

Issue 70

November 2002

THIS MONTH

- Fine Needle Aspirates of internal organs: are they any use?
- Don't judge a book by its cover: Integrated analysis of uroliths
- Rabies Testing Reminder
- Clin Path Club - Next Meeting
- Interpretation of Proteinuria
- Tail End "Zoophobias"

Editor

Alistair J Parker

e-mail

nwlab@nwlab.co.uk

Web Site

For an on-line version of this newsletter with additional links, and information go to:- www.nwlab.co.uk
Where there is also an archive of back issues.

Telephone

01253 899215

Fine Needle Aspirates of Internal Organs: - are they any use?

FNA's of superficial lesions are now well recognised as being a useful sample for the diagnosis of many lesions. The technique can also be applied to deep organs. Just as with superficial lesions the sample must be representative, with a good yield of quality cells.

Before taking FNA's of internal organs, it is important to consider the nature of the disease. It is important to remember when sampling an organ that unless there is diffuse involvement an FNA may not sample an affected area. Focal lesions are best sampled with ultrasound guidance.

The structure of the organ should also be considered. For example, liver function is dependant on a lobular structure. An FNA will not help assess tissue architecture and will give no information about possible fibrosis. For assessing architecture a wedge biopsy or Tru-cut biopsy are needed. FNAs are however very useful for assessing diffuse cellular infiltrates such as lymphoma and diffuse cellular changes e.g. hepatic lipidosis.

Deep FNA of any organ should not be attempted if there is any bleeding disorder or haemangiosarcoma is suspected. A coagulation screen should be performed including a platelet count, prothrombin time (OSPT) and activated partial thromboplastin time (APTT). von Willebrands factor concentration should be measured in breeds at risk.

Lung: Transthoracic FNAs are most useful when there is diffuse parenchymal disease or a discrete mass or masses. A specific diagnosis may not be possible but an FNA can be useful to differentiate between inflammation and neoplasia. After aspiration the patients

respiratory and cardiac function should be checked frequently for the first few hours. A thoracic radiograph should be examined 1 hour after aspiration or at any time if there is increased respiratory distress to look for evidence of pneumothorax.

Liver: Hepatic cytology is useful for the initial evaluation of hepatomegaly. Ultrasound guided FNAs are useful for focal lesions. FNAs are not helpful where hepatic architecture is important such as in chronic active hepatitis, nodular hyperplasia or fibrosis. The patient should be carefully monitored for 24hrs after liver FNA.

Spleen: The main indication is diffuse splenomegaly where myeloproliferative or lymphoproliferative disease is suspected. Nodular or focal lesions such as hyperplasia can be assessed but if there is any suspicion of haemangiosarcoma FNAs are contraindicated. Again, the patient should be monitored for 24hrs after FNA.

Kidney: FNA is most rewarding when there is diffuse enlargement e.g. with renal lymphoma. When taking an aspirate avoid the hilus with the renal artery and vein. Patients should again be carefully monitored after an FNA.

Prostate: This is the most common deep FNA. It is useful for investigation of enlargement of the prostate whether due to hyperplasia or neoplasia. Squamous metaplasia can also be identified. If there is asymmetrical enlargement, the FNA should be directed to the enlarged area.

Aspirated material should be expressed onto clean microscope slides and spread either with another slide as a blood smear or by gently placing another slide on top and gently drawing the slides apart, both slides being submitted. Smears should be air dried before packing in slide mailers. **Do not use coverslips.**

Jane Miller BVetMed MRCVS
FRCPATH

Test Name: Cytology: Cellular morphology

Test Code: CYTO

Sample : Air dried smears

Price : £19.00

Turnaround : Same day - 1 day

Don't Judge a Book by its Cover Urolith Analysis

"Integrated analysis of uroliths brings together a range of analytical techniques to provide as accurate an analysis of the stone as possible."

Does anyone remember the good old days of transitional metal chemistry and growing a 'crystal garden,' or am I just showing my age? Crystals formed around a nidus, often a hair, suspended in a solution maintained in a state of super-saturation. Our chemistry group used to run competitions to see who could grow the largest and most even specimens.

When considering urolith formation in dogs and cats, the principles are exactly the same. There must be a nidus around which precipitation begins, and then, if the urine is a supersaturated solution, growth continues, slowly but surely, layer by layer. If the solute changes, for example due to dietary manipulation or alteration in the pH, a pre-existing crystal may function as a new 'nidus' and a urolith of mixed composition is the result. Briefly considering why and how crystals or uroliths develop helps in the understanding of why it is important to obtain as much detail as is possible from analysis.

Size, shape, colour and location of the uroliths should be established; in addition, the species and breed may be relevant.

The composition of the outer layers and the nidus should be analysed separately. The nature of the nidus may be crystalline,

organic, artefact, drug or drug-metabolite based, but often produces vital information as regards the pathogenesis of the disease, and is likely to influence management of the case whether attempting to dissolve stones or prevent their recurrence post surgery.

METHODS OF ANALYSIS

Chemical analysis:

This has been for many years the most commonly employed technique in the UK and has certain advantages, but unfortunately suffers from several drawbacks. The process gives rapid results, is inexpensive and will identify the major chemical constituents of a urinary calculus. It can also be very useful if the sample size is small.

Prior to analysis the calculus is ground to a fine powder, which is then tested with various chemical reagents. Limited information is provided as regards the composition of the calculus but obviously no information is gained about the structure. This highlights a major disadvantage in that nothing is learned about the nature of the nidus. Other problems include the inability to identify matrix or certain organic materials that may be present

Chemical analysis is widely used by laboratories employing complex integrated analysis techniques, but as a stand alone method is certainly of limited use.

