Cytopathology methods and various applications.

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Cytopathology is a branch of pathology that studies and diagnoses diseases at the cellular level. Cytopathology is commonly used for samples of free cells or tissue fragments, as opposed to histopathology, which examines the entire tissue. Cytopathology is often less accurate and is called "cytology", meaning "study of cells". Cytopathology often studies diseases that affect a wide range of body parts, not only to assist in the diagnosis of cancer, but also to assist in the diagnosis of some infectious diseases and other inflammatory conditions. Commonly used for. For example, a common use for cytopathology is Papanicolaou stain, a screening tool used to detect precancerous cervical lesions that can lead to cervical cancer. Cytopathological tests are sometimes called cotton swab tests because the specimen can be smeared on a glass microscope slide for staining or microscopic examination. However, cytological samples can be prepared by other methods, including cell centrifugation. Cancer can also be diagnosed using different types of swab tests. In this sense, it is called a cytological smear.

There are two methods for collecting cells for cytopathological analysis: exfoliation cytopathology and intervention cytopathology.

Exfoliative cytology

A micrograph of an exfoliative cytopathology specimen (Pap test, Pap stain). In this method, cells are accrued when they had been both spontaneously shed with the aid of using the body, or manually scraped/dismissed of a floor withinside the body. An instance of spontaneous exfoliation is whilst cells of the pleural hollow space or peritoneal hollow space are shed into the pleural or peritoneal fluid. This fluid may be accrued thru numerous techniques for examination. Examples of mechanical exfoliation consist of Pap smears, wherein cells are scraped from the cervix with a cervical spatula, or bronchial brushings, wherein a bronchoscope is inserted into the trachea and used to assess a seen lesion with the aid of using brushing cells from its floor and subjecting them to cytopathologic analysis. After sampling, most important strategies may be used: traditional cytology and liquid-primarily based totally cytology. With the latter, the pattern is located in a liquid this is then processed for similarly investigation.

Intervention cytology

In intervention cytology the pathologist intervenes into the body for sample collection.

Fine-needle aspiration

Needle aspiration or needle aspiration cytology (FNAC) uses a needle attached to a syringe to collect cells from lesions or masses in various body organs by micropunching. Often, negative pressure (suction) is used to increase yield. FNAC can be performed using palpation guidance for masses in superficial areas such as the neck, thyroid, and chest (that is, the doctor can feel the lesion). FNAC is assisted by ultrasound or CAT scans and can examine deep lesions in the body that cannot be identified by palpation. FNAC is widely used in many countries, but success rates depend on the skill of the practitioner. When performed by a pathologist alone or in a team of pathologists and cell engineers, the success rate of a correct diagnosis is higher than when performed by a non-pathologist. This may be due to the ability of the pathologist to evaluate the specimen immediately under a microscope and repeat the procedure immediately if the specimen collection is inadequate.

Fine needles are 23 to 27 gauges. FNAC is often the least damaging way to obtain diagnostic tissue from a lesion, as a small 27-gauge needle can produce diagnostic material in most cases. With a syringe holder, you may be able to easily perform a biopsy with one hand and fix the mass with the other hand. Imaging equipment such as CT scanners and ultrasound can be used to identify the area to be biopsied. FNAC has become synonymous with interventional cytology.

Sediment cytology

For sediment cytology, the sample is taken from the fixation fluid used to process the biopsy or autopsy specimen. Mix the fixative well and place in a centrifuge tube for centrifugation. The precipitate is used for lubrication. These precipitates are cells released from autopsy and biopsy specimens during processing.

Imprint cytology

The tissue of interest to come into contact with the glass slide and leave its mark on the slide in the form of cells. You can then stain and examine the impression.

Cytopathologic techniques are used in the examination of virtually all body organs and tissues:

Gynecologic cytology, Urinary tract cytology, Urine cytology, Effusion cytology, Breast cytology, Vaginal cytology, Thyroid cytology, Lymph node cytology, Respiratory cytology, Gastrointestinal cytology, Soft tissue, bone and skin cytology, Kidney and adrenal cytology, Liver and pancreas cytology, Central nervous system cytology.

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