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DOG AND CAT DENTISTRY
OR
YOU DON'T KNOW WHAT YOU GOT UNTIL YOU GET IN THERE

Dental disease is the most neglected part of healthcare of our pets. When I first graduated from veterinary school we had virtually no schooling in veterinary dentistry. Our knowledge and skills were severely limited and combined with the lack of awareness by owners many pets were doomed to chronic pain and inadequate procedures.

In the last 10-15 years our knowledge of dental and oral problems and our skills for diagnosis and treatment has exploded. There are now a number of veterinary dental specialists who can perform the very same procedures they do in humans. And we have all come to the realization that many animals have been suffering in silence.

so the following are some quick facts:

- 1- as stated above dental disease and dental care are woefully ignored by many owners
- 2- many animals especially dogs live in constant pain from their mouths
- 3- dogs in particular do not show obvious discomfort even if they are in pain...while cats may show more discomfort due to the different nature of many of their oral problems
- 4- the severe advanced dental disease we see in many pets have significant impact on their bodies including:
 - pain and quality of life
 - constant background inflammation and inflammatory changes in their biochemistry
 - increase disease in other organs such as their liver and kidneys
 - significant tooth loss at younger ages especially in small breed dogs
- 5- dental procedures can be one of the longest most challenging procedures that a veterinarian may do on a daily basis. Dentistry can be relatively expensive for the very same reasons
- 6- Dental x-rays are a definite necessity to perform and in fact it is now considered standard of care ..which means if a veterinarian is not capable of doing dental radiography they should not be doing dental procedures on their patients.

7- no sedation dentistry is a waste of time ..perhaps if it was done regularly from the time the pet is 6 months of age every week or every month it may have some preventative value but without sedation it is impossible to do dental x-rays ..or evaluate and reach the more difficult areas of the mouth..plus even scaling teeth properly under the gum line hurts and very few animals will stand for a proper cleaning...it is not uncommon for a dog to lose half their teeth during a proper dental after years of no sedation dentistry.

8- on the same theme as #7 most of the important pathology is under the gum line so cleaning the obvious surfaces on the crown has done nothing to halt the evolution of periodontal disease.

9- YOU NEVER KNOW WHAT YOU GOT UNTIL YOU GET IN THERE!!!

Animals cannot talk ...therefore other than obvious problems there can be a lot of hidden problems under the gums which may only be revealed by a thorough exam under anesthesia or with dental x-rays...that is why it may be difficult to give an accurate estimate or what may need to be done..

10- as mentioned above there are specialists in veterinary dentistry ..though fortunately not too common the general practitioner may find a problem beyond their skill level and though it is disappointing to not be able to fix everything that may be found after a thorough evaluation.. our jobs as vets is to do the best job possible for the patient and that may include backing off a procedure and suggest a referral for a difficult problem.

QUICK FACTS

1- Dogs have 28 baby teeth and 42 adult teeth

2- Cats have 26 baby teeth and 30 adult teeth

3- by 5-6 months of age in both species they have lost all their baby teeth and the last teeth to come in is the adult k-9 teeth..which is a good marker for age if you are unsure of your puppy or kittens age ..once the adult k-9 tooth starts to appear they are 5 months old

4- tooth problems will vary due to breed differences ..there are different problems in different breeds ..compare a pug to a collie or a persian cat to a demestic shorthair ..these breeds due to severe differences in their jaw anatomy experience different level of problems

5- small breed dogs under 20 lbs such as poodles yorkies Lhasa apso/Shih tzu have a tendency to develop severe end stage periodontal disease as young as 4 years of age..and it is not unusual for a 8 year old small breed dog to lose a dozen teeth during a dental procedure if they have not received regular preventative care.

6- Cats have some very specific species related problems with their teeth and mouths

7- oral cancer is very common in older cats and dogs and is usually caught very late in the course of the disease and may initially be mistaken for more ordinary gum or teeth problems.

WHAT DOES A 'DENTAL' CONSIST OF?

We should actually stop using the description DENTAL to describe the procedure of dental evaluation and cleaning as it consists of much more than that word describes.

