Chapter 18

Practical Sessions

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The Postmortem Examination

Definitions

Webster's Medical Dictionary

necr-, necro-, [Greek nekros, corpse]. A combining form meaning "pertaining to death".

necr-rop-sy (neck"rop.see) η. [necr+-opsy]. To look at/in the dead.

Autopsy. Compare "biopsy"

au-top-sy (au'top-see) η. [Greek. autopsia, seeing with one's own eyes, from auto+opsis, sight, seeing]. A medical examination of the body after death to confirm or correct the clinical diagnosis, to ascertain the cause of death, to improve understanding of disease processes and aid medical teaching. SYN. necropsy, postmortem examination.

Very Useful Reading on the Purpose of Autopsies

Majorie J. Williams - The Autopsy: A Beginning, Not an End (1978) Am J. Clin. Path. Vol 69 (2)S:215-265.

King LS, Meehan MC – A History of the Autopsy, A Review (1974) Am J. Pathol 73:514-544.

Quotation

King says, "it is a pernicious misconception that the mere performance of postmortem dissection leads to progress in medical science. Progress depends not on the autopsy but on the person who is examining the material. Those who believe that the more autopsies we perform the more medical science will progress are pleading not for more autopsies but for more persons who can profitably utilise the data of autopsies, persons who have imagination, originality, persistence, mental acuity, sound education and background and the indispensable prepared mind. It is a grave disservice to confuse the performance of autopsies with the spark of insight which the autopsy may trigger".

Recording the Autopsy

Pritchard RW "Descriptions in Pathology" (1955) A.M.A. Archives of Pathology 59:612-617. Reprinted in full as an editorial in 1966 in Path.Vet. 3:169-177.

A few quotations might stimulate curiosity!

Quotation 1

The recording of pathological material in words is not a literary exercise, but a utilitarian method for the preservation of certain features of gross and microscopic examination. Despite its humble nature, it should be concise, grammatical, and, especially, precise. No interpretation should

appear in descriptions, and it is theoretically possible for a person with a command of the language to describe perfectly a surgical specimen or an autopsy, although he knows nothing of its significance. The time such a task would require of the untutored would be great, and special knowledge permits a rapid choice of words. If description and interpretation are intermingled, the total value of the effort declines rapidly; their separation is hygienic, forcing the observer to check himself and to cast the scales of preconceived diagnosis from his eyes. The power of the latter should not be underestimated. For a thousand years anatomists saw pores in the interventricular septum of the heart because they believed Galen, and he said pores were there. One good way to foster this objectivity in gross description, until experience makes it second nature, is first, to look the material over, then, describe it as it is gone over a second time, and, finally, read the description back to oneself as the material is scanned again to see if what is described can be demonstrated. The practically universal convention of putting descriptions in the present tense recognises the necessity of immediate objective description.

Brevity is not only the soul of wit but the sign of a mind in good training when it comes to descriptions in pathology. The beginner, who must grope for words which he wishes would roll off his tongue, stuffs his descriptions full of sentences such as, "When the uterus is opened, it is seen that a polypoid projection of endometrium is present, which when lifted up is seen to attach to the right cornu". As the final word is reached, one has either lost the reader or bored him. One's audience is only rarely interested in the mechanics of dissection; they look for one's findings and know full well that the uterus had to be cut open to see inside it, etc. The sentence would be more readily digestible as, "As polypoid endometrial projection is attached to the right cornu". It is hard to carry such trimming too far. It is my own view, opposed by some of my colleagues, that it is also superfluous to precede weights and measurements by confession of the act, eg, "The thyroid weigh 22gm and measures 5.0 x 3.0 x 1.0cm". When one records a weight or measurement, res ipsa loguitur, as our legal confreres would say. In the same vein, it is not a matter of taste to point out that it is sheer redundancy to follow a statement of colour by "in colour", as, "The tissue is blue in colour". What else would it be blue in? We are not given to describing the mood in which we find tissue.

