The first 100 cases of Percutaneous Transluminal Coronary angioplasty in Maharat Nakhon Ratchasima Hospital: Personal Experience.

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Abstract

From June 2000 to April 2002, 100 cases (156 lesions) of percutaneous transluminal coronary angioplasty (PTCA) had been performed at Maharat Nakhon Ratchasima Hospital. Fifty seven percent of the patients were male. Mean age was 62.2±9.3 years and mean ejection fraction was 63±19.5%. The indication for PTCA consisted of chronic stable angina (67%), unstable angina (31%) and acute ST elevation myocardial infarction (MI) (2%). Emergency PTCA was performed on 4 cases with one patient in cardiogenic shock. The patients were classified into 3 groups, according to number of stenosed coronary arteries, single vessels 58 % , double vessels 35% and triple vessels 70% .The vessels dilated were left anterior descending artery (LAD) 51.1%, right coronary artery (RCA) 16%, left circumflex artery (LCx) 30.8% and left main 1.92%. Mean balloon size was 2.5 mm.The overall success rate of PTCA defined on residual diameter stenosis less than 50%, was 95%. In addition to PTCA, 140 stent implantation with mean stent size 2.95 mm. was performed. Complication of PTCA occurred in 6 cases (6%). It comprised 1 abrupt closure (1%), 1 acute stent thrombosis (1%), 1 subacute stent thrombosis, 2 groin hematoma and 1 acute fatal thrombosis of left anterior descending coronary artery with retrograde clot to the left main artery.

Conclusion: PTCA is the coronary interventional procedure that can be performed in Maharat Nakhon Ratchasima Hospital with high success rate and minimal complications.

Keyword: Percutaneous transluminal coronary angioplasty, Maharat Nakhon Ratchasima Hospital.

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บทคัดย่อ: 100 รายแรกในการทำบัลลูนขยายหลอดเลือดหัวใจ ในโรงพยาบาลมหาราชนครราชสีมา: ประสบการณ์ส่วนตัว

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ระหว่างเดือน มิถุนายน 2543 ถึงเมษายน 2545 ผู้ป่วยหลอดเลือดหัวใจตีบ 100 รายได้รับการรักษาโดยการทำบัลลูนขยายหลอดเลือดหัวใจ ที่โรงพยาบาลมหาราชนครราชสีมา ร้อยละ 75 ของผู้ป่วยเป็นชาย อายุเฉลี่ย 62.2± 9.3 ปี และมี ejection fraction เท่ากับ 63±19.5 เปอร์เซนต์ ข้อบ่งชี้ในการทำบัลลูนขยายหลอดเลือดหัวใจตีบคือ stable angina (ร้อยละ 67), unstable angina (ร้อยละ 31), acute myocardial infarction (ร้อยละ 2) ผู้ป่วย 4 รายได้รับการทำบัลลูนแบบฉุกเฉิน โดยที่ 1 รายมีภาวะช็อคจากหัวใจร่วมด้วย ร้อยละ 58 ของผู้ป่วยมีเส้นเลือดหัวใจตีบ 1 เส้น, ร้อยละ 35 มีเส้นเลือดหัวใจตีบ 2 เส้น และร้อยละ 7 มีเส้นเลือดหัวใจตีบ 3 เส้น บัลลูนถูกใช้ในการขยายเส้นเลือดแดง Left anterior descending ร้อยละ 51.1, เส้นเลือดแดง Right coronary 16, เส้นเลือดแดง Left circumflex ร้อยละ 30.8 และเส้นเลือดแดง Left main ร้อยละ 1.92 ค่าเฉลี่ยขนาดของบัลลูนที่ใช้ 2.5 มิลลิเมตร, อัตราการทำบัลลูนสำเร็จ (เหลือการตีบแคบของเส้นเลือดที่ทำบัลลูนน้อยกว่า 50 เปอร์เซนต์) เท่ากับ ร้อยละ 95 บางรายมีการใส่ขดลวดขยายเส้นเลือดร่วมด้วย จำนวน 140 อัน โดยค่าเฉลี่ยขนาดขดลวดขยายเส้นเลือดเท่ากับ 2.95 มิลลิเมตร ภาวะแทรกซ้อนของการทำบัลลูนพบ 6 ราย คิดเป็นร้อยละ 6 ซึ่ง 1 ราย (ร้อยละ 1) เกิดการอุดตันของเส้นเลือดทันจำเป็นต้องได้รับการผ่าตัดต่อเส้นเลือดอย่างรีบด่วน 1 ราย (ร้อยละ 1) เกิดการอุดตันของขดลวดขยายเส้นเลือดทันที สองราย (ร้อยละ 2) เกิดก้อนเลือดใหญ่ที่ขาหนีบและหนึ่งรายเสียชีวิตจากก้อนเลือดอุดตันเส้นเลือด Left main

