Fine needle aspiration cytology in small animal practice

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Introduction

Fine needle aspiration cytology (FNAC) is widely used all over the world for accurate diagnosis of disease, tissue evaluation, etc in medical science. As it is a cheaper method of diagnostic procedure, which has many advantages over operative biopsies, this can be widely employed in diagnosis of animal diseases.

Advantages of FNAC over biopsy

- ❖ It is one of the cheapest and easiest tools available for early detection and diagnosis of cancer.
- ❖ Being not much invasive, this is a simple procedure that can be performed on any swelling or localized lesion, which can be identified either by clinical examination or by radiography.
- ❖ It is a rapid technique in which diagnosis can be made in 15-20 minutes.
- ❖ It can be performed without sedating or anesthetizing the animal and does not require elaborate instrumentations. A dispo sable 22G needle, spirit swabs, 10 or 20 ml syringes, slides and 95% ethanol for fixation are all that are required.
- ❖ It alleviates the animal owner's anxiety in a short time especially where a malignancy has been clinically suspected.
- ❖ In general, when performed by a skilled veterinarian conjoined with an experienced veterinary cytopathologist, the accuracy of diagnosis is 80-90%.
- ❖ The technique can be applied in any organ or tissues.
- ❖ This can be repeated any number of times in the same tissue.

Disdvantages of FNAC

- ❖ Hemorrhages of the organ punctured.
- ❖ Septicemia after prostate aspiration.
- ❖ Pneumothorax after lung aspiration.

Limitations of FNAC in Veterinary practice

- ❖ Inadequate experience.
- ❖ Difficulty in reaching the lesion especially in large animals.
- ❖ Absence of imaging facilities to reach deep-seated lesions.
- ❖ Scarcity of veterinary pathologist in the field especially in rural areas.
- ❖ Willingness of the animal owner.

Who should perform the technique

No doubt every doctor may succeed in acquiring some material but to achieve an ideal standard of proficiency, constant daily experience is essential. When a clinician collects the material, it is of great importance for the pathologist to safeguard the quality of the preparation. Veterinary pathologists are very few in number in the field and it is of great value to make use of the nearest human pathologist to explain the smear in field condition, then the veterinarian can make interpretations and thereby diagnosis can be made.

Materials required

- ❖ 21Gneedles of 1.5 inches and 5 inches length.
- ❖ Fresh, dry 10cc and 20cc syringes.
- ❖ Clean, grease-free glass slides.
- ❖ 95% methanol or ethanol for fixing smears.
- ❖ Spirit or tr.iodine as skin disinfectant.

❖ Various culture media in case of suspected infections (optional)

❖ Leishman's, Wright's and Papanicoloav stains.

Fine needle aspiration Biopsy (FNAB) procedure

A single puncture multi-directional technique is used using a syringe and needle.

❖ Clip the hairs, clear the area and sterilize the skin.

❖ Attach disposable 21G needle to a well-fitted glass syringe.

❖ Immobilize area to be aspirated with thumb and index finger of left hand.

❖ Place the needle against the skin at the determined puncture site and insert it into the mass, with single quick motion without negative pressure in the syringe

❖ Once the needle is in the mass, retract the plunger of the syringe to create negative pressure in the syringe and needle lumen. This draws material into the lumen.

❖ Move the needle back and forth several times and direct it into different areas of the mass

❖ Maintain constant negative pressure in the syringe throughout this manipulation by keeping the plunger of the syringe retracted.

❖ Closely observe the junction of the needle and syringe. At the first sight of the material, the aspiration is completed.

❖ Allow the pressure in the syringe to return to atmospheric pressure by gently releasing the plunger. The aspirated material remains within the needle.

❖ Withdraw the needle from the lesion and apply pressure on the puncture with spirit soaked cotton/ gauze.

❖ Needle is detached and air is drawn into the syringe. Needle should never be removed when any negative pressure is applied in the syringe.

❖ Needle is again attached and aspirate is blown on the slides.

Never dilute the fluid. If cyst is encountered, remove all the fluid till the cavity collapses. Then make to and fro movements on the cyst wall. If blood is aspirated, stop the procedure and choose another site. If pus is aspirated, withdraw as much of pus as possible and the rest same as that in the cyst. In humans, guided aspiration is commonly used for deep-seated lesions. CT (Computerized Tomography) and ultra sound guided technique are commonly used. Both are unable to do under field conditions.

Preparation of smears

This can be of two types.

1. Direct smearing / one step smearing -can be employed in the case of cellular aspirate which contains less fluid content.

2. Indirect smearing /two step smearing procedure is used in the case of aspirates containing excessive fluids. In the first step, the excess fluid is drained off the slide and only then the smears are made with the cellular material in the second step.

Fixation

It is done immediately after smears are made. This can be done in 95% ethyl or methyl alcohol. A few air-dried smears may be kept aside for Romanovsky's stain. Optimal fixation time is half an hour. For rapid fixation, a mixture of 2ml 40% formalin and 50ml 95% ethyl alcohol can be used where the fixation time can be brought down to 5-10 minutes.