Quotation 2

One matter which deserves special attention has been purposely avoided above. That is the serious one of where to get one's supply of words. A teacher of mine said that after he had been in pathology for a few months he found himself rapidly losing appetite and weight. Considering the matter, he soon realised that he had been describing foul and loathsome specimens as "like a tomato", or "filled with a material resembling pea soup", and so on ad nauseum. He resolved that, even if Virchow's father had been a grocer (an unfounded rumour), he was not so poor in his native tongue and limited in experience of the world as to draw all his descriptive terms from the table. I share his sentiments

completely. It certainly is poverty of intellect which makes one fall back on such terms, or sheer laziness. A concise statement of fact is preferable to an example. Many people have pointed out, furthermore, that the wide variation in fruits, vegetables, etc, makes descriptions of things, as "the size of an orange", hazardous, since one never knows from whence the orange comes. To La Fontaine, who said, "Example is a dangerous lure; where the wasp got through the gnat sticks sure", I doff my hat.

Animal Autopsy

The following veterinary paper by Paul Stromberg DVM PhD gives a concise summary of how to describe what you might behold in the "veterinary" autopsy.

Remember that for veterinary clinicians doing their own postmortem examinations this represents the ideal opportunity to confirm or correct the clinical diagnosis and to ascertain the cause of death.. It is a quality control much to be desired in any medically-based profession! Indeed the recent Rural Veterinary Review touched on the effects of economic rationalism on the conduct of autopsies in laboratories. The Review is quoted as follows – "Significantly, the Review was informed the closure of regional laboratories and the general inability of private laboratories to conduct gross postmortems on large animals has led to a marked reduction in the number of gross postmortems on production animals. A comprehensive diagnosis of a suspect disease may rely on a wide range of investigative tests including gross pathology services (ie postmortems) and laboratory-based services involving histological pathology, virology, microbiology and serology to confirm the presence or absence of disease. In NSW there has been a fall of approximately 50% in the numbers of postmortems and diagnostic investigations in the government laboratories".

However it may be no bad thing overall if less autopsies are done in laboratories, provided as a consequence more were done by clinicians in the field. Armed with a sharp knife and an inquiring mind veterinary clinicians can, and do, well serve the production livestock industries with valuable autopsy information. This information should be captured and paid for by state and national disease surveillance systems and be valued as the mainstay of disease intelligence, especially when further validated by appropriate laboratory confirmation. Failure to perform autopsies condemns livestock owners, veterinary clinicians and the National Animal Health Information System (NAHIS) to self-imposed ignorance of the deepest and most fatuous kind.

DESCRIPTION OF POSTMORTEM LESIONS AND SURGICAL SPECIMENS

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The final pathologic diagnosis in every necropsy depends upon information from multiple inputs. Contrary to popular belief histopathologic or microscopic examination is not necessarily the most important or definitive tool. In most cases, the pathologist evaluates a lcm x 2cm x 5μm piece of tissue. This is all he sees with the microscope! In order to make an accurate diagnosis, additional information is nearly always necessary. A complete signalment is the minimal requirement (i.e. species, age, sex, breed). In addition, an accurate, concise medical history of the relevant facts together with current clinical findings and a differential diagnosis is extremely useful in focusing a pathologist's attention on your case. This need not be long. Indeed, brief and to the point, including key laboratory results (BUN = 348; WBC = 56,000; PCV = 12; etc.) is optimal. Don't inundate him with lots of needless information. These data should be part of a good medical record and readily accessible to you. Take the time to share it with the pathologist.

Those of you practicing in a medical centre where there is good pathology support need only be concerned with providing the information mentioned above. Pathologists doing the postmortem examination will be responsible for identifying and recording the gross findings. However, the vast majority of you are not going to practice medicine in that setting. Most of you will perform necropsies in the field or the back room of your clinic WITHOUT THE BENEFIT OF HAVING A PATHOLOGIST PRESENT. Therefore, you must perform that function yourself. Generally, you do the necropsy (or surgical biopsy) and send the tissues to a laboratory for a pathologist to examine. Because of this separation, the quality, speed, and accuracy of the diagnosis you receive depend in large part upon the information you send. The information should be complete and accurate. HELP THE PATHOLOGIST HELP YOU!

Beside the relevant clinical information you provide from your medical record, what the pathologist wants most is to know what the gross lesions looked like. Often, he does not even see the specimen when it is trimmed. Therefore, he must rely upon your description of the lesions to make the correct diagnosis and interpret its significance. Your ability to accurately describe lesions and communicate with the pathologist is of the utmost importance.