สรุป การทำบัลลูนขยายหลอดเลือดหัวใจสามารถทำได้ ในโรงพยาบาลมหาราชนครราชสีมา โดยประสบความสำเร็จในอัตราที่สูงและมีภาวะแทรกซ้อนต่ำ

คำสำคัญ: การทำบัลลูนขยายหลอดเลือดหัวใจ, โรงพยาบาลมหาราชนครราชสีมา

Percutaneous transluminal coronary angioplasty (PTCA) is one of the treatments for recanalization in the patients with coronary artery disease. Andreas Guntzig [1-4] performed the first coronary angioplasty in 1977 and after that many cases of angioplasty have been done worldwide. Many studies demonstrated that PTCA is better treatment for controlling anginal chest pain with a high success rate,[5-7] as compared with medical treatment. However, the restenosis after PTCA remains the most important problem, 30-40 percent occur within 6 months after successful PTCA. To reduce the restenosis rate, many new devices [8-11] and pharmacologic drugs have been added such as intracoronary stent, Rotational athrectomy, Transluminal extraction athrectomy and platelet glycoprotein IIb,IIIa receptor antagonist. In Maharat Hospital, PTCA was initiated in June 2000, the number of cases has increased every year. This study was done to evaluate

the initial procedural success and complication rate of PTCA.

Patients and method

All patients who had percutaneous transluminal coronary angioplasty at Maharat Nakhon Ratchasima Hospital from June 2000 to April 2002 were enrolled. History, angio-graphic information, initial procedural success and complications were recorded prospectively at least 6 months after complete angiography.

Definition

A successful case was defined as a patient who has less than 50% angioplasty residual diameter stenosis without adverse events such as acute myo-cardial infarction (MI), emergency coronary artery bypass graft or death during the procedure or hospitalization.

Table 1 Baseline characteristics of the patients

Number of patients	100
Mean age (Year)	62.2 ± 9.3
Male : Female	1.3 : 1
Hyperlipidemia (%)	3
Hypertenion (%)	50
Diasetes millitro (%)	31
Smoker(%)	22
Prior MI (%)	10
Previous CABG (%)	2
Previous PTCA (%)	1
LVEF (%)	62.28 ± 19.5

LVEF: Left ventricular ejection fraction

Table 2 Indication for PTCA

Indication	%
Chronic stable angina	67
Unstable angina	31
Acute MI	2

Statistical analysis

The continuous variables were expressed as mean ± SD. For the analysis of continuous data, the two-tail t-test was used to assess differences between the two groups. The nominal variables were expressed as counts and percentages. Statistical significance was calculated with chi-square test. All tests were considered statistically significant when P values was less than 0.05.

