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INTRODUCTION TO HISTOPATHOLOGY

1.1 INTRODUCTION

Surgical pathology includes gross and microscopic examination of resected specimens and biopsies by histopathologists for tissue diagnosis. Several steps are followed to get the tissue in a form, by which diagnosis can be made under light microscope.



OBJECTIVES

After reading this lesson, you will be able to:

- list the steps involved in the processing of surgical specimens for histopathologic examination
- explain the after care of the specimens
- explain grossing and gross room
- describe the laboratory hazards and safety measures.

Steps involved in the process are

1. Receipt of specimens from OT
2. Grossing
3. Tissue processing
4. Embedding
5. Section cutting
6. Staining and labelling
7. Dispatch of slides to pathologist for diagnosis

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Once the diagnosis is made, the slides come back to the laboratory. After the reports are sent to the surgeons either as soft copy or hard copy, the laboratory has to perform the following functions -

1. Slides are filed for future reference or teaching/research for at least 10 years.
2. Requisition forms are filed and/or stored in digital form for at least 10 years.
3. Specimens may be divided according to their use
 - (a) Well preserved specimens with representative lesion should be kept for
 - teaching
 - research
 - museum
 - (b) For future reference (6 months to 1 year)
 - (c) Discard – The specimens which are not required or not useful for any of the above purpose should be discarded.

Apart from these essential functions, various other procedures are performed in a surgical pathology laboratory depending upon the requirement, feasibility and availability of instruments and qualified personnel.

- Cryosections
- Histochemical stains
- Immunohistochemistry
- Electron microscopy
- Advanced techniques like in-situ hybridization, immunofluorescence.

1.2 GROSSING

It is the process by which pathology specimens are inspected with bare eye to obtain diagnostic information. Following points should be noted before the tissue is processed for microscopic examination-

- A. Identification of the specimen-confirmation of patient and anatomical site from which the specimen has been obtained.
- B. Clinical details
- C. Gross description – written record of physical appearance of the specimen.
 - Only a small portion from the large specimen can be subjected to microscopic examination, hence gross examination should be done by a skilled person.

- Only soft tissue can be cut into small blocks and processed directly.
- Bony specimens need to be decalcified before processing.
- Stones and teeth require special treatment.

Gross room

- A. The size and features of surgical pathology gross room depend on the number of specimens, number of staff pathologists and residents and type of institution.
- B. The room should be large enough to permit the work to all the pathologists simultaneously. The room should be well illuminated, ventilated and with a exhaust fan to remove the formalin vapors.

Following items should be in a gross room.

- (a) A cutting board. The fluid from the board must run directly into the sink.
- (b) Shelves for specimen containers.
- (c) Ready access to hot and cold water.
- (d) Ready access to formalin.
- (e) Box of instruments containing forceps of various size, scissors of various types and size, probe, bone cutting saw or electric bone cutter, scalpel handle, disposable blades, long knife and ruler to measure the size of lesion and specimens.
- (f) Box with cassettes and labels.

Apart from these items a good gross room should also have -

- (a) Large formalin container
- (b) Other fixatives
- (c) Refrigerator
- (d) Photographic facility
- (e) Balance for gross specimens
- (f) X-ray view box

1.3 LABORATORY HAZARDS AND SAFETY MEASURES

Gross room

1. Formalin vapors are irritant to eyes and throat. Exhaust may be used as outlet for vapors.



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2. One should always use mask, apron, eye glasses and gloves to protect oneself from
 - infected material
 - formalin vapors
 - spilt blood or any other fluid
3. Keep the grossing table clean with antiseptic solution.
4. All specimens should be in container with 10% formalin and covered with lid.
5. After grossing specimen should be kept according to accession number.

1.4 HISTOPATHOLOGY LABORATORY

The laboratory should be large enough to accommodate various equipments and personnel to work with ease. The equipments which are kept in this laboratory are -

- Tissue processor
- Tissue embedding table
- Microtome
- Tissue warming plate
- Tissue flotation bath
- Slide stainer or glassware for manual staining
- Table to label and dispatch the slides.

The handling of the tissues and description and functioning of various equipments is detailed in the respective lessons.

1.5 LABORATORY HAZARDS AND SAFETY MEASURES

Histopathology laboratory

1. Most of the equipments present in this laboratory are functioning 24x7 days. Electrical connections should be checked before leaving the laboratory every day.
2. Many chemicals are inflammable, hence care should be taken to avoid any fire hazard.
3. Fire extinguisher should always be available.
4. Minimum inflammable substances should be kept in the laboratory. Substances like wax, xylene alcohol, acetone should be stored at a separate place.
5. Some chemicals are carcinogenic or harmful to the skin. Therefore staining and other work should be performed with the gloves on.



INTEXT QUESTIONS 1.1

1. Slides and requisition forms are preserved for future reference for atleast years
2. Specimens may be divided according to their use as, &
3. The process by which specimens are inspected with bare eyes to obtain diagnostic information is
4. Formalin vapors may be expelled from the gross room by the use of
5. All specimens should be stored in solution



Notes



WHAT HAVE YOU LEARNT

- Surgical pathology includes gross and microscopic examination of resected specimens and biopsies for tissue diagnosis
- The steps of process of diagnosis are receipt of specimen, grossing, tissue processing, embedding, section cutting, staining, labeling
- Slides and requisition forms are stored for atleast 10 years for future references
- Specimens may be divided according to their use as well preserved specimen for teaching, research and museum, for future reference from 6 months to 1 year or may be discarded
- Grossing is the process by which the specimens are inspected with bare eyes to obtain diagnostic information
- Gross room should permit the smooth functioning of pathologists, should also be well illuminated and ventilated with exhaust fan
- Gross room should also have cutting board, shelves, formalin, hot and cold water, required instruments
- All the specimens should be stored in 10% formalin container
- Personal protective equipments like gloves, mask, apron, eye glasses should be used for preventive occupational hazards
- Electric equipments should be cared for their functioning.

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TERMINAL QUESTIONS

1. What is grossing
2. What are the precautions to be taken for maintaining the safety in the laboratory
3. How should the gross room be built



ANSWERS TO INTEXT QUESTIONS

1.1

1. 10 years
2. For museum, future reference and teaching discard
3. Macroscopic examination
4. Exhaust fan
5. 10% Formalin