



ABSTRACT BOOK

EVOLUTION OF EXAMINATION METHODS IN PULMONOLOGY, GASTROENTEROLOGY, AND NEPHROLOGY

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Scientific
student's
conference**

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Medical University**

Propedeutics to Internal
Medicine Department N1,
Basis of Bioethics and
Biosafety

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COMPUTED TOMOGRAPHY (CT OR CAT SCAN) OF LIVER

Abu Elenin Ahmed Kotb Sadek, Gerasimchuk N.

Computed tomography (CT or CAT scan) is a noninvasive diagnostic imaging procedure that uses a combination of X-rays and computer technology to produce horizontal, or axial, images (often called slices) of the body. A CT scan shows detailed images of any part of the body, including the bones, muscles, fat, and organs. CT scans are more detailed than standard X-rays. In standard X-rays, a beam of energy is aimed at the body part being studied. A plate behind the body part captures the variations of the energy beam after it passes through skin, bone, muscle, and other tissue. While much information can be obtained from a standard X-ray, a lot of detail about internal organs and other structures is not available. In computed tomography, the X-ray beam moves in a circle around the body. This allows many different views of the same organ or structure. The X-ray information is sent to a computer that interprets the X-ray data and displays it in a two-dimensional (2D) form on a monitor. CT scans may be done with or without "contrast." Contrast refers to a substance taken by mouth and/or injected into an intravenous (IV) line that causes the particular organ or tissue under study to be seen more clearly. Contrast examinations may require fasting for a certain period of time before the procedure.

The liver and biliary system. The biliary system consists of the organs and ducts (bile ducts, gallbladder, and associated structures) that are involved in the production and transportation of bile.

The liver is the largest internal organ in the body. This dark reddish brown organ is located in the upper right-hand portion of the abdominal cavity, beneath the diaphragm, and on top of the right kidney and intestines. The wedge-shaped liver consists of 2 main lobes, both of which are made up of thousands of lobules. These lobules are connected to small ducts that connect with larger ducts to ultimately form the hepatic duct. The hepatic duct transports the bile produced by the liver cells to the gallbladder and duodenum (the first part of the small intestine).

The liver carries out many important functions, such as:

- Making bile. Fluid that helps break down fats and gets rid of wastes in the body
- Changing food into energy
- Clearing the blood of drugs and other poisonous substances
- Producing certain proteins for blood plasma
- Regulating blood clotting

CT scans of the liver and biliary tract (the liver, gallbladder, and bile ducts) can provide more detailed information about the liver, gallbladder, and

related structures than standard X-rays of the abdomen, thus providing more information related to injuries and/or diseases of the liver and biliary tract.

CT scans of the liver and biliary tract may also be used to visualize placement of needles during biopsies of the liver or during aspiration (withdrawal) of fluid from the area of the liver and/or biliary tract. CT scans of the liver are useful in the diagnosis of specific types of jaundice (yellowing of the skin and eyes as a result of certain conditions of the liver).

Reasons for the procedure. A CT scan of the liver and biliary tract may be performed to assess the liver and/or gallbladder and their related structures for tumors and other lesions, injuries, bleeding, infections, abscesses, unexplained abdominal pain, obstructions, or other conditions, particularly when another type of examination, such as X-rays, physical examination, and ultra sound is not conclusive. A CT scan of the liver may be used to distinguish between obstructive and nonobstructive jaundice. Another use of CT scans of the liver and biliary tract is to provide guidance for biopsies and/or aspiration of tissue from the liver or gallbladder.

EVOLUTION OF EXAMINATION METHODS IN NEPHROLOGY

Akpowhe Roberts, Ashcheulova T.

During ancient Greek and Byzantine periods prominent medical writers described acute renal failure (ARF) and speculated on it as etiology, signs, treatment and prognosis.

The first indication concerning the preoccupation of Greek thought with kidney diseases is an archaeological find from Cyprus. This is a bronze model of a kidney, with an inscription in the cyprominoic script, dating from the thirteenth century BC. It was found during excavations at the temples of Kition". The model resembles similar findings from Mesopotamia, and it was assumed to be a votive offering from a patient with kidney problems, or that it was used by the priest doctors of the temple as a teaching means for the novices. It should not be thought that the existence of such a magical/religious practice prevented the development of sound scientific knowledge. Even very recently, during the nineteenth century AD, simultaneously with the brilliant observations of Bright about renal diseases, natives in other parts of the world used to eat the perirenal fat of their human victims in order to acquire their strength.

Aristotles (fourth century BC) thought that urine was formulated at the bladder and it was Galen of Pergamos (second century AD), the observant anatomist of the renal system, who correctly proposed that blood is cleared by the kidneys. This statement was repeated in the fourth century AD by Bishop Nemesius of Emessa , who summarized the opinion of the ancients that the

kidney is a sieve separating the urine. Hippocrates has been considered the founder of clinical nephrology. His well-known aphorism 'bubbles appearing on the surface of the urine indicate diseases of the kidneys and a prolonged illness.

Several pathological conditions recognized nowadays as causes of ARF were also considered so by ancient Greek doctors. We refer to renal inflammation, destruction of renal parenchyma, crush syndrome, poisoning, cooling of the kidneys, etc. Hippocrates, who lived in the fifth century BC, notes that external hurt is causing hemorrhage of capillaries and destruction of renal parenchyma. According to the renowned military doctor Dioscurides (first century BC), who served under emperor Nero, phases of ARF, and refers to the critical point when poisoning causes renal inflammation. Aretaeus Capadoceus (second century AD) refers to renal inflammation and thrombosis. Breakage of capillaries into the kidneys, inflammation and thrombosis are also mentioned by Galen of Pergamos. Theophanes Nonus (tenth century AD) noted particularly the haematuria caused by poisonous remedies and the venom of serpents, while Maximus Planudes held the cooling of the kidneys responsible for the increased opacity of the urine.

We know now that ARF usually presents itself with oliguria (with variably concentrated urine) which may last from few days until almost a year. (Later the patient may die, or develop chronic renal failure). In the most favorable outcome the acute phase is followed by polyuria (with hypo concentrated urine) and, finally, a normal volume of urine output with normal concentration. We recognize that there are however cases of non-oliguric ARF where oliguria never develops. During the historical period under discussion medical writers did not know anything about non-oliguric ARF, but distinguished correctly the two typical phases of oliguric and polyuric ARF. They had also noticed that if the latter did not follow the former, the prognosis was gloomy. Rufus Ephesius studied the changes of urine through the first and second phases of ARF, and supported the idea that prognosis depends mainly on the kind of therapy, but also on the gravity and etiology of underlying disease. He described some symptoms of the syndrome, such as vertigo, anorexia, nausea, vomiting, shock, hypothermia and perspiration. In the same century Aretaeus Capadoceus noted the small and irregular pulse, the paleness and coma characteristic of severe cases, and rightly associated prolonged anuria with death.

Aetius Amidenus, author of the *Tetrabiblion*, is the Byzantine medical writer who had been most influenced by Rufus Ephesius' ideas about natural history and prognosis of ARF. He described the increase of both urine volume and concentration in parallel with the patient's recovery and thought that the

etiology, and the kind of treatment, influences the outcome of the illness. Paul of Aegina (seventh century AD), describes the oliguria of ARF noting that 'little urine is passed'. Byzantine doctors generally were deeply involved in observations about urine volume, colour, smell and concentration in several renal dysfunctions. This uroscopy was undertaken by doctors of all specialties, but also by specialists called 'technicians'.

EVOLUTION OF EXAMINATION METHOD IN GASTROENTEROLOGY. DOUBLE-BALLOON ENTEROSCOPY

Amesho Josephine, Ashcheulova T.

Double-balloon enteroscopy, also known as push-and-pull enteroscopy is an endoscopic technique for visualization of the small bowel. It was developed by Hironori Yamamoto in 2001. It is novel in the field of diagnostic gastroenterology as it is the first endoscopic technique that allows for the entire gastrointestinal tract to be visualized in real time.

The technique involves the use of a balloon at the end of a special enteroscope camera and an overtube, which is a tube that fits over the endoscope, and which is also fitted with a balloon. The procedure is usually done under general anesthesia, but may be done with the use of conscious sedation. The enteroscope and overtube are inserted through the mouth and passed in conventional fashion (that is, as with gastroscopy) into the small bowel. Following this, the endoscope is advanced a small distance in front of the overtube and the balloon at the end is inflated. Using the assistance of friction at the interface of the enteroscope and intestinal wall, the small bowel is accorded back to the overtube. The overtube balloon is then deployed, and the enteroscope balloon is deflated. The process is then continued until the entire small bowel is visualized.

The double-balloon enteroscope can also be passed in retrograde fashion, through the colon and into the ileum to visualize the end of the small bowel.

