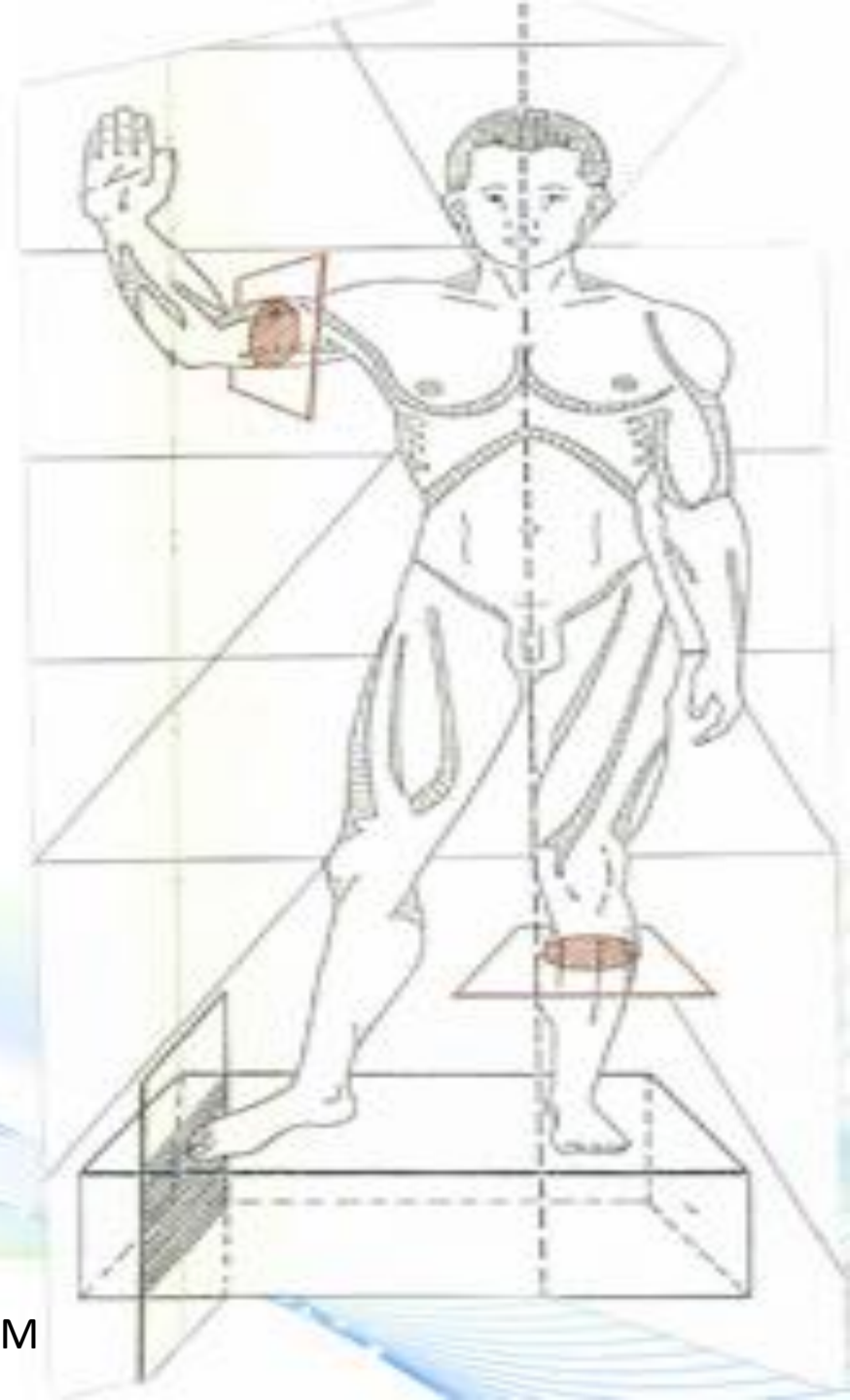


# SUPRARENAL GLANDS



Pr. M.D.EL AMRANI

Dr. BENTALEB OUSSAMA

Dr. BIBORCHI HOUSSAM

# CONTENTS

**I. INTRODUCTION**

**II. DESCRIPTIVE ANATOMY**

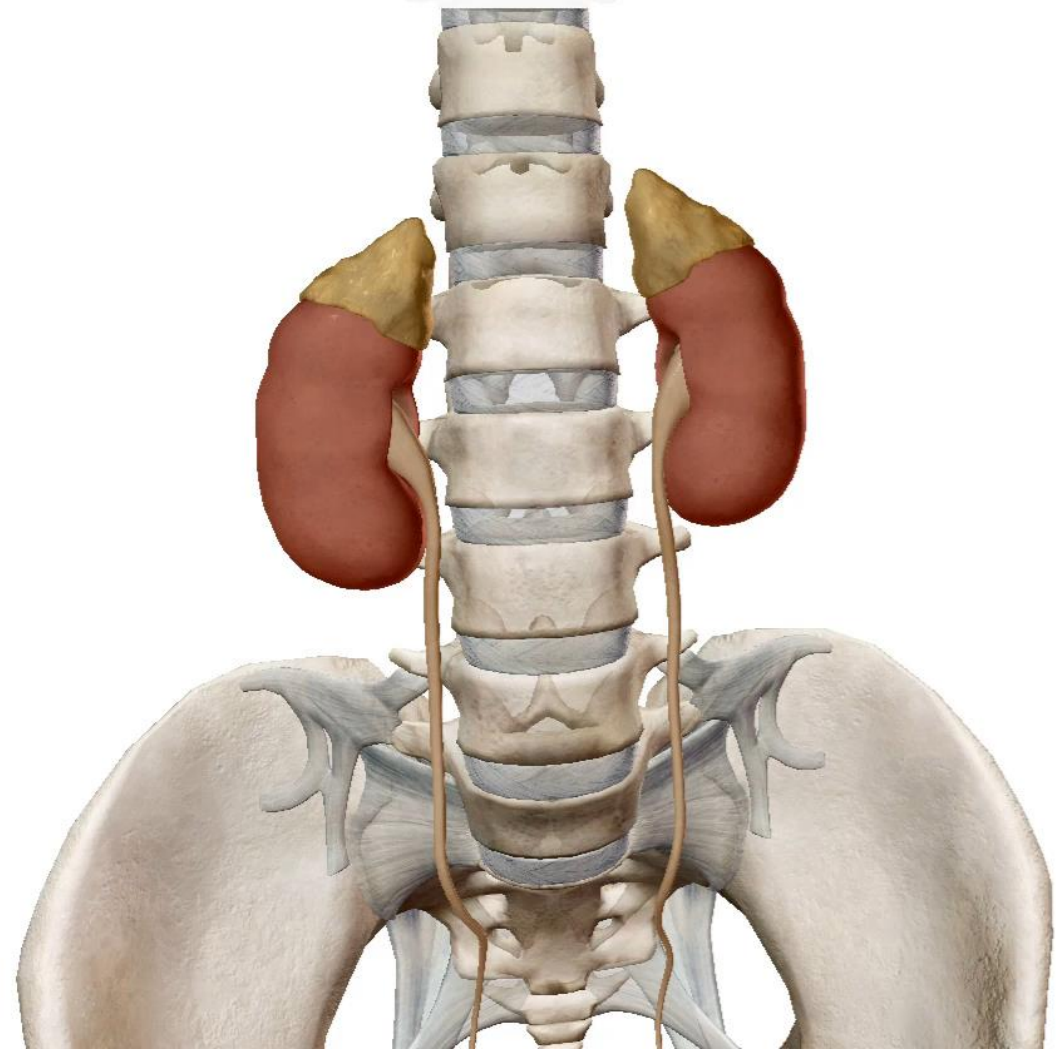
**III. STRUCTURE**

**IV. ANATOMICAL  
RELATIONS**

**V. BLOOD SUPPLY; LYMPH  
DRAINAGE AND NERVE  
SUPPLY**

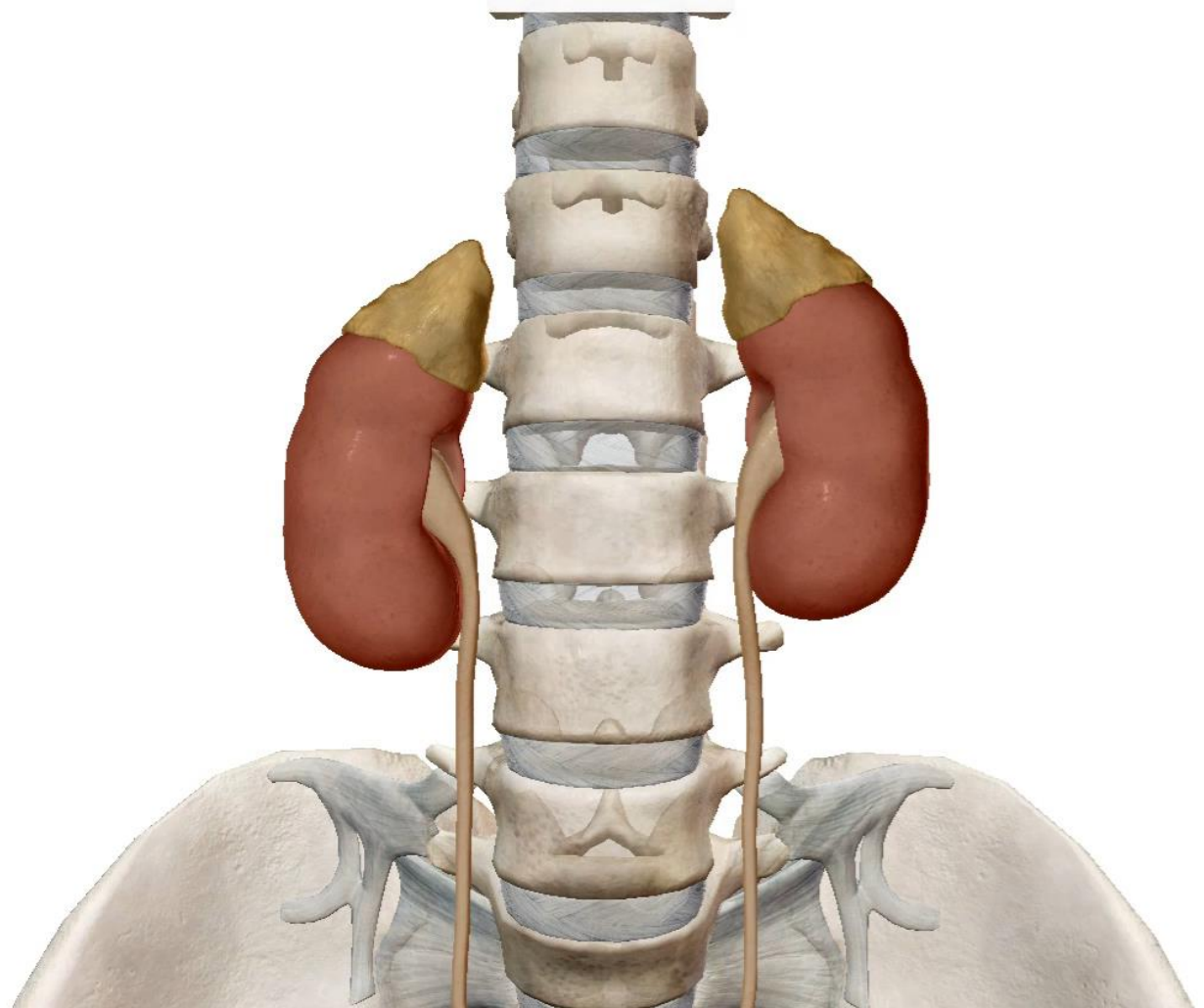
**VI. SURGICAL APPROACH**

**VII. CONCLUSION**



# I. INTRODUCTION

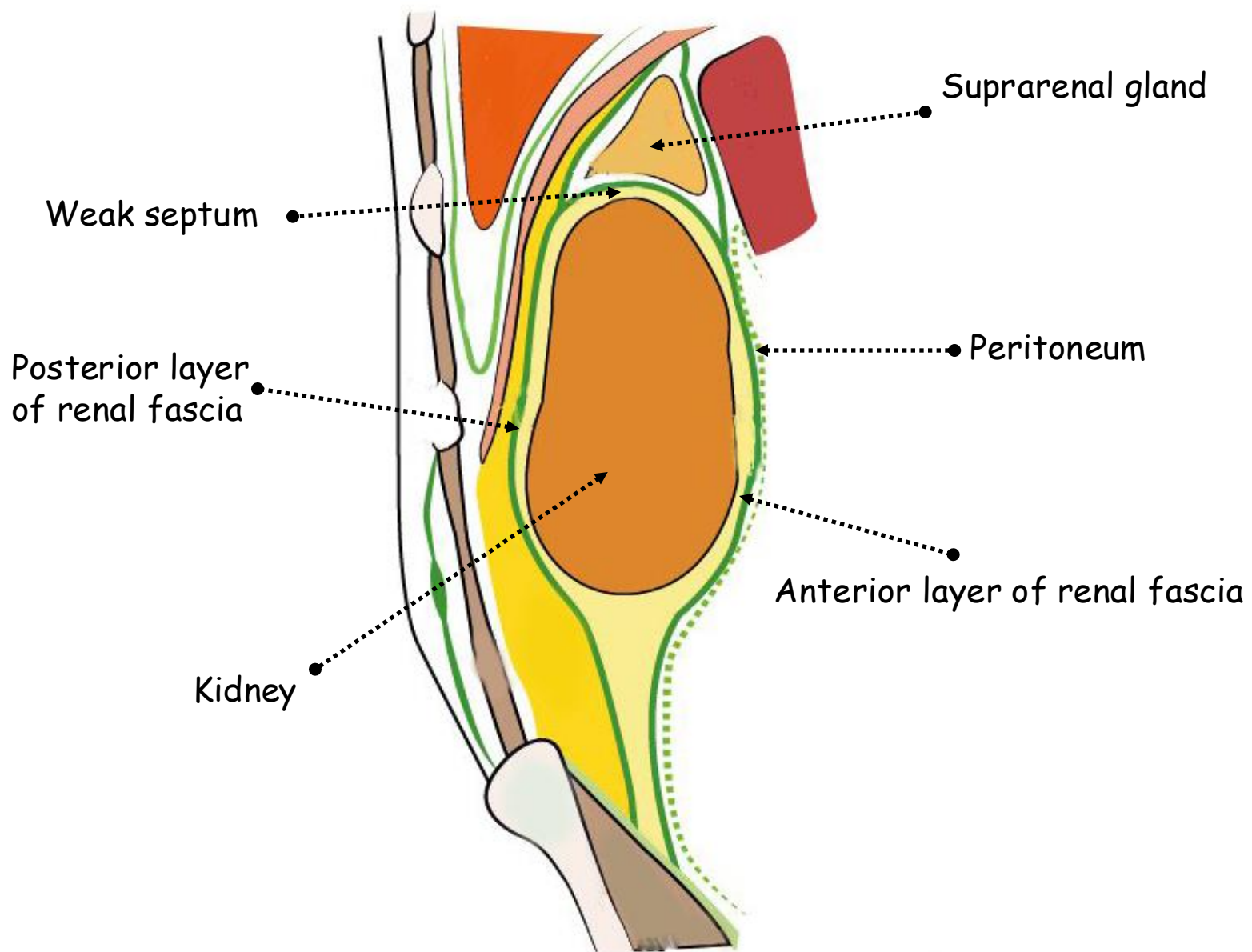
- Paired endocrine glands
- Retroperitoneal
- Located at the upper pole of the kidneys
- It is an organ **essential** to life