Elements Of Description

1) Location
2) Distribution
3) Shape and Contour
4) Size
5) Colour
6) Consistency and Texture
7) Special Features

The first step in describing lesions or abnormal findings is to determine if the tissue or organ is in fact abnormal. Often this decision , is made intuitively or subconsciously without knowing why because "it just looks abnormal". For instance numerous white dots in a liver are abnormal because the liver should be homogeneous reddish-brown. Or, 2 kidneys that are not the same size is abnormal because you know that they should be equal in size. Thus the first question:

Is It Normal Or Abnormal?

This decision should immediately be followed by the next question:

What Is The Abnormal Part?

You may have decided that the kidneys are of unequal size but before you begin describing the "lesion" you need to decide whether the large one or the small one is abnormal. Likewise, the white dots on the liver are abnormal but white areas on a dark lung may be normally aerated alveoli in a severely congested lung. If you submit these areas, the pathologist will diagnose "normal lung" even though there may be severe congestion and possible heart failure.

This is where you need to draw upon your experience and medical knowledge of what constitutes normal (colour, shape, size etc.). Remember that sometimes there is no detectable gross abnormality. However, your clinical history indicates a problem with that tissue which you would like to have examined (i.e. the BUN was 400 and I think the animal is in renal failure but the kidney looked normal). It is still important to record that the tissue appeared normal (the gross lesion of acute renal failure is subtle and often appears normal).

1) Location

Once you have decided on what is abnormal (or what you want to submit for analysis) the first data bit is the location from which you sampled the lesion. Although this may be obvious to you, it is one of the most frequently omitted pieces of data.

For instance, not uncommonly I see specimens labelled "from the abdomen". This may be from the skin, subcutaneous or the peritoneal cavity. If it is an undifferentiated neoplasm, the prognosis may be very different for a skin tumour than for an abdominal one. Apocrine gland tumours look alike wherever they originate. However, topographical site data indicating that the specimen is from the mammary gland now allows definitive identification as mammary carcinoma. Therefore, accurate descriptions should always begin with ORGAN OR TISSUE IDENTIFICATION AND TOPOGRAPHICAL SITE. For instance, skin abdomen; left kidney; lung, caudal lobe; left popliteal lymph node etc. This should alway be the first element you write down.

2) Distribution

Knowing the distribution or spatial pattern of the lesion is the first key to interpreting the pathogenesis and the significance of the lesion. Distribution patterns can often be related to certain general disease mechanisms and sometimes indicative of specific disease entities. This data bit, when recognised and recorded, helps to see the whole picture. Remember, the pathologist only sees a small piece. It may be important to know, if this was the only lesion or if there were many similar lesions or even if this lesion represents a process occurring in the entire organ or tissue.

A) FOCAL - usually a single abnormal area.

B) FOCALLY EXTENSIVE - I use this to indicate one large lesion or a single area which is severely affected.

C) MULTIFOCAL - many abnormal areas. The range of this term is extremely variable. It may mean more than one to many. Often when I want to connote more than just a few, I will use the term MULTIFOCAL WIDESPREAD. In all cases it means discrete foci or areas of abnormalcy surrounded by normal.

D) MULTIFOCAL COALESCING - discrete focal lesions which appear to be growing together.

E) MILIARY - literally means thousands, but I use it when there are so many focal lesions I can't count them easily.

F) DIFFUSE - appropriate term when the entire organ or topographic site is uniformly or nearly all affected.

   BECAUSE THERE IS NO CONTRAST WITH NORMAL, DIFFUSE LESIONS MAY BE EASILY OVERLOOKED!

G) SEGMENTAL - best used to describe a portion of a tubular organ like ileum. For instance: "Intestine, ileum, segmental diffuse dark red" means that portion of the ileum was diffusely affected.

H) RANDOM this refers to the spacing of lesions. Lesions which occur without any particular relationship to anything are said to be random.

I) UNIFORM - lesions which are regularly or evenly spaced or occur at some organised interval.

Remember that pathologic processes are usually independent random events. If you detect some symmetry in the distribution of the lesions, it is likely that some anatomic feature is being highlighted by the process. A uniform miliary distribution of white areas in the liver is likely to be hepatic lobules. A similar distribution in the spleen is lymphoid tissue or white pulp. These areas many be abnormal (centrilobular lipidosis; lymphoid hyperplasia) but the uniformity or symmetry helps you interpret what the change could be.

