SAMSUNG
강북삼성병원

Coronary Intervention : Pre and Post-procedural Consideration

강북삼성병원 심장센터
RN 김 태 우

SAMSUNG
강북삼성병원

Pre-procedural Consideration

Indications for cardiac cath.

- **Identify structural cardiac disease**
  - Suspected or known coronary artery Dx.
    (new-onset angina, UAP. SAP. Atypical chest pain or varient Angina, Evaluation before a major Op.)
  - Myocardial infarction or Cardiomyopathy
  - Valvular Dx.
  - Congenital heart abnormal
  - Aortic dissection
  - Pericardial constriction or tamponade

Contraindications to cardiac cath

- **Absolute Contraindications**
  - Inadequate equipment or Cath. Facility
- **Relative Contraindications**
  - Acute gastrointestinal bleeding or Anemia
  - Uncontrolled bleeding diathesis
  - Electrolyte imbalance
  - Fever

Contraindications to cardiac cath

SAMSUNG 강북삼성병원

- **Relative Contraindications**
  - Medication intoxication (e.g., digitalis, phenothiazine)
  - Pregnancy
  - Recent CVA (< 1month)
  - Uncontrolled CHF. High BP. Arrhythmias
  - Uncooperative patient

Complication of Cardiac cath.

SAMSUNG 강북삼성병원

- **Major Complication**
  - Cerebrovascular accident
  - Death
  - Myocardial infarction
  - Ventricular tachycardia, Fibrillation or serious arrhythmia

Complication of Cardiac cath.

SAMSUNG 강북삼성병원

- **Other Complication**
  - Aortic dissection
  - Cardiac perforation, temponade
  - CHF.
  - Contrast reaction (*anaphylaxis, nephrotoxicity*)
  - Heart block, asystole
  - Hemorrhage(*local, retroperitoneal, pelvic*)

Complication of Cardiac cath.

SAMSUNG 강북삼성병원

- **Other Complication**
  - Infection
  - Protamine reaction
  - Supraventricular tachyarrhythmia, atrial fibrillation
  - Thrombosis, embolus, air embolus
  - Vascular injury, pseudoaneurysm
  - Vasovagal reaction

Major Complication of **diagnostic Cath.**

SAMSUNG 강북삼성병원

	Number	Percent
Death	65	0.11
Myocardial infarction	30	0.05
Neurologic	41	0.07
Arrhythmia	229	0.38
Vascular	256	0.43
Contrast	223	0.37
Hemodynamic	158	0.26
Perforation	16	0.03
Other	166	0.28
Total (patients)	1184	1.98

Modified from Noto TJ, Johnson LW, Krone R, et al: Cardiac catheterization 1998; a report of the Registry of the Society for Cardiac angiography and intervention (SCA&I) ; *Cardiac catheterization: concepts, techniques, and applications, Walden, Mass, 1997, Blackwell Science.*

Preparation of the Patient

- **Consent for the procedure**
  - Simple terms
  - Risks for routine cardiac Cath.
  - Explain any portions of the study used for research and the associated risks
  - Provide the necessary information and explanation but do not overwhelm the patient

Preparation of the Patient

- **In-Laboratory Preparations**
  - Patient's ID band,
  - BP & baseline ECG
  - Baseline peripheral pulses
  - Known allergies
  - Determine recent anticoagulation therapy. (*INR. PTT.)*
  - Check Female Pt. β-HCG levels
  - Check laboratory results
  - Check IV in Pt. (18 or 20G)
  - Check premedication

Medical Conditions Ⅰ

▪ Allergy

- ✓ Contrast
- ✓ Aspirin

▪ Cardiovascular

- ✓ CHF., decompensated
- ✓ Severe Hypertention
- ✓ Uncontrolled arrhythmias
- ✓ A V block (Type Ⅱ 2° or 3°)

▪Electrolyte abnormalities

- ✓ K+ <3.3 or > 6.0 mEq/L
- ✓ Na+ <125 or >155 mEq/L

▪ Hemotologic

- ✓ Platelet count <50,000/ul
- ✓ Leukocytosis, unexplained
- ✓ Hemoglobin < 10gm/dl, acute
- ✓ Prothrombi time > 16 seconds

