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The Nurses' Compliance in Femoral Sheath Removal Procedure in Relation to the Incidence of Hematoma in Patients after PTCA

by Christina Yuliastuti

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The Nurses' Compliance in Femoral Sheath Removal Procedure in Relation to the Incidence of Hematoma in Patients after PTCA

Jati, Christina Yuliastuti and Nisha Dharmayanti Rinarto
STIKES Hang Tuah Surabaya, East Java, Indonesia

Keywords: Hematoma, Nurses' Compliance, PTCA, Sheath Removal.

Abstract: Femoral hematomas may occur after Percutaneous Transluminal Coronary Angioplasty (PTCA). The objective of this study was to identify the correlation between the nurses' compliance of femoral sheath removal with the incidence of hematoma in patients after PTCA. This observational study enrolled 20 nurses and 20 patients after PTCA in Intensive Care Unit, taken by simple random sampling. Data collection was undertaken using a set of observation sheet based on Standard Operating Procedure and the presence of hematoma. The data were analyzed with Spearman Rank test with significance level of 0,05. Results showed that there was a significant correlation between compliance of nurses in performing the procedure of sheath removal with the incidence of hematoma ($\rho = 0.000$). A properly performed compression manual on removal of the arterial sheath, ie, for 15-20 minutes until hemostasis is reached where no bleeding through the catheter inserts will minimize the incidence of the hematoma. Supervision, training and simulation will improve the capacity of nurses' knowledge and skills in performing sheath removal procedures.

1 BACKGROUND

Percutaneous Transluminal Coronary Angioplasty (PTCA) is a procedure whereby a balloon catheter is inserted through a wire, and then developed at the site of stenosis to increase the lumen diameter (Philip, 2010), it is expected to improve blood flow to the myocardium, myocardial damage is not widespread, chest pain and symptoms of tightness can be reduced even disappeared by the inclusion of ring or stent in blood vessels that have blockage. Elective PTCA within 30 days post IMA may reduce mortality and risk of complications when compared with medical therapy especially in patients with unstable conditions, but in patients with stable asymptomatic and stable hemodynamic risk the results are no better than optimal medical therapy (Subagyo, 2012).

Klemsová and Žiaková (2014) said that both approaches to catheterization carry the risk of complications associated with the removal of cannula sheath. The most common complication after cardiac catheterization through the femoral artery is the development of vascular complications (bleeding, hematoma, pseudoaneurysm). From history it is known that complications associated with the removal of cannula (sheath) from the femoral artery were up to 11%. Hamon et al. (2007) indicate, based on a systematic review and meta-analysis of randomized trials, incidence of complications in the femoral approach in 2–5% of patients after interventional procedures. Studies in 90 patients undergoing cardiac interventional procedures were randomly selected to undergo one of 3 sheath removal methods : manual compression, mechanical compression with Compressar, and mechanical compression with Femostop. The results showed that patients undergoing sheath removal manually had fewer complications than patients who underwent sheath removal using Compressar or Femostop (Benson et al., 2005). Research on 413 patients with Following Sheath Removal With Percutaneous Coronary Intervention, as many as 60 (16.5%) had complications. Sixty-four (15.5%) had hematoma, 6 (1.5%) had bleeding, 4 (1%) had arteriovenous fistula and 3 (0.7%) had pseudoaneurysms. No significant difference in complications either using manual compression, C-Clamp or arterial vascular closure device (Sulzbach-Hoke, Ratcliffe, Kimmel, Kolansky, & Polomano, 2010).

Walker, Cleary, & Higgins (2001) conducted a comparative study (FemoStop compression versus manual compression) in order to reduce the complications at the injection site. The results showed

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that the incidence of hematoma has a great relationship to the method of compression used on the femoral artery. Walker said that although using manual pressure compression the hemostasis was achieved faster than with FemoStop, both methods are considered as effective to reduce complications in the groin. However, non-compliance of nurses in the procedure of removing the femoral sheath will lead to hematoma, discomfort, healing period and elongated day. Risk factors predisposing patients to these complications are both modifiable (procedure technique, medications, hemostasis method) and nonmodifiable (sex, age, body mass index, blood pressure, renal function). Patients' risks can be reduced by nurses who are knowledgeable about these risk factors and identify complications before they become problematic (Merriweather & Sulzbach-Hoke, 2012). The objective of this study was to identify the correlation between the nurses' compliance of femoral sheath removal with the incidence of hematoma in patients after PTCA.

