Renal artery aneurysms

Types

- **Saccular**: the most common. Located at the renal arterial bifurcation, they tend to compromise its branches. They may undergo atheromatosis, calcification, or both, leading to rupture, thrombosis with peripheral renal embolisms, or erosion of the renal pelvis or vein.

- **Fusiform**: 1-3 cm long and with a diameter up to 3 times larger than the normal diameter of the renal artery. Generally not calcified, they present as a post-stenotic dilation, in young patients with stenosing fibrous dysplasia and hypertension.

- **Dissecting**: due to intimal tearing in patients with atheromatous or fibrous dysplasia. The dissection sometimes reopens to the arterial lumen, preserving renal function, or can be complicated by thrombosis and renal infarction/rupture with secondary hemorrhage.

- **Intrarenal**: can be congenital, traumatic, iatrogenic, neoplastic, or associated with polyarteritis nodosa. They may be saccular or fusiform, calcified or not, with a high rupture risk.

Symptoms

- Renovascular hypertension, abdominal bruit, hematuria.
- Sudden flank pain in cases of dissecting aneurysm or rupture. Factors for rupture: incomplete calcified or non-calcified aneurysms, >2 cm, concomitant hypertension, and pregnancy.

Diagnosis

- **KUB X-ray**: detects annular calcifications in the renal hilum (50% of cases).
- **Doppler ultrasound**: quantifies stenosis and its functional behavior.
- **Conventional arteriography or intravenous digital subtraction angiography (IV-DSA)**: former uses a greater volume of contrast medium and thicker catheters. IV-DSA uses less contrast and smaller catheters; the resolution is somewhat lower, but this is balanced by its capability to digitally remove bone and soft tissue from the image. Currently, it is the most widely used method.
- **Angio-MRI or helical CT angiography**: allows 3D anatomical study of the aneurysm.

Treatment

- **Treatment indications**: highly calcified aneurysms <2 cm in asymptomatic normotensive patients do not require treatment. Serial KUB X-ray can be used to show the size. Treatment should be initiated in the following cases:
  - If they cause renal ischemia and hypertension.
  - If they are the dissecting type.
  - In the presence of symptoms such as flank pain or hematuria.
  - In women of child-bearing age who wish to become pregnant.
  - If associated with significant stenosis of the renal artery.
  - If arteriography shows thrombosis and evidence of a distal embolism.
  - Partially calcified and intrarenal aneurysms (rupture risk).

- **Intravascular treatment**:
  - Embolization with **coils** to occlude the aneurysm without altering renal blood flow.
  - Placement of a vascular endoprosthesis in the renal artery or affected branch. Can also be performed to treat acute rupture or a dissection.

- **Open surgery**: only if intravascular treatment fails.
  - Aneurysmectomy and substitution with grafts.
  - Aneurysmectomy and aortorenal, splenorenal, or hepatorenal bypass.
  - Extracorporeal microvascular reconstruction and self-transplantation.