Medical Conditions II

SAMSUNG 강북삼성병원

Gastrointestinal

- ✓ Acute hepatitis
- ✓ Active GI bleeding

Neurologic

- ✓ Neurologic deficit, unexplained or progressive
- ✓ Cerebral hemorrhage, recent

Pulmonary Disease, decompensated

DM. poorly controlled

Renal

- ✓ Renal insufficiency,
- ✓ unexplained or progressive

Systemic

- ✓ Bacterial infection
- ✓ Unexplained Fever

Preprocedual Medication

Routine pre-PTCA;	• NPO after midnight except medications • Aspirin 325mg & clopidogrel 300mg P.O. • Nitroglycerin and/or Calcium channel antagonist • Sedative/anxiolytic on call to the lab
Diabetics;	• Insulin – ½ usual A.M. • IV fluids should contain dextrose • If possible, PTCA early in the day
Coumadin Patients;	• Stop 4~6days prior to the procedure • If necessary – IV heparin
Renal insufficiency;	• The patient must be well hydrated prior to PTCA IV crystalloids are usually administered for 6~12hrs (100~150ml/hr) • Serum creatinine >2.5-3.0mg/dl and diabetic nephropathy – Mannitol(12.5-25g IV over 30min)

Preprocedual Medication

Dye allergy;	• premedication regimens- Prednisone 60mg, Diphenhydramine 50mg Cimetidine 300mg • Prior to PTCA – Hydrocortisone (100mgIV) Diphenhydramine 25-50mg/dl
Aspirin – allergy;	• ticlopidine 250mg QD. Start at least 72h. Before PTCA

Transfemoral acess

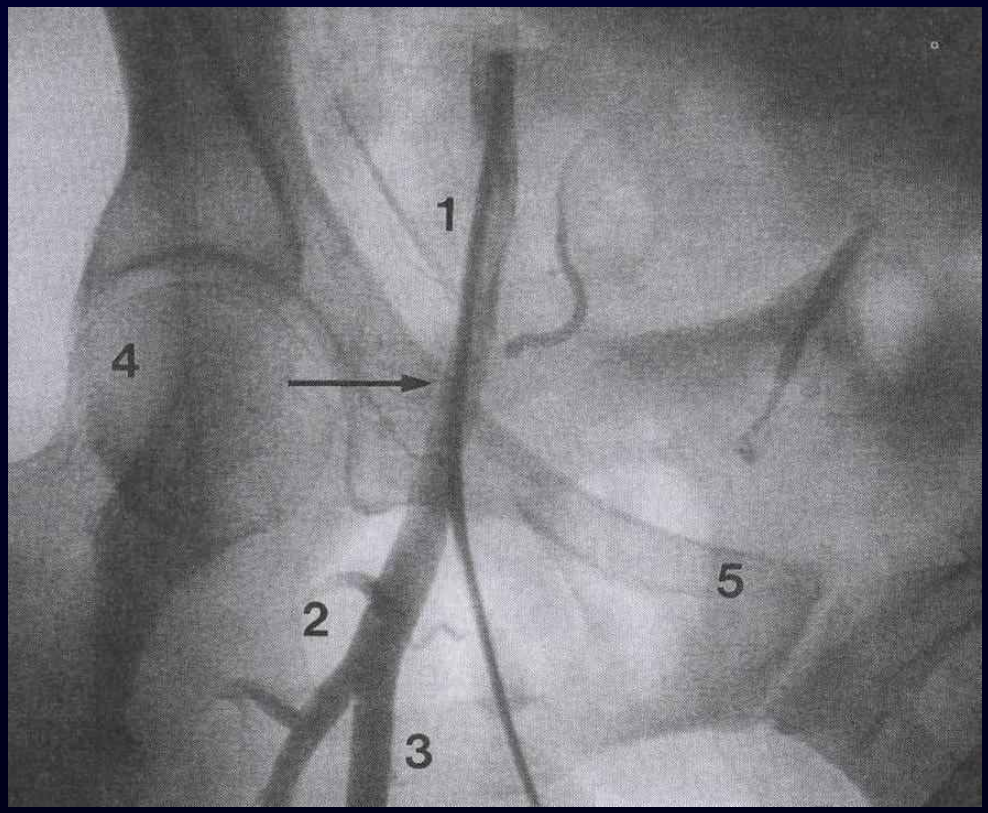
- **Pulse palpation scale**

0 : not palpable
1 : faintly palpable(week & thready)
2 : palpable (normal)
3 : full, increased
4 : bounding(hyperdynamic)