Indications. Double-balloon enteroscopy has found a niche application in the following settings: bleeding from the gastrointestinal tract of obscure cause; iron deficiency anemia with normal colonoscopy and gastroscopy; visualization and therapeutic intervention on abnormalities seen on traditional small bowel imaging

ERCP in post-surgical patients with long afferent limbs;

Advantages and disadvantages. Double-balloon enteroscopy offers a number of advantages to other small bowel image techniques, including barium imaging, wireless capsule endoscopy and push enteroscopy:

it allows for visualization of the entire small bowel to the terminal ileum; it allows for the application of therapeutics; it allows for the sampling or biopsying of small bowel mucosa, for the resection of polyps of the small bowel, and in the placement of stents or dilatation of strictures of the small bowel.

It allows for access to the papilla in patients with long afferent limbs after Billroth II antrectomy.

The key disadvantage of double-balloon enteroscopy is the time required to visualize the small bowel; this can exceed three hours, and may require that patients be admitted to hospital for the procedure. There have also been case reports of acute pancreatitis] and intestinal necrosis associated with the technique.

Conclusion. Double balloon enteroscopy has enabled dozens of physicians to view the GIT in real time, providing better ways for diagnosis as well.

EVOLUTION OF EXAMINATION METHOD IN PULMONOLOGY, SPIROMETRY

Bankole Oluwalorisuna Yomi, Kochubiei O.

Pulmonology is the medical specialty dealing with disease involving the respiratory tract. The spirograph is a major diagnostic instrument, which is useful in cases of asthma, COPD, and the diagnosis of many other respiratory diseases.

History One of the first major discoveries relevant to the field of Pulmonology was the discovery of pulmonary circulation. Major Contributions before 19th century. The earliest known history of the concept of spirometry goes back to the time of the Roman Empire, specifically between 129-200 AD. Greek doctor and philosopher, Claudius Galen, performed a volumetric experiment on human ventilation. He had a boy breathe in and out of a bladder and discovered that after a period of time, the volume of gas did not change. After this, Around 1681, Giovanni Alfonso Borelli attempted to measure the volume of air inspired in one breath by sucking a liquid up a tube and measuring its volume. One thing he did that is still performed today is block off the nostrils. During the early 1700's, J. Jurin was the first known scientist to record absolute measurements of air volumes. He measured a tidal volume of 650 mL and also a maximal expiration of 3610 mL.

Major Contributions during the 19th century. At the beginning of the 1800's, Sir Humphry Davy used a gasometer to measure various volumes and capacities. He took his own measurements, which turned out to be a vital capacity of 3110 mL, a tidal volume of 210 mL, and, using a hydrogen dilution

method, a residual volume of 590-600 mL. The gasometer he used was a complex instrument with an ingenious counterweight used to balance the increased weight of the gasometer when the gas enters from the silk bag.

Invention of the spirometer. By the 1840's, John Hutchinson, a surgeon, had begun his work with spirometers. He invented the spirometer to measure vital capacity, which he believed to be a powerful indicator of longevity. His spirometer consisted of a calibrated bell inverted in water, which captured exhaled air from the lungs. According to Eckert, Hutchinson recorded the vital capacities of over 4000 persons with his spirometer. Less than ten years after Hutchinson came out with his spirometer, Wintrich developed a spirometer that was easier to use. He performed tests on over 4000 people and concluded that the three parameters that determine vital capacity are body height, weight, and age. Later in 1859, E. Smith developed a portable spirometer, on which he measured gas metabolism. In 1866, Salter added a kymograph to the spirometer in order to record time while obtaining air volumes. T.G. Brodie was the first to use a dry bellows wedge spirometer in 1902, which is the precursor of the Fleisch spirometer.

Modern spirometry. Spirometry falls under the broader concept of calorimetry. Calorimetry is the accurate quantification of energy expenditure during rest and physical activity. And there are open circuit (which measures energy expenditure in physical activity) and closed (used less frequently during physical activity) circuit spirometry.

In conclusion, the history of spirometry consists of various researchers, concepts, and equipment. It began in the 2nd century with measurements of ventilatory volumes, progressed into more complex measurement of lung functions using a variety of techniques. Now, after years of experiments, it is an accurate way to measure energy expenditure.

BIOPSY OF LIVER

Chukwuma Mercy, Vizir M.

Anatomical features of liver. The liver is a reddish brown organ with four lobes of unequal size and shape. A human liver normally weighs 1.44–1.66 kg (3.2–3.7 lb), and is a soft, pinkish-brown, triangular organ. It is both the largest internal organ (the skin being the largest organ overall) and the largest gland in the human body. It is located in the right upper quadrant of the abdominal cavity, resting just below the diaphragm. The liver lies to the right of the stomach and overlies the gallbladder. It is connected to two large blood vessels, one called the hepatic artery and one called the portal vein. The hepatic artery carries blood from the aorta, whereas the portal vein carries blood containing digested nutrients from the entire gastrointestinal tract and

also from the spleen and pancreas. These blood vessels subdivide into capillaries, which then lead to a lobule. Each lobule is made up of millions of hepatic cells which are the basic metabolic cells. Lobules are the functional units of the liver.

Functions of the liver. detoxification, protein synthesis, and production of biochemicals necessary for digestion.

Biopsy of liver. A liver biopsy is done using a needle inserted between two of the right lower ribs to remove a sample of liver tissue. The tissue sample is sent to a laboratory and looked at under a microscope to see if there are any liver problems.

Instruments use for biopsy. A liver biopsy may be done when liver blood tests are abnormal. It may be done when an X-ray, an ultrasound, or a computed tomography (CT) scan shows a problem with the liver.

A liver biopsy may be done to:

- Find the cause of jaundice. A liver biopsy can find certain liver diseases (such as cirrhosis), infections (such as hepatitis), and liver tumors.
- Find the cause of abnormal blood test results from aspartate aminotransferase (AST) and alanine aminotransferase (ALT) tests. Both ALT and AST levels show liver damage and can help confirm liver disease.
- See how much the liver is inflamed or scarred by hepatitis or other liver diseases.
- See whether other liver conditions, such as hemochromatosis and Wilson's disease, are present.
- Check the response to treatment for liver disease.
- Determine whether a medicine, such as methotrexate, is causing a toxic effect on the liver.
- Check the function of a transplanted liver.
- Find the cause of an unexplained and ongoing fever.
- Check a liver mass found on an X-ray, ultrasound, or CT scan.

A liver biopsy can also be done to find the cause of jaundice or to check on cirrhosis, hepatitis, or liver cancer.

Before you have a liver biopsy, tell your doctor if you:

- Are taking aspirin, nonsteroidal anti-inflammatory medicines (such as ibuprofen or naproxen), blood thinners (such as Coumadin or heparin), or antiplatelet medicines such as clopidogrel (Plavix). You may be asked to stop taking these medicines at least 1 week before the test to lower the chance of bleeding after the test.
- Are taking any heart medicines.
- Are using any herbal supplements.

- Are allergic to any medicines, including anesthetics.
- Have had bleeding problems.
- Are or might be pregnant.
- Have recently had pneumonia, which may make it hard to do this test.
- Have a history of fluid buildup in the belly (ascites). Ascites may make it hard to do this test.

Liver biopsy remains an important tool in the evaluation and management of liver disease. However it is invasive, can cause significant complications and clearly, needle liver biopsy is far from an ideal test. Even though it is an imperfect “gold standard”, liver biopsy remains an important tool in the evaluation and management of liver disease.

ELASTOGRAPHY FOR THE DIAGNOSIS OF LIVER CIRRHOSIS

Ekott Nyikkeabasi Bassey, Kochubiei O.

Elastography is a technique used for diagnosis which works on the principle of measuring the elasticity of organs and tissues. This principle works because organs and tissues have different values of elasticity when they are normal and when they are pathological. Also, there are marked differences in the elasticity of organs or tissues depending on the level of pathology with benign tumours being more elastic/compressible than malignant tumours which are almost not compressible. Liver cirrhosis is a slow progressing disease where healthy liver tissue is replaced by scar tissue which blocks or slows down the processing of nutrients, blood, drugs, hormones and toxins in the liver.

Methods of diagnosing and staging liver cirrhosis include histological methods which involve biopsies, biochemical methods which involve the use of serum markers and lately elastography. Problems with histology include sampling error and slow progression of liver fibrosis from normal to cirrhosis. Also, investigation of serum markers is invasive procedure which requires time for analysis thereby translating into more than one visit to the physician.

Elastography for the diagnosis or staging of liver cirrhosis is done by taking a picture of the liver using ultrasound technology before compression (deformation) and after compression. The two images could be compared and the degree of compression noted. Compression could be achieved using manual compression by an operator using a transducer (static elastography), organ compression by heartbeat or vascular pulsations, push pulse waves compression and compression by supersonic shear waves.

The advantages of elastography for the diagnosis of liver cirrhosis include non-invasiveness, speed, accuracy and the fact that it requires only one hospital visit. With the technology being developed further, it would likely be a

key player in the diagnosis or staging of liver cirrhosis possibly combined with other methods.