2 METHODS

This study used observational analytic and conducted to identify the correlation between the nurses compliance of femoral sheath removal with the incidence of hematoma in patients after PTCA. Samples were taken by simple random sampling consisting of 20 nurses and 20 patients after PTCA in Intensive Care Unit, aged 40-60 years and take anti-platelet drugs (Pavix, aspilet and the like), not suffering from Diabetes mellitus and thrombocytopenia. Data collection was undertaken using a set of observation sheet based on Standard Operating Procedure (SOP) and the presence of hematoma. The applicable SOP in Intensive Care Unit consisted of 15 steps of the procedure. Both nurses compliance in performing sheath removal and the incidence of hematoma were observed only one at a time. The data were analyzed with Spearman Rank test with significance level of 0.05.

3 RESULTS

Overall, from 20 respondents, the majority of patient were male (60%) and The average age was 51≤60 years old (50%) and has suffered from the disease for 0-1 years (50%). Mostly get CPG as a drug therapy. Characteristics of patients can be seen in Table 1. While the participant nurses, mostly were female

Table 1: Patients characteristic.

No	Patients Characteristic		Frequency	
			n	%
1	Gender	Male	12	60.0%
		Female	8	40.0%
2	Age	30-<40 years old	5	25.0%
		40-<50 years old	5	25.0%
		51-<60 years old	10	50.0%
3	Length of suffering disease	0-1 year	10	50.0%
		2-3 year	3	15.0%
		3-5 year	2	10.0%
		>5 year	5	25.0%
4	Drugs	CPG	17	85.0%
		Plavix	3	15.0%
		Blistra	0	0.0%

Table 2: Nurses characteristic.

No	Nurses Characteristic		Frequency	
			n	%
1	Gender	Male	7	35%
		Female	13	65%
2	Age	20-<25 years old	6	30%
		25-<30 years old	13	65%
		30-35 years old	1	5%
3	Last Education	Diplomas	18	90%
		Bachelor	2	10%
4	Marital status	Not Married	11	55%
		Married	9	45%
5	Length of work in ICU	0-6 months	4	20%
		6 months - 1 year	3	15%
		1-3 years	6	30%
		>3 years	7	35%
6	The position of nurse	Nurse ascociate	18	90%
		Nurse team chief	2	10%
7	Experience in special training	Have attended training	5	25%
		Never	15	75%

(65%) and aged 25≤30 years old (65%). Mostly educated diplomas (90%), not married (55%), and the average nurse has worked >3 years in Intensive Care Unit, as a nurse ascociate (90%) and never participated in any specific training on sheath removal procedures (75%). Characteristics of nurses can be seen in Table 2.

Table 3: Correlation between compliance of nurses in the femoral sheath removal procedure and the incidence of hematoma.

Compliance of nurses	The incidence of hematoma					
	hematoma		No hematoma		Total	
	n	%	n	%	n	%
Not Obedient	7	77.8%	2	22.2%	9	100%
Obedient	0	0%	11	100%	11	100%
Total	7		13		20	100%
p = 0.000			r = 0.811			

Table 3 showed that 7 (77.8%) non-adherent nurses on the procedure of femoral sheath removal causing hematoma in patients and 11 nurses (100%) who adhered to the procedure did not cause hematoma in patients after PTCA. This study found that there was a significant correlation between compliance of nurses in the femoral sheath removal procedure and the incidence of hematoma (p = 0.000).

4 DISCUSSION

Percutaneous Transluminal Coronary Angioplasty (PTCA) is a coronary angioplasty action using a technique with balloons inserted into a stenotic coronary vessel, after which the balloon is developed and thus the stenosis disappears or is greatly reduced, then the balloon is deflated and removed (Sudoyo, 2006). Percutaneous transluminal coronary angioplasty (PTCA), formerly known as balloon angioplasty (European Society of Cardiology, 2010). The sheath removal procedure should be performed carefully and in accordance with the procedure so as not to cause vascular complications such as hematoma. Sabo, Chlan, & Savik (2008) found that the most frequently occurring Vascular Complications (VCs) after sheath removal following a percutaneous coronary intervention procedure were ecchymosis, hematoma, and oozing. Body surface area significantly influenced hematoma formation.