Transfemoral acess

- **Indications for Alternative Routes to Femoral arterial Cath.**
  - Claudication
  - Absent popliteal pulses
  - Femoral bruits
  - Absent femoral pulse
  - Prior femoral artery surgery
  - Extensive inguinal scarring
    (radiation therapy, surgery, or prior cath.)
  - Excssively tortuous or diseased iliac artery
  - Severe back pain, inability to lie flat
  - Patient request
  - Morbid obesity

Transfemoral acess



1.Common femoral artery

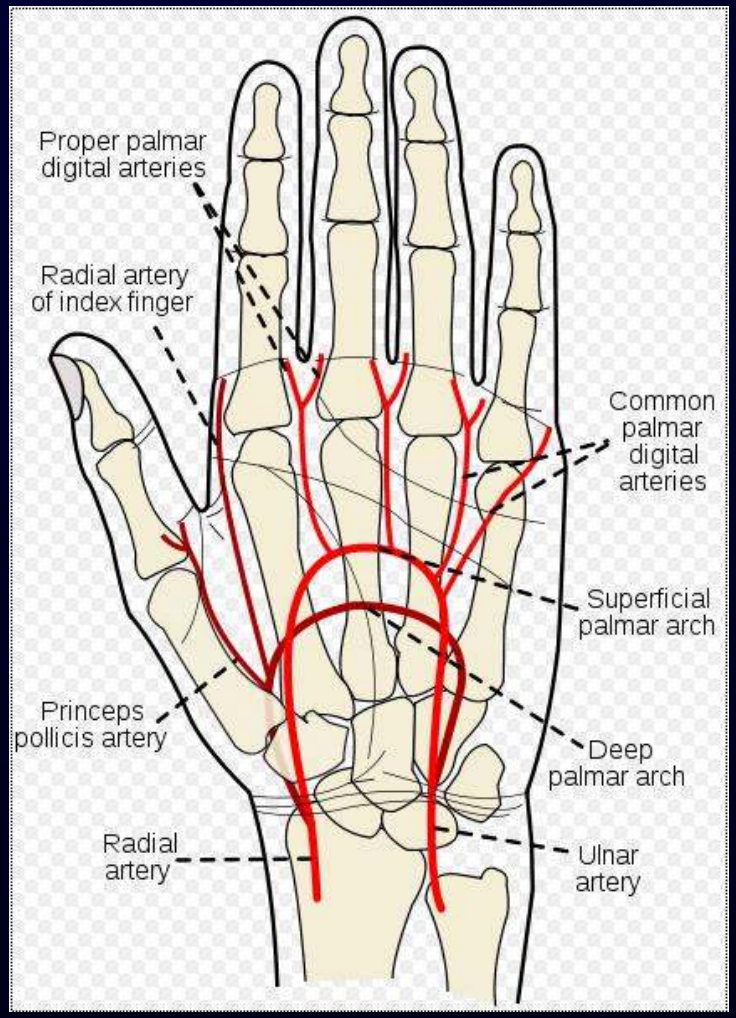
2.Bifuraction of profunda

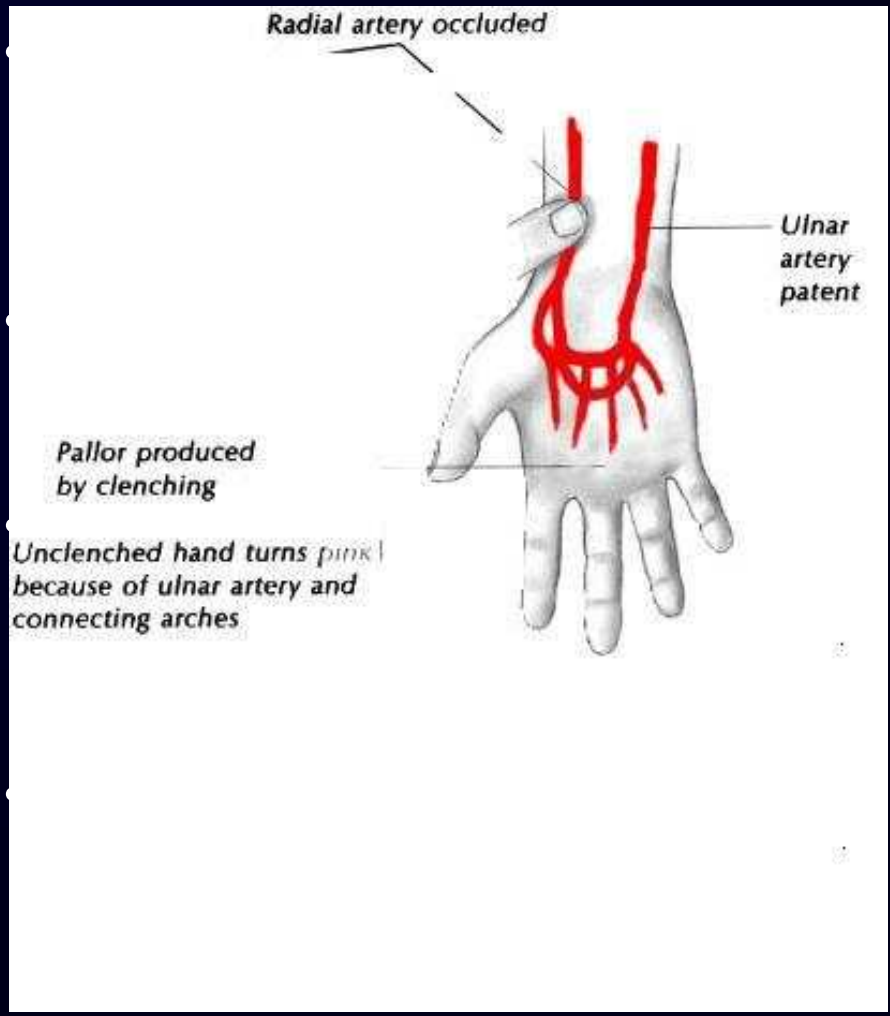
3. Superficial femoral A.

4.Midpoint of femoral head

5.iliac-symphysis pubis ridge
(inguinal ligament line)

Transradial acess





Post-procedual Consideration

Post procedure

List	Check up
• Vital signs	
– Low BP – Tachycardia	– indicates blood loss
• Arterial access	– Pain, hematoma and DPA.
	– Local hemorrhage & hematoma – Retroperinoneal hematoma – Pseudoaneurysm – Cholesterol embolism

Post procedure

List	Check up
Urine output	– 30ml/hr – unsatisfactory volume replacement – contrast induced renal failure
Cool extremity	– thrombus – spasm – vasoconstriction (arterial occulsion)

Sheath removal

SAMSUNG 강북삼성병원

- **Transfemoral acess**
  - 시술 후 헤파린 사용을 중단한 뒤 4~6hr.후에
- **Femoral sheath 제거 기준**
  - ACT < 140~160sec
  - INR < 2.0
  - INR > 2.0 경우 ⟹ FFP투여 또는 aterial closure device 사용
  - Fibrinogen > 150mg/dl