CYSTIC FIBROSIS: ETIOLOGY, DIAGNOSTICS, AND TREATMENT

Francis Cliojis, Ashcheulova T.

Cystic fibrosis (CF), also known as muco-viscidosis, is an autosomal recessive genetic disorder that affects most critically the lungs, and also the pancreas, liver, and intestine. It is characterized by abnormal transport of chloride and sodium across an epithelium, leading to thick, viscous secretions. The name cystic fibrosis refers to the characteristic scarring (fibrosis) and cyst formation within the pancreas, first recognized in the 1930s. Difficulty breathing is the most serious symptom and results from frequent lung infections that are treated with antibiotics and other medications. Other symptoms - including sinus infections, poor growth, and infertility - affect other parts of the body.

Cystic fibrosis or CF, is an inherited disease of the secretory glands. Secretory glands include glands that make mucus and sweat. CF is caused by a point mutation in the gene for the protein cystic fibrosis transmembrane conductance regulator (CFTR). This protein is required to regulate the components of sweat, digestive fluids, and mucus. CFTR regulates the movement of chloride and sodium ions across epithelial membranes, such as the alveolar epithelia located in the lungs. Most people without CF have two working copies of the CFTR gene, and both copies must be missing for CF to develop, due to the disorder's recessive nature. CF develops when neither copy works normally (as a result of mutation) and therefore has autosomal recessive inheritance. CF is most common among people of Central and Northern European ancestry, but occurs in many demographic groups around the world. The prevalence of CF is the rarest in Asia and the Middle East. Individuals with cystic fibrosis can be diagnosed before birth by genetic testing, or by a sweat test in early childhood. Ultimately, lung transplantation is often necessary as CF worsens.

The main signs and symptoms of cystic fibrosis are salty tasting skin, poor growth and poor weight gain despite normal food intake, accumulation of thick, sticky mucus, frequent chest infections, and coughing or shortness of breath. Males can be infertile due to congenital absence of the vas deferens. Symptoms often appear in infancy and childhood, such as bowel obstruction due to meconium ileus in newborn babies. As the children grow, they must exercise to release mucus in the alveoli. Ciliated epithelial cells in the patient have a mutated protein that leads to abnormally viscous mucus production. The poor growth in children typically

presents as an inability to gain weight or height at the same rate as their peers and is occasionally not diagnosed until investigation is initiated for poor growth. The causes of growth failure are multifactorial and include chronic lung infection, poor absorption of nutrients through the gastrointestinal tract, and increased metabolic demand due to chronic illness. In rare cases, cystic fibrosis can manifest itself as a coagulation disorder.

Cystic fibrosis may be diagnosed by many different methods including newborn screening, sweat testing, and genetic testing. As of 2006 in the United States, 10 percent of cases are diagnosed shortly after birth as part of newborn screening programs. The newborn screen initially measures for raised blood concentration of immunoreactive trypsinogen. Infants with an abnormal newborn screen need a sweat test to confirm the CF diagnosis. In many cases, a parent makes the diagnosis because the infant tastes salty. Trypsinogen levels can be increased in individuals who have a single mutated copy of the CFTR gene (carriers) or, in rare instances, in individuals with two normal copies of the CFTR gene. Due to these false positives, CF screening in newborns can be controversial.

While there are no cures for cystic fibrosis, there are several treatment methods. The management of cystic fibrosis has improved significantly over the past 70 years. While infants born with cystic fibrosis 70 years ago would have been unlikely to live beyond their first year, infants today are likely to live well into adulthood. Recent advances in the treatment of cystic fibrosis have meant that an individual with cystic fibrosis can live a fuller life less encumbered by their condition. The cornerstones of management are proactive treatment of airway infection, and encouragement of good nutrition and an active lifestyle. Pulmonary rehabilitation as a management of cystic fibrosis continues throughout a patient's life, and is aimed at maximizing organ function, and therefore quality of life. The most consistent aspect of therapy in cystic fibrosis is limiting and treating the lung damage caused by thick mucus and infection, with the goal of maintaining quality of life. Intravenous, inhaled, and oral antibiotics are used to treat chronic and acute infections. Mechanical devices and inhalation medications are used to alter and clear the thickened mucus. These therapies, while effective, can be extremely time-consuming for the patient. One of the most important battles that CF patients face is finding the time to comply with prescribed treatments while balancing a normal life. In addition, therapies such as transplantation and gene therapy aim to cure some of the effects of cystic fibrosis. Gene therapy aims to introduce normal CFTR to airway.

In conclusion, Cystic Fibrosis is a recessive inherited disease that affects secretory glands and organs such as lung, liver, pancreas that secretory

enzymes and mucus. Pertaining sinus infection, breathing problems, gastrointestinal problems are the primary symptoms of CF. Gene therapy, antibiotic treatments and transplantation can control the symptoms of CF and increase the life expectancy.

USING ULTRASONIC DIAGNOSTIC TECHNIQUES IN EXAMINATION OF THE KIDNEYS

Ibraheem Nabila, Ashcheulova T.

An ultrasound scan, also referred to as a sonogram, diagnostic sonography, and ultrasonography, is a device that uses high frequency sound waves to create an image of some part of the inside of the body.

A kidney ultrasound is a non-invasive (the skin is not pierced) procedure used to assess the size, shape, and location of the kidneys. Ultrasound technology allows quick visualization of the kidneys and related structures from outside the body. Ultrasound may also be used to assess blood flow to the kidneys, Paediatric urology, Evaluation of infertility.

A kidney ultrasound uses a handheld probe called a transducer that sends out ultrasonic sound waves at a frequency too high to be heard. When the transducer is placed on the abdomen at certain locations and angles, the ultrasonic sound waves move through the skin and other body tissues to the organs and structures of the abdomen. The sound waves bounce off the organs like an echo and return to the transducer. The transducer picks up the reflected waves, which are then converted into an electronic picture of the organs.

By using an additional mode of ultrasound technology during an ultrasound procedure, blood flow to the kidney can be assessed. An ultrasound transducer capable of assessing blood flow contains a Doppler probe. The Doppler probe within the transducer evaluates the velocity and direction of blood flow in the vessel by making the sound waves audible. The degree of loudness of the audible sound waves indicates the rate of blood flow within a blood vessel. Absence or faintness of these sounds may indicate an obstruction of blood flow.

Reasons for the procedure. A kidney ultrasound may be used to assess the size, location, and shape of the kidneys and related structures, such as the ureters and bladder. Ultrasound can detect cysts, tumors, abscesses, obstructions, abnormalities present since birth, fluid collection, and infection within or around the kidneys. Calculi (stones) of the kidneys and ureters may be detected by ultrasound.

A kidney ultrasound may be performed to assist in placement of needles used to biopsy (obtain a tissue sample) the kidneys, to drain fluid from

a cyst or abscess, or to place a drainage tube. This procedure may also be used to determine blood flow to the kidneys through the renal arteries and veins.

Kidney ultrasound may be used after a kidney transplant to evaluate the transplanted kidney.

Risks of the procedure. There is no radiation used and generally no discomfort from the application of the ultrasound transducer to the skin. There may be risks depending upon your specific medical condition.

Certain factors or conditions may interfere with the results of the test. These include, but are not limited to, the following: severe obesity; barium within the intestines from a recent barium procedure; Intestinal gas; renal ultrasound is a safe and painless test.

COLORECTAL CANCER TREATMENT

Isaac Precious Adaora, Kochubiei O.

Colon, or colorectal, cancer is cancer that starts in the large intestine (colon) or the rectum (end of the colon).

Colorectal cancer treatment involves not only specific therapies for curing or controlling the disease, but also strategies for meeting a patient's emotional and physical needs

The main types of treatment for colorectal cancer are surgery, radiation therapy, and chemotherapy. Depending on the stage of the cancer, these treatments may be combined.

Surgery is the most effective treatment for local colorectal tumors. Very small tumors can be removed through a colonoscope, but even with small tumors, removing the portion of the colon containing the tumor, the surrounding fat, and nearby lymph nodes is often the best treatment.

Radiation therapy is treatment with high-energy rays that destroy the cancer cells. For rectal cancer, radiation is usually given after surgery, along with chemotherapy (known as adjuvant therapy), in order to destroy any cancer cells left behind. For patients with stage IV disease that has spread to the liver, treatments directed at the liver can be used. This may include: Burning the cancer (ablation), delivering chemotherapy or radiation directly into the liver, freezing the cancer (cryotherapy), surgery.

Chemotherapy drugs are used to treat various stages of colorectal cancer. They include 5-fluorouracil, Xeloda, Camptosar, and Eloxatin. These drugs are commonly used in combination with one another. Chemotherapy is also used to improve symptoms and prolong survival in patients with stage IV colon cancer. Monoclonal antibodies, including cetuximab (Erbix), panitumumab (Vectibix), bevacizumab (Avastin), and other drugs have been used alone or in combination with chemotherapy. You may receive just one

type, or a combination of these drugs. There is some debate as to whether patients with stage II colon cancer should receive chemotherapy after surgery. You should discuss this with your oncologist.