The following is a summary of what should happen during a dental intervention:

1- blood work is performed to make sure that the patient has no underlying problems that would make anesthesia a risk

2- the pet is placed under general anesthesia ..the pet may have an intravenous line placed and an endotracheal tube is always placed and the pet placed on inhalation anesthesia. Cardiac ..oxygen and respiratory blood pressure temperature and many times co2 levels are monitored continuously by our anesthetic monitoring equipment and 1-2 dedicated trained nurses.

3- once the patient is completely under a cursory exam of the their teeth and oral cavity is performed

4- dental x-rays are them done and evaluated

5- a thorough exam is then done in which all the teeth are examined and measurements are made of periodontal pockets ..the recognition of obvious problems such as fractures or chips of the visible surface of the teeth and the gum lines.. exam for tumors or growths and then the visual exam of the teeth are combined with the dental x-rays to formulate a treatment plan

6- in most cases teeth that are loose or not viable are extracted if they are easy by a simple extraction method...in these cases I do not call the owner for these easy extractions unless it is obvious that the patient will lose a number of teeth.

7- there may be teeth that have significant pathology and may be large multi rooted teeth or another type of difficult extraction..some of these teeth may need to have a surgical extraction which can be very difficult and unless the owner was aware that this would happen before the procedure I must call and get an informed consent as these can be quite challenging and more expensive. Plus some of these teeth can be saved by the intervention of a specialist and the owner has the right to have that choice presented to them .

8- after all the difficult stuff is done (extractions) then all the teeth are cleaned with an ultrasound scaler/cleaner both above and more importantly below the gum line so that all the tarter is removed ...packing the periodontal pockets with medication is often done

..then the teeth are polished as the tarter and the action of the scaler can leave small pits and irregularities which are prime areas for the return of tarter

9- after the procedure is done antibiotics and pain medications may be given by injection or sent home with pet depending on the severity of the intervention .

9- the anesthesia is then stopped and the pet is observed until it is obvious that they are breathing well ..in small breed dogs and cats many times their temperature may drop due to the loss of heat due to their small size and the cool water from the ultrasound cleaning and drills..if this happens then they are placed in a warm air heating system until their temperature returns to normal..

10- when they are ready to go home the owner receives a report with pictures of what was found and what was done and a treatment plan adapted to the individual patient dependent on what level of problems they have and what can be done at home to prevent the quick return of the tarter ..to encourage the resolution of any periodontal disease and avoid further tooth loss...

THE EVOLUTION OF TOOTH PROBLEMS

Imagine if you never brushed your teeth ..the amount of pathology that would develop would be predictable and the resulting tooth loss would be expected. Of course in the wilds and in our homes animals tend to keep their teeth somewhat clean by chewing on hard material such as bones or rawhide or dry kibble.

Unfortunately due to breed conformations (think pug face or toy breed) this every day habits may not be enough to keep all the surfaces of the teeth clean and the tissue under the gum line free of tarter.

Plus genetics seem to play a major role ...other than the above mentioned breed specific issues some dogs and cats are just prone to bad teeth as some people are and have a predisposition to develop severe periodontal disease.

Cavities are not common in our pets though cats have a variation of cavities to be discussed later ..and they hide pain so advanced periodontal disease may go under the radar.

The basic evolution of oral disease follows a particular evolution :

- 1- plaque forms on the teeth very quickly and attracts bacteria and minerals to form tarter.
- 2- the tarter creeps below the gum line carrying the mineral buildup and bacteria with it
- 3- the combination of the bacteria and the minerals thru both irritation and chemical productions cause the gums to become swollen and start to separate from the tooth

4- this is advances in 2 ways ..the periodontal membrane which is strong becomes weaker ..this membrane anchors the tooth around the roots.. the second event is the loss of the bone around the teeth

5-both processes evolve until there is enough bone and tissue loss and then the tooth becomes loose the root canal can become infected and eventually the tooth becomes loose painful and either falls out or fractures or is extracted..

6- in the same mouth of any patient they can have varying degrees of pathology affecting different teeth and regions of the mouth.

7- different areas of the mouth may have completely different local biochemical and mechanical environments from a tooth or region a few millimeters away

8- plaque starts to form within a few hours of a thorough cleaning

9- the severity of disease will also be determined by the anatomy of the jaw and teeth...crowded teeth...retained baby teeth...fractured teeth ...abnormal bite anatomy all contribute to the level of disease and the difficulty in preventing oral disease.