The results showed that of the 11 nurses who adhered to Standard Operational Procedure (SOP), 6 nurses (54.5%) had worked >3 years, while from 9 non-compliant nurses to SOPs, 4 (44.4%) were new nurses working between 0-6 months. In addition, 5 nurses who had attended the training, all complied with SOP, while from 15 nurses who never received special training, as many as 9 (60%) did not comply with SOP. It can be explained that experience affects nurse compliance in performing procedures according to the rules, but this ability needs to be rehearsed and repeated continuously in order to create habits. This is in accordance with the research of (Schiks, Verheugt, & Achterberg, 2007) about performance evaluation of arterial femoral sheath removal by registered nurses after PCI that was perform in 1999 and 2005, they explained that registered nurses achieved the norm for good performance (80–89%) of removing arterial sheaths according to protocol after a training programme and this is stable in time. Since the norm for excellent performance (≥90%) was not achieved, current performance could be improved. e.g. by yearly repetition of training and observation of skills.

The study founds 9 nurses (45%) who did not comply with SOPs. The non-compliance was also caused by the lack of supervision from the supervisor, so the nurses performed the sheath removal procedure, sometimes less cautious, because they assumed that no one was watching during or after the procedure. This is as stated by (Niven, 2002) that the quality of interaction between health professionals is an important part in determining the degree of non-compliance due to the lack of reprimand and sanction for nurses who have disobedient behavior in doing aff sheath, lack of interaction between nurses because there is no mutual reminded to be obedient to the SOP.

Hematoma is an accumulation of external bleeding or it can also hide inside a tissue (Ramzi S, 2004). Hematoma when evaluated in terms of extent may be small, with only one blood point or can become large and cause significant swelling. The blood vessels in the body are always under constant repair. Minor flocs occur routinely and the body is usually able to repair damaged vessel walls by forming fibrin patches. Sometimes the repair fails when extensive damage and major damage lead to continuous bleeding. Likewise, if there is great pressure in the blood vessels, for example the main artery, the blood will continue to leak and the hematoma will dilate. Blood coming out of the bloodstream is very irritating and may cause inflammatory symptoms including pain, swelling and redness. Symptoms of a hematoma depend on location, size and whether it causes swelling and edema. (Walker et al., 2001) said that the incidence of hematoma has a great relationship to the method of compression used on the femoral artery. This study found that 7 (77.8%) non-adherent nurses on the procedure of femoral sheath removal causing hematoma in patients and 11 nurses (100%) who

adhered to the procedure did not cause hematoma in patients after PTCA. There are several systems that play a role in the hemostatis vascular system, platelets and blood clotting. Prevention of blood loss, if the blood vessels that have ruptured through several ways between other : blood vessel constriction that is immediately after the blood vessels cut or rupture wall smooth muscle blood vessels contract so that the blood flow from blood vessels that rupture will decrease, the formation of platelet stoppers where very small blood vessels are usually covered by small disc-shaped platelets stacked with 1 to 4 micrometres in bone marrow, clot freezing in ruptured vessels that begin to form within 1 to 2 minutes and 20 minutes to 60 minutes of clot will experience retraction, this can close the site of the wound is the formation of fibrous tissue as a response to rupture of blood vessels occur complex chemical structures in the blood involving various factors of blood clotting which the end result is the formation of a complex of activated substances that collectively in call the prothrombin activator. the prothrombin activator catalyzes the conversion of the protombin to thrombin, thrombin acts as an enzyme to convert fibrinogen into fibrin fibrils that sequence platelets of blood cells and plasma to form clots. (Guyton, A.C., dan Hall, 2008) The use of thrombolytic therapy also has an effect on the occurrence of hematoma during sheath removal. Researchers also found that patients were still taking thrombolytic therapy before the sheath removal that resulted in blood thinning. Anticoagulant drugs are used to prevent the occurrence of thrombosis, which works to inhibit blood clotting. The mechanism of action of anticoagulant drugs is to suppress the synthesis of clotting factors that influence vitamin K ie protombin, VII, IX, and X. The main work of anticoagulant drugs is to inhibit the action of enzymepoxide reductase. After a week of consecutive treatment, the activity of the clotting factor will be very low in the blood. Patients taking blood-thinning drugs (anticoagulation) such as warfarin (coumadin), aspirin clopidogrel (plavix), and prasugrel. These drugs increase the potential for spontaneous bleeding and for widespread hematoma because the body can not efficiently repair blood vessels and blood is constantly out through damaged areas. Besides the proper compression technique will reduce the occurrence of hematoma.