SPIROMETRY – AS A VALID METHOD OF LUNG FUNCTION EXAMINATION

Jacobs Yvonne, Ashcheulova T.

Introduction. Spirometry is a test that can help diagnose various lung conditions, most commonly chronic obstructive pulmonary disease (COPD). Spirometry is also used to monitor the severity of some other lung conditions, and their response to treatment.

What is a spirometer and spirometry? Spirometry is the most common of the lung function tests. These tests look at how well your lungs work. Spirometry shows how well you breathe in and out. Breathing in and out can be affected by lung diseases such as chronic obstructive pulmonary disease (COPD), asthma, pulmonary fibrosis and cystic fibrosis.

Spirometry is the name of the test, whilst a spirometer is the device that is used to make the measurements.

There are various spirometer devices made by different companies, but they all measure the same thing. They all have a mouthpiece that you use to blow into the device. A doctor or nurse may ask you to blow into a spirometer (spirometry) if you have chest or lung symptoms. Many GP surgeries now have spirometers; small portable devices are available relatively cheaply. In hospitals, the spirometer machinery is more sophisticated and expensive, and can give more detailed results.

How is it done?



If it has not already been done, you will have your weight and height measured. For the spirometry itself, you need to breathe into the spirometer machine. First you breathe in fully and then seal your lips around the mouthpiece of the spirometer. You then blow out as fast and as far as you can until your lungs are completely empty. This can take several seconds. You may also be asked to breathe in fully and then breathe out slowly as far as you can.

The image below is of a portable spirometer. A clip may be put on to your nose to make sure that no air escapes from your nose. The measurements may be repeated two or three times to check that the readings are much the same each time you blow into the machine. Sometimes the tests are performed with you in a separate glass cubicle - this can help to obtain more detailed and precise results.

What does the spirometer measure?

Spirometry measures the amount (volume) and/or speed (flow) of air that can be inhaled and exhaled. The most common measurements used are:

Forced expiratory volume in one second (FEV1). This is the amount of air you can blow out within one second. With normal lungs and airways you can normally blow out most of the air from your lungs within one second.

Forced vital capacity (FVC). The total amount of air that you blow out in one breath.

FEV1 divided by FVC (FEV1/FVC). Of the total amount of air that you can blow out in one breath, this is the proportion that you can blow out in one second.

A spirometry reading usually shows one of four main patterns: normal; an obstructive pattern; a restrictive pattern; a combined obstructive/restrictive pattern.

Normal spirometry. Normal readings vary, depending on your age, size, and sex. The range of normal readings is published on a chart, and doctors and nurses refer to this chart when they check your spirometry readings.

Obstructive pattern on spirometry. This is typical of diseases that cause narrowed airways. The main conditions that cause narrowing of the airways and an obstructive pattern of spirometry are asthma and COPD. Spirometry can therefore help to diagnose these conditions.

If your airways are narrowed then the amount of air that you can blow out quickly is reduced. So, your FEV1 is reduced and the ratio of FEV1/FVC is lower than normal. As a rule, you are likely to have a disease that causes narrowed airways if:

Your FEV1 is less than 80% of the predicted value for your age, sex and size; or your FEV1/FVC ratio is 0.7 or less.

However, with narrowed airways, the total capacity of your lungs is often normal or only mildly reduced. So, with an obstructive pattern, the FVC is often normal or near normal.

Spirometry can also help to assess if treatment (for example, inhalers) opens up the airways. The spirometry readings will improve if the narrowed airways become wider after medication. This is called reversibility (see later for more details). Generally, asthma has more of a reversible element to the airways obstruction, compared with COPD. However, COPD is graded according to severity, in terms of the FEV1 measurement after a bronchodilator medication has been given to open up the airways. This response is not as big as that seen in asthma. As a guide, the following values help to diagnose COPD and its severity:

Mild COPD - FEV1 is 80% or more of the predicted value. This effectively means that someone with mild COPD can have normal spirometry after bronchodilator medication.

Moderate COPD - FEV1 is 50-79% of the predicted value after a bronchodilator.

Severe COPD - FEV1 is 30-49% of the predicted value after a bronchodilator.

Very severe COPD - FEV1 is less than 30% of the predicted value after a bronchodilator.

Restrictive pattern on spirometry. With a restrictive spirometry pattern your FVC is less than the predicted value for your age, sex and size. This is caused by various conditions that affect the lung tissue itself, or affect the

capacity of the lungs to expand and hold a normal amount of air. Conditions that cause fibrosis or scarring of the lungs give restrictive patterns on spirometry. Some physical deformities that restrict the expansion of the lungs can also cause a restrictive defect. Your FEV1 is also reduced but this is in proportion to the reduced FVC. So, with a restrictive pattern the ratio of FEV1/FVC is normal.

A combined obstructive and restrictive pattern on spirometry. In this situation you may have two conditions - for example, asthma plus another lung disorder. Also, some lung conditions have features of both an obstructive and restrictive pattern. An example is cystic fibrosis where there is a lot of mucus in the airways, which causes narrowed airways (the obstructive part of the spirometry results), and damage to the lung tissue may also occur (leading to the restrictive component).

Is spirometry the same as peak flow readings? No. A peak flow meter is a small device that measures the fastest rate of air that you can blow out of your lungs. Like spirometry, it can detect airways narrowing. It is more convenient than spirometry and is commonly used to help diagnose asthma. Many people with asthma also use a peak flow meter to monitor their asthma. For people with COPD, a peak flow reading may be useful to give a rough idea of airways narrowing, but it can underestimate the severity of COPD. Therefore, spirometry is a more accurate test for diagnosing and monitoring people with COPD.

You should get instructions from the doctor, nurse, or hospital department that does this test. Always follow these carefully. The instructions may include such things as not to use a bronchodilator inhaler for a set time before the test (several hours or more, depending on the inhaler). Also, not to have alcohol, a heavy meal, or do vigorous exercise for a few hours before the test. Ideally, you should not smoke for 24 hours before the test.

Spirometry is a very low-risk test. However, blowing out hard can increase the pressure in your chest, tummy (abdomen) and eyes. So, you may be advised not to have spirometry if you:

- Have unstable angina. Have had a recent pneumothorax (air trapped between the outside of the lung and the chest wall - often incorrectly called a punctured lung).

- Have had a recent heart attack or stroke.

- Have had recent eye or abdominal surgery.

- Have coughed up blood recently and the cause is not known.

Reversibility testing. Reversibility testing is done in some cases where the diagnosis of the lung condition is not clear. For this test, you will be asked to do spirometry as described above. You will then be given a medicine by

inhaler or nebuliser which may open up the airways. A nebuliser allows a medicine to be inhaled like a fine mist, through a mask. The spirometry test is then repeated 30 minutes or so afterwards. The aim of this is to see if your airways open wider with medication or not. Generally, asthma has more of a reversible element to the airways obstruction, compared with COPD.

Although spirometry shows the type, pattern and severity of lung disease, it does not give an indication of the long-term outlook (prognosis) or of your quality of life.

ANGIOGRAPHY IN SMALL INTESTINE DISEASES

Joseph Moyosore Sandra, Kochubiei O.

An angiogram is an x-ray test that uses a special dye and camera (fluoroscopy) to take pictures of the blood flow in a vessel while Angiography is the method of the procedure. This procedure is to provide detailed images of blood flow in your small intestine and to look for blocked arteries. During an angiogram, a thin tube called a catheter is placed into a blood vessel. The catheter is guided to the area under study. Then an iodine dye (contrast material) is injected into the vessel to make the area show clearly on the X-ray pictures. This method is known as conventional or catheter angiogram. The angiogram pictures can be made into regular X-ray films or stored as digital pictures in a computer. An angiogram can find a bulge in a blood vessel (aneurysm). It can also show narrowing or a blockage in a blood vessel that affects blood flow. An angiogram can show if coronary artery disease is present and how chronic it is.

Certain treatments can be done during this procedure. These items are passed through the catheter to the area in the artery that needs treatment. These include:

- Dissolving a blood clot with medicine
- Opening a partially blocked artery with a balloon
- Placing a small tube called a stent into an artery to help hold it open

After the x-rays or treatments are finished, the catheter is removed. Pressure is immediately applied to the puncture site for 20-45 minutes to stop the bleeding. After that time the area is checked and a tight bandage is applied. The leg is usually kept straight for another 6 hours after the procedure. This test is done when someone has symptoms of a narrowed or blocked blood vessel in the intestines, to find the source of bleeding in the gastrointestinal tract, to find the cause of ongoing abdominal pain and weight loss when no cause can be identified, when other studies do not provide enough information about abnormal growths along the intestinal tract, to look at blood vessel damage after an abdominal injury.