Although diffuse lesions generally are more significant than focal lesions because more tissue is involved or more function is compromised, it does not mean that all focal lesions are insignificant. The significance of a particular lesion is related to the "3 R's" of the tissue or organ in which it occurs: REDUNDANCY, RESERVE and REGENERATION. A large neoplasm in the right kidney may not be life threatening because there are 2 kidneys (redundancy) and the contralateral kidney has enough reserve function to compensate. On the other hand, a small abscess in the cardiopulmonary centre of the brainstem may be fatal because there is only one centre (no redundancy), its very small (no reserve) and it doesn't regenerate if destroyed.

3) Shape

There are 2 important implications in the shape of a lesion. These are related to whether it is raised or depressed.

A) RAISED - elevated above the level of the adjacent tissue. Also bulging or nodular. Raised is implied when the term "mass" is used. A raised lesion means that SOMETHING EXTRA IS ADDED. That's why it bulges. The something extra may be fluid, exudate, normal tissue (hyperplasia) or abnormal tissue (neoplasia). Other elements in the description will help you to determine which interpretation is most likely to be correct.

B) DEPRESSED - the abnormal area is below the level of the adjacent tissue. A depression means that SOMETHING IS MISSING OR LOST. This often means necrosis has occurred but it could also mean atrophy or, in dynamic tissues like the lung, a lack of air. When necrosis has been resolved by fibrosis or scar tissue, there is traction on the adjacent tissue. This "pulls" the tissue creating an irregularity in shape. This gives an asymmetrical or unorganised look to the area.

C) FLAT - the abnormal area is neither raised nor depressed. Flatness may imply an acute process which has not had time to either accumulate cells or fluid or lose tissue through architectural loss.

Beyond the contour of a lesion, its precise geometric shape is not of critical importance. Most neoplasms, abscesses and granulomas generally grow as spheres. Acute necrosis originating from a bacterial colony may spread centripetally as a circle. Other geometric shapes such as squares, triangles etc. may imply a unit of anatomic structure. Vascular obstructions (infarcts) are often discrete lesions outlining the geometric shape of a vascular bed. Atelectasis in the lung may outline discrete groups of lobules whose common airway is obstructed.

An additional dimension of shape relates to how WELL DEMARCATED OR POORLY DEMARCATED the lesion is. This means how easy it is to see where the normal ends and the abnormal begins. This data bit helps the pathologist predict whether or not the lesion is likely to recur after you resected it. Well demarcated inflammatory lesions are often surrounded by fibrosis and therefore are old or chronic. Poorly demarcated inflammatory lesions are often younger. Benign neoplasms are often well demarcated masses because they grow by expansion.

4) Size

The size of a lesion is important in determining its significance and impact. Often you will need to determine if the postmortem lesions you observed could explain the clinical signs or even the cause of death. Therefore, ALWAYS INCLUDE AN ESTIMATE OF SIZE OR EXTENT in your descriptions.

Ideally you should give a relatively precise estimate in numeric units (millimetres, centimetres, inches, feet etc.). However, if you don't have a ruler or can't estimate linear dimensions well, use a common cultural reference to indicate absolute size (golf ball, tennis ball, pea, thumbnail etc.). The key here is that it does not need to be exact, only approximate, so that later you or the pathologist could estimate its significance. Large neoplasms often have necrotic areas which when submitted for histopathology will be diagnosed as "necrosis", when clinically you "know" the lesion is a tumour. If a size estimate accompanies the specimen, the pathologist will be aware of this possibility.

Related to absolute size is the estimation of relative size or extent. HOW MUCH OF THE ORGAN OR TISSUE IS INVOLVED? This is very important in determining the functional significance of the lesion. Usually it is estimated as a percentage of the organ involved and it is most useful when the lesion is not a discrete mass which can be easily measured For example, pneumonia is usually a focally extensive lesion involving a certain portion of the lung or a lobe. Rather than measuring it, simply state that"25% of the right lung" or "90% of the right cranial lung lobe" was abnormal. If the signalment is properly included with the specimen, the pathologist should be able to interpret the significance of a 2 cm infarct in the kidney of a 5 year old Great Dane differently from a similar lesion in a 3 week old Chihuahua. Nevertheless, an additional statement indicating that it obliterated the cranial 15% of the kidney in the first

case (insignificant) or 90% of the kidney in the second case (significant) would be helpful. Without it, all that you will receive is a diagnosis of "coagulation necrosis" and no indication of significance.