Sheath removal

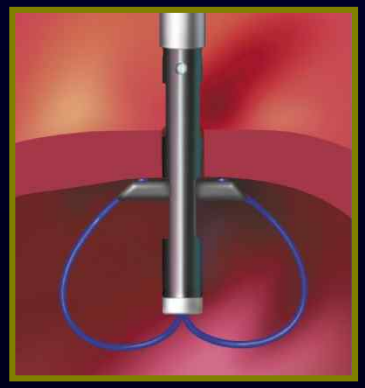
SAMSUNG 강북삼성병원

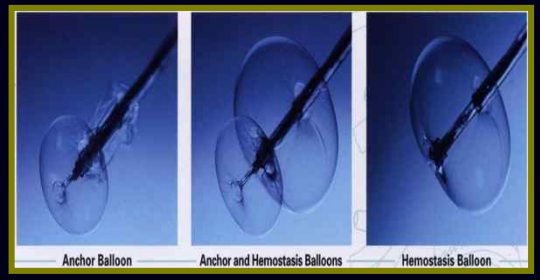
- **Transradial acess**
  - 일반적으로 검사 후 바로 sheath 제거하며, 지혈시간은 2~3시간 정도.

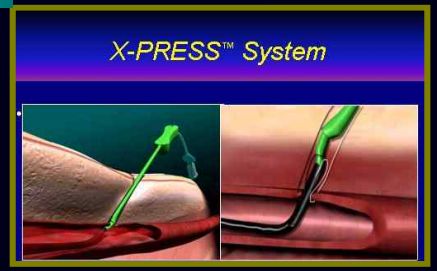
Vascular compression

- **External compression**
  - Manual pressure
  - C-clamp
  - Femo-stop pressure system
- **Arterial Closure Devices**

Vascular compression







Vascular compression

- **Contraindication of Closer device**

  - Atherosclerotic disease
  - Small vessel(< 5mm) diameter
  - Bifurcation puncture
  - Heavy scarring by previous acess

Complication of Arterial access

SAMSUNG 강북삼성병원

- **Local hemorrhage & hematoma**

빈도	➢ 0.5~7%
발생군	- 여자, 저체중, 고령, 응급시술, 빈혈, 시술시간, - sheath의 크기, 헤파린의 용량, 혈전용해제의 사용, - 다혈관의 질환
증상	- 저혈압, 빈맥, 혈종으로 인한 신경의 압박통증
치료방법	- Manual compression, - 사용하고 있는 항응고제 투여중단
예방법	- 정확한 천자, - 적절한 헤파린 사용

Complication of Arterial access

SAMSUNG 강북삼성병원

- **Retroperitoneal hematoma**

빈도	➢ 1% 미만
발생군	- high femoral A. puncture
증상	- 복부팽만, 통증, 둔한복부, 골반통증, 혈색소치 감소
치료방법	- 치명적 일 수 있으나 3~4pint 수혈 후 저절로 멈출 수 있다. - Manual compression을 매우 오랜시간 시행 - 혈류학적으로 불안정 할 경우 수술을 용함.
예방법	- Inguinal ligament 하부의 common femoral artery

Complication of Arterial access

SAMSUNG 강북삼성병원

- **Pseudo aneurysm**

빈도	➢ 0.03~0.04%
발생군	– 심한 말초혈관질환, Sheath길이가 긴 경우 – 장시간 유지한 경우, 조기보행, 항응고제 사용 – 혈소판 기능장애
증상	– 수축기 잡음을 동반한 통증, 박동성이 있는 종괴, – 대퇴신경과 상완신경의 마비, – 파열시 심한 통증과 부종
치료방법	– 직경 < 3cm 미만인 경우 -> 1~2주후 자연치유 – 직경 > 3cm 이상인 경우 -> 파열의 위험성으로 수술 필요 수술하지 못하는경우 -> 공기압박, coil 주입,stent 삽입
예방법	– 적절한 크기의 sheath 사용 – 적절한 시간에 sheath 제거 및 고혈압 조절 – PCI 후 항응고제 자제

Complication of Arterial access

SAMSUNG 강북삼성병원

▪ Thrombotic occlusion

빈도	➢ radial approach – 0.96 % ➢ femoral approach – 0.22 %
발생군	– 혈관 직경이 작은 경우 – 고령, 심근증, 말초혈관질환, 과응고 상태, 저체중, – 위험인자가 없더라도 혈관박리, spasm
증상	– 갑작스런 or 점진적인 통증 발생, 저림, 청색증, – 창백, 말단부위의 맥박손실 및 저온증
치료방법	– 즉각적인 헤파린 사용 및 혈전제거,
예방법	– 고위험 환자에서 작은 직경의 sheath사용 주의 – 시술중 주기적인 sheath의 세척 – 적절한 항응고제 사용 및 sheath제거

Complication of Arterial access

SAMSUNG 강북삼성병원

Quiz ?