Results are considered normal if the arteries being examined are normal in appearance. A common abnormal finding is narrowing and hardening of the arteries that supply the large and small intestine. This is called mesenteric ischemia. The problem occurs when fatty material (plaque) builds up on the walls of your arteries. Abnormal results may also be due to bleeding in the small and large intestine. This may be caused by: Angiodysplasia of the colon, blood vessel rupture from injury, blood clots, cirrhosis, tumors.

EVOLUTION OF EXAMINATION METHODS IN GASTROENTEROLOGY (COLONOSCOPY)

Kafiyaro Sukba Philp, Ashcheulova T.

Introduction: Colonoscopy is an endoscopic tool used for the visualization and biopsy of the large intestine with important applications in the investigation of colorectal cancers. Colonoscopy has been used to diagnose colorectal cancer, gastrointestinal hemorrhage and others since the late nineteen sixties, and is currently the gold standard. However, colonoscopy is not without shortcomings and attempts have been made to improve this technique.

History Of Colonoscopy: Dr Williams Wolff, and Dr. Hiromi Shinya pioneered the development of the colonoscope. Their invention, in 1969, was an advance over the barium enema and the flexible sigmoidoscope because it allowed for the visualization and removal of polyps from the entire large intestine. Wolff and Shinya advocated for their invention and published much of the early evidence needed to overcome skepticism about the device's safety and efficacy. Once the basic technology of the colonoscope had been accepted, the device lent itself to adaptations that have bettered its performance, and broadened its applications.

Medical uses: Conditions that call for colonoscopies include gastrointestinal hemorrhage, unexplained changes in bowel habit and suspicion of malignancy. Colonoscopies are often used to diagnose colon cancer but are also frequently used to diagnose inflammatory bowel disease. In older patients (sometimes even younger ones) an unexplained drop in hematocrit (one sign of anemia) is an indication that calls for a colonoscopy, usually along with an esophagogastroduodenoscopy (EGD), even if no obvious blood has been seen in the stool (feces). Fecal occult blood is a quick test which can be done to test for microscopic traces of blood in the stool. A positive test is almost always an indication to do a colonoscopy. In most cases the positive result is just due to hemorrhoids; however, it can also be due to diverticulosis, inflammatory bowel disease (Crohn's disease, ulcerative colitis), colon cancer, or polyps. Among people who have had an initial colonoscopy that found no polyps, the risk of developing colorectal cancer within five years is extremely low. Therefore,

there is no need for those people to have another colonoscopy sooner than five years after the first screening

Risk: This procedure has a low (0.35%) risk of serious complications. In a 2006 study of colonoscopies done from 1994 to 2002, Levin et al., found serious complications occurred in 5.0 of 1000 colonoscopies, comprising 0.8 in 1000 colonoscopies without biopsy or polypectomy, and a rate of 7.0 per 1000 for colonoscopies with biopsy or polypectomy; although McDonell and Loura criticize this rate as being unacceptably high.

The rate of complications varies with the practitioner and institution performing the procedure, as well as a function of other variables.

The most serious complication generally is the gastrointestinal perforation which is life-threatening and requires immediate major surgery for repair. A 2003 summary study of 25,000 patients showed a perforation rate of 0.2%, and a death rate of 0.006% on a total of 84,000 patients. The 2006 study by Levin et al. showed a perforation rate of 0.09%; while a 2009 study quoted a similar perforation rate of 0.082%. Appendicitis has been associated with either perforation or colonoscopy, in case reports in Korean, Italian and English journals.

According to a study published in the *Annals of Internal Medicine*, for which researchers reviewed colon cancer screening data from 1966 to 2001, the most severe complications from colonoscopy are perforation (that occurred in 0.029% to 0.72% of cases), heavy bleeding (occurring in 0.2% to 2.67% of colonoscopies) and death (occurring in 0.003% to 0.03% of colonoscopy patients).

Although complications after colonoscopy are uncommon, it is important for patients to recognize early signs of any possible complications. They include severe abdominal pain, fevers and chills, or rectal bleeding (more than half a cup).

Conclusion: No prospective, randomized controlled trials have been performed to define the optimal approach to the management of colonoscopic complications. In the absence of such data, surgeons pursuing evidence-based practice must rely on case studies, surveys, and reviews. Although definitive studies are lacking and patients with clinical peritonitis or historical details suggestive of a longitudinal sigmoid tear following rupture of a large sigmoid loop, criteria may be proposed for non-surgical management of colonoscopic perforation in selected patients utilizing fasting, parenteral antibiotics, and careful monitoring with a low threshold for operative intervention.

KIDNEY BIOPSY – AN INVASIVE METHOD OF RENAL DISEASES DIAGNOSTIC

Khaled Shadi, Ashcheulova T.

A renal biopsy is a procedure used to obtain a segment of renal tissue, usually through a needle or another surgical instrument. Analysis of this tissue is then used in the diagnosis of an underlying renal condition.

Renal biopsy is used to diagnose renal diseases ranging from infection to transient rejection to renal cell carcinoma. Once a biopsy diagnosis is established, it can be used to help guide treatment options and may also assist in determining prognosis of the underlying condition.

Renal biopsy is typically performed by a radiologist under CT or ultrasonographic guidance. However, a urologist can also perform renal biopsy during renal surgery.

There are multiple indications to perform renal biopsy, including the following: Unexplained renal failure; Acute nephritic syndrome; Nephrotic syndrome; Isolated nonnephrotic proteinuria; Isolated glomerular hematuria; Renal masses (primary or secondary); Renal transplant rejection; Connective-tissue diseases (eg, systemic lupus erythematosus).

Paripovic et al and Printza et al both performed retrospective studies to determine indications of pediatric renal biopsy. Both found that nephrotic syndrome was the most common indication (32.9%). Paripovic et al found that other indications included asymptomatic hematuria (23.4%), urinary abnormalities in systemic diseases (15.8%), and proteinuria (11.4%). Both studies found that glomerular disease was most prevalent.

Paripovic et al found that the most common causes of glomerular disease included focal segmental glomerulosclerosis (20.9%), mesangioproliferative glomerulonephritis (14.6%), immunoglobulin A (IgA) nephropathy (8.9%), minimal change disease (13%), lupus nephritis (6%), and Henoch-Schönlein nephritis (4%). Printza et al found that the most common findings included focal segmental glomerulosclerosis (15%), IgA nephropathy (13.5%), minimal change disease (10%), various stages of lupus nephritis (8.5%), Henoch-Schönlein nephritis (7.5%), membranous glomerulonephritis (7.5%), mesangioproliferative glomerulonephritis (6%), postinfectious glomerulonephritis (6%), hemolytic uremic syndrome (5%), tubulointerstitial nephropathies (3.5%), and acute tubular necrosis (2.5%).

Application of biopsy in the renal allograft. The application of biopsy to renal allografts is a controversial indication that is still being actively researched.

Rush et al from the Manitoba Adult Renal Transplant Program were the first to report the finding of subclinical rejection within the first 3 months post

transplantation. Subclinical rejection can be broadly defined as lymphocytic infiltration of a renal allograft with normal function. Rush et al further classified subclinical rejection as a serum creatinine increased by more than 10% 2 weeks before the protocol biopsy and a histological Baniff score (system used for scoring renal allograft histology) of “ai2at2” (type 1A acute rejection) or greater. The controversy regarding this topic is whether detecting subclinical rejection from a specific biopsy protocol can guide early successful treatment of renal allograft pathology, ultimately improving long-term graft function.

A study analyzed a 10-year follow-up of their patient population diagnosed with subclinical rejection at 14 days post transplantation. Their results showed a significant decrease in graft survival over the 10-year period, concluding that subclinical rejection can predict transplant outcomes. Another study attempted to determine the benefit of early detection of subclinical rejection and subsequent treatment with corticosteroids. The study featured 72 patients randomized to 2 biopsy groups, one receiving biopsies at 1, 2, 3, 6, and 12 months (biopsy arm) and the other receiving biopsy at 6 and 12 months (control group). Patients in the biopsy group showed a decrease in acute rejection, reduced chronic tubulointerstitial score at 6 months, and a lower serum creatinine at 24 months compared with patients in the control group.

Despite whether biopsy in normal, functioning renal allografts will be determined clinically beneficial in the future, renal biopsy remains the criterion standard for the diagnosis of renal transplant abnormalities. In a patient with suspected renal transplant abnormalities, whether based on laboratory findings, such as elevated creatinine levels, or clinical signs, such as fever, edema, hypertension, oliguria, and proteinuria, histological confirmation of the diagnosis is often required. One study analyzed the accuracy of clinical prediction of allograft pathology related to diagnosis found after renal biopsy. Findings revealed 43% of clinical predictions were totally correct and of the 57 % of cases where predictions were not accurate, 26% of those cases were completely incorrect, clarifying the necessity of renal biopsy for accurate diagnosis of allograft pathology.