Most pathologic processes begin at the microscopic level and are thus small early in their development. If they progress (neoplasms and abscesses grow) it takes time. Therefore, as a rule large lesions are older than small ones. Similar lesions of 2 different sizes may imply a continuing process or repeated events. For instance, separate embolic "showers" or metastatic events might appear as miliary lesions of different sizes.

5) Colour

Colour is probably the easiest change to detect because it is so obvious. Coupled with other elements, it provides a basis for accurate interpretation of changes. The normal colour of organs and tissues is a net result of the relative amount of parenchyma, connective tissue, fat, blood, other pigments and in the case of lung, air.

The most important of these colour elements is blood because it is found everywhere, and it is very dynamic, ie the amount present is variable depending upon many physical, physiological and pathologic factors. Organs that are well perfused or very vascular are pink to dark red. Changes in the amount of blood in a tissue can be inferred by increases or decreases in the shade of red.

A) RED TO REDDISH BLACK - A common colour and almost always due to increased amounts of blood. Significant haemorrhage is usually very dark because the haemoglobin is depleted of oxygen. Focal or segmental lesions are usually interpreted as haemorrhage while diffuse lesions are probably congestion. Because of the contrast, this colour is most obvious and spectacular in light tissues (brain, lung, GI, kidney etc.) and more difficult to see in liver and spleen. If the reddish-black area is a nodule, think about a vascular neoplasm, haematoma or possibly an abscess with haemorrhage.

B) BLACK TO BROWNISH-BLACK - Usually due to melanin or exogenous carbon. Sometimes putrefactive bacteria can cause a black necrotic exudate. If the lesion is a mass, think about a melanin-containing neoplasm (melanoma). If not raised, it may be a non-neoplastic accumulation of melanocytes (melanosis). Hydrogen sulphide from the GI lumen is a common cause of postmortem black discolouration.

   "DIFFERENTIATION OF BLOOD FROM MELANIN CAN BE VERY DIFFICULT SO LOOK CAREFULLY"!

C) BROWN TO GOLDEN BROWN - Usually caused by haemosiderin. Haemosiderosis implies old or chronic congestion or haemorrhage. When focal, think haemorrhage. When diffuse, think passive congestion.

D) GREEN - Usually bile pigment. Bile commonly stains tissues green to greenish-black. Some fungal agents growing in body cavities or airways have a green to greenish-black colour.

E) YELLOW - This colour may be due to the presence of fat, bile pigment (bilirubin), fibrin, cellular exudate or neoplasms. Information from the other descriptive elements is needed to fully interpret it. A diffuse yellow colour may be due to icterus (bilirubin) or lipidosis. Focal nodules of yellow are likely to be inflammation or neoplasms. Dirty yellow, dry, stringy stuff on membranes is probably fibrin.

F) WHITE - Somewhat similar to yellow. May be exudate, neoplasia or connective tissue (fibrous, cartilage, bone).Elevated lesions (something extra) are probably inflammatory or proliferative (hyperplasia/neoplasia) including granulation tissue. Depressed, contracted irregular areas may be scar tissue. White foci often indicate necrosis. Because it takes time for a response to either elevate or depress the area, flat foci may be interpreted as acute necrosis.

"REMEMBER THAT DARK COLOURS MAY OBSCURE CHANGES ASSOCIATED WITH LIGHT COLOURS".

If haemorrhage occurs into an area of necrosis, it will appear red. Likewise, necrosis in the spleen is often red because there is so much blood in the organ.

Autolysis causes a distinct, diffuse dirty light reddish colour which has a non-vital look about it. It too can be modified by darker colours. It is best appreciated in an aborted fetus.

6) Consistency And Texture

CONSISTENCY relates to the physical firmness of the area as measured by palpating. There are distinct interpretations associated with different levels of consistency.