- Radial approch 후 sheath를 제거하고
  지혈을 하였다.
  이후 2, 3, 4번째 손가락의 저림을 호소하는 경우.

Ular artery가 Radial artery와 같이
Compression 되었기 때문이다 ?

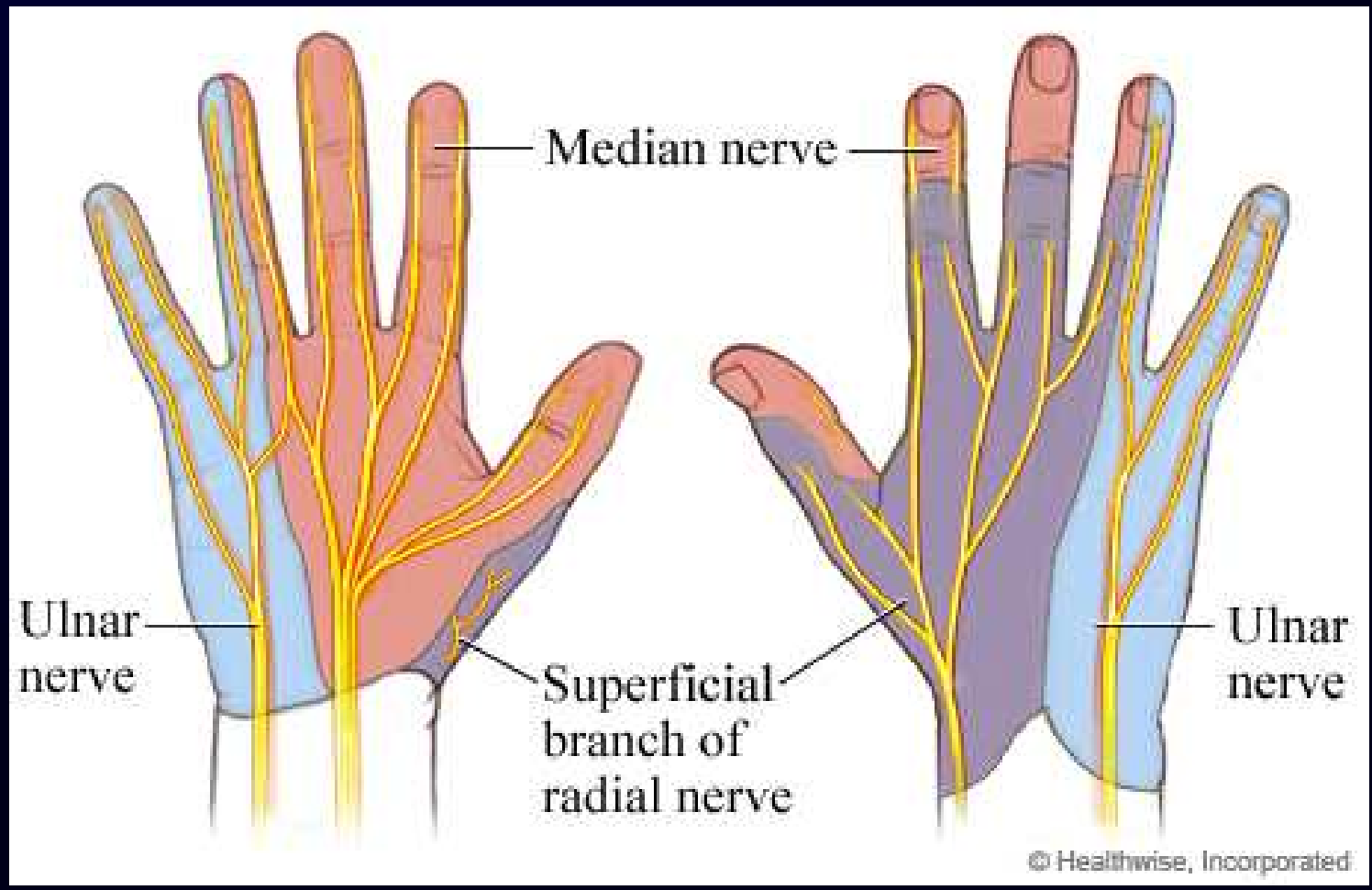
1. YES

2. NO

Complication of Arterial access

SAMSUNG 강북삼성병원

- Answer !



Anaphylactoid reaction to Contrast medium

- **Cutaneous and Mucosal**
  - Angioedema
  - Flushing
  - Laryngeal edema
  - Pruritus
  - Urticardia

Anaphylactoid reaction to Contrast medium

SAMSUNG 강북삼성병원

- **Smooth Muscle**
  - Bronchospasm
  - Gastrointestinal spasm
  - Uterine contraction
- **Cardiovascular**
  - Arrhythmia
  - Hypotension(shock)
  - Vasodilation

Anaphylactoid reaction to Contrast medium

SAMSUNG 강북삼성병원

Minor

Rash
Uticaria
Pruritus
Nausea
Flushing

Major

Coughing
Dyspnea
Wheezing
Syncope
Shock
Stridor
Seizure

Check Airway → Breathing → Circulation → CPR

References

1. Sajja LR, Mannam G, Pantula NR, Sompalli S. Role of radial artery graft in coronary artery bypass grafting. Ann Thorac Surg. 2005 Jun;79(6):2180-8. PMID 15919345
2. ^ Cohen G, Tamariz MG, Sever JY, Liaghati N, Guru V, Christakis GT, Bhatnagar G, Cutrara C, Abouzahr L, Goldman BS, Fremes SE. The radial artery versus the saphenous vein graft in contemporary CABG: a case-matched study. Ann Thorac Surg. 2001 Jan;71(1):180-5; discussion 185-6. PMID 11216742