CAPSULE ENDOSCOPY – ONE OF THE MODERN METHODS OF DIGESTIVE SYSTEM EXAMINATION

Mahmoud Malek, Ashcheulova T.

Capsule endoscopy: is one of many methods for digestive system examination in which person ingests a small pill camera.

This pill camera takes a lot of images inside the digestive system and then showed as a video on the computer screen.

Many diseases can be diagnosed for example tumors, ulcers. Bleeding can also be detected by it.

General information about capsule endoscopy method. This technique was invented in Japan and was approved in April 2007. It was the Pill Cam SB.

CE: is the first line tool for detection abnormalities of the small bowel, due to many things: 1. it's the easiest procedure among the other methods like: esophgo-gastro-duodenoscopy, double balloon endoscopy, or non endoscopic such as: x-ray, CT, MRI; Unlike EGD, DBE, it doesn't require any kind of anesthesia; It is good for people who are afraid of the other methods (EGD, colonoscopy).

Capsule endoscopy procedure. Patient preparation: Full fast 12 hours pre-exam. Patient should not take any medication during 2 hours pre-exam. Make sure that all the equipment is ready (Pill-Cam, sensors, recorder belt, data recorder). Write the date of this exam in patient file in the computer by connecting the data recorder to the computer. Make the patient lay on the bed and uncover his abdomen and attach the sensors on the surface of his abdomen connect the sensor to the data recorder and then put it in the belt fix the belt on his waist. Take out the capsule from the box and close it to the belt for 15 sec as a normal result the recorder must start blinking that means there is a connection between them and they both work normally if not don't continue. Then ask the patient to take the capsule from its holder and see if the capsule is blinking also and then swallow it with some water. (inside as long as the Pill Cam is taking photos these photos are sent wirelessly to the data recorder and saved). Patient is released now and should continue fasting for 2 hours after then patient may drink water and after 4 hours may eat light snack. After 8 approximately patient should go back to the doctor then doctor and he will take the data recorder and connect it to the computer and see all the photos and he can play it as video show and analyze what he is seeing now.

HISTORY AND EVOLUTION OF ESOPHAGOGASTRODUODENOSCOPY

Momodu Naomi, Kochubiei O.

Gastroenterology is a branch of medicine focused on the digestive system and its disorders. Citing from Egyptian papyri, Nunn identified significant knowledge of gastrointestinal diseases among practicing physicians during the periods of the Pharaoh. Irynakhty of the tenth dynasty, c. 2125 B.C., was a court physician specializing in gastroenterology, sleeping, and proctology. Among ancient Greeks, Hippocrates attributed digestion to

concoction. Galen's concept of the stomach having four faculties was widely accepted up to modernity in the seventeenth century.

One of the numerous instruments used in gastroenterology for diagnosis, is the gastroscope, used in esophagogastroduodenoscopy.

Esophagogastroduodenoscopy (EGD) is a diagnostic procedure that allows the physician to diagnose and treat problems in the upper gastrointestinal (UGI) tract. The doctor uses a long, flexible, lighted tube called an endoscope. The endoscope is guided through the patient's mouth and throat, then through the esophagus, stomach, and duodenum (first part of the small intestine). The doctor can examine the inside of these organs and detect abnormalities.

The early pioneers faced two obvious albeit formidable problems: the gut is not straight and its dark in there. Kussmaul is generally credited with the first gastroscopy in 1868. Although unrecognised at the time, the illumination problem was solved around 1878 by Thomas Edison, but 25 years elapsed before the incandescent lamp was incorporated into endoscopes. The first approach to the tortuosity of the gut was an instrument with articulated lenses and prisms, as proposed by Hoffmann in 1911. Approximately two decades elapsed before this concept was perfected in the semi-flexible gastroscope, the work of Wolf, a fabricator of medical instruments, and Schindler, a physician.

Image transmission using flexible quartz fibres was conceptualised in the late 1920s but it was not until 1954 that Hopkins built a model of a flexible fibre imaging device. The most significant development in the history of endoscopy then occurred in 1958: the flexible fibreoptic endoscope of Larry Curtiss, then a graduate student in physics, and Basil Hirschowitz, a trainee in gastroenterology. What made this instrument possible was the availability of highly transparent optical quality glass. Over the next 30 years, the fibrescope evolved to a level of technical sophistication that seemed insurmountable. But obsolescence was assured with the invention of the charge coupled device (CCD) in 1969. Ten years later, this technology was incorporated into an endoscope. Because the CCD produced an electronic image, endoscopy suddenly had a wider audience, a television audience. Moreover, the image was digital, and instantaneously an interface between endoscope and computer was established. From 1968 to 1990 there was an explosion of technical achievements that transformed the practice of gastroenterology. These remarkable 22 year period was so formative that I believe it will come to be considered historically as the golden era of gastrointestinal endoscopy.

Two things are evident from the history of endoscopy. Firstly, innovation arose from close collaborations between physicians struggling to solve clinical problems and artisan-engineers: witness (among many) Schindler

and Wolf, Hirschowitz and Curtiss. Secondly, progress occurred largely through incorporation of technology from other fields.

EVOLUTION OF EXAMINATION METHODS IN NEPHROLOGY: GLOMERULONEPHRITIS

Ngozi Morah Patricia, Ashcheulova T.

Microscopic examination of urine has been used since time immemorial for the diagnosis and prognosis of nearly every disease. The aim of this present article is to briefly illuminate the evolution of urine examination in glomerulonephritis

Glomerulonephritis is a term used to refer to several renal diseases (usually affecting both kidneys). Many of the diseases are characterized by inflammation either of the glomeruli or small blood vessels in the kidneys, hence the name, but not all diseases necessarily have an inflammatory component. As it is not strictly a single disease, its presentation depends on the specific disease entity: it may present with isolated hematuria and/or proteinuria (blood or protein in the urine); or as a nephrotic syndrome, a nephritic syndrome, acute renal failure, or chronic renal failure.

Glomerulonephritis is a type of kidney disease in which the part of your kidneys that helps filter waste and fluids from the blood is damaged. (Damage to the glomeruli causes blood and protein to be lost in the urine. The condition may develop quickly, and kidney function is lost within weeks or months (called rapidly progressive glomerulonephritis). A quarter of people with chronic glomerulonephritis have no history of kidney disease.)

The history should begin by focusing on cause-specific symptoms to determine the source of the chronic kidney disease (CKD). Often, the exact cause of Glomerulonephritis is unknown, may be caused by problems with the body's immune system.

Recognition of any symptoms facilitates the next step, to look for symptoms related to uremia to determine if renal replacement therapy is needed. The following symptoms suggest uremia:

- Weakness and fatigue
- Loss of energy, appetite, and weight
- Change in taste sensation
- Reversal in sleep pattern (ie, sleepiness in daytime and wakefulness at night)
- Seizures

The presence of edema and hypertension suggests volume retention. Dyspnea or chest pain that varies with position suggests fluid overload and

pericarditis, respectively. Leg cramps may suggest hypocalcemia or other electrolyte abnormalities. Weakness, lethargy, and fatigue may be due to anemia.

MODERN GASTROENTEROLOGICAL EXAMINATION METHODS

Ofure Abigael Obinyan, Ashcheulova T.

The physical examination of the abdomen is the key step in the evaluation of abdominal complaints such as pain, distension, enlarged organs, or masses. The examination is conducted in a predetermined sequence starting from observation and then sequentially performing auscultation, palpation, and percussion followed by ancillary maneuvers. Although the abdominal examination has been a well described and fundamental component of a systematic diagnostic evaluation since antiquity, its role in modern medicine is being minimized. In the United States, Western Europe, and most of the developed world, the role of the examination has been supplanted by high-resolution imaging techniques that are widely available. The available high resolution imaging techniques for abdominal examination includes Ultrasound, Computed Topography and Magnetic Resonance Imaging.

Ultrasound is the most common and usually the first procedure used, since it is widely available and fairly inexpensive; it is also non-invasive and therefore repeatable. There is no radiation, and very significant diagnostic information can be gained from images of the organs. US is also an excellent way of visualizing the blood vessels, since blood flow can also be displayed. The procedure provides a rapid overview of changes in the upper abdominal organs (liver, gall bladder, pancreas, spleen, kidneys) as well as the blood vessels and lymph nodes of the upper abdomen.

Computed Topography is a technology that uses computer-processed x-rays to produce tomographic images (virtual 'slices') of specific areas of the scanned object, allowing the user to see what is inside it without cutting it open. It is used frequently to determine stage of cancer and to follow progress. It is also a useful test to investigate acute abdominal pain.

Magnetic Resonance Imaging (MRI) is a noninvasive medical test that helps physicians diagnose and treat medical conditions. MRI uses a powerful magnetic field, radio frequency pulses and a computer to produce detailed pictures of organs, soft tissues, bone and virtually all other internal body structures. The images can then be examined on a computer monitor, transmitted electronically, printed or copied to a CD. MRI does not use ionizing radiation (x-rays).