Physical analysis:

X-ray diffraction analysis has long been cited as the gold standard in terms of calculus analysis. This can now be combined with other techniques to make it a truly integrated approach.

Integrated analysis

Integrated analysis utilises a variety of techniques the most common of which include X-ray diffraction, infra-red spectroscopy, chromatography, ultraviolet visible spectroscopy fluorescence and chemical analysis.

X-ray diffraction involves bombarding crystalline structures of the calculus with X-rays; the characteristic diffraction patterns obtained are like fingerprints which enable accurate identification of the crystalline components.

X-ray diffraction is of limited use in identifying amorphous material and constituents present in very small quantities.

Infra-red spectroscopy is particularly useful when it comes to the identification of non-crystalline materials. Amorphous or fatty calculus constituents will be revealed and drug or drug metabolites and artefacts which may be present can be readily identified.

Fluorescence is exhibited by many organic compounds when excited by light of specific wavelength, and this can be invaluable when attempting to detect or measure compounds present in extremely low concentrations.

Other methods can be employed as and when indicated to ensure the maximum amount of useful information is made available to the practitioner. It is even possible to have photographs of the exterior and internal appearance of the calculus provided for a small additional cost!

Until now the real and possibly only drawback of this integrated approach has been the limited availability of diagnostic laboratories able to perform these highly sophisticated techniques, making the process unacceptably time consuming and potentially expensive.

We are now in a position to offer our clients this 'state of the art' service at a reasonable cost and with a realistic turn around time of between 7 and 10 days.

The price is £25.00 net and the test code is UCA. A dry calculus should be submitted.

Chemical analysis will still be available if specifically requested by the practice, however, comprehensive integrated analysis will surely be the method of choice when dealing with most cases of canine and feline uroliths.

Susan F Beck BVMS MRCVS

Next issue: Part 2 The Composition of Uroliths

RABIES TEST REMINDER

During last summer we were frequently presented with demands for urgent rabies blood test results because "the client was going on holidays in a few days". It is important to remember that there needs to be a 6 month gap between the blood test and the animals RETURN to the UK.

Now is the ideal time to promote Rabies vaccination in time for next summer. A waiting room leaflet is available on request.

CLIN PATH CLUB

Next Meeting

Thursday 14th November 2002

The Clin Path Club is free and open to all vets and vet nurses

Venue

Swallow Hotel, Salmesbury, Preston. Directions: Junction 31 M6, follow A59 Blackburn, 1 mile.

Speaker

Dr A Coughlan BVSc Cert VA DSAS (Orth) PhD FRCVS *Working up the lame dog "Tricks and Traps"*
Tea & coffee available, refreshments will be served after the meeting

To book your place, request further information or a location map call Joanne Kenyon on 01253 899215 or visit the web site.

Diary Dates:-

10th January 2003 - Dr Peter Graham BVMS PhD CertVR MRCVS: "*Feline Thyroid Disease*"

Interpreting Proteinuria

"The protein patch on the dipstick is a sensitive indicator of albuminuria"

The urine dipstick is a qualitative test, which means that more protein must be lost into dilute urine than into concentrated urine to give the same result.

A trace or 1+ reaction is usually considered normal with a specific gravity of 1.035 or greater although the guidelines have to be approximate, as the test is so sensitive. As a rough guide, 2+ or more of protein in urine with specific gravity of 1.035 or more. In a urine with a specific gravity less than 1.035 any amount of protein is significant and warrants a further investigation.

Urine sediment examination is the first consideration when there is proteinuria. Inflammation or infection of the lower tract, or haematuria will affect protein levels. If there is no haemorrhage or inflammation then proceed to check a urine protein:creatinine ratio (UPCR). The UPCR has superseded the 24-hour urine measurement test

for purely practical reasons but has shown to be well correlated as a measure of protein excretion.

Normal UPCR in dogs and cats is less than 0.4. Ratios higher than 1.0 are abnormal. The range is higher in dogs treated with prednisolone. Occasionally there will appear to be a discrepancy between the dipstick and UPCR tests. The UPCR is more accurate. Significantly raised UPCR can indicate glomerulonephritis and amyloidosis. Renal biopsy will be required to distinguish between the two.

Bence Jones proteins are free light chains, which are produced in myelomas. These do not cause a positive dipstick reaction but are positive on precipitation testing. Protein electrophoresis is indicated in these patients and most of the urinary protein will be found in a monoclonal spike in the beta or gamma regions.

Dr Geraldine Hale BVM&S PhD CertPM MRCVS

Test Name: Urine Protein

Test Code: UPCR

Sample : Plain urine

Price : £19.00

Turnaround : Same day

Test Name: Urine Protein

Test Code: UPEP

Sample : Plain urine

Price : £20.00

Turnaround : Same day

Tail End

A-Z of Zoophobias

A phobia is an irrational, uncontrollable fear of a specific object or situation.

More than one in ten people will suffer from an extreme phobia at some point in their lives.

Phobias affect people from all walks of life, of all races and of both sexes, although they are slightly more prevalent in women.

Zoophobia, the fear of animals, is one of the most common.

These are just some of the specific zoophobias:-

ailurophobia: cats
alektorophobia: chickens
apiphobia: bees
arachnophobia: spiders
bacteriophobia: bacteria
bactrachophobia: reptiles
cnidophobia: stings
cynophobia: dogs
entomophobia: insects
equinophobia: horses
helminthophobia: worms
ichthyophobia: fish

mottephobia: moths
musophobia: mice
ophidiophobia: snakes
ornithophobia: birds
parasitophobia: parasites
pediculophobia: lice
pteronophobia: feathers
rodentophobia: rodents
spermophobia: germs
spheksophobia: wasps
zoophobia: animals