

HIGH FREQUENCY ULTRASONOGRAPHY FOR WOUND HEALING ASSESSMENT AND DERMATOLOGICAL DIAGNOSIS

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Compared to radiology and magnetic resonance imaging (MRI), ultrasonography has the advantageous of being non invasive, non ionizing and less expensive. Although it has still not become routine veterinary dermatology, ultrasonography is now more frequently used in dermatology in human practice. Ultrasound represents the only method for measuring skin thickness that is non invasive, harmless, reproducible, and usable at each anatomic location. It has been successfully employed in assessing normal skin and also in study in a variety of conditions such as skin tumours; steroid induced dermal atrophy, scleroderma, allergic and irritant reactions, burn depth and wound healing. Ultrasonic tissue characterization techniques can be valuable in veterinary dermatology because they provide non invasive quantification of acoustic parameters on the basis of the use of whole signal information.

Skin Thickness Evaluation

The main problem encountered in the implementation of ultrasonic skin characterization techniques is the thinness of the cutaneous layers. An adequate frequency must be chosen to achieve sufficient resolution for assessment of the details of skin. High resolution transducers with a frequency that ranges from 8.0 to 20 MHz are necessary to characterize skin.

Prior to scanning, the skin area must be thoroughly cleaned with saline to assure the site is free of debris and residues the ultrasound transmission gel is used to fill the area to eliminate any dead space or air pockets. The dressing seals the wound containing the gel and protects the wound from the transducer. Additional transmission gel is applied to the surface of the transducer and placed at a 90 degree angle to the

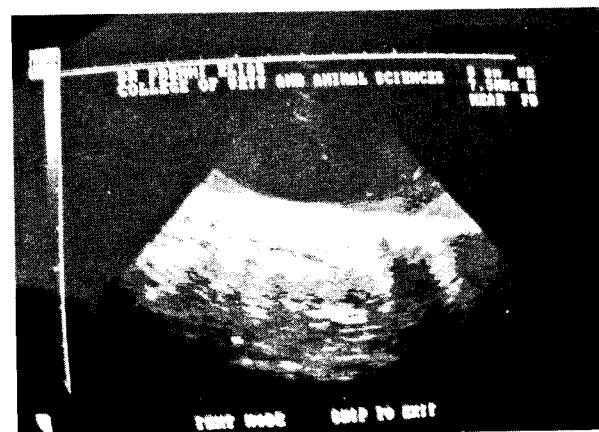
wound. Longitudinal and transverse scans are obtained by placing the probe in either direction

Normal Canine Skin

The applicability of high frequency diagnostic ultrasonography (16 MHz) for evaluation and accurate measurement of the skin thickness of clinically normal dogs has been assessed. Comparison between ultrasonographic and histologic appearance of the skin revealed that layering of canine skin and subcutaneous tissue could be recognized and measured by the use of high frequency diagnostic ultrasonography. Ultrasonographic pattern of canine skin is characterized three distinct defined layers corresponding to dermal entry echo, epidermis, dermis and subcutaneous tissue. The distance from the epidermis to the acoustic interphase of subcutis has been reported as 5mm.

Assessment of Wound Healing

Developments in advanced wound care have concentrated on wound treatments and therapies. There has been little progress in the field of wound assessment and diagnostics. Clinicians have had to rely on clinical assessment and invasive histopathology for wound healing and wound complication studies.



Using diagnostic ultrasound, a novel technique has been evaluated to assess wound healing non invasively. Ultrasonography is a significant advance in the field of wound assessment and offers a sophisticated way to measure the wound size depth, oedema and abnormalities in the dermis. The distance from the epidermis to the acoustic interphase of subcutis in canine surgical wound has been measured using 7.5 MHz. (Fig).

Nearly exact objective measurements can be made non invasively and without probing. Chronic wound and surrounding tissue can be assessed for abnormalities foreign bodies and depth of injury. Inflammation and oedema can be evaluated and measured in order to gauge the effects of therapies.

Dermatological Diagnosis

An ideal non invasive procedure for preoperative assessment of skin tumours should enable a diagnosis

of tumour type and an identification of malignant skin tumours so as to avoid unnecessary excisions. It can also evaluate the tumour margin and depth of invasion. Determination of tumour volume by means of three dimensional reconstructions could lead to new prognostic perspectives. Course of dermatitis, steroid induced dermal atrophy, scleroderma, abscess, cyst, allergic and irritant reactions, burn depth and effects of drugs can be assessed non invasively by sonographic imaging.

Conclusion

This method may be a viable diagnostic tool to evaluate various dermatologic conditions, wound and associated soft tissue pathology. The combination of clinician's assessment and this diagnostic assessment tool suggests a reduction in treatment costs and improved well being of the patients. □

SHORT COMMUNICATION

Phimosis in Dog – A case report

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Phimosis is inability to protrude the penis beyond the preputial sheath. It can be congenital or acquired. Clinical signs depend on the cause and the size of the preputial orifice. Congenital phimosis is usually accompanied by a distended prepuce and inability to urinate normally. Acquired phimosis results from scarring after preputial trauma or neoplasia (Slatter, 1985). The present paper reports a case of phimosis and its surgical management in a dog.

A case of phimosis in a nine month old German Shepherd dog was presented at the University Veterinary Hospital, Kozhikode, Thrissur, with the history of passing urine in thin stream. The animal had been operated earlier for the same condition at the age of 2 months. On clinical examination the animal was found monorchid with narrow preputial orifice. Hence decided to repeat the surgical correction of the condition.

The dog was sedated with intramuscular administration of xylazine @ 1mg/kg body weight. Local anesthesia was achieved by local infiltration of two percent solution of 2 millilitres of lignocaine

hydrochloride at the ventral aspect of prepuce. Enlarged the preputial orifice by excising a portion of the sheath on ventral aspect. The corresponding skin and mucous edges of either side where incision has been made was sutured using twisted silk (2/0). Roscillin tablets given orally for 5 days post operatively. On ninth day of operation sutures were removed. The dog had an unevenfull recovery.

Discussion

Congenital phimosis is due to a narrow preputial orifice, which may only admit a probe in the dog. The urine escapes through this opening in a thin stream or in a thin stream or in drops when it is very small (O'Connor, 1998).

The prognosis after repair of congenital phimosis is generally favourable. Another operation may be necessary to enlarge the preputial orifice further after the patient is fully grown (Slatter, 1985).

It may be possible to separate adhesions between the penis and prepuce, and prevent their recurrence by the repeated application of a lubricant (O'Connor, 1998). □