The abdominal examination is part of all comprehensive examinations of all patients of all ages which includes inspection, auscultation, palpation, and

percussion. However, due to the advancement in science high resolution imaging techniques are now available and should be included in abdominal examination so as to assist in giving a more comprehensive diagnosis.

LAPOROSCOPY AS DIAGNOSTIC AND TREATMENT PROCEDURE IN DISEASES OF DIGESTIVE ORGANS

Olawole Olawale Martins, Ashcheulova T.

Laparoscopy is a type of surgery which utilizes small cameras and mechanical devices at the end of small ports which can be inserted through tiny incisions into body cavities such as the abdomen, pelvis or chest. It is a much less invasive operation than open surgery and is often preferred by doctors and patients alike.

Short History. Laparoscopic surgery owes much of its history to the development of endoscopic technique. Early physicians such as the Arabian, Albukasim (936-1013 A.D.), and later in 1805, the Frankfurt-born physician, Phillip Bozzini, were among the first to develop methods to examine body orifices.

The first effective open-tube endoscope was developed in 1853 by Desormeaux. This instrument was used to examine the urethra and the bladder. In the late 1800's, other physicians including Kussmaul and Nitze refined the original endoscopic models and began utilizing their new tools in their medical practice.

Laparoscopy or endoscopically examining the peritoneal cavity was first attempted in 1901 by George Kelling who called this examining procedure "Celioscopy".

Initial procedures included lysis of abdominal adhesions and diagnostic biopsies of abdominal organs under direct visualization. Throughout the 1960's and 1970's, laparoscopy became a vital part of gynecological practice. Despite these technological advances, it was not until after 1986, following the development of a video computer chip that allowed the magnification and projection of images onto television screens, that the techniques of laparoscopic surgery truly became integrated into the discipline of general surgery.

The first laparoscopic cholecystectomy performed on a human patient was done in 1987 by the French physician Mouret.

Advantages of laparoscopy. There are a number of advantages to operating on the patient with laparoscopic surgery versus open surgery. Some of these are: Less post-operative scarring, Reduced pain, Shorter recovery time, Less time spent in hospital to recover, Reduced haemorrhaging, Reduced risk

of exposing internal organs to external contaminants, Quicker return to normal activities, Reduced wound complications.

Disadvantages. The surgeon has limited range of motion at the surgical site resulting in a loss of dexterity. Poor depth perception. Surgeons must use tools to interact with tissue rather than manipulate it directly with their hands. This results in an inability to accurately judge how much force is being applied to tissue as well as a risk of damaging tissue by applying more force than necessary. This limitation also reduces tactile sensation, making it more difficult for the surgeon to feel tissue .

General procedure. For laparoscopic surgery, three or more small (5-10 mm) incisions are made in the abdomen to allow access ports to be inserted. The laparoscope and surgical instruments are inserted through these ports. The surgeon then uses the laparoscope, which transmits a picture of the abdominal organs on a video monitor, allowing the operation to be performed.

Surgical Diagnostic and treatment procedures of laparoscopy in Gastrointestinal pathology. Proctosigmoidectomy: Surgical removal of a diseased section of the rectum and sigmoid colon. Used to treat cancers and noncancerous growths or polyps, and complications of diverticulitis; Right colectomy or Ileocolicectomy; Total abdominal colectomy; Fecal diversion. Surgical creation of either a temporary or permanent ileostomy or colostomy. Used to treat complex rectal and anal problems, including poor bowel control; Abdominoperineal resection. Surgical removal of the anus, rectum and sigmoid colon; Rectopexy. A procedure in which stitches are used to secure the rectum in its proper position. Used to correct rectal prolapse; Total proctocolectomy. This is the most extensive bowel operation performed and involves the removal of both the rectum and the colon.

Laparoscopic Cholecystectomy is more simply described as a procedure to surgically remove the gallbladder. The surgery is used to treat gallstone disease, acalculous cholecystitis or for removal of gallstones.

Roux-en-Y Gastric Bypass: Gastric bypasses are achieved by surgical restriction of the stomach by creation of a small pouch from the upper stomach. The result of this is that food cannot get into the majority of the stomach delivering loss of weight and suppression of hunger.

Gastric Banding is a restrictive procedure which involves partitioning the stomach so that a pouch of extremely limited volume is created.

Sleeve Gastrectomy is a restrictive surgical procedure which involves reducing stomach volumes.

Laparoscopic Nissen Fundoplication is a surgical procedure to treat chronic heartburn which is often caused by either gastroesophageal reflux disease.

Biopsy—a laparoscopic incision lets the surgeon collect tissue samples

from liver, gallbladder, kidneys or other abdominal organs without too much risk.

Cancer-laparoscopy can be used to check if abdominal cancers such as stomach cancer, kidney cancer, liver cancer, pancreatic cancer and gallbladder cancer have spread to other parts of the abdomen.

Laparoscopic Appendectomy

SONOGRAPHIC EVALUATION OF THE KIDNEYS AND URINARY TRACT: SHORT HISTORY, DEFINITION OF TERMS, AND POTENTIAL USES

Oluwayemi Moses, Ashcheulova T.

Indirect means of visualizing the urinary tract during life became available only at the end of the 19th century. In 1877 Maximilian Nietze of Berlin designed a cystoscope after attending a demonstration of a similar instrument used to examine the nasal sinuses.

The first ureter cystoscope was designed in Berlin in 1894 by Leopold Casper. The use of radio-opaque dyes to outline the kidneys date back to Fritz Voelcker and Alexander von Lichtenberg (Heidelberg)], who in 1905 used colloidal silver for retrograde pyelography, but found it toxic.

Later E. D. Osborne and L. G. Rowntree treated syphilitics with a large dose of iodides and observed that the kidneys rapidly excreted the dye. In 1923 Rowntree reported that iodinated dyes could be used for intravenous urography. Several other dyes were later synthesized, and then introduced by Moses Swick into urologic practice, eventually with compression of the ureters to obtain better visualization.

In the 1960s it was shown that larger quantities of dye could be used to visualize the kidneys of patients with renal insufficiency. This Has Now Been Replaced By ultrasonography, computed tomography (Hounsfield, 1929), and magnetic resonance imaging (Pauli, Bloch Purcell, et al., from 1923).

- ultra: Beyond the range, scope, or limit
- sono: This is simply relating to sound.
- graphy: a combining form denoting a process or form of drawing, writin, representing, recording, describing, etc. It can also be said to be an art or science concerned with such a process.
- ultrasonography

The visualization of deep structures of the body by recording the reflections or echoes of ultrasonic pulses directed into the tissues.

Ultrasonography plays critical roles in many aspects of nephrology practice. Applications include the:

- evaluation of the kidneys and urinary tract.

- guidance for the percutaneous kidney biopsy.
- temporary hemodialysis access placement.
- vascular ultrasound of upper extremities related to the permanent hemodialysis access.

The simplicity of technique and the limited spectrum of pathological changes coupled with portability, low cost, and safety make sonography the modality of choice for kidney and vascular imaging.

Although many ultrasound findings are nonspecific, their diagnostic use is greatly enhanced by knowledge of the clinical presentation.

Therefore, it is essential for nephrologists to possess skills in performing and interpreting ultrasound studies in order to improve the care of patients with kidney diseases.

Because of their location, architecture, and limited spectrum of pathology, the kidneys are ideally suited for evaluation by ultrasound.

Evaluation includes assessment of the

- Size and Shape.
- Echogenicity.
- The urinary space (including the lower urinary tract).
- Presence of masses.
- The vasculature.
- Very few findings are specific, and interpretation, therefore, requires clinical correlation, another reason for the participation of nephrologists in this procedure.
- An echogenic kidney is defined as an organ that is capable of generating sound waves. This is also defined as an organ that contains structures that seemingly reflect high frequency sound waves.

These particular sound waves can be found when imaged by an ultrasound technician. In most cases, when this is found in an individual, it is reflected as an echo signal on the ultrasound image, which can be a direct indication of kidney disease.

Several kidney disorders can cause increased echogenicity. Renal cortex, which constitutes the outside portion of the kidney, is an important parameter in evaluating the results of ultrasonography. It can clearly demonstrate changes in the cortical structures. It is also called renal cortical echogenicity. In case of kidney stones, generation of very high-frequency waves indicates the presence of mineral deposits inside the organ.

Sonography is essential to the practice of nephrology; it is inexpensive and relatively easy to learn, making it an ideal tool to be incorporated into the practice of nephrology.

With appropriate training, nephrologists can be competent at both performing and interpreting sonograms, and can provide the clinical correlation that is usually required for interpretation.

However, nephrology has the dubious distinction of being one of the few specialties or subspecialties that has not embraced ultrasound and incorporated it into its training and practice.

INTRAVENOUS UROGRAPHY USED IN DIAGNOSIS OF KIDNEY DISEASES

Oppong Isaac, Kochubiei O.