SYMPTOMS OF DENTAL DISEASE

1- BAD BREATH!!!... There are a few causes of bad breath unrelated to the teeth but bad breath is the number one sign of oral disease.

There is some hesitation to recommend a full dental cleaning on a younger animal that has minimal tarter and mild bad breath with no obvious severe changes...though understandable this is a mistake...to wait for the more advanced signs of dental disease allows the changes associated with more severe periodontal disease to take place ...so once there is gingivitis permanent changes have already taken place and are difficult to reverse.

2- PAIN- as stated above many animals will eat without a sign of pain including hard food or treats even though they have oral discomfort...in fact most pets will do everything they can do to eat thru the pain ...but clear signs of pain include:

- eating off to one side of the mouth
- dropping food out of the mouth
- chattering especially in cats
- avoiding hard food or treats
- crying in pain
- drop in appetite

However in some cases both the owner and the veterinarian may wrongly blame a drop in appetite on the pain from a bad mouth ...in fact since it takes a great amount of discomfort to stop a pet from eating and since they cannot talk it may be difficult on a

routine exam in an awake pet to determine if the reason for not eating is dental pain ...in fact many cases of dog or cat whose appetite has dropped is erroneously blamed on their teeth...

In fact especially in cats the pet may go to the food and either look like it wants to eat or will take a bite and walk away which is interpreted by the owner as a reluctance to eat from possible discomfort ..when in reality the pet does not feel well for another reason and is just behaviorally going thru a reflexive activity of going to the food source and once there realized they are just not hungry...

So in some cases we must pursue other causes of anorexia before blaming the mouth ..and then if no other causes are found a thorough exam with x-rays under sedation may need to be done.

3- Blood - blood can appear from just severe gingivitis but will also be associated with:

- oral tumors
- a devitalized tooth that finally and suddenly becomes loose but remains in the socket
- trauma and foreign bodies
- clotting problems

REMEMBER: pets hide dental pain until it is quite severe...the pet may be without symptoms other than odor even in the face of advanced dental disease..

EXTRACTIONS

There are 3 levels of extractions that vary in difficulty:

1- minor---these teeth are already loose and not vital and they just need gentle elevation to remove ...these extractions are rarely painful and in fact many times the tooth in place is causing more discomfort than the extraction itself

2- major-- this is where the tooth is not vital but still is attached to the surrounding tissues and needs a little more work to extract ..most of the discomfort comes from the surrounding gum which is pushed away from the necessary digging to get the tooth out

3- Surgical extraction -- this s a true surgery and usually involves some specific teeth which either have multiple roots or 1 deep root

The teeth that we use surgical extractions on with great predictability are the 4th premolars and molars and K-9 tooth ..though any tooth can wind up as a surgical extraction ..

THE 4TH PREMOLAR-- this is one of the most difficult teeth to extract ..as it has 3 deep roots and in older animals the roots may be fused with the bone of the jaw..it can take anywhere from a 10 to 60 minutes to extract just one of these teeth...

the technique is to make a 3 rooted tooth into 3 single rooted sections and the following takes place:

- 1- the gum is incised in a way that it can be turned back and away from the base of the tooth
- 2- the bone is drilled away to expose the roots ...a drill may be used to outline the tooth roots to separate them from the bone of the jaw
- 3- then a high speed drill is used to section the roots into individual pieces which then can be extracted separately...
- 4- after the sockets are smoothed and flushed the gum is than sutured over the defect with absorbable suture material

the 4th premolar is one of the most common teeth to have problems ..in dogs it often is fractured from chewing hard things or constant trauma causes an abscess of a root....one very common manifestation of an abscess is a lump or oozing hole right under the eye on the same side as the diseased molar has roots that communicate with the sinus above the root...in some cases the tooth looks great on the crown and only dental x-rays will reveal the problem

Once again extracting this tooth can be one of the most challenging procedures we have to do though in most cases everything eventually goes well..

THE CANINE TEETH- the canine teeth have very very deep roots and in fact in some animals the root is twice the size of the visible crown and once again it can be fused to the surrounding jaw bone ...a surgical technique is used as above but since it is single rooted no sectioning is needed...the upper k-9 teeth are easier to remove than the lower k-9 teeth...