A) FLUID - There are a limited number of possibilities for fluids. Clear fluid is always excess extra vascular fluid (oedema). If it contains fibrin (serofibrinous) it means inflammation. Serofibrinous effusion is usually tinted yellow and, if it contains abundant fibrin, may clot. Urine is clear also but has a distinct odour (see special features). Blood is dark red. Real haemorrhage into body cavities is thick, and often has clots. Most "blood" observed at autopsy is really blood-tinged oedema (serosanguinous) fluid. Turbid fluid indicates cellular elements and may be due to inflammatory exudate, lymphatic or neoplastic effusion. The accumulation of fluid may indicate a vascular problem, either vessel leakage or fluid equilibrium disturbance, inflammation, or obstruction.

B) SOFT - Probably fluid-rich cellular elements, loosely organised tissues, fat etc. Tissues without much stroma. The normal consistency for many tissues.

C) FIRM - fluid-poor, cell rich tissues. The occurrence of many cells in an enclosed area will give it a firm feel. Many inflammatory as well as proliferative lesions feel firm. This is the normal consistency of many tissues. The addition of fibrous scar tissue will increase the firmness of a tissue or organ. End stage kidneys are firm, with irregular depressions, contracted, lighter in colour and small because of fibrosis. Pneumonia feels firm because of the dense accumulation of exudate.

D) HARD - usually implies mineral density i.e. cartilage, bone or deposition of mineral salts.

TEXTURE refers to the smoothness or roughness of the area and is best evaluated on a fresh cut surface. I use it to compare the similarity of the lesion cut surface to that of the adjacent normal tissue. The difference in texture of a lesion is likely to indicate the degree to which the lesion differs from normal. If the lesion is white but has the texture of adjacent heart muscle, it probably means the lesion is composed of heart muscle but altered usually interpreted as coagulation necrosis. If the white area appears to have structure, and holds together but is smooth, I interpret it to be tissue but not myocardium. If it is also a discrete, bulging mass, I will conclude that it is probably a neoplasm. If the lesion has no structure, but is a cheesy material which can't hold its shape, I will conclude that it is inflammatory exudate and diagnose an abscess or granuloma. If the texture is normal, and the abnormalness is simply that there is more myocardium than I think should be there, I conclude that it is normal myocardium which has hypertrophied.

7) Special Features

These differ for many tissues, organs and processes but can provide valuable information. For me, this includes data from sense modalities other than my eyes. You have already used your sense of touch in evaluating consistency, but the weight of an organ, especially dynamic organs like lung, spleen, urinary bladder can be important. Indeed, the most important data bit about a lung is usually if it feels heavy. The odour of a lesion or the lack thereof is often a useful characteristic. Putrefactive bacterial infection is best diagnosed with your nose. Pyometras and canine parvoviral enteritis have distinct odours. Uraemic animals often have an ammoniacal odour in their stomach or GI. Gastric haemorrhage smells like apple cider. The crepitant sound that air or gas in tissue makes is characteristic and could indicate postmortem autolysis or clostridial infection. I've never tasted anything in the postmortem room, but if I could figure out an acceptable way to use this sense, I'm sure we could find useful information with it.

Building A Complete Description of Lesions

Once you know the elements that constitute a description, putting them together is simple. The order is not critical but I recommend you do it the same way each time so that you don't omit anything important. Although we all like to read nice flowing prose, the only essential thing is that you accurately communicate what you discovered. Not all of the elements are critical to an adequate description and many lesions do not need every element. The minimum should always include **LOCATION, DISTRIBUTION, SIZE, COLOUR, and SHAPE**. When submitting masses suspected to be neoplasms, demarcation is helpful in predicting likelihood of recurrence and metastasis.

Below are some examples of what I consider to be good descriptions of lesions:

Skin, left hock: Multifocal, raised, 2x2mm yellow white, firm, ulcerated nodules arranged linearly. Cut surface was amorphous and well demarcated.
INTERPRETATION - probably granulomas in a lymphatic. Possible ulcerative lymphangitis.

Lung: Diffuse, dark red, wet and heavy with foamy fluid running out of airways. Cut surface looked similar. 100 % of lung involved. (Probably blood and fluid filled).
INTERPRETATION - pulmonary congestion and oedema.

Liver: Miliary 1mm white flat foci. (In this case, the lesion is too small to gather additional information).
INTERPRETATION - probably acute necrosis. The distribution suggests a recent shower of particulate emboli such as would occur in viral or bacterial septicaemia.

Kidney right: On the cut surface there is a focal, well demarcated, pale, wedge-shaped area spanning the cortex. The overlying capsule is depressed.
INTERPRETATION - probably an infarct. The depression is probably caused by fibrosis and therefore it is an old lesion.