Intravenous urography is a test that uses X-rays and a special dye to help assess the kidneys, ureters, bladder and urethra. Intravenous urography (also known as intravenous pyelography) is an X-ray procedure which is used to assess problems in the kidneys, ureters, bladder and urethra. With intravenous urography a contrast dye is injected into a vein ('intravenous' injection). The dye travels in the bloodstream, concentrates in the kidneys, and is passed out into the ureters with urine made by the kidneys. The dye blocks X-rays so the structure of the kidneys, ureters and bladder shows up clearly as white on X-ray pictures. The X-ray pictures produced are called an intravenous urogram (IVU). Intravenous urography can help to assess a range of problems. For example: Kidney stones: A stone in a kidney or in the tube which goes from a kidney to the bladder (the ureter) will normally show up quite clearly. Urine infections: If you have infections of the bladder or kidney which is recurrent, an IVU may help to find if you have a blockage or other abnormality of the urinary tract. Blood in the urine: This can be due to various causes such as infection, inflammation and tumors of the kidney, an IVU may help to clarify the cause. Obstruction or damage to any part of the urinary tract can often be seen on an IVU. Contrast dye is then injected into a vein in your hand or arm. The dye then starts to filter through the kidneys into the tubes which go from each kidney to the bladder (the ureters). A series of X-ray pictures is then taken over your tummy (abdomen), usually every 5-10 minutes. You stay on the couch between each X-ray picture, but you may be asked to get up to empty your bladder before the final X-ray picture is taken. The procedure usually takes about 30-60 minutes. However, some pictures may be taken hours later in certain circumstances. You can eat normally straight afterwards. An allergic reaction to the dye occurs in a small number of cases. Symptoms may be mild - for example, an itchy skin rash and some mild swelling of the lips. More severe symptoms are rare - for example, breathing difficulties and collapse due to low blood pressure. It has to be stressed that severe reactions are rare, and the hospital department doing the procedure will have access to full resuscitation

equipment, should it be needed. Intravenous urography is not done as often as it used to be. This is because of the development of other scanning techniques. Certain kidney problems are now more commonly assessed with techniques such as ultrasound scan, CT scan and MRI scan.

ABDOMINAL ULTRASONOGRAPHY

Rastogi Suyash, Kochubiei O.

Abdominal ultrasonography (also called abdominal ultrasound imaging or abdominal sonography) is a form of medical ultrasonography (medical application of ultrasound technology) to visualise abdominal anatomical structures. It uses transmission and reflection of ultrasound waves to visualise internal organs through the abdominal wall (with the help of gel which helps transmission of the sound waves). For this reason, the procedure is also called a transabdominal ultrasound, in contrast with endoscopic ultrasound, the latter combining ultrasound with endoscopy through visualize internal structures from within hollow organs.

Abdominal ultrasound examinations are performed by gastroenterologists or certain other specialists in internal medicine, radiologists or sonographerstrained for this procedure.

Ultrasound testing helps in the diagnosis of a wide range of diseases and conditions, including stomach problems, gallbladder or pancreas problems, and abdominal pain. During an ultrasound test, high-frequency sound waves, inaudible to the human ear, are transmitted through body tissues using an instrument called a transducer, which transmits the information to a computer that displays the information on a monitor.

Ultrasound is used to create images of soft tissue structures, such as the gallbladder, liver, kidneys, pancreas, bladder, and other organs and parts of the body. Ultrasound can also measure the flow of blood in the arteries to detect blockages. Ultrasound testing is safe and easy to perform.

Abdominal ultrasound can be used to diagnose abnormalities in various internal organs, such as the kidneys, liver, gallbladder, pancreas, spleen and abdominal aorta. If Doppler imaging is added, the blood flow inside blood vessels can be evaluated as well (for example, to look for renal artery stenosis).

Through the abdominal wall, organs inside the pelvis can be seen, such as the as urinary bladder or the ovaries and uterus in women. Because water is an excellent conductor for ultrasound waves, visualizing these structures often

requires a well-filled urinary bladder (this means the patients has to drink plenty of water before the examination).

Abdominal ultrasound is commonly used in the setting of abdominal pain or an acute abdomen (sudden and/or severe abdominal pain syndrome in which surgical intervention might be necessary), in which it can diagnose appendicitis or cholecystitis.

In patients with deranged liver function tests, ultrasound may show increased liver size (hepatomegaly), increased reflectiveness (which might, for example, indicate cholestasis), gallbladder or bile duct diseases, or a tumor in the liver. The same is true for patients with an abnormal kidney function or pancreatic enzymes (pancreatic amylase and pancreatic lipase), in which ultrasound can be used for additional anatomical information.

Ultrasound can also be used if there is suspicion of enlargement of one or more organs, such as used in screening for abdominal aortic aneurysm, investigation for splenomegaly or urinary retention.

Ultrasound imaging is useful for detecting stones, for example kidney stones or gallstones, because they create a clearly visible ultrasound shadow behind the stone.

Ultrasonography can be used to guide procedures such as treatment for kidney stones with Extracorporeal shock wave lithotripsy, needle biopsies or paracentesis (needle drainage of free fluid inside the abdominal cavity).

Ultrasound may be used to detect the following digestive problems:

- Cysts or abnormal growths in the liver, spleen, or pancreas
- Abnormal enlargement of the spleen
- Cancer of the liver or fatty liver
- Gallstones or sludge in the gallbladder

Generally, no special preparation is needed for an ultrasound. Depending on the type of test, you may need to drink fluid before the ultrasound or you may be asked to fast for several hours before the procedure.

During the Ultrasound: you will lie on a padded examination table; a specially trained technologist will perform the test; A small amount of water-soluble gel is applied to the skin over the area to be examined. The gel does not harm your skin and will be wiped off after the test; a wand-like device called a transducer is gently applied against the skin, you may be asked to hold your breath briefly several times; the ultrasound test takes several minutes to complete, a radiologist will interpret the test results.

Studies have shown that ultrasound is not hazardous. There are no harmful side effects and there is virtually no discomfort during the test. In addition, ultrasound does not use radiation, as X-ray tests do.

BRONCHOSCOPY IS ALTERNATIVE TESTING IN PULMONOLOGY

Saloum Ibrahim, Kochubiei O.

Bronchoscopy is a medical procedure involving the direct examination of one's air passages (the larynx, trachea, and bronchi) via the use of a flexible, lighted tube called a bronchoscope. The bronchoscope is a piece of equipment that can be directed and moved around the bends in the larynx, trachea, and bronchi. These images are transmitted through the bronchoscope either to the eyepiece or a video screen. An open channel in the scope allows other instruments to be passed through it to take tissue samples (biopsies) or to remove fluid. The flexible bronchoscope may be passed transnasally, transorally, or through an endotracheal or nasotracheal tube, tracheostomy or stoma.

There are many medical reasons for having a bronchoscopy. The following are some reasons for performing a bronchoscopy: abnormal findings on a chest x-ray; CT scan abnormal finding; coughing up blood; pneumonia; tuberculosis; pain; unexplained cough/

Bronchoscopy is carried out: to obtain specimens for microbiology and for histology; to assess hemoptysis; to assess unresolved lung abscess, pneumonia or atelectasis; to assess airway involvement in a burn patient; to evaluate bronchial abnormalities; to remove foreign bodies; to evaluate trachea and or lungs prior to surgery; to evaluate trachea and or lungs post surgery, post radiation, or post chemotherapy; to place a brachy therapy catheter prior to radiation; to treat strictures and insert stents;

Bronchoscopy is usually performed on an outpatient basis. It is performed with the patient lying on their back. The patient is sedated with MAC. The physician will insert the bronchoscope through your mouth and throat or through the nose, then down past the vocal cords to your windpipe and into your lungs. When the tube passes through your vocal cords you may feel the urge to cough or feel some minor discomfort. The feeling is not unusual and is temporary. Occasionally, the examination is done with the aid of x-ray equipment to help your physician locate the exact area from which to take a sample. Pain is unlikely to occur during the procedure.

The benefits of bronchoscopy include:

- The physician can see abnormalities, like inflammation or bleeding, through the bronchoscope that don't show up well on x-rays.
- Copious fluid can be removed from lungs.
- The physician can insert instruments into the scope to treat abnormalities or remove samples of tissue (biopsy) for further tests.

Alternative testing of bronchoscopy includes x-ray exams, CAT scans and MRI.

Bronchoscopy is a safe test that carries little risk. Complications are rare, but if they occur, they may include collapsed lung, bleeding from the sample site, and an allergic reaction to medicines, hoarseness, and slight fever. Only rarely do patients experience other more serious complications. Due to sedation, the patient should not drive or operate machinery for the remainder of the day following the exam.

Bronchoscopy is a simple outpatient exam which can uncover a serious medical problem. Specific diagnoses can be made. Treatment programs can be evaluated, or reassurance can be provided when the exam is normal. It is one of the most useful and simple exams in medicine.

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