The extraction of these teeth can present 2 problems afterwards;

- 1- the tongue can hangout of the mouth -- this is due to the fact that the k-9 teeth play a role in keeping the tongue centered in the mouth
- 2- a persistent fistula..this is a hole which in some cases can communicate with the nasal sinus ..this hole persists because the tooth has been non vital for a longtime and healthier tissue has migrated around the lining of the socket of the root ..this tissue is not open or raw so it does not heal onto itself and the defect persists..in some cases the defect will fill in ..in other cases the communication with the sinus and/or the hole persists...this may be fixed at the time of surgery or later if it does not fill in ...however in some dogs special repair techniques are needed and a referral to a specialist may be needed if simple repair does not work..

Any tooth may need a surgical technique for extraction depending on the problem and the size of the animal ..

COMPLICATIONS OF EXTRACTIONS

There are some possible complications of extractions fortunately most are minor and easy to remedy but some can be serious:

- 1- tooth is fractured during the extraction process and root tip is left behind and not recognized
- 2- tooth root is pushed into the sinus
- 3- broken jaw--- this is rare but in some small breeds the pathology at a tooth root can be so severe and the jaw bone so thin that manipulation of the tooth can cause a fracture in the jaw which has already been weakened/eroded by the longstanding infection

CATS

Cats as a species do share many of the problems that dogs and people suffer from but have also some problems peculiar to themselves..

- 1- cervical line lesions also called FORLs ..which stands for feline odontoclastic resorption lesions...

These are erosive lesions usually at the gum line which are somewhat like cavities in people ..they can be very painful and if left untreated can cause the substance of the affected tooth to be eaten away and the crown may get sheared off leaving the root in place...some of these if caught early can be treated but in most cases they are extracted..if the crown of the tooth is missing the root will have to be exposed and extracted..

- 2- resorption lesions...this is similar to the above but affects the roots..in these cases the roots of the teeth with or without the crown gets slowly absorbed until it disappears into the surrounding bone...at some point these roots stop being painful but the trick is to decide what stage the root is in as some early stages are painful and the root needs to be extracted

- 3- Feline lymphocytic plasmocytic gingivitis...this can be one of the most painful diseases of the mouth anyone can experience and unfortunately is too common in the cat.

It can vary from mild to so severe the cat cannot eat and is suffering..It consists of a brick red inflammation of the gums and the tissues in the back of the mouth ...the inflammation can become very thick tissue and responds poorly to most conservative treatments.

The exact cause is unknown...many of the affected cats are positive for feline aids virus but not all ...the working theory is that it is an immune mediated disease by the cats body against the bacteria found in the gums and around the teeth...this reaction causes the cats body to mount a robust reaction which causes the severe inflammation ..

Different treatments have been tried with varying amount of success dependent on the individual patient and the severity of the disease.

Immunosuppressant drugs such as corticosteroids and/or cyclosporin combined with antibiotics and if possible good oral hygiene may help some cases if they are not too severe.

In very severe intractable cases the treatment of choice is full mouth extraction of all the teeth...this theoretically works because we are removing the roots and therefore eliminates all the bacteria stimulating the immune reaction ...it works in over 90% of the cases however as with everything in medicine a few cats may have some lesions that persist but they are almost always significantly more comfortable.

My advice to my clients if they have the financial resources is that the procedure been done by a veterinary dental specialist for a few reasons:

- 1- The procedure can be quite time consuming and a specialist has the skill and special techniques to significantly shorten the time the pet is under anesthesia.
- 2- many times there are varying degrees of difficulty in the extractions..feline teeth are quite fragile when diseased and roots break easily and may be difficult to extract all parts of every tooth completely
- 3- If even a few tooth root fragments are left behind they will continue to fester and cause problems and pain
- 4- Cats that are afflicted with this disease are often somewhat debilitated and may have not eaten well for a while and may not eat for a certain time after the procedure..Specialist often use esophageal feeding tubes to allow food to be administered to the patient while bypassing the mouth until the mouth stops being painful

This is one procedure that needs to be done right the first time otherwise the patient has been poorly served.

ORAL TUMORS/CANCER

Unfortunately oral tumors are very common in both cats and dogs. Not all are malignant but every oral mass should be viewed as a possible potential cancer.