This study also founds that there was a significant correlation between compliance of nurses in the femoral sheath removal procedure and the incidence of hematoma (p = 0,000). Manual compression in sheath removal is done until the hemostasis is reached where no bleeding occurs through the catheter insertion mark, which is 15 to 20 minutes. Compliance of nurses in this case is assessed from the adherence of the 15 steps based on the standard operational procedure of femoral sheath removal applicable in Intensive Care Unit. The researcher gave a score of 1 if not done and score 2 when done. This study found that of the 20 nurse respondents, the highest total score was 40 at the fourth, fitfh, sixth and eightth steps, this means that all nurses performed observation/ monitoring of vital signs during the procedure, palpated the dorsalis pedis pulsation, placed 2 fingers 2-3 cm above the sheath for touch pulsation of the femoral artery and perform manual compression properly until the blood does not come out. The compression is done by reducing the strength 25% after ± 15 minutes while the patient is observed, if blood is still out then back to the beginning until no blood came out, 5 minutes later strength of pressure minus 50%. When it is stop to came out, then give a band aid and do a compression bandage. The researcher assumes that all steps in Standard Operational Procedure (SOP) must be done properly and carefully to minimize the complication of femoral sheath removal (hematoma).

5 CONCLUSIONS

Percutaneous Transluminal Coronary Angliplasty (PTCA), or Coronary Angioplasty, is a non-surgical procedure with minimal incisions used to open narrowed blood vessels. This procedure uses a flexible catheter with a balloon at the end, which is inflated at high pressure inside the narrowed artery wall. This action will plaque plaque in the blood vessels and improve blood flow to the heart muscle. This procedure can eliminate some of the symptoms of artery blockage, such as chest pain or shortness of breath. Nurses compliance in the femoral sheath removal procedure in patients after PTCA is associated with the incidence of hematoma, The compression should be performed carefully and in accordance with the standard operational procedure to prevent the occurrence of vascular complications, one of which is a hematoma. Yearly repetition of training and observation of skills (supervision) will improve the capacity of nurses' knowledge and skills in performing sheath removal procedures. Limitations of the study were in terms of confounding variables that can not be controlled by the researchers, such as body surface, bleeding and blood clotting period, which may affect the occurrence of hematoma.

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REFERENCES

Benson, L. M., Wunderly, D., Perry, B., Kbboord, J., Wenk, T., Birdsall, B., & Nyirenda, T. (2005). Determining best practice: comparison of three methods of femoral sheath removal after cardiac interventional procedures. *Heart & Lung: The Journal of Acute and Critical Care*, *34*(2), 115–121.

European Society of Cardiology. (2010). Guidelines for Myocardial Revascularisation.

Guyton, A.C., dan Hall, J. . (2008). *Buku Ajar Fisiologi Kedokteran* (11th ed.). Jakarta: EGC.

Klemsová and Žiaková. (2014). Standardization of the Possibility of Specialised Nursing Care After Cardiac Catetrization, *7*.

Merriweather, N., & Sulzbach-Hoke, L. M. (2012). Managing risk of complications at femoral vascular access sites in percutaneous coronary intervention. *Critical Care Nurse*, *32*(5), 16–29.

Niven, N. (2002). *Psikologi Kesehatan Pengantar Untuk Perawat Profesional Kesehatan lain*. Jakarta: EGC.

Ramzi S, dkk. (2004). *Buku Ajar Patologi* (7th ed.). Jakarta: EGC.

Sabo, J., Chlan, L. L., & Savik, K. (2008). Relationships among patient characteristics, comorbidities, and vascular complications post-percutaneous coronary intervention. *Heart & Lung: The Journal of Acute and Critical Care*, *37*(3), 190–195.

Schiks, S., Verheugt, A., & Achterberg. (2007). Performance evaluation of arterial femoral sheath removal by registered nurses after PCI. European. *Journal of Cardiovascular Nursing*, *6*(3), 172–177.

Subagyo. (2012). *Basic Clinical Approach In Cardiovasculer Management*. Surabaya: RSUD Dr. Soetomo.

Sudoyo, A. (2006). *Buku Ajar Ilmu Penyakit Dalam*. Jakarta: Fakultas Kedokteran Universitas Indonesia.

Sulzbach-Hoke, L. M., Ratcliffe, S. J., Kimmel, S. E., Kolansky, D. M., & Polomano, R. (2010). Predictors of complications following sheath removal with percutaneous coronary intervention. *Journal of Cardiovascular Nursing*, *25*(3).

Walker, S. B., Cleary, S., & Higgins, M. (2001). Comparison of the FemoStop device and manual pressure in reducing groin puncture site complications following coronary angioplasty and coronary stent placement. *International Journal of Nursing Practice*, *7*(6), 366–375.

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