Results

One hundred patients underwent percutaneous coronary angioplasty from June 2000 to April 2002 with 100 % follow up. The baseline characteristics of the patient were shown in table 1. Stable angina pectoris was the most common indication for PTCA followed by unstable angina and acute ST-elevation MI respectively (table 2). Only 2 cases of acute MI were treated with PTCA because of learning period. The number of vessel distribution and vessel for PTCA are shown in table 3. As an adjunction to PTCA, stents were implanted about 90% of lesions. Mean number of lesions per procedure was 1.56:1, and fluoroscopy time in average was about 22 minutes (table 4). The lesion success rate and case success rate were about

Table 3 Number of vessels and distribution for PTCA

Number and distribution of vessels	%
Single vessel disease (SVD)	58
Double vessel disease (DVD)	35
Triple vessel disease (TVD)	7
Left anterior descending artery (LAD)	51.1
Left circumflex artery (LCx)	30.8
Right coronary artery (RCA)	16
Left main artery (LM)	1.9

95%. There was one hospital death in the case of unstable angina after MI waiting for coronary artery bygass graft (CABG) (ostial LAD and distal left main coronary artery disease) because of recurrent MI with cardiogenic shock during PTCA.

Table 5 shows the complication of PTCA , i.e.: abrupt closure, acute and subacute stent thrombosis only 1 case (1%) of each complication was found and all can be corrected with re-PTCA. Two patients developed large groin hematoma but could be resolved with conservative method within 2 weeks. Overall complication rate was 6%.

Table 4 The results of percutaneous transluminal coronary angioplasty

Number of patient	100 cases
Lesions : PTCA	1.56 : 1
Mean fluoroscopic time	21.8 minutes
Mean procedural time	70.2 minutes
Stent implantation(% of lesions)	90
Success rate	95%

Table 5 Complication of PTCA

Complication	%
Abrupt closure	1
Acute stent thrombosis	1
Subacute thrombosis	1
Groin hematoma	2
Death	1

Discussion

The incidence of coronary artery disease in Thailand seems to be increased rapidly over the latest decade according to the increase in number of coronary angiography and coronary intervention. Primary prevention is the best measure against coronary artery disease. But once the disease has developed PTCA is one of the treatments to relieve symptom of chest pain but prevention of artherosclerosis is most important. People should be educated about dietary fat intake and modification of other risk factors. When the disease occurs, PTCA is one of the treatments which should be considered. The problem of PTCA is how to do it and get the best success. Restenosis is the most important problem and usually occur within 6 months. Thirty to fifty percents of cases after successful PTCA will develop this complication within 6 months.[12-15] Stent can decrease the restenosis rate to 10-20% and now is the era of Drug eluting stent [16-20], which is claimed that restenosis approaches near zero. From our data success rate was about 95% and restenosis rate was low about 11% comparable to other institutes in Thailand [21]

Summary

In my experience, PTCA can be performed with a high success rate and minimal complication rate.