Benign tumors are common and the most common one is called an epulis which can be found in any dog breed but is very common in certain breeds especially boxers and bulldogs..they look like flesh colored smooth growths found on the outside of the gums..the cause is not known but many times they are associated with severe gingivitis so a reactive mechanism is postulated ..they can be removed easily and rarely occur again in the same place though they can come back in other parts of the gum ..

Malignant tumors are common in both cats and dogs and consist of :

- 1- squamous cell carcinoma
- 2- malignant melanoma
- 3- fibrosarcoma
- 4- osteosarcoma

Most oral tumors are seen in older animals over 8 years of age.

Unfortunately they are usually discovered a little late as they seem to cause little discomfort in the beginning and the first signs may actually take along time to appear early signs may be bleeding from the mouth or changes in the way the pet chews.

Sometimes... especially in the cat ...cancers may be mistaken for severe inflammation or infection secondary to dental disease. However after the local teeth are extracted and the area does not heal well raises the suspicion especially in an older animal that a tumor may be the cause.

This is an important concept ...there are places in our bodies which tend to heal quickly as they are exposed to constant trauma in health and seem to have adapted to return to function very quickly..

So the mouth ..paws ..anal area for example all seem to heal quickly. So when there is a delay of healing in the mouth and especially in an older cat ..one must suspect that there is something preventing the normal healing process such as cancer.(squamous cell carcinoma)

Treatments can consist of local excision however often the tumor returns...to more aggressive resection of the affected jaw to radiation therapy...and in fact I have seen some cats who have squamous cell carcinoma respond to radiation and live healthy and comfortable for months longer than without the therapy.

OWNER RESISTANCE TO DENTAL CARE

I MUST REPEAT THAT ONE OF THE MOST NEGLECTED PARTS OF OUR PETS HEALTHCARE ARE THEIR TEETH. PREVENTION OF DENTAL DISEASE CAN BE STRAIGHT FORWARD AND MANY PETS LIVE SUBOPTIMAL LIVES AND LIVE IN SILENT DISCOMFORT

Resistance to dental care or dental interventions by owners can be divided into 3 causes:

- 1- The lack of recognition of the value and benefits of routine preventative care.

2- The lack of recognition of the health hazards and discomfort many pets experience when they have oral disease

3- Expense--- now that we have more training and have added a whole bunch of technology such as high speed drills..dental radiography ..nerve blocks ..advanced extraction techniques ..the cost for these procedures can get a little pricey...plus a good dental procedure is often one of the longest procedures veterinarians do on a regular basis ..and combine that with the expense of the continuing education needed to master some of these skills the cost can be more than an owner might expect.

Many pets afflicted with severe dental disease are elderly. The 14 or 15 year old Lhasa apso that has such a bad mouth that the odor is detectable from across the room and on exam obviously has lesions in their mouth that are predictably painful is a very common scenario. There is an understandable reluctance to invest 400-800 dollars at this stage of the pet's life because frankly the pet is in the sunset of his life and may actually become ill or pass away in the near future from some unrelated medical problem.

This is a personal philosophical decision ..on one hand we can argue that if we can make the pet's life as comfortable as possible in whatever time they have left it is worth it ..on the other hand even a loving owner may kick themselves after such an investment is made and the pet passes away from something else a month later ...this is a decision the owner needs to reconcile.

I will tell you though that I see owners spend hundreds more a year on the newest fad food or supplement and yet ignore their pet's dental health because of the expense. However they end up ignoring the one thing that gives outside rewards for the investment as it really affects the health and quality of life of their pet.

4- Fear of anesthesia - my Dad used to say ' if it is a million to one shot that something will go wrong but then it happens to me then as far as I am concerned it was 100% ...

We are all afraid of anesthesia because we all know that there is an inherent risk in any anesthetic procedure. However with the techniques ..newer anesthetic agents ..a more sophisticated understanding of pre-existing conditions and how to control them ..and human level technology and training for anesthetic monitoring ...anesthesia has never been safer.

Many pets with severe dental disease are older pets and therefore the fear is understandably increased.

I never feel comfortable in talking a client into a procedure which would include anesthesia because I would feel terrible if that pet has a serious adverse reaction...having said that we routinely anesthetize pets who are 14 -17 years old. Old age is not a disease it is a dynamic condition that needs to be managed and adapted to.