Colon left, ventral and dorsal: Segmental (12 feet) diffuse, transmural, dark red, wet and bulging. INTERPRETATION - Congestion and oedema with probable coagulation necrosis. Most likely infarction due to mechanical displacement of GI.

Heart, ventricles: Multifocal to coalescing, irregular, flat, pale white areas which look like myocardium. 30% of heart involved
INTERPRETATION - Acute coagulation necrosis. In a ruminant, most likely white muscle disease.

Description Versus Interpretation

Description is the listing of empirical physical characteristics or facts you observed which identify the lesion. It is the common usage terms which tell about distribution, size, shape, colour, firmness, odour etc.

Interpretation is your translation of what the collective presence of those characteristics is most likely to mean in medical or pathological terms. I encourage you to interpret your descriptions. Its your right and privilege as a medical professional. In addition, the pathologist wants to know what you think the findings mean. After all, it was your eyes which made the observations, and that is usually better than a written description. However, the price of admission to interpretation is a good description.

IF YOU INTERPRET WITHOUT DESCRIBING YOU MAY COMPLICATE DIAGNOSIS IF YOUR INTERPRETATION IS INCORRECT. Therefore, ALWAYS DESCRIBE THE LESION FIRST THEN INTERPRET IT!

For instance, the lung was "diffuse dark red" not "haemorrhagic". Haemorrhagic is an interpretation of your observation that the lung was red. In fact, diffuse dark red lungs are usually not due to haemorrhage but congestion. A very real and important difference. If you describe accurately, you can always go back and re-interpret your findings. If you don't, later you may not be confident about what you saw. An easy way to do both is to describe the lesion and immediately afterwards give your interpretation in parentheses. The lung was diffuse, dark red, wet and heavy (congestion and oedema). This way, later, you or your pathologist know what you saw and what you thought it represented at the time. Interpretation of gross lesions is always a guess. We are often wrong. There is no shame in being wrong about gross lesions. With diligence and experience, though, it can become an educated guess and provide you and your clients with immediate data about what the likelihood of the problem is. In addition, you can help your pathologist give you a more definitive diagnosis. Interpret (guess), but ALWAYS DESCRIBE!

An integral part of your interpretation is the sorting out of LESIONS from POSTMORTEM CHANGES. A lesion is a defect in a living tissue caused by a pathologic process. It may be biochemical or structural. Postmortem changes are abnormalcies that occur after death usually as a result of the process of autolysis. AGONAL CHANGES are lesions that occur just before death and may not be clinically significant (pulmonary congestion is often an agonal change). NON-LESIONS are normally occurring structural changes that are not caused by a pathologic process (melanosis). These interpretations are based on experience which takes time.

What Should You Expect From The Pathologist?

The pathologist will give you a brief description or morphologic diagnosis. Morphologic diagnosis indicates a kind of pathologic process or anatomic change in the tissue that the lesion represents. This will be based upon what he can see in that small piece of tissue he examines. If the specimen is a neoplasm, he will identify the specific neoplasm if it is differentiated sufficiently. If it is a benign neoplasm, the pathologist will indicate that. If the tumour is malignant, you can expect a comment about how well differentiated it is, whether or not surgical excision was complete, and the likelihood of recurrence and metastasis. The pathologist will expect you to be familiar with the names of tumours. I recommend you purchase Tumours of Domestic Animals by Moulton. A new edition of this book is available. It will be a valuable source of information for you.

Non-neoplastic lesions will be identified as precisely as possible. When causes are present in the specimen, they should be identified. Quite often, the cause is not present but the pattern of pathologic change is characteristic enough to indicate or suggest a certain disease or class of diseases. In this case, often you will see that a certain change is "compatible with" or "suggestive of a certain disease or syndrome.

Pathologists vary in their willingness to speculate on what the lesion might represent. It is here that the difference between a veterinary pathologist and a human pathologist reading your biopsy is most evident. You want someone professionally experienced with the diseases you see clinically to interpret the findings. The degree to which the pathologist can do this is related to his experience and very dependent upon the completeness of the data you provide about the case and the lesions. This is where you help the pathologist to help you. It often makes the difference between giving you the generic name of a pathologic process and confirming a specific disease or syndrome.