Stains

For routine use, Leishman's, Giemsa's or combined Leishman's and Giemsa's can be used. Papanicolaov stain brings out excellent nuclear morphology. Romanovsky's stains such as Leishman's and Giemsa's are useful for cytoplasmic details provided it should be air-dried.

Sites on which FNAC is performed

The organs on which FNAC can be done are the thyroid, mammary gland, lymph nodes, prostate and intra-abdominal soft tissue masses. In human medicine, fine needle aspiration (FNA) of deep-seated lesions in the liver, pancreas, kidney, adrenals, lung and GI lumen are done by guiding the FNA needle with the help of Ultra sound, CT or Fluoroscopy.

Experimental application of FNAC in Veterinary practice

(a). Special stains such as Periodic Acid Schiff Reagent for mucin, Gram's stain for micro organisms, acid fast stain for M.tuberculosis and Masson's Trichrome stain for collagen.

(b). Electron microscopy.

(c). Immune cytochemistry.

Prospects of FNAC in Veterinary clinical diagnosis

In modern veterinary clinical diagnostic procedures, FNAC has been used widely as prescapular lymph mode FNAC in suspected Theileriosis for the detection

of Koch's blue bodies and bone narrow aspirations. FNAC can be used for diagnosis of various inflammatory, non-inflammatory and infectious diseases. The technique can be employed in accurate diagnosis of various tumors of the body such as mammary tumors, skin tumors, skin tumors, epithelial tumors etc.

SO FAR & WHAT NEXT

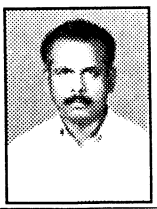
Dr. M.M. Chacko
President,IVA, Kerala

Dear Veterinarians,

Time wasted cannot be regained and there is no use crying over the spilt milk. You will all agree with me that our association activities need to be revamped. It is not enough that we pledge to strengthen our association. The need of the hour is to work united with renewed vigour and enthusiasm.

It is a fact that the future of our association lies in the hands of the young veterinarians, especially those who graduated recently. It is they who have to keep the torch of our association glowing, prevent it from getting extinguished and pass on to the future generation. But the present reality is totally different. Only a few of these young vets have come to the general streamline of association activities. This I consider a severe shortfall of our association. Misunderstanding and painful conditions caused knowingly and unknowingly needs to be forsaken, forgiven and wiped out from the minds of all concerned. I call upon all the district units to see to that these young, enthusiastic, aspiring, talented and committed brothers and sisters of ours are made active members of the IVA, Kerala at the earliest. Dear young fellow veterinarians, let bygones be bygones!! Let us join hands for a better tomorrow.!!

I here by appeal to all vets to make a sincere self assesment as to what you have done to strengthen the association before asking what the association has done for you. Only if the association is strong can it function and act to the expectation of its members.



Dr. Theodore John
General Secretary, IVA

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Generalized demodicoses is difficult to treat and owners should be made aware at the onset of the difficulty, cost and length of treatment (in some cases 6 month or more)

3% rotenone is used for the treatment of generalized demodicosis. The solution is diluted with three equal volumes of surgical spirit for immediate use. This preparation is applied to one third of the entire body daily in rotation. This regimen is continued until the dog is clinically normal and multiple skin scrapings have been negative for mites at two weeks interval. A useful adjuvant to therapy is the use of 1% selenium sulphide shampoo. This preparation cleanses the skin of debris and is also antiseborrhoeic and acaricidal. Antibiotic cover is essential when there is a secondary pyoderma.

Amitraz solution 5% w/v is diluted 1:100 with water and applied to the entire body at weekly interval. This solution is not rinsed off.

Ivermectin @ 200mcg per kg B w s/c is found to be effective. Glucocorticoids should not be used in dogs with demodicosis.

Prevention

Animals that have generalized demodicosis or have produced pups that have developed the desease should not be used for breeding. Entire females or males in these categories should be neutered because tendency to develop demodicosis is inherited and secondly it prevents the relapse of the condition that may occur shortly after oestrous.

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in dogs with below normal thyroid gland function. The normal value in dogs is 110-314 mg / decilitre and in cats is 90-150 mg / decilitre.

K. Electrolytes (Sodium, Potassium, Chloride): The balance of these chemicals is vital to health. Abnormal levels can be life threatening. Electrolyte tests are important in evaluating vomiting, diarrhoea and cardiac symptoms. Sodium and potassium levels can be seriously affected in diseases of the adrenal glands, heart or kidney, by various medications, etc. The normal values of sodium in dogs is 140-151 mEq/L and in cats is 143-153 mEq/L and that of potassium in dogs is 3.4-5.4 mEq/L and in cats is 3.5-5.2 mEq/L. The normal level of chloride in dogs is 105-120 mEq/L and that of cats is 108-128 mEq/L.