

ANGIOGRAPHY-ARTERIOGRAPHY

---2 types: 1- DIAGNOSTIC : USING IODINE DYE CONTRAST ,<5 MG. \KG, ESP. IN DIABETIC OR CRF. PAT.:

2- Interventional (PCI –Peripheral angioplasty-Carotid angioplasty-renal angioplasty).

PCI uses balloon (with or without stenting-DES., OR PREVIOUSLY BMS (BARE METAL STENT))

--- There are 3 types of stents:

1-BMR (BARE METAL STENT) has high incidence of ISR (in-stent restenosis) (with grades) (present as CSA)(if within 6 months of related PCI) (dilated with a balloon ALONE or another stenting) .

2-DES (DRUG ELUTING STENT) has low ISR – but relatively high STENT THROMBOSIS (presents and treated as STMI)(mainly due to interrupted use of anticoagulants).Stents for Peripheral or Carotid Angioplasty : use Smart stent \Wall stent.

3- TISSUE COVERED STENT-(for cor. Dissection, with pericardial effusion \catastrophic). INSTEAD ,USE PROLONGED BALL. INFLATION , BEFORE THE SITE OF ART. DISSECTION.

---3 TYPES OF BALLOONS : A. BARE BALL, FOR USUAL DILATION OF STENOTIC LESION, OR ISR OR THROMBUS –RELATED LESION .,--TERM OF INFLATION IS :BAR, ITS NUMBER IS ACCORDING TO THE SPECIAL PAPER INSERTED WITH EACH BALLOON CATHETER., USUALLY 14-20 BARs,

B.DEB. (DRUG ELLUTING BALL.)-IN DISTAL STENOTIC LES., IN SMALL LUMEN LES. , ALTERNATIVE TO DES., IN FAIR OF ISR.\ USE IT WITH PROLONGED INFLATION-ONE MINUTE.

C. STENT- MOUNTED IN BALL. , TO INFLATE THE STENT , AFTER OPTIMAL LOCALISATION.(WITH OR WITHOUT PRE-STENTING BALL. DILATION)

---3 TYPES OF VASCULAR ARTERIAL ACCESSES

- A. RT. FEMORAL ARTERY: THE COMMONEST, EASIEST, MORE RAPID , FOR EMERGENCIES.
- B. LT, FA. : IF RT. FA. IS ABSENT, OR COMPLICATED ,OR SCARRING RT. ACCESS FOR PREVIOUS PCIs.
- C. Rt. Radial art. , using special needle, sheath, if difficult , or absent other accesses, or in elective pci ,- need no prolonged arterial Compression, easy ambulation after procedure.

---3 types of PCI ,according to timing –

- a- Emergency- primary pci- for STMI , within 4hr,WITH 2 EXCEPTIONS – continuous resting chest pain, cardiac\ ischemic –shock state , if not drug related
- b- Urgency- within days , for NSTMI\UA. high risk.
- c- Elective .for CSA. , refractory to medical optimal treatment).

---Actions of patient before CATH.-

--shaving-- fasting--continue usual drugs---no insulin--no AHO --no Glucophage (3 days before ,to prevent lactic acidosis)

– plavix loading dose ,75 mg., 2.2.2.1 - ----- asperine

.-- normal investigations(RFT –CONTROLLED FBS- SEROLOGY FOR VIROLOGY

---NORMAL INR(<1.3, IF ELEVATED; CAG. WILL BE CI.)-- IF TAKING WARFARIN (5days withdrawal –TILL REACHIN NORMAL LEVEL).

---Actions, precath, in CCU-

1-ECG (STMI,NSTMI, location, age ,ST elevation extent, ST depression, BBB,HR,NORMAL)

2-BP. Recording-hypo, hyper ,N, 3-HR ,tachy ,brady, N,. 4 HF evidence ,
5-making sure taking plavex ,aspirin. ,if PCI. 6. IVF .for DM. to prevent
contrast –nephropathy.