Reference

1. Gruntzig A, Hirzel H. Goebel N, Gattiker r, Turina M, Myler R, et al. Perkutane transluminale dilatation of chronic coronary stenoses. Schweiz med Wpchenschr 1978; 108:1721-3.
2. King SB. Angioplasty from bench to bedside to bench. Circulation 1996;93:1621-1629.
3. Gruntzig A. Transluminal dilatation of coronary artery stenoses (letter). Lancet 1978; 1: 263.
4. Gruntzig A, Senning A, Siegenthaler WE. Non-operative dilatation of coronary artery stenosis: percutaneous transluminal angioplasty. N Engl J Med 1979; 301: 61-8.
5. Parisi AF, Folland ED, Hartigan P. A comparison of angioplasty medical therapy in the treatment of single vessel coronary artery disease (Veterans affairs ACMD Investigator). N Engl J Med 1992; 326: 10-6.
6. Dekugibyk U, Vandermael MG, Kern MJ. Coronary angioplasty: A therapeutic option for asymptomatic patients with two and three vessel coronary artery disease. J Am Coll Cardiol 1988; 11: 1173-9.
7. O'Keefe JH Jr, Rutherford BD, McConahay DR, Johnson WL Jr, Giorgi LV, Ligon RW, et al. Multivessel coronary angioplasty from 1980 to 1989: Procedural results and long - term outcome. J Am Coll Cardiol 1990; 16: 1097-102.
8. Topol EJ, Leya F Pinkerton CA, Whitlow PL, Hofling B, Simonton CA, et al. A comparison of directional athrectomy with coronary angioplasty in patients with coronary artery disease: the CAVEAT Study Group. N Engl J Med 1993; 329: 221-7.
9. Bertrand ME, Lablanche JM, Leroy F, Bauters C, De Jaegere P, Serruys PW, et al. Percutaneous transluminal coronary rotary ablation with Ratablator (European experience). Am J Cardiol 1992; 9: 470-4.
10. Popma JJ, Leon MB, Mintz GS, Kent KM, Salter LF, Garrand TJ, et al. Results of coronary angioplasty using the transluminal extraction cathetor. Am J Cardiol 1992; 70: 1526-32.
11. Ghazzal ZM, Hearn JA, Litvack F, Goldenberg T, Kent KM, Eigler N, et al. Morphological predictors of acute complications after percutaneouse excimer lasercoronary angiographic analysis : importance of the eccentricity index. Circulation 1992; 86: 820-7.
12. Holmes DR Jr, Vlietstra RE, Smith HC, Vetrovec GW, Kent KM, Cowley MJ, et al. Restenosis after percutaneous transluminal coronary angioplasty (PTCA) : a report from the PTCA Registry of the National Heart, Lung, and Bolld Institute. Am J Cardiol 1984; 53: 77c-81c.
13. Gruentzig AR, King SB, Schlumpf M, Siegenthaler W. Long-term follow-up after percutaneous transluminal coronary angioplasty : the early Zurich experience. N Engl J Med 1987; 316: 1127-32.
14. Nobuyoshi M, Kimura T, Nosaka H, Mioka S, Ueno K, Yokoi H, et al. Restenosis after successful percutaneous transluminal coronary angioplasty : serial angiographic follow-up of 229 patients. J Am Coll Cardiol 1988;12: 616-23.
15. Hirshfeld JW Jr, Schwartz JS, Jugor R, MacDonale RG, Goldberg S, Savage MP, et al. Restenosis after coronary angioplasty : a multivariate statistical model to relate lesion and procedure variables to restenosis. J Am Coll Cardiol 1991;18:647-56.
16. Morice MC, Serruys PW, Sousa JE, Fajadet J, Ban Hayashi E, Perin M, et al. A randomized comparison of a sirolimus-eluting stent with a standard stent for coronary revascularization. N Engl J Med 2002; 346:1773-80.
17. Fischman DL, Leon MB, Baim DS, Schatz RA, Savage MP, Penn I, et al. A randomized comparison of coronary-stent placement and balloon angioplasty in the treatment of coronary artery disease. N Engl J Med 1994; 331: 496-501.

18. Serruy P, Jargerc P, Kiemeneij F, Macaya C, Rutsch W, Heyndrickx G, et al. A comparison of balloon-expandable-stent implantation with balloon angioplasty in patients with coronary artery disease. N Engl J Med 1994; 331: 489-95.

19. Serruys PW, Emanuelsson H, Giessen W, Lunn AC, Kiemeney F, Macaya C, et al. Heparin-coated Palmaz-schatz stents in human coronary arteries. Early outcome of the Benestent-II pilot study. Circulation 1996; 93: 412-22.

20. Versaci F, Gaspardene A, Tomai F, Crea F, Chiariello L, Gioffre PA. A comparison of coronary-artery stenting with angioplasty for isolated stenosis of the proximal left anterior descending coronary artery. N Engl J Med 1997; 336: 817-22.

21. Srimahachota S, Udayachalerm M, Boonyaratavej S, Sittisuk S, Suithichaiyakul T, Chaipromprasit J, et al. Percutaneous transluminal coronary angioplasty in King Chulalongkorn Memorial Hospital: a four-year experience. J Med Assoc Thai. 1998;12:1181-6.