RENAL ARTERY ANEURYSMS (RAA’S)

- Rupture rate estimated in < 3%
- When ruptured, the estimated non-gestacional MORTALITY is 10%
- Historically, treatment is indicated when RAA > 2 cm

Although,
- Scarce evidence regarding RAA’s natural history
- Some authors believe such threshold is too aggressive

WHEN ARE THEY DANGEROUS?

- Several conditions are known to INCREASE the risk of aneurysm Rupture
- Prompt treatment should be considered, regardless of their size, in:
  - Pregnant women
  - Women of childbearing age
  - Symptomatic aneurysm (pain; hematuria)
  - Medically refractory hypertension
  - Thromboembolism
  - Dissection
  - Polyarteritis nodosa

TREATMENT OPTIONS

ENDOVASCULAR TREATMENT
- Exclusion with covered stent
- Selective coil embolization
- Coil and cage
- Superselective segmental branch embolization

OPEN SURGERY
- Aneurysmorphy with primary repair and patch angioplasty
- Resection and end-to-end anastomosis
- Bypass
- Extravalvular repair
- Nephrectomy

Choice of technique is highly dependent on LOCAL ANATOMY

DISCLOSURES

• nothing to declare

ANATOMICAL DISTRIBUTION

- The majority are EXTRAPARENCHYMAL
- 80% are SACCULAR
- Most common location is the renal artery bifurcation
- For unknown reasons, right RAA’s are more common
RUNDBACK CLASSIFICATION

**Type I**
Saccular aneurysms arising from the main renal artery or the large segmental branch

**Type II**
Fusiform aneurysms arising from the main renal artery or the large segmental branch

RUNDBACK CLASSIFICATION

**Type III**
Intralobar aneurysms arising from small segmental arteries or accessory arteries

ENDOVASCULAR OPTIONS FOR RAA’s

**1. COVERED STENT EXCLUSION**
- Aneurysm must be located up to 15mm from the renal artery ostium
- Requires distal landing zones proximal to the RAA bifurcation
- Presence of nurturing branches originating from the aneurysm sac should exclude this technique, due to the risk of retrograde perfusion
- Usually restricted to TRUNCAL ANEURYSMS, namely:
  - Proximal Type I RAA
  - Proximal Type II RAA

ENDOVASCULAR OPTIONS FOR RAA’s

**2. SELECTIVE COIL EMBOLIZATION**
- Adaptation of the classic aneurysm sac coiling technique
- Uses a self-expandable stent to cage the coils in the aneurysm sac, and therefore prevent distal coil migration
- Usually useful in:
  - Type I RAA with wide necks
  - Proximal Type II RAA

ENDOVASCULAR OPTIONS FOR RAA’s

**3. “COIL AND CAGE” TECHNIQUE**
- Adaptation of the classic aneurysm sac coiling technique
- Uses a self-expandable stent to cage the coils in the aneurysm sac, and therefore prevent distal coil migration
- Usually useful in:
  - Type I RAA with wide necks
  - Proximal Type II RAA
**ENDOVASCULAR OPTIONS FOR RAA's**

4. **SUPERSELECTIVE EMBOLIZATION OF RENAL SEGMENTAL BRANCHES**

- Glue, Onix® or microcoils
- The occlusion of the native segmental vessel causes a small RENAL INFARCTION
- Restricted to **type III RAA** not amendable by other techniques

**WHEN IS OPEN REPAIR INDICATED?**

- Although there seems to be a consensus on endovascular treatment regarding **truncal and intra-parenchymatous aneurysms**:

  **TRUNCAL RAA**
  - Proximal type I RAA
  - Proximal type II RAA

  **INTRA-PARENCHYMATOUS RAA**
  - Type II RAA

- Renal branch aneurysms (Distal Type I and Type II) are more challenging, and their treatment options remain open for discussion

**CONCLUSION**

- Renal artery aneurysms are rare pathologies, with significant mortality rates when ruptured
- Available comparative studies reported **NO DIFFERENCES** between open or endovascular interventions
- **ENDOVASCULAR TREATMENT** should be considered the first treatment option for truncal and intra-parenchymatous aneurysms
- Renal artery **BRANCH** aneurysms can be treated by either **OPEN** or **ENDOVASCULAR** techniques, provided the centre has proper expertise in the technique used

**RENAL ARTERY ANEURYSMS: WHEN ARE THEY DANGEROUS ENDOVASCULAR TECHNIQUES FOR TREATMENT WHEN IS OPEN REPAIR INDICATED**

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