---Actions during CAG-

1-preparation before needle insertion-ECG monitoring-Art. Pr. Monitoring.

2-Needle insert.—local anesth.-GW.-Sheath,6-7 french (size)-Dx catheter-
connect to manifold-cath. Engagement-flouro-cine- decision\discussion
with colleage or attendant staff--removal of catheter-- reporting--sending
to ccu, for observation .

---Action during PCI

-inserting Guiding cath., as CAG-cine as a road map- -measure lumen of the
prox. Art.- -measure length of lesion.--insert floppy GW--ball. Cath.--cine to
localize it in the les.- inflate—withdraw--insert stent cath. with its ball.
through GW .--inflate it at the same sit--multiple views ,orthogonal
–remove all as one unit-

---Special needs during CATH.

—DC\SYNCRONISED,for VT. , rapid AF., SVT, with hypotension\WITH OR
WITHOUT AMBOU BAG .

--TRIDAL, for, HT ,chest pain,

- -DOPAMINE for shock\INTRA AORIC BALLOON COUNTERPULSATION,AS A
TEMPORARY MEASURE

--ATROPINE FOR S. Brady. , if coughing is not useful- PM, TEMPORARY , IF
ATROPINE IS NOT USEFUL\ACCESS: LT. OR RT. FEM. VEIN ,IN AS
EMERGENCY\LT. SUBCLAVIAN VEIN AS ELLECTIVE

-- CS .for rigor, contrast related\not infection-related –

---COMPLICATIONS during CAG –PCI-

1-Dissection –during engagement , GW insert.-BALL .inflat .-stent inflat.
Might abort procedure –observe-pericardiocent.-reversal of anticoagulant-
surgeon consultat.

2TYPES OF DISSUCTIONS: A. OUTSIDE ,INTO PERICARDIAL SPACE ---B.
INSIDE ARTERIAL LUMEN –CALLED DOUBLE LUMEN-FALSE LUMEN DURING
PCI -Rx. INSERT ANOTHER GW. INTO PRESUMED TRUE LUMEN , KEEPING
THE FIRST GW. IN ITS FALSE LUMEN ,2-SLOW FLOW—or NO ANTEGRADE
FLOW- esp. in a large thrombus, shock ,, delayed present. Of STMI.-POOR
PROGNOSIS

3-ARRHYTHMIAS-VT, VF, BRADY , SVT,,ASYSTOLE,-NEED
OBSERV.,COUGHING, ATROPINE,DC, PACEMAKER, ACCORDINGLY .

IF RECURRENT VT DURING CATHETER ENGAGEMENT –USE CATHETERS
WITH SIDE HOLES.

4- CVA- AIR, CLOT, PLAQUE EMBOLISM – ABORT

5- Chest pain during inflation—angesid-observe

6- Surge of HT –TRIDAL

7- RIGOR - contrast relate-CS.

8. FEMORAL ARTERY HEMATOMA ,(OR LATELY FALSE ANEYRESM)—TO
OBSERVE ,USE OTHER SITE AS ACCESS,PROLNGE LOCAL COMPRESSION,OR
ABORT, VASCULAR SURGEON, ACCORDINGLY.

--- INDICATIONS of CAG,PCI

1.-MI-STMI –if thrombolytics are Cl., or UNAVAILABLE, or ONGOING PAIN
OR SHOCK, ,OTHERWISE within 4 hr.-

NSTMI-UA, HIGH RISK-, otherwise 5 days in ccu –esp. for heparine iv,

2- CSA-REFRACTORY, OR +VE HIGH RISK ETT---FOR ELLECTIVE PCI ,

3- AP.after CABG TO ENGAGE LIMA(LT. INTERNAL MAMMARY ART.),SVG,

4- VT: with or without chest pain.