So yes ..until you get the call that everything went well and you can pick-up your furry family member most people will worry no matter what ...and I am included in that group.

And we have all heard of the horrible stories or even have experienced a loss of a pet undergoing a dental or another common procedure and every vet has lost a patient if they practice long enough...but statistically it is very safe. It will always be a worry but it should not be an absolute barrier to doing the right thing...

Of course there are patients that are truly poor candidates for anesthesia/surgery and those cases need sober critical thinking to weigh the risks vs the benefits.

And once again ...except for some limited cases no sedation dentistry does not in the vast majority of cases effectively resolve the most important problems and without x-rays the 1 in 4 animals who have early pathology that can only be seen on x-rays are missed.

TOTAL ORAL HEALTHCARE

Every pet has their individual needs ...but as discussed earlier small breed dogs and pushed in face dogs have a significant risk to develop severe periodontal disease starting at young ages. In any individual genetics play an important role...but the following are steps that can help prevent pain and tooth loss and promote a better health status;

1- Yearly cleanings starting when there is a small amount of tarter or the hint of bad breath...this could be as young 2 years for a yorkie or at 5 years for a Labrador retriever . But every dog should have their teeth cleaned on a regular basis.

2- Start home care early...which would consist of :

a- Brushing--- there will always be dogs (and most if not all cats) that will resist letting you brush their teeth ..but most dogs can be persuaded to tolerate and even enjoy having their teeth brushed...start young and use a finger with a little bit of dental paste made for dogs..these tend to taste good and at this point you are just getting the pet used to an object in their mouth that tastes good then substitute a special finger cot with bristles that can be bought from veterinarians or pet storesand then eventually a brush made for animals..

I can tell immediately in the few dogs I see that their owners brush their teeth..the difference can be amazing ..and even 3 times a week can produce amazing benefits.

b- treats toys rawhide chewies ..special boutique treats ..popular treats such as Greenies..there are hundreds of products on the market with more effective ones coming out all the time ..

c- special foods such as Hills t/d food that prevents tarter build- up ...however though dry food would be expected to keep the teeth clean due to its crunchy substance most dogs and cats with severe periodontal disease eat dry food...

d- additives to the water---there are some products that as an adjunct prevents tarter from building up

e- there are some over the counter products that are dubious such as sprays that remove the visible tarter..this may or may not be true but once again they cannot address where the real problem is --under the gum line.

f- for cats there are more limited preventative interventions and they seem to develop certain problems no matter what you do...

SPECIALIST REFERRAL

After taking many advanced courses on oral medicine and surgery I have increased my skill tremendously. However at the same time I realized that there are oral problems that should only be left to the specialists. In fact the more I learn the more respect I have for the dental profession as a whole whether for humans or for animals. Dental and oral disease can be very difficult to diagnose or treat properly in some animals. Therefore there are cases that should only be handled by a board certified veterinary dental specialist ...these specialists can perform procedures that very few general practices can duplicate ..specifically they can do:

- 1- difficult extractions
- 2- complex jaw fractures
- 3- surgical approach to oral cancers
- 4-root canal with the ability to save important teeth
- 5- caps for fractures of important teeth
- 6- bonding
- 7- advanced skill in multiple complex full mouth extraction
- 8- second opinions by referrals

The downside of referrals is that the specialists tend to be expensive but in many cases the expense is worth it as compared to a pet in chronic pain due to inadequate or improper treatment. Plus it is nice to salvage some important teeth like the k-9s or the large molars and premolars when possible. But a root canal can cost 2000 dollars while an extraction of the same tooth might be a few hundred dollars. So sometimes practicality trumps the best procedure..but you should all be aware that these specialists exist.

In the Phoenix metro area there is the Arizona Veterinary Dental Specialists who have offices throughout the valley. They are just a great ethical group of veterinarians with amazing skills and I refer to them often.

Remember : YOU NEVER KNOW WHAT YOU GOT UNTIL YOU GET IN THERE..
So if your pet has a dental there may be things that need to be addressed that may be more than the estimate that was given in good faith ...or conditions may be found that are difficult to diagnose or may be above the skill level of the veterinarian. Some clients will get angry when the veterinarian informs them that they can fix everything ...but if that ever happens you should be thankful that you had an honest vet with the integrity to do the best for your pet.