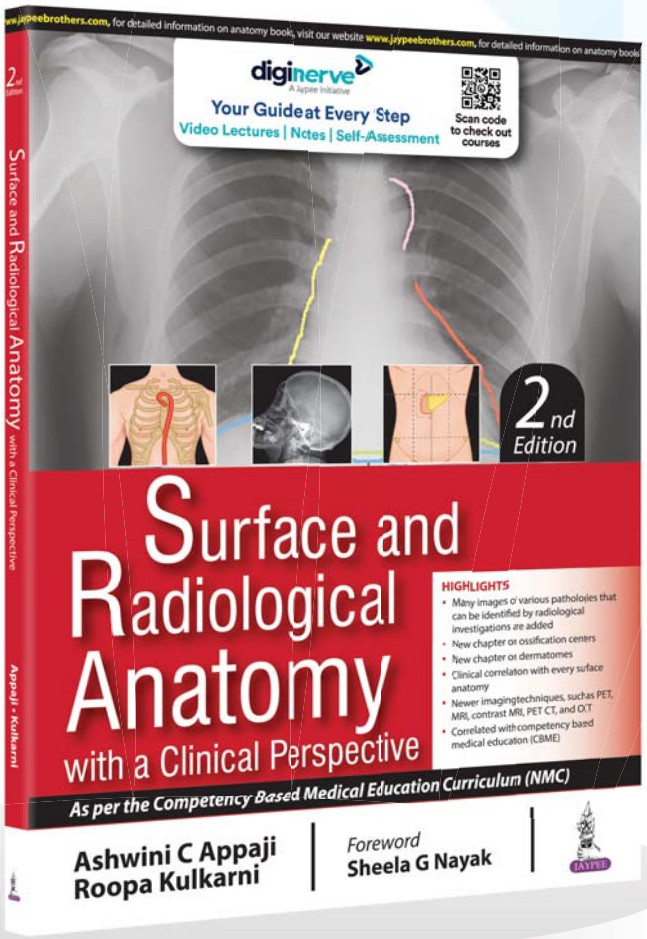

JAYPEE

Surface and Radiological Anatomy

with a Clinical Perspective

As per the Competency Based Medical Education Curriculum (NMC)

2nd Edition

Ashwani C Appaji
Roopa Kulkarni

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Why to Buy this Book ?

- As per the **Competency Based Medical Education Curriculum (NMC)**
- Book divided in two Section - Section 1 : **Surface Anatomy,** Section 2 : **Radiological Anatomy**
- **Competencies** are given in the beginning of each chapter.
- **Applied Anatomy** are highlighted in the yellow boxes.
- New Chapters are added on **Ossification Centers** and **Dermatomes.**
- Latest Imaging Techniques are included, such as **PET, MRI, Contrast MRI,** and **OCT.**

SAMPLE PAGES

Competencies are given in the beginning of each chapter.

CHAPTER 2

Surface Anatomy of Upper Limb

AN13.6: Identify and demonstrate important bony landmarks of upper limb: Jugular notch, sternal angle, acromial angle, spine of the scapula, vertebral level of the medial end, inferior angle of the scapula.

AN13.7: Identify and demonstrate surface projection of: Cephalic and basilic vein, palpation of brachial artery, radial artery.

- Acromion process (2)
- Lateral epicondyle (3)
- Medial epicondyle (3a)
- Head of humerus (5)
- Styloid process of radius in supinated position (6)
- Head of ulna in pronated position (7)
- *Knuckles:* They are pointed projections seen on the dorsum of the hand when a fist is made. They represent the head of the metacarpal bones (8).
- Medial epicondyle (A), lateral epicondyle (B) and olecranon process (C) of ulna form the angles of isosceles triangle in flexed elbow. The same bony landmarks lie in a single plane in extended position **(Figs. 2.3A and 2.3B)**.
- Axilla (10) is also called the arm pit. It lies in the depression where the upper limb joins the trunk via the shoulder joint. It is bounded anteriorly by the anterior axillary fold (9) formed by pectoralis major. The posterior axillary fold (11) is formed by latissimus dorsi **(Fig. 2.4)**.
- The anatomical snuff box can be identified by extending the thumb when a depression can be seen **(Fig. 2.2B)**.

Fig. 2.1A: Showing soft tissue landmarks. (C: Clavicle; N and A: Nipple and Areola).

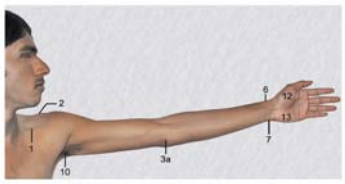
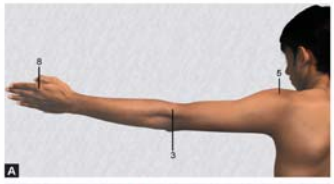


Fig. 2.1B: Bony landmarks of the upper limb.



Figs. 2.2A and B: (A) Upper limb: Back; (B) Anatomical snuff box.

Fig. 2.7: Axillary nerve.

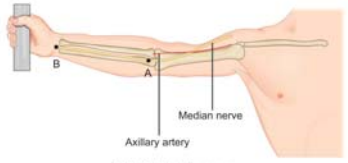
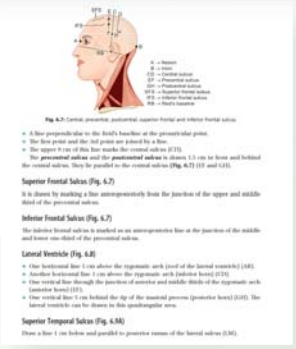


Fig. 2.8: Median nerve.

Figures of surface making are used to highlight various diagnostic understanding.



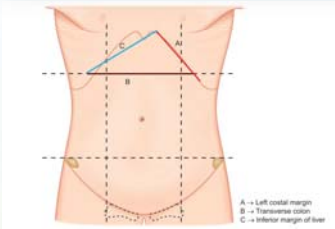


Fig. 5.7: Gastric triangle.

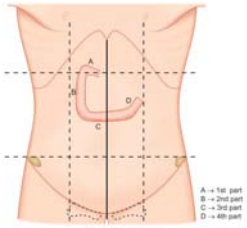


Fig. 5.8: Duodenum.

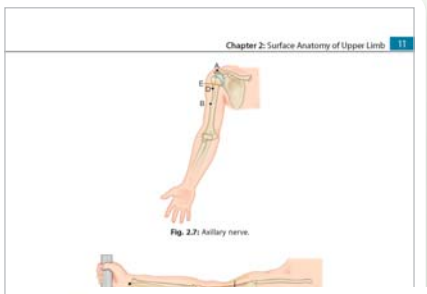


Fig. 2.7: Axillary nerve.

Applied Anatomy are highlighted in the yellow boxes.

Applied Anatomy

The median nerve lies very superficial in the wrist. It lies deep to the flexor retinaculum and might get easily compressed/damaged in injuries of the wrist. This may result in paralysis of the thenar muscles and lateral two lumbricals. This is associated with numbness and pain the lateral half of the palm and lateral 31/2 fingers. This is called carpal tunnel syndrome.

SAMPLE PAGES

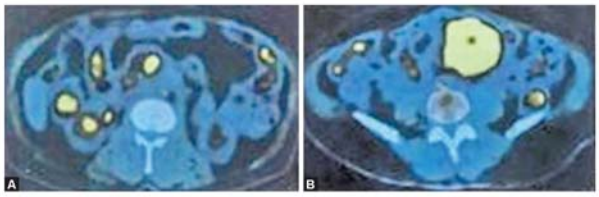
- **Tumor stain:** Certain high vascular brain tumors produce a shadow in cerebral angiograms. Such areas of (tumor shadows of) high vascularity are called 'tumor stain.' This area of increased density due to accumulation of contrast material in the abnormal or distorted vessels especially neoplasm.
- A written consent
- Fasting for 3 to 4
- History of allergy

POSITRON EMISSION TOMOGRAPHY

Positron emission tomography (PET) method is used to identify high metabolic areas in the human body as in the case of cancers. It uses the principle of emission of positrons when radioactive tracers are injected into the body. The PET scan is a functional imaging technique. This measures the metabolic activities, such as chemical reactions, blood flow, etc. It uses different traces such as **18F-FDG to detect cancer, NaF-F18 for bone formation, Oxygen-15 to measure blood flow**. When the tracers enter the body, it breaks down to release gamma rays which are detected by gamma cameras which are designed to form 3D images. It is an outpatient procedure.

PET-CT: When PET gets incorporated into CT scan, it is called PET-CT.

- The combination with CT is an anatomic and metabolic imaging.
- The tracer will collect in the areas of **higher metabolic/chemical activity** which is normally associated with disease. Such areas appear as **bright spots in PET scans (Figs. 10.7 and 10.8)**.
- It is used to measure the oxygen usage, metabolism in the tissues and organs, utilization of sugar in the body, blood flow, etc. The disease at cellular level can be detected by this procedure.
- A radioisotope called Cyclotron is used to detect diseases by PET. 10 millicurie (mci) of the radioisotope is injected into the vein.



Figs. 10.7A and B: Showing metabolically active areas in lymph nodes of the abdominal cavity (yellow bright areas).

Positron Emission Tomography (PET) Scan images are given to visualize metabolic activity and biochemical function.

MRI Scan Images are given to highlight the disease detection, diagnosis, and treatment monitoring concepts.

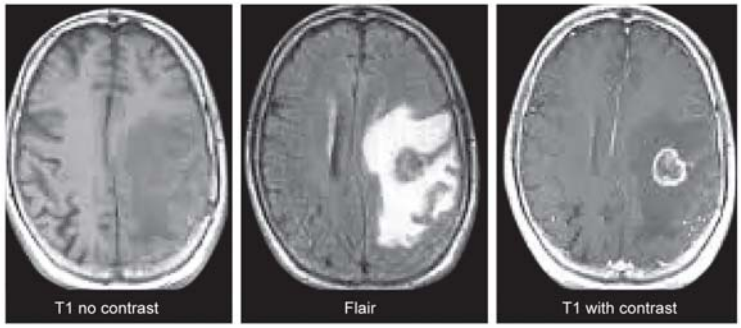


Fig. 10.11: Contrast magnetic resonance imaging (MRI) of skull without contrast and with contrast medium introduced.

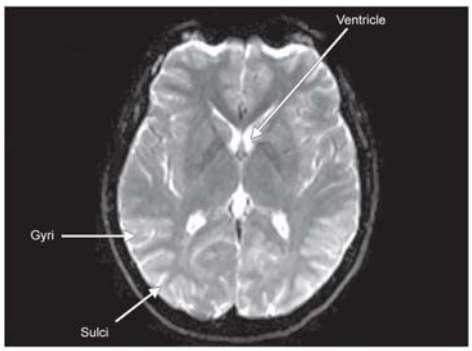


Fig. 10.10: Magnetic resonance imaging (MRI) of the head region showing ventricles containing cerebrospinal fluid as white shadows. The gray and white matters appear as shades of gray.

Fig. 10.11: Contrast magnetic resonance imaging (MRI) of skull without contrast and with contrast medium introduced.

Gadolinium is used intravenously to study blood vessels specifically as in magnetic resonance angiography (MRA). It is used in brain tumor enhancement associated with degradation of blood brain barrier. For aorta and its branches the concentration of the contrast medium can be 0.1 mmol per kg body weight. Higher concentrations are used for smaller vessels. Because of hydrophilic nature of the gadolinium chelates, they do not pass through the blood brain barrier and thus enhance the lesions wherever there is a leak in the blood brain barrier, caused by the tumor growth. In the rest of the body, the contrast medium may enter into interstitial space and finally it is excreted through the kidneys.

Disadvantages of Gadolinium

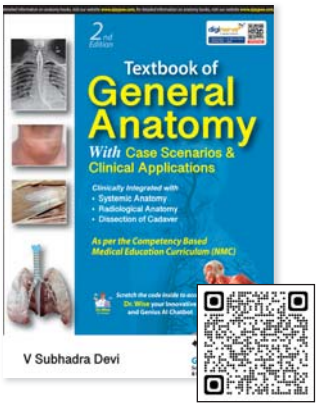
- It is NOT safer than the contrasts of iodine compounds.
- Anaphylactic shock has not been seen in about 0.02–0.1% of cases.
- It is toxic if it is not used in chelated form.
- The contrast agents containing gadolinium are—omniscan, magnegita, gado-MRT-ratiopharm (brand of gadopentetate dimeglumine is the N-methylglucamine salt of the gadolinium complex of diethylenetriamine penta acetic acid is an injectable contrast medium), optimark, magnevist, etc. These compounds were banned as they caused renal damage. These drugs are contraindicated in people with kidney disease, recent liver transplants and neonates.

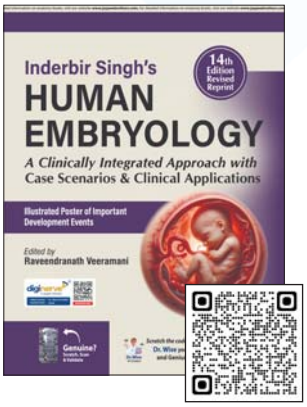
Other compounds used are, iron oxide, iron platinum, manganese, barium sulfate, air, clay, blueberry, green tea, perfluorocarbon and any other natural agents, which reduce the hydrogen ion in body cavity are used. If there is more hydrogen the area appears white and if here is less or no hydrogen ion in the part to be examined the image will be from shades of gray to dark (black) **(Fig. 10.11)**.

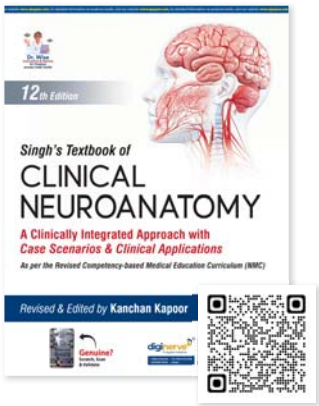
MAGNETIC RESONANCE ANGIOGRAPHY (FIG. 10.12)

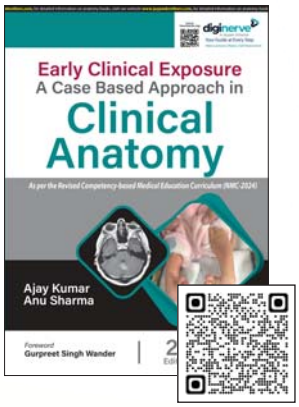
Magnetic resonance angiography (MRA) is an advanced technique in which the study of blood vessels is done. In this test, a powerful magnetic field, radio waves and a computer

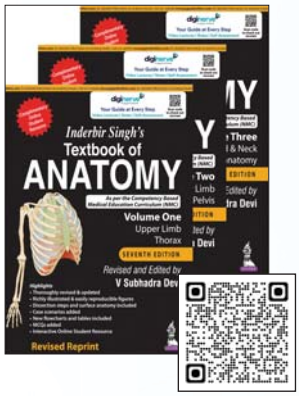
Other Useful Titles

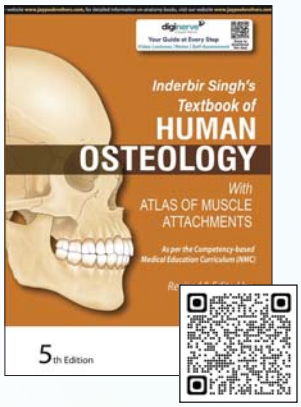


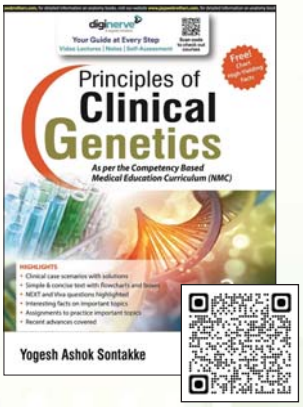


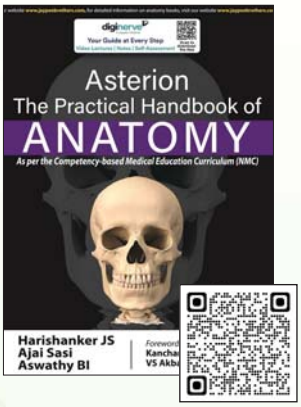


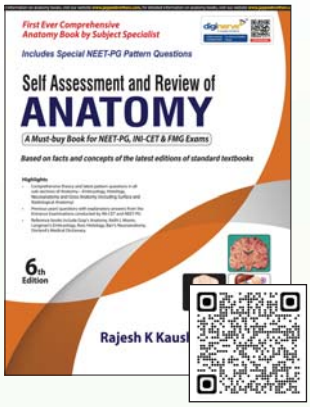












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