3. ^ Rutherford RB (June 2006). "Randomized EVAR trials and advent of level i evidence: a paradigm shift in management of large abdominal aortic aneurysms?". Semin Vasc Surg. 19 (2): 69-74. doi:10.1053/j.semvascsurg.2006.03.001. PMID 16782510.
4. ^ Routine screening in the management of AAA, UK Department of Health study Report
5. ^ Abdominal Aortic Aneurysm screening, a review by Bandolier, a UK independent source of evidence-based healthcare information for both healthcare professionals and consumers. Bandolier 27-3 Article
6. 관상동맥 조영술과 관련된 간호관리 -지혈기구 선택과 주의사항- ; The 2nd Cardiovascular technologist & Nurese Encore Symposium ; 영동세브란스 김경애

대한심혈관기술연구회
Korea Cardiovascular Technology Association

KCTA소개 | 자료실 | 연구회소식 및 일정 | 사이버강좌 | 마이페이지

Member Login

로그인

ID저장

아이디찾기 | 패스워드찾기 | 회원가입

회원주소록
자유게시판
Q&A
마이페이지

Sym
HuMED
Abbott Vascular
(주) 바 소 케 어 VASOCARE CO., LTD.
SHINAE MEDICAL

ANGIOPLASTY SUMMIT
TCTAP2010
LEFT MAIN & BIFURCATION SUMMIT

중재시술연구회
KRTA

공지사항 Notice

CIVUS발표자 모집	[2010-04-21]
정회원 사용 권한 부여(4월 10일...	[2010-04-12]
2010 CTST 시험 일정	[2010-04-06]
TCTAP2010 in Korea	[2010-03-29]

질문과답변 Q&A

[질문] 여러 선생님들께 질문드...	[2010-04-13]
퍼즐퀴즈관련 질문입니다-	[2010-04-12]

SeQuent® Please
The Only Clinically proven Drug Eluting Balloon...

완료 | 인터넷

SAMSUNG
강북삼성병원

Thank you for listening.