- Their dysfunction is the cause of **several** diseases: Addison's disease, Cushing's syndrome, Conn's disease, hyperandrogenism's syndroms...



## II. DESCRIPTIVE ANATOMY

### A. SITUATION

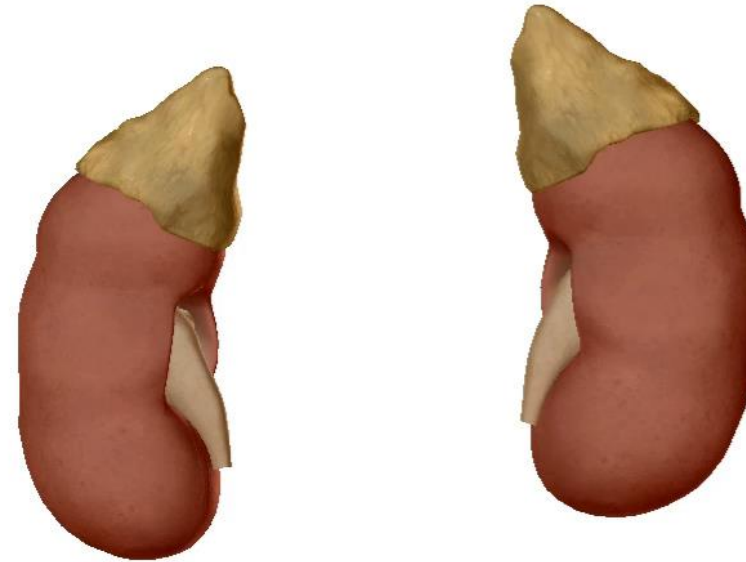
- The **right** suprarenal gland surmounts the upper pole of the right kidney
- The **left** suprarenal gland drapes over the medial border of the left kidney above the hilum and is situated lower down
- The suprarenal glands are surrounded by the **perinephric fat** and enclosed in the **renal fascia**, though a **thin septum** separates each gland from its associated kidney



SAGITTAL SECTION OF THE LUMBAR REGION SHOWING THE POSITION OF SUPRARENAL GLANDS

## **B. SHAPE**

- The right gland is shaped like a **pyramid**
- The left suprarenal gland is **crescentic** in shape
- Coloration : **yellowish**
- Texture : **soft**
- It presents:
  - **3 faces**:
    - anterior : contains **the hilum**
    - posterior : convex
    - inferior : concave
  - **2 borders** :
    - superior
    - medial



### C. DIMENSIONS

- Height : 5 cm
- Width : 3 cm
- Thickness : 1cm
- Weight : 5 g

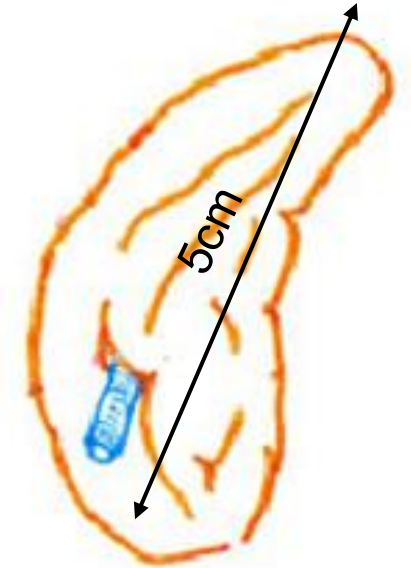
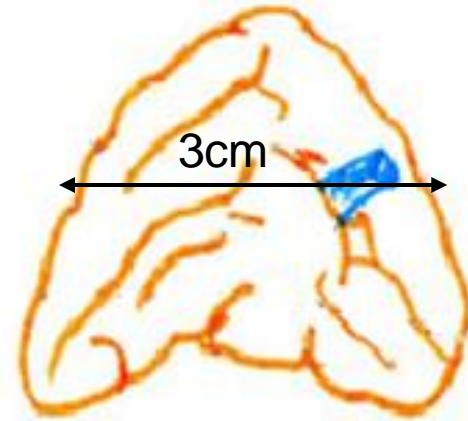


FIGURE SHOWING THE DIMENSIONS OF SUPRARENAL GLANDS

### III. STRUCTURE

- To the naked eye a section across the suprarenal resembles a sandwich
- **Two layers of cortex (the bread):** immediately **beneath** the connective tissue capsule
- **A much thinner layer of medulla (the meat):** between them
- Covered by a **connective tissue capsule**

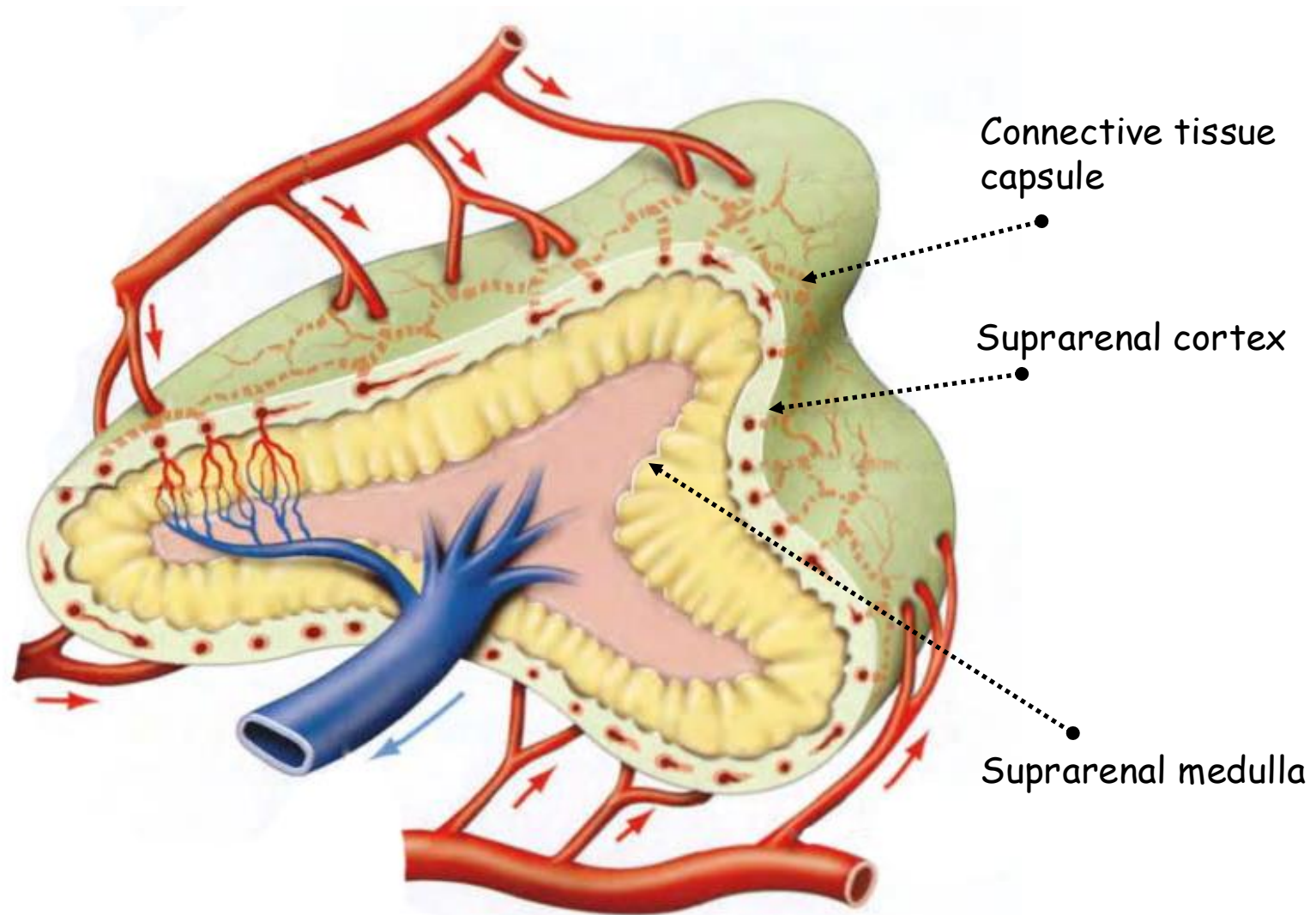


FIGURE SHOWING THE STRUCTURE OF THE SUPRARENAL GLANDS  
(FROM KAMINA)

## A. SUPRARENAL CORTEX

- Consists of **three** layers or zones, from the periphery to the centre:

### 1. The zona glomerulosa:

- Small rounded groups of cells
- Produces **aldosterone** and participate in the renin angiotensin system

### 2. The zona fasciculata:

- Consisting of parallel rows of pale-staining vacuolated cells with a high cholesterol content
- Produces **cortisol**

### 3. The zona reticularis:

- Network of smaller and darker-staining cells
- Produces **androgens**

Zona glomerulosa

Zona fasciculata

Zona reticularis

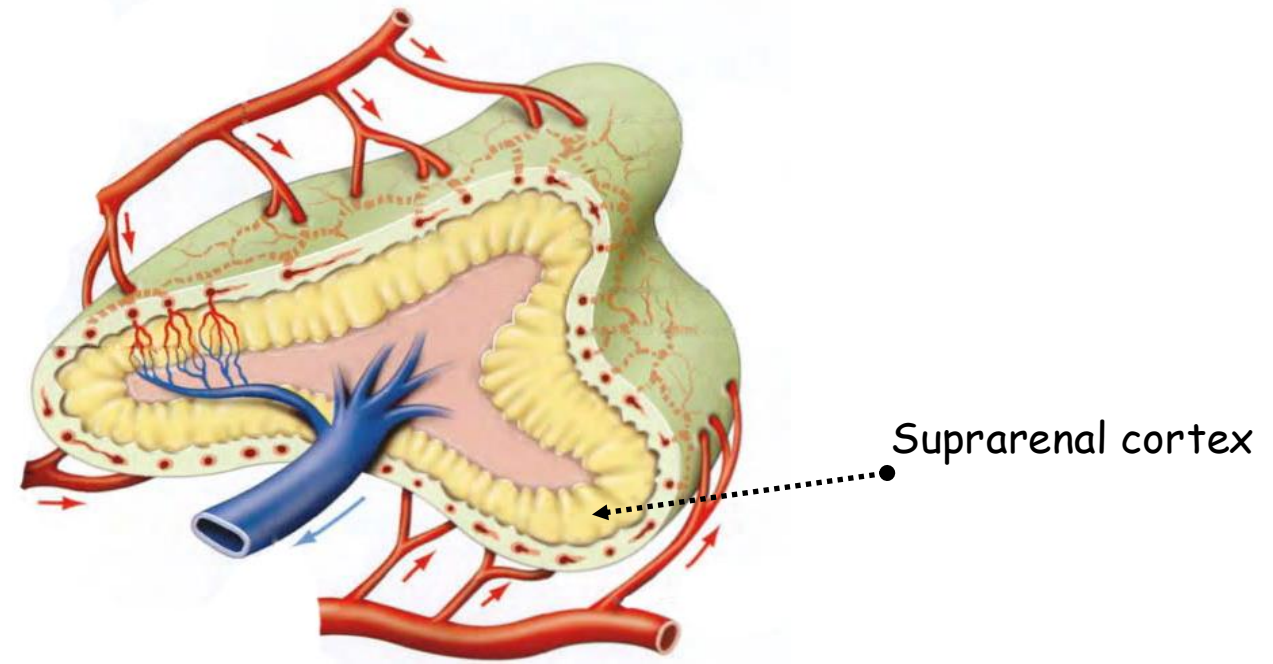
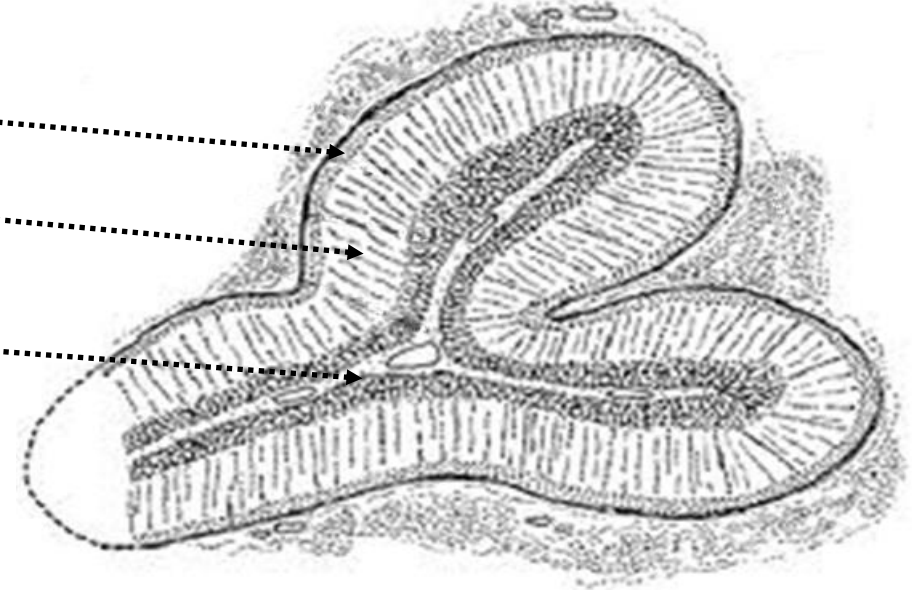


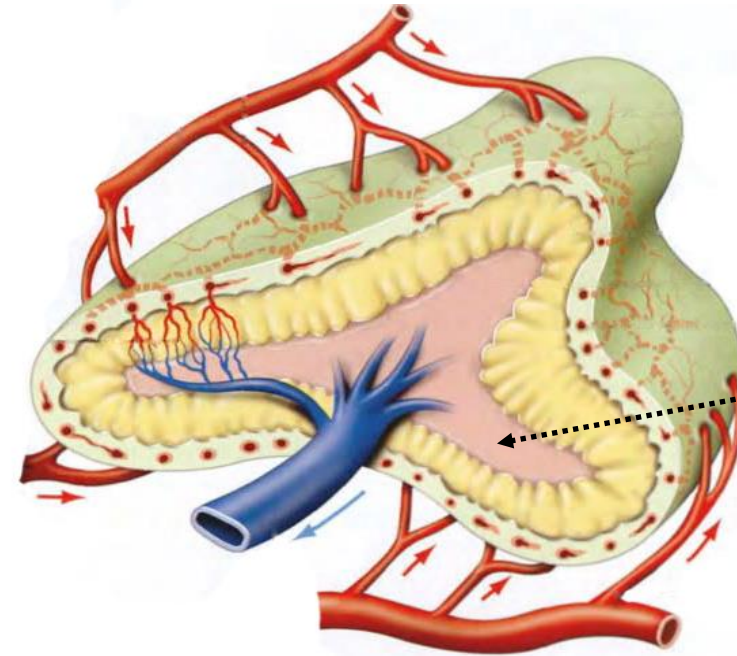
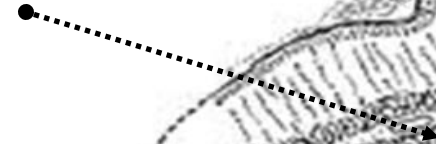
FIGURE SHOWING THE STRUCTURE OF THE SUPRARENAL GLANDS  
(FROM KAMINA)



## B. SUPRARENAL MEDULLA

- Many of the medullary cells exhibit the **chromaffin** reaction: they contain fine cytoplasmic granules (**the catecholamine precursors**)
- Secretes the catecholamines **adrenaline** (80%) and **noradrenaline** (20%) and some **dopamine**
- Contains **capillaries**

Suprarenal medulla



Suprarenal medulla

FIGURE SHOWING THE STRUCTURE OF THE SUPRARENAL GLANDS  
(FROM KAMINA)

## IV. ANATOMICAL RELATIONS

### A. THE RIGHT SUPRARENAL GLAND

#### 1. Anterior face:

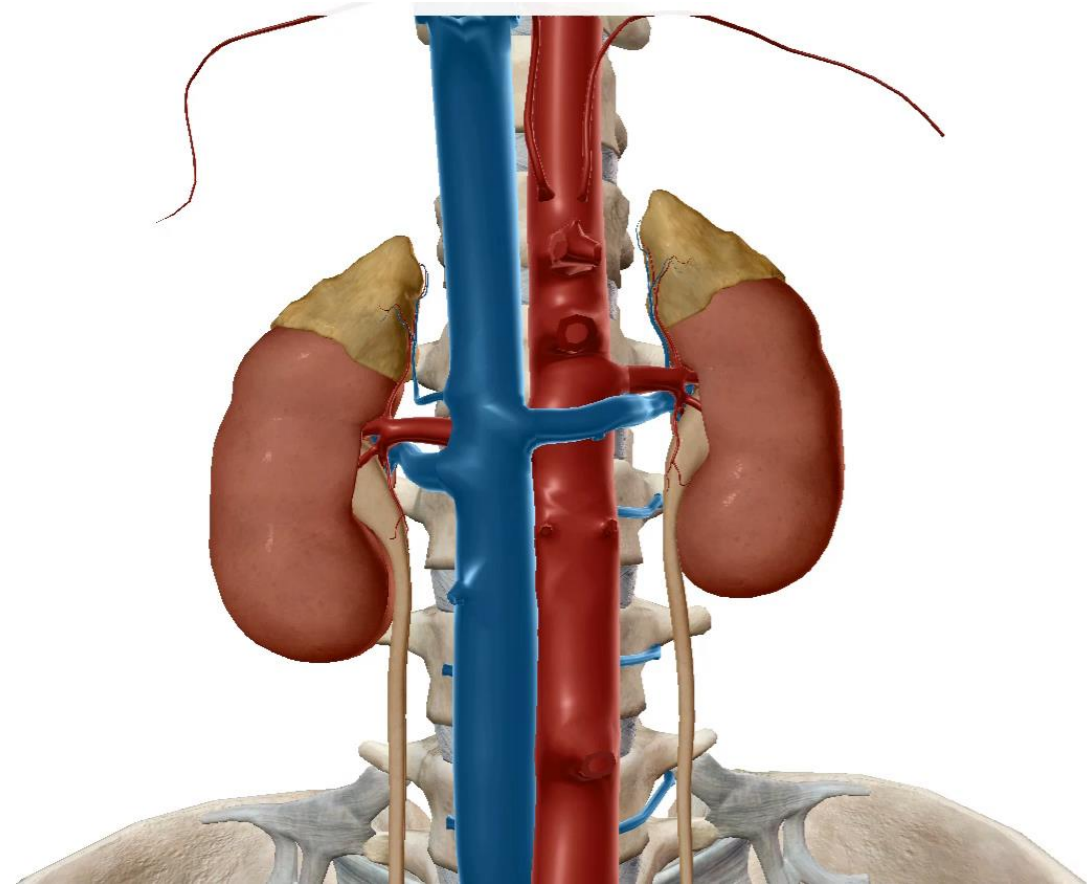
- The medial surface is in contact with the inferior vena cava
- The lateral surface adheres to the right triangular ligament of the liver
- The lower surface is in contact with the liver and duodenum

#### 2. Posterior face:

- Adheres to the diaphragm, the pleura and the two last ribs

#### 3. Renal face:

- Surmounts the upper pole of the right kidney

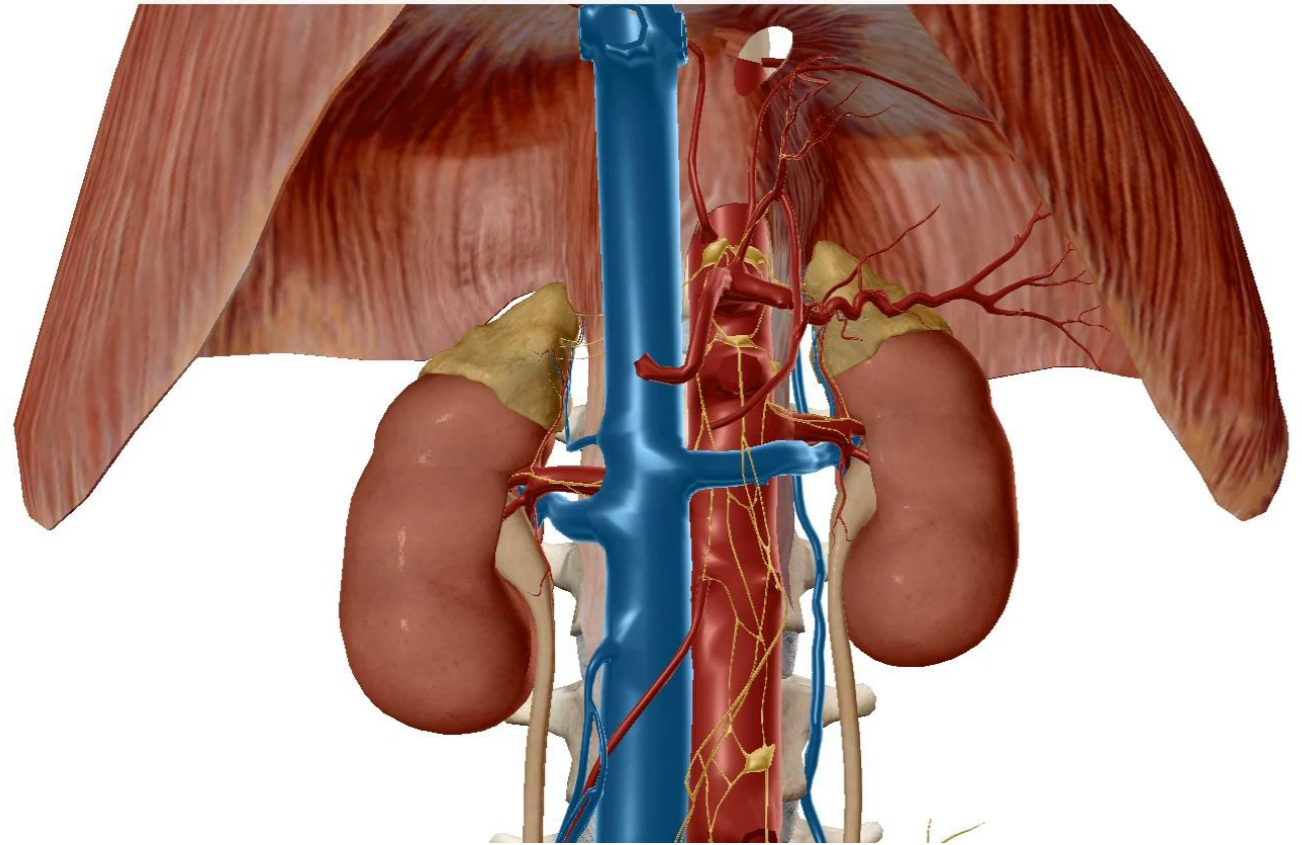


#### 4. Superior border:

- Lies under the diaphragm

#### 5. Medial border:

- It is to the right of the celiac plexus, the right inferior phrenic artery and the right crus of the diaphragm



## B. THE LEFT SUPRARENAL GLAND

### 1. Anterior face:

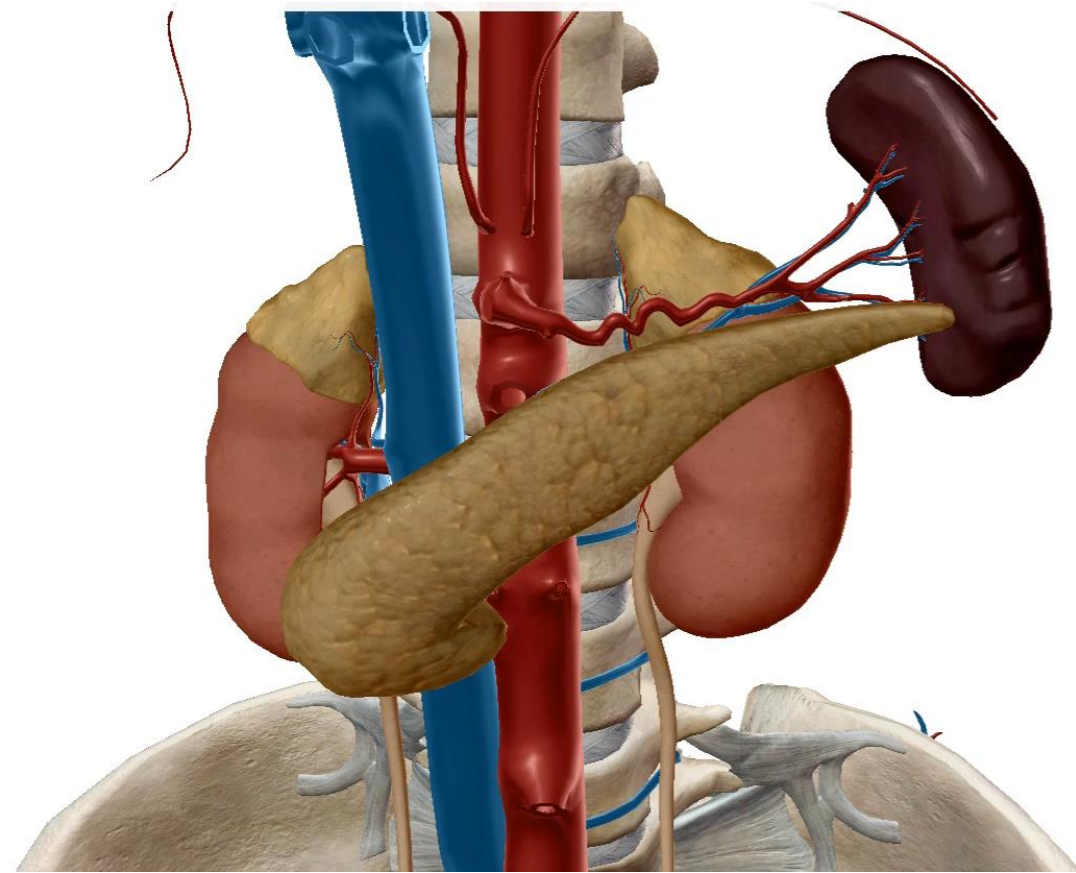
- **The upper pole:**
  - covered with peritoneum of the lesser sac and forming part of the stomach bed
- **The lower pole:**
  - covered in front by the body of the pancreas and the splenic artery

### 2. Posterior face:

- Adheres to the left crus of the diaphragm

### 3. Renal face:

- Drapes over the medial border of the left kidney above the hilum

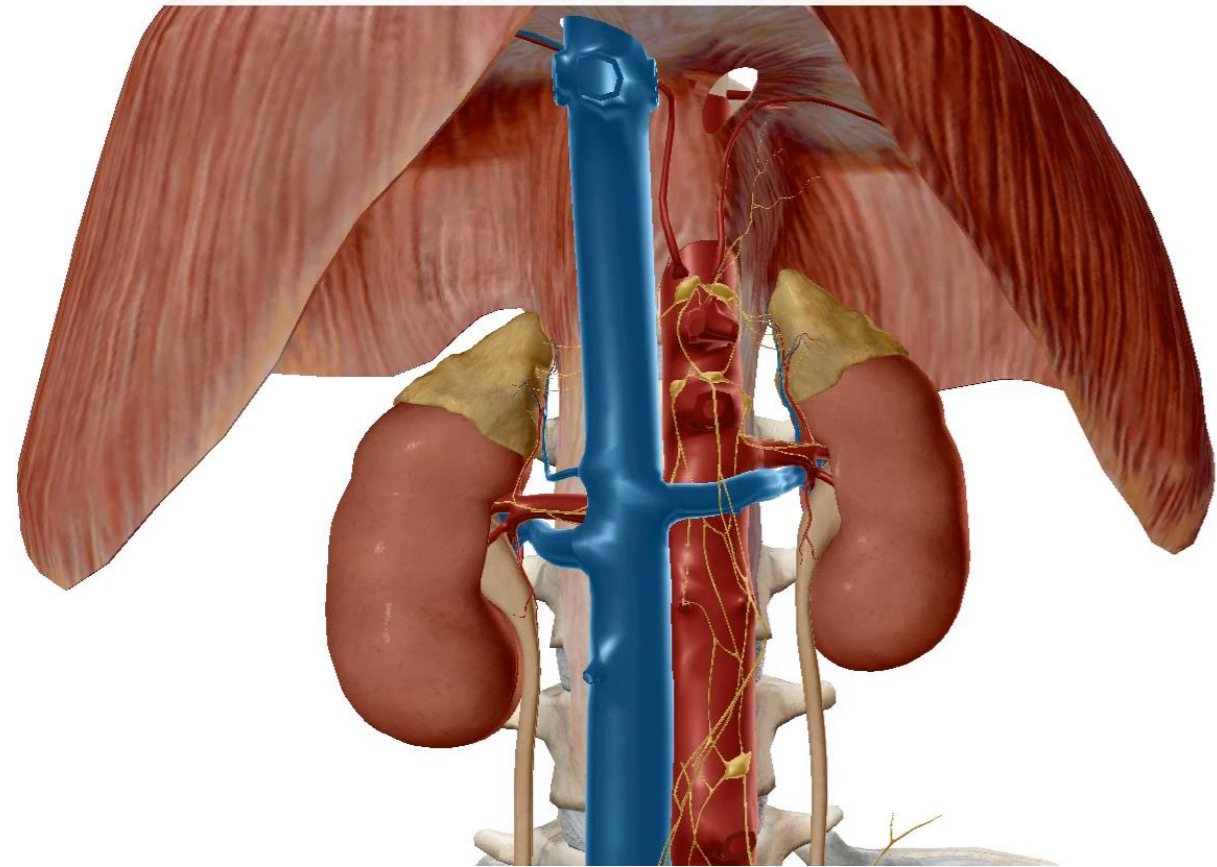


#### 4. Superior border:

- Lies under the diaphragm

#### 5. Medial border:

- It is to the left of the celiac plexus, the left inferior phrenic artery and the aorta



## V. BLOOD SUPPLY; NERVE SUPPLY AND LYMPH DRAINAGE

### A. ARTERIES

#### 1. Superior suprarenal arteries:

- Several small branches provided from the inferior phrenic artery

#### 2. Middle suprarenal arteries:

- Provided from the aorta

#### 3. Inferior suprarenal arteries:

- Provided from the renal artery

Left inferior phrenic artery

Aorta

Superior suprarenal artery

Middle suprarenal artery

Inferior suprarenal artery

Left renal artery

FIGURE SHOWING ARTERIES OF THE SUPRARENAL GLANDS (FROM KAMINA)

## B. VEINS

- The venous plexus of the medulla drains into one central vein
- The central vein emerges from the hilum to become the right and left suprarenal veins

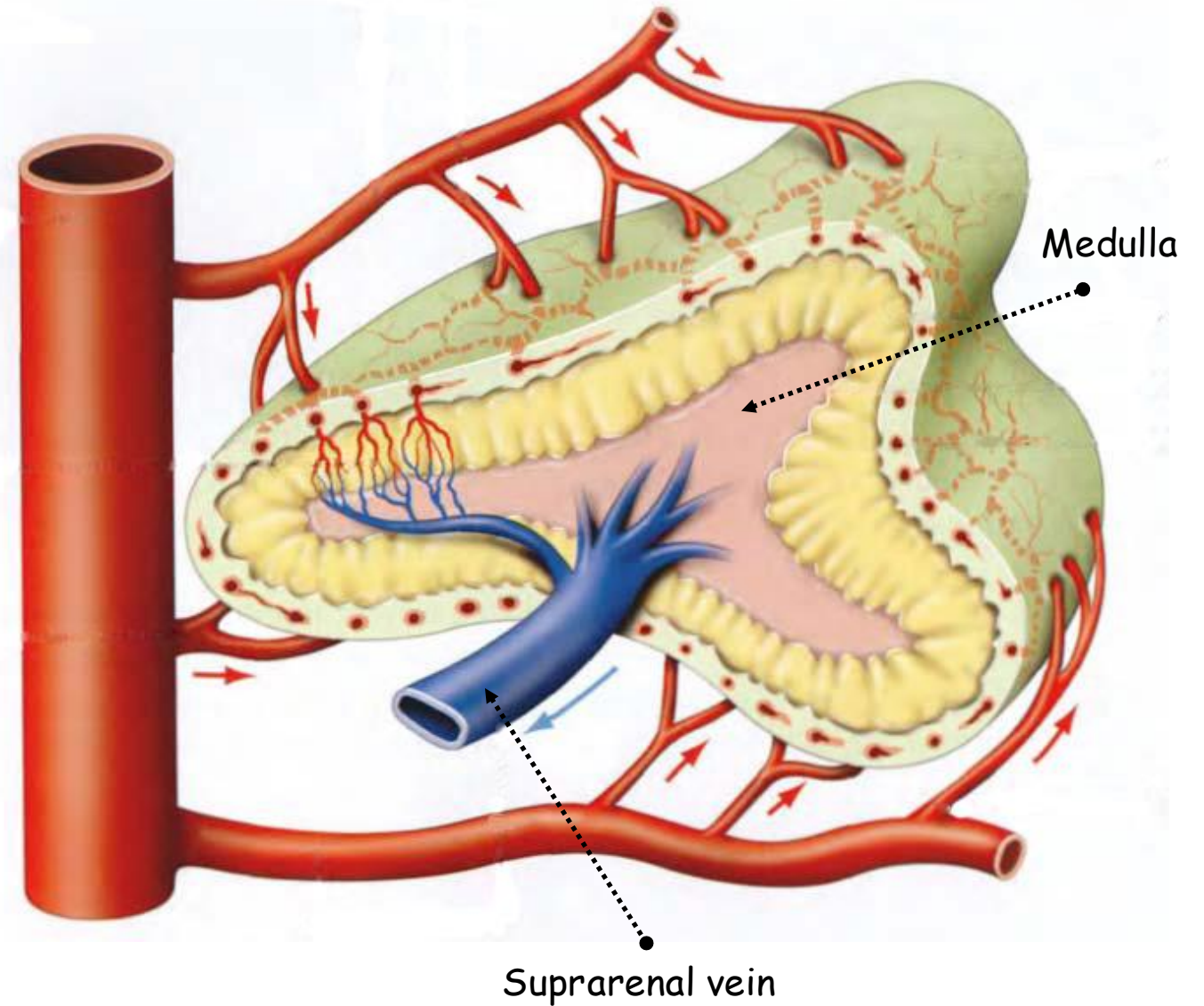


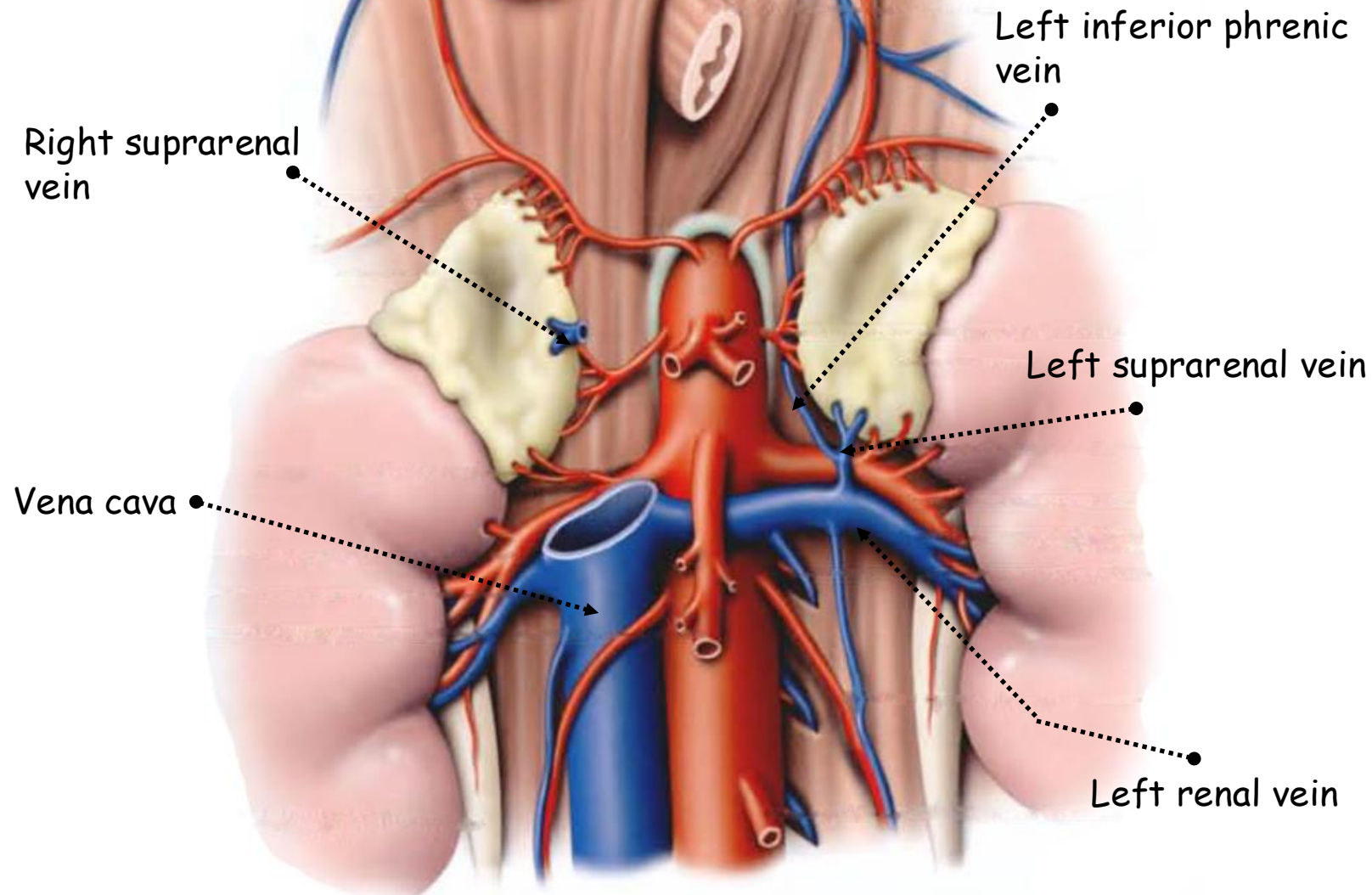
FIGURE SHOWING THE STRUCTURE AND BLOOD SUPPLY OF THE SUPRARENAL GLANDS (FROM KAMINA)

## 1. Right suprarenal vein:

- The right vein is only a few millimetres long and enters the vena cava

## 2. Left suprarenal vein:

- The left vein is longer and enters the left renal vein
- It anastomoses with the left inferior phrenic vein, creating a renal suprarenal shunt

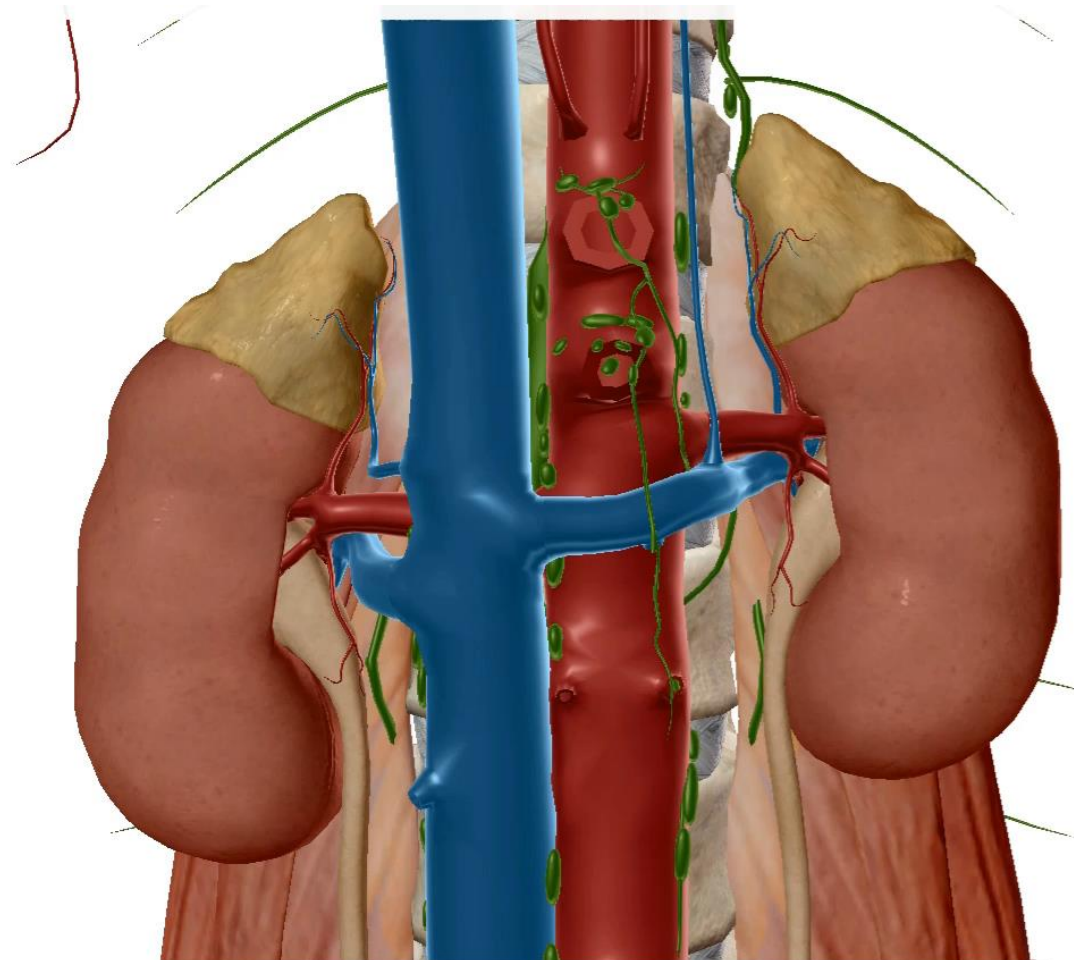
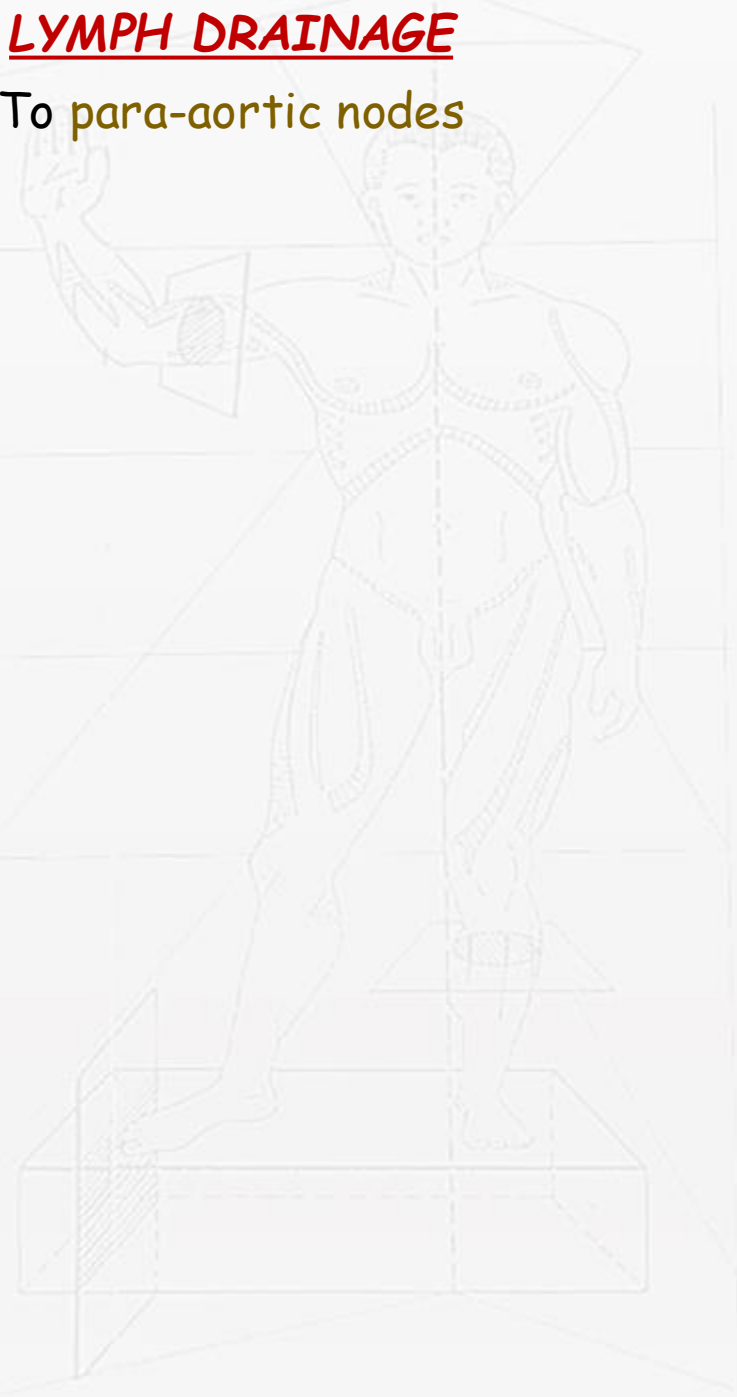


**FIGURE SHOWING THE VEINS OF THE SUPRARENAL GLANDS (FROM KAMINA)**



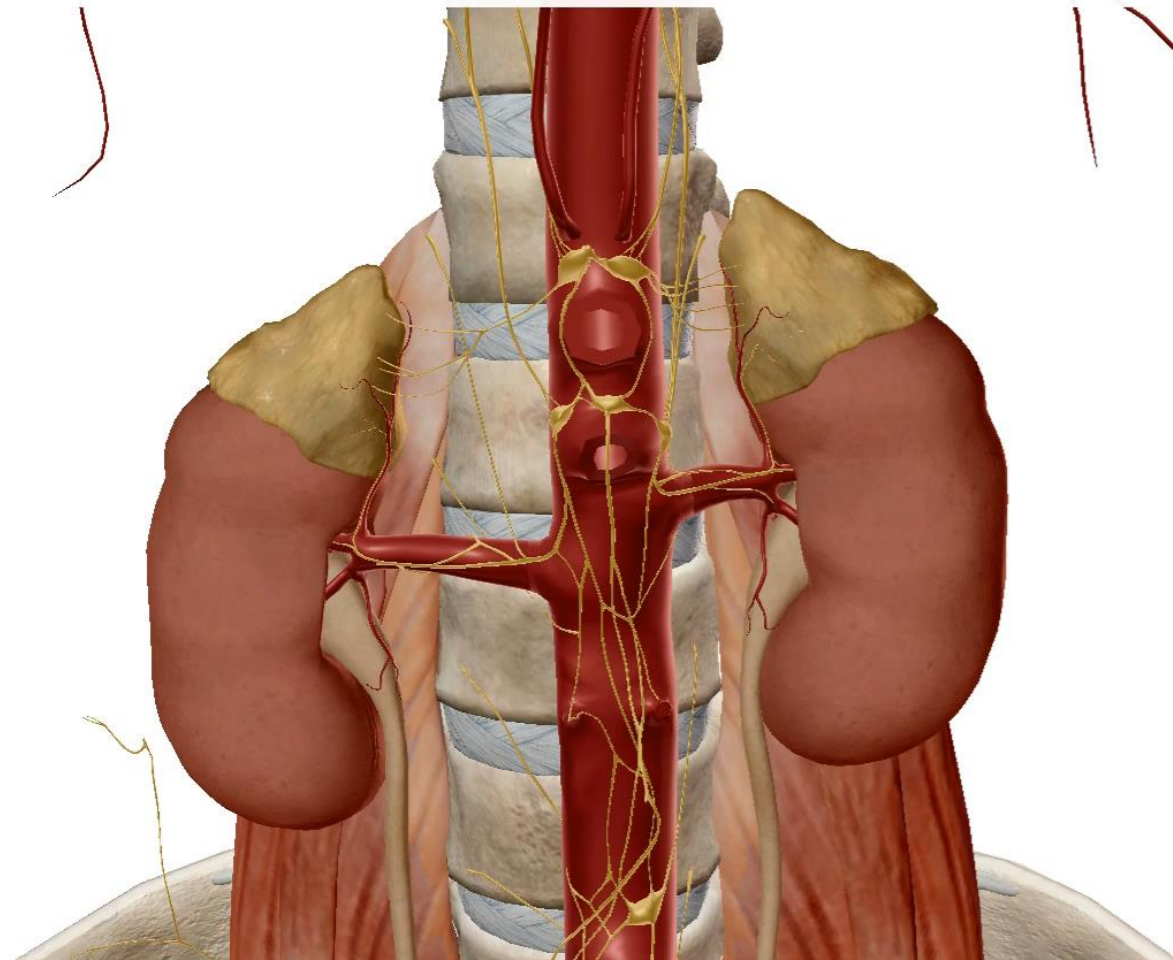
## C. LYMPH DRAINAGE

- To para-aortic nodes



## D. NERVES

- The main supply is by myelinated preganglionic sympathetic fibres from the splanchnic nerves via the celiac and renal plexuses
- Although, cortical control is not neural but by ACTH from the anterior pituitary



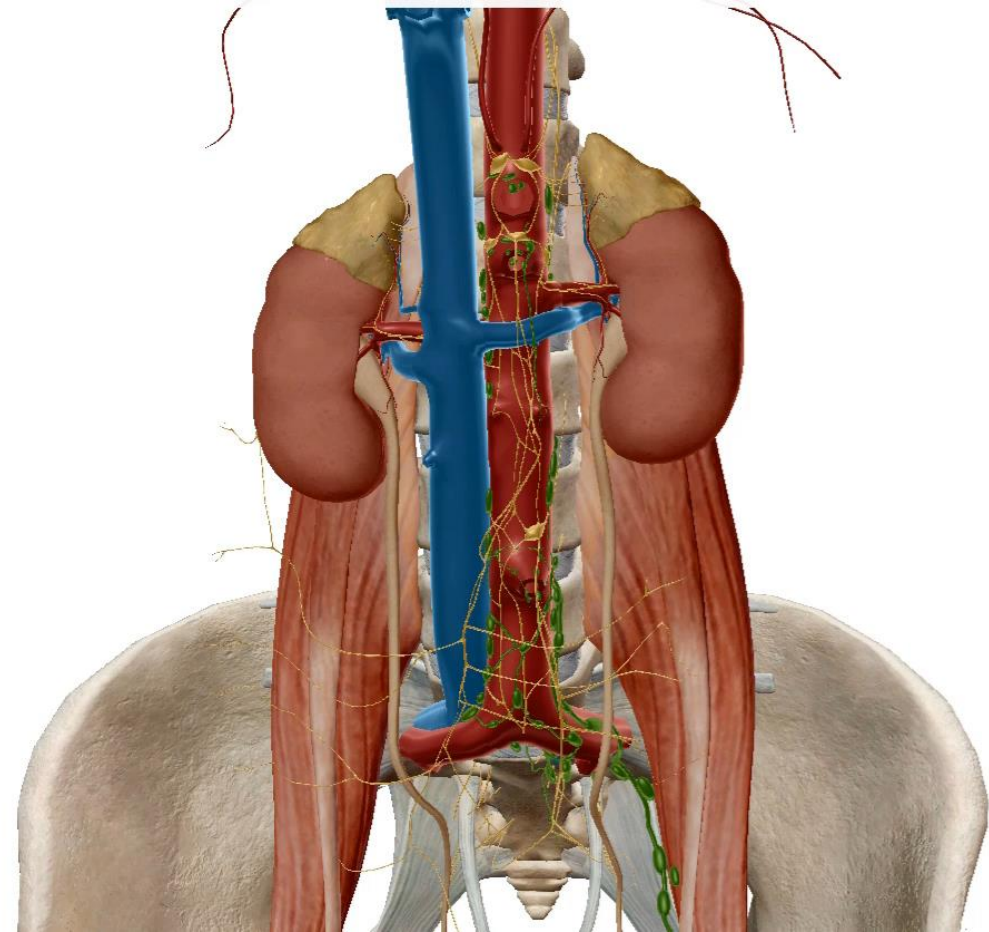
## VI. SURGICAL APPROACH

- **Suprarenalectomy (adrenalectomy):**
  - Front approach
  - Harder on the left
  - Veinous ligation before arterial
  - Dangers: the vena cava is easily torn on the right and surges of hormone release must be avoided



## VII. CONCLUSION

- Paired endocrine glands
- **Retroperitoneal**, surmount the upper pole of the kidney
- **Essential to life**
- Sandwich like : two layers of **cortex** and one thin layer of **medulla**
- Secrete different adrenal hormones
- Several anatomical relations
- Rich blood supply
- Nerves mainly provided from **the celiac plexus**
- Lymph drainage is ensured by **the para-aortic nodes**





كلية الطب  
والصيدلة - مراكش  
FACULTÉ DE MÉDECINE  
ET DE PHARMACIE - MARRAKECH

