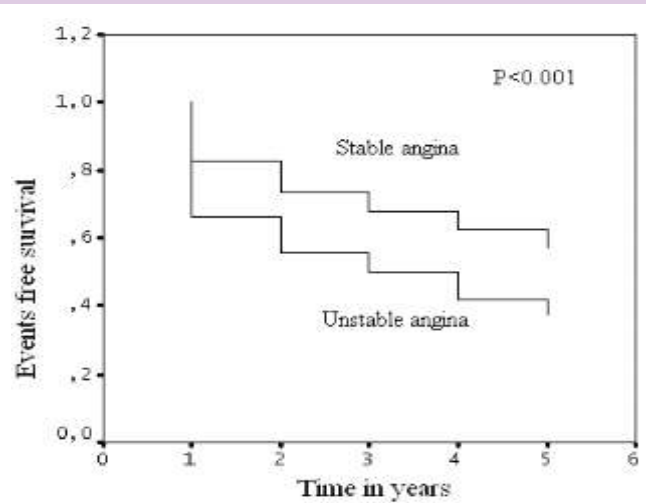
The use of coronary stents decreased the rate of acute and late vessel closure, leading to a lower rates of restenosis, myocardial infarction, mortality and need for CABG surgery[24]. The clinical use of glycoprotein IIb/IIIa receptor blocker have decreased incidence of acute ischemic events furthermore[25].

In conclusion, patients with UAP who underwent PTCA exhibited significantly more procedural complications and required significantly more reinterventions in 5 years follow-up, mainly due to restenosis, especially within the first year following the procedure. The overall mortality and cardiac mortality was similar in patients with UAP and SAP during long-term follow up.

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Figure 2. Kaplan-Meier curves of event-free survival in patients with stable and unstable angina pectoris.



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