5-SYNCOPE,: unexplained, not related to complete heart block

6-VALV.HD:.. as pre-operative assess

----APPROACHING THE PAT. WITH a Hx. Of A CAG-PCI :TO Review the followings:—

1-indications of CAG\ PCI.: timing ,success \failure \complication\ attempted ---2-CD-REPORT\THE DISC ITSELF- --3-MEDICATION (TYPE- DOSE- TIMING-COPMLIANCE) (B.BLOCKERS- VENODILATORS- LIPID LOWERIN ASGENTS- ANTIHYPERTENSIVES- ANTIFAILURES- CORDARONE --ASPERINE --PLAVEX-- OHAs—

4- CHANGES IN CLINICAL STATUS—

-new chest pain, cardiac or non cardiac-- --exert. Dyspnea for HF.----exert palpit. For HT.---5.-lipid profile , fasting, every 3-6 months—6.-DIET HABIT CHANGES(salt\ fluid\ lipids)----7.CHANGE IN LIFE STYLE AND ACTIVITY(sydentary\active\heavy lifting),---8.B .SUGER CONTROL

---TYPES of cor. Les..-----

A—According to luminogram (Dx ANGIO. ---1—STENOTIC—subtotal, critical subcritical , noncritical plaque ,diffusely diseased-----2—TOTAL CUT, SUBTOTAL.-----3—ECTATIC--.segmental, multiple, treated as CSA.,- NO INTERVENTION.

b—Acoring to the site of the les. --ostial,prox, mid, distal, diffusely dis.,

c—According to the number of involved cor. Art.----

1—LMS, dis.--

2---single ve. --as in CSA, MI, UN , ---pci.

3—2 ves. Dis. ----if in CSA.---2 different session.-----if in MI.,UA.----PCI to the CULPRIT les.---ETT ,ONE MONTH LATER

4---3 ves. Dis.-----if MI., UA..---as in 2 ves. Dis. ----ifCSA---PCI in multiple sessions .if approachable, otherwise....CABG.

-----CRITERIA of HIGH RISK UA---

--resting ST dep. T inver.---dynamic T. inver. --all SEGMENTAL

+VE troponin, HYPOKINESIA,, segmental,---BASAL
CREPITATION—MR—POST MI ANGINAA...one month.

----CRITERIA OF HIGH RISK +VE ETT

---1mm ST dep.,<1 slope, in 5 leads

1mm ST dep. <1 slope, in 3 leads---PERSISTANCE OF 1mm.ST. dep. ,<1 slope
in recovery.---hypotension---VT, during ETT.

-----OTHER CATH. Related procedures---

1---LT-RT. Heart STUDY for CHD—DX.

2—CHD.-INTERVENTION—ASD OCCLUDER—PS BALLOON— rarely for VSD.
OCCLUDER\AS. BALLON DILATION---

3— PACEMAKERS(PM): 2 LEADS IN RV., AND RA. — ICD, ONE LEAD IN RV. ,
WITH A COIL IN RA. —CRT , 3 LEADS , 2 AS PM. ,3RD. OVER LV: ITS LAT. WALL
, THROUGH CORONARY SINUS: VENOUS CARDIAC DRAINAGE.--- ALL THESE
with SPECIAL programming machine , periodically...

4. EPS electro-physiology study for ablation of paroxysmal SVT, AP, AF
FOCUS, IN PULMONARY VEINS IN LA,—ATRIAL TACHY IN RA..\using 5leads:
RV, RA HIS BUNDLE FOR HIS HISTOGRAM , CORONARY SINUS CATHETER,
,AND THE ABLATING CATHETER (WITH OR WITH OUT SUPPORTING
SHEATH,FOR CATHETER STABILITY)

5.MS —BALLOON VALVULOPLASTY-by INOEA BALL.(PMV.)

---ORTHOGONAL VIEWS---

--1—FOR LT SYSTEM---

(RA. =RT. ANTERIOR), (LA. =LT. ANTERIOR), (AP .= ANTERO- POSTERIOR)

RA CAUDAL—SPIDER (LA CAUDAL)

AP CAUDAL --- LT.LATERAL.-----

RA CRANIAL---LA CRANIAL

--2—FOR RT SYSTEM—

-LA OBLIQUE---RA OBLIQUE