Introduction to Pathology

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Study of Diseases

• Definition: pathos + logos
• Pathophysiology: pathos + physiology
• Health and disease: dis + ease
Your practice of medicine is as good as is your knowledge and understanding of Pathology.

-Sir William Osler
Terminology

- Patient
- Lesions
- Pathologic changes or morphology
- GA and ME
- Etiology: *Why?*
- Pathogenesis: *How?*
- Signs and symptoms
- Diagnosis, prognosis, treatment, prevention: *What?*
Evolution of Pathology

Religious beliefs and magic to rational approach (prehistoric time to AD1500)

Greeks:
- Asclepios, Apollo
- Socrates, Plato, Aristotle
- Hippocrates

*Web Image 1.1: Hippocrates (460-370 BC). The great Greek clinical genius and regarded as ‘the father of medicine’. He introduced ethical aspects to medicine.*
Religious beliefs and magic to rational approach (prehistoric time to AD1500) contd..

- Romans: Celsus, Galen
- Indians: Dhanvantri, Charaka, Sushruta
- Theory of vitalism
Human Anatomy to Era of Gross Pathology
(AD1500-1800)

- Renaissance: Leonardo da Vinci (1452-1519)
- Vesalius (1514-1564)
- Fallopius (1523-1562)
**Web Image 1.2:** In 16th Century, postmortem amphitheatre in Europe was a place of learning human anatomic dissection conducted and demonstrated by professors to eager learners and spectators.
Human Anatomy to Era of Gross Pathology
(AD1500-1800) cond..

• Leeuwenhoek (1632-1723)
• Malpighi (1624-1694)
• Morgagni (1682-1771)
• Pott (1714-1788)
• Hunter brothers, Jenner, Matthew Baillie
• 3 Great guys of “Guys”: Bright, Addison, Hodgkin
• Xavier Bichat, RTH Laennaece
• Rokitansky
**Web Image 1.3:** Giovanni B. Morgagni (1682–1771), an Italian physician-anatomist who introduced clinicopathologic methodology in the study of disease by correlation of clinical findings with findings at postmortem examination.

**Web Image 1.4:** John Hunter (1728-1793). Scottish surgeon, regarded as the greatest surgeon-anatomist of all times who established first ever unique collection of pathological specimens that later resulted in the Hunterian Museum of the Royal College of Surgeons, London.
Technology Development & Cellular Pathology
(1800-1950)

- Louis Pasteur
- Hansen
- Ehrlich
- Gram
- Romanowsky
- Koch
- May-Grunwald and Giemsa
- Leishman
- Feulgen
Surgeon-pathologists to Surgical Pathologists

• Surgeon doubling up as pathologist from 19th century up to mid-20th century
• Famous surgeon pathologists during this era: James Ewing, Stout, Ackerman, Pierre Masson, Willis
**Father of Blood Transfusion**

*Web Image 1.7:* Carl Landsteiner (1863-1943). An Austrian pathologist who first discovered the existence of major human blood groups in 1900 and was recipient of Nobel prize in 1930.

**Father of Exfoliative Cytology**

Modern Pathology

- Structure of DNA (Watson & Crick, 1953)
- Number of chromosomes (1956)
- In situ hybridisation (1969)
- Recombinant DNA (1972)
- PCR i.e. xeroxing DNA fragments (1983)
- Flexibility and dynamism of DNA (1983)
- Mammalian cloning (1997)
- Stem cell research (1998)
- cDNA microarrays, microdissection
Web Image 1-10: Molecular structure of human chromosome.
Subdivisions of Pathology

- General and systemic pathology
- Histopathology: *Surgical pathology, Forensic pathology and autopsy work, Cytology*
- Haematology
- Chemical pathology
- Immunology
- Experimental Pathology
- Medical genetics
- Molecular pathology
Basic Objectives of Teaching Pathology at UG Level

- Teaching students the mechanisms and scientific basis of disease from a gross level to microscopy and to molecular level.
- Teaching them how to use a medical laboratory?
- Teaching